SPECIFICATIONS

FOR

INDEPENDENCE COUNTY BUILDING RENOVATION

FOR USDA

INDEPENDENCE COUNTY, ARKANSAS

December 2024

MILLER-NEWELL ENGINEERS, INC.
P.O. Box 705
510 Third Street
Newport, AR 72112

WILLIAM M. WAGE, ARCHITECT
5341 S. Irvin Drive
Memphis, TN 38119

M-N 24-025

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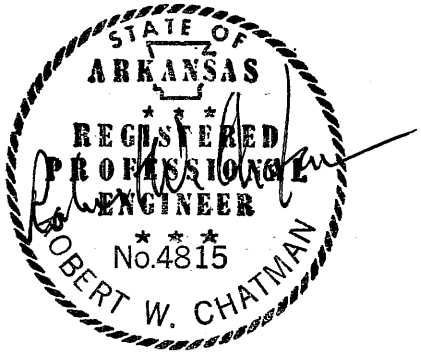

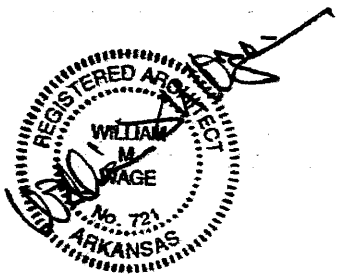

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ADVERTISEMENT FOR BIDS

Separate sealed bids for INDEPENDENCE COUNTY BUILDING RENOVATION FOR USDA, will be received by the Independence County Judge at the Judge's Office, 192 E. Main Street, Batesville, Arkansas, until 11:00 o'clock A.M., on January 30, 2025 and then at said location publicly opened and read aloud.

The Instructions for Bidders, Form of Bid, Form of Contract, Plans, Specifications, Form of Bid Bond, and other Contract Documents may be examined at the following locations:

Miller-Newell Engineers, 510 Third Street, Newport, AR
Dodge Plan Room, (www.dodgeplans.construction.com)
Construction Market Data (www.cmdgroup.com)
Southern Reprographics, 901 West Seventh, Little Rock, AR

Copies of the Contract Documents must obtained at the office of Miller-Newell Engineers, Inc., 510 Third Street, Newport, AR 72112, upon the payment of $50.00 for each set. There shall be no refund of deposit.

A pre-bid meeting will be held at the project building at 1800 Meyers Street, Batesville, Arkansas at 10:00 o'clock A.M. on January 21, 2025. Contractors are encouraged to attend.

The Owner reserves the right to waive any informalities or to reject any or all bids.

Each bidder must deposit with his bid security in the amount, form and subject to the conditions provided in the Information for Bidders.

In accordance with Act 150 of 1965, as amended, all bidders shall conform to the requirements of the Arkansas State Licensing Law for Contractors.

No bidder may withdraw his bid within 60 days after the actual date of the opening thereof.

This Advertisement for Bids is being published by and paid for by the following:

Independence County Judge
Independence County Courthouse
192 E. Main Street
Batesville, AR 72501

The amount of this publication is $_____ .

INDEPENDENCE COUNTY, ARKANSAS
County Judge Kevin Jeffery
Date: January 12, 2025

INSTRUCTIONS TO BIDDERS

1.1 RECEIPT AND OPENING OF BIDS

Independence County, Arkansas (hereinafter called the "Owner"), invites bids on the form attached hereto, all blanks of which must be appropriately filled in. Bids will be received by the Owner at the Independence County Judge's Office, 192 E. Main Street, Batesville, Arkansas, until 11:00 o'clock A.M. on January 30, 2025 and then at said office publicly opened and read aloud. The envelope containing the bid must be sealed; addressed to the Independence County Judge, Independence County Courthouse, 192 E. Main Street, Batesville, AR 72501, and designated as BID FOR INDEPENDENCE COUNTY BUILDING RENOVATION FOR USDA.

The Owner may consider non-responsive any bid not prepared and submitted in accordance with the provisions hereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 60 days after the actual date of the opening thereof.

2.1 PREPARATION OF BID

Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required.

Each bid must be submitted in a sealed envelope bearing the following on the outside: (1) the name and address of the bidder, (2) name of the project for the bid that is submitted and (3) contractor's Arkansas Contractor's License Number. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified above.

Bid prices must be shown for each item in the Proposal. The correct total amount bid for each unit price item is defined as the correct product of the quantity listed for the item and the unit price bid. The correct total amount bid for the complete work is defined as the correct sum total of the amounts bid for the individual items in the Proposal.

It is expressly understood that all quantities stated therein, although given with as much accuracy as is possible in advance, are for the comparison of bids only and that said Owner may increase or decrease the quantities as the conditions of the work and their funds may justify and that any increase or decrease in the quantities will be made at the rates stipulated in the schedule of prices given in the Proposal.

Should the actual quantities required in the construction of the work be greater or less than the quantities shown in the items, an amount equal to the difference in quantities at the unit prices bid for the item will be added to or deducted from the contract price.

3.1 METHOD OF BIDDING

The Owner invites the following bid(s):
BASE BID - SCHEDULE I
BASE BID SCHEDULE I - LESS ALTERNATE NO. 1
BASE BID - SCHEDULE II

4.1 QUALIFICATIONS OF BIDDER

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work; the bidder shall furnish the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids shall not be accepted.

5.1 BID SECURITY

Each proposal must be accompanied by a certified check or by a Bid Bond in an amount equal to not less than five (5) percent of the amount of the Bid to guarantee that the successful bidder will, within ten (10) days from the date of the notice of award of contract, enter into an agreement with the Owner and execute to the Owner a Performance Bond and Payment Bond each equal to 100% of the contract amount; the agreement and bonds to be in the form set forth in the contract documents. If for any reason whatever, the Bidder withdraws from the competition after the bid opening time or refuses to execute the required agreement and bonds if his bid is accepted, the Owner may retain the amount of the certified check or proceed on the Bid Bond. The surety on the Performance Bond and Payment Bond shall be a surety company authorized to do business in the State of Arkansas and shall be countersigned by an agent residing in the State of Arkansas. The bonds and surety thereon shall be subject to approval by the Attorney for the Owner.

6.1 LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the contract and bids required within 10 days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

7.1 TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the Contract within NINETY (90) consecutive calendar days thereafter. Bidder must agree also to pay as liquidated damages the sum of $500.00 for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

8.1 CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor

thereof. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible, the Contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work or any other contractor.

9.1 ADDENDA AND INTERPRETATIONS

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

Every request for such interpretation should be in writing addressed to Miller-Newell Engineers, Inc., at P.O. Box 705, Newport, AR 72112, and to be given consideration must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the contract documents which, if issued, will be mailed by certified mail with return receipt requested or via United Parcel Service with delivery confirmation request to all prospective bidders (at the respective addresses furnished for such purpose), not later than three days prior to the date fixed for the opening of bids. In the alternative, in order to expedite issuance, addenda may be "faxed" to prospective bidders with a hard copy mailed the same date. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents. The bidder must acknowledge receipt of the addenda.

10.1 SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed contract, the Contractor shall furnish separate performance and payment security bonds. One bond as a security for faithful performance of this contract and a second bond as surety for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bonds shall be a duly authorized surety company satisfactory to the Owner.

11.1 POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively-dated copy of their power of attorney.

12.1 LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over the construction of the project shall apply to the contract throughout; they will be deemed to be included in the contract the same as though herein written out in full.

13.1 DETERMINATION OF LOW BID

The contract will be awarded, if it is awarded, to the low, responsible, responsive bidder. The Owner will decide which is the low, responsible, responsive bidder. Responsiveness shall be defined by (a) the completeness and regularity of the Proposal Form, (b) a Proposal Form without exceptions or special conditions, and (c) a Proposal Form having no substitute for any items except as allowed under these specifications. Responsi-bility will be based on whether the bidder involved (a) maintains a permanent place of business; (b) has adequate plant equipment to do the work properly and within the time limit established; (c) has a suitable financial status to meet obligations incident to the work properly and within the time limit established; (d) has appropriate experience; and (e) complies with the various statutory requirements.

14.1 RIGHT TO REJECT BIDS

The Owner reserves the right to reject any or all bids and to waive minor informalities. No bids will be received after the bid opening time. Unauthorized conditions, limitations, insertions, and provisions attached to the Proposal, except as provided herein, will cause its rejection. Unbalanced or tied bids will be subject to rejection.

15.1 RETURN OF BID SECURITY

The Owner will, within ten (10) days following the bid opening, return the bid security of all bidders, except the bid security posted by the three lowest bidders. Upon the award and execution of the contract, the remaining bid securities will be promptly returned.

16.1 OBLIGATION OF BIDDER

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect of his bid.

17.1 SUBCONTRACTS - The Bidder's attention is directed to the General Conditions concerning subcontracts. The Bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract:

A. Must be acceptable to the Owner. Consent will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.

B. Must provide insurance equal to that of the bidding Contractor.

Consent of the proposed subcontract award cannot be given by the Owner unless and until the proposed subcontractor has submitted the Certification and/or other evidence showing that it has fully

complied with any reporting requirements to which it is or was subject. Although the bidder is not required to attach such Certifications by proposed subcontractors to his bid, the Bidder is hereby advised of this requirement so that appropriate action can be taken to prevent subsequent delay in subcontract awards.

BID FOR CONTRACT

PLACE Independence County, Arkansas
DATE _____

Proposal of _____ (hereinafter called "Bidder"), a corporation organized and existing under the laws of the State of _____, a partnership, or an individual doing business as _____.

(*Strike inapplicable phrase).

TO: INDEPENDENCE COUNTY, ARKANSAS
(Hereinafter called "Owner")

GENTLEMEN:

The Bidder, in compliance with your invitation for bids for the furnishing of materials and labor for INDEPENDENCE COUNTY BUILDING RENOVATION FOR USDA, having examined the plans and specifications with the 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, hereby proposed to furnish all materials and supplies in accordance with the Contract Documents, within the time set forth therein, and at the lump sum and unit prices stated below. These prices are to cover all expenses incurred in furnishing the equipment/materials required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within NINETY (90) consecutive calendar days thereafter. Bidder further agrees to pay as liquidated damages, the sum of $500.00 for each consecutive calendar day thereafter as hereinafter provided in Paragraph 34 of the General Conditions.

Bidder acknowledges receipt of the following addendum:

_____

_____

_____

_____

NOTE: **Improvements are being funded by USDA and Independence County. Schedule I is considered Tenant Improvements and is being paid by USDA; Schedule II is considered Shell Improvements and is being paid by Independence County. The total of both Schedules will be used to determine the winning Bidder. Schedules will not be split.**

BID SCHEDULE - SCHEDULE I
USDA Building Construction/Renovation
Independence County, Arkansas

SCHEDULE I - USDA / TENANT IMPROVEMENTS (TI)

	Material				Labor		
DESCRIPTION	QUAN.	UNIT	COST	TOTAL	HOURS	RATE	TOTAL
Division 1 - General Requirements							
Bond & Insurance	0.5	LS					
Mobilization	0.5	LS					
Permits	0.5	LS					
			Total		+ Total		
						Division 1 - Total	
Division 2 - Site Work							
Location Sign	1	EA					
6' Chain Link Fence - Clean Existing Fence	200	LF					
16' Cantilever Gate	1	EA					
Clear Vegetation from Existing Fence	300	SF					
			Total		+ Total		
						Division 2 - Total	

Division 3 - Concrete							
Pipe Column Footings		LS					
			Total		+ Total		
						Division 3 - Total	
Division 5 - Metals							
Pipe Columns	5	EA					
I Beam	35	LF					
Temporary Bar Joist Support		LS					
Steel Studs - Partition Walls		LS					
			Total		+ Total		
						Division 5 - Total	
Division 7 - Thermal & Moisture Protection							
Insulation		LS					
			Total		+ Total		
						Division 7 - Total	
Division 8 - Doors & Windows							
Solid Core Wood Door - Existing Opening	3	EA					
Solid Core Wood Office Doors	8	EA					
18ga Metal Door (ADP Room)	1	EA					

Store Front Aluminum Window & Door	1	EA					
Interior Window	1	EA					
Door Hardware		LS					
Pass Through Window	2	EA					
Threshold Plates		LS					
			Total		+ Total		
						Division 8 - Total	
Division 9 - Finishes							
Paint		LS					
LVT Flooring		LS					
Ceiling with Grid		LS					
Static Dissipative Resilient Tile Floor		LS					
Vinyl Base Board		LS					
			Total		+ Total		
						Division 9 - Total	
Division 10 - Specialties							
Install Fire Extinguishers in Existing Cabinets	2	EA					
Refurbish Fire Alarm System		LS					
Window Blinds		LS					
Signs		LS					

			Total		+ Total		
					Division 10 - Total		
Division 13 - Special Construction							
Cabinets		LS					
ADP Room		LS					
			Total		+ Total		
					Division 13- Total		
Division 15 - General Construction							
Drywall Construction		LS					
			Total		+ Total		
					Division 15 - Total		
Division 22 - Plumbing							
Sink in Break Room	1	EA					
Mop Sink	1	EA					
Water Fountain Hi-Lo	1	EA					
Water Heater		LS					
			Total		+ Total		
					Division 22 - Total		
Division 23 - HVAC							

Replace Registers		LS					
Replace Return Air Grill		LS					
Extend Ducts		LS					
Relocate Thermostat	1	EA					
Reroute Ductwork		LS					
Mini-split AC		LS					
			Total		+ Total		
						Division 23 - Total	
Division 26.1 - Electrical							
Install Receptacles & Circuit		LS					
Install New Sub-Panel		LS					
Lighting Circuits		LS					
Conference Room Floor Junction Box Panel & Communication		LS					
			Total		+ Total		
						Division 26.1 - Total	
Division 27 - Communications, Security & Other Electrical Systems							
Telephone Outlets & Circuits		LS					
Data Outlets & Circuits		LS					
			Total		+ Total		

					Division 27 - Total		
Division 28.2 - Building Security							
Panic Buttons (Wireless)	6	EA					
Alarm/Disarm Keypad	2	EA					
Motion Sensors	4	EA					
Door Contact Switches	6	EA					
Emergency Lock Down		LS					
Door Chime	1	EA					
Call Chime	2	EA					
			Total		+ Total		
					Division 28.2 - Total		
					SCHEDULE I - TOTAL BASE BID COST		

SCHEDULE I - WRITTEN IN WORDS: _____

_____

_____

ALTERNATE NO. 1 :

DELETE Aluminum Store Front - 1 EA $_____

ADD Modify Glass for Entry Door - 1 EA $_____

Total Deduction $_____

TOTAL BASE BID w/ ALTERNATE NO. 1 $_____

WRITTEN IN WORDS: _____

_____

_____

BID SCHEDULE - SCHEDULE II
USDA Building Construction/Renovation
Independence County, Arkansas

SCHEDULE II - INDEPENDENCE COUNTY / SHELL COSTS

	Material				Labor		
DESCRIPTION	QUAN.	UNIT	COST	TOTAL	HOURS	RATE	TOTAL
Division 1 - General Requirements							
Bond & Insurance	0.5	LS					
Mobilization	0.5	LS					
Permits	0.5	LS					
			Total		+ Total		
						Division 1 - Total	
Division 2 - Demolition							
General/Walls/Doors/Etc.		LS					
HVAC Registers, Return Air Grill		LS					
Electrical - Abandon Unused Circuits		LS					
Flooring		LS					
Lay in Ceiling System		LS					
Light Fixtures		LS					
Tipping Fee & Dumpster Rental		LS					

			Total			+ Total	
						Division 2 (Demolition) - Total	
Division 2 - Site Work							
Mark Parking		LS					
Seal Coat Existing Paving	1445	SY					
Pour 6' Wide Sidewalk	132	SF					
Class-7 Base Course	100	CY					
			Total			+ Total	
						Division 2 - Total	
Division 3 - Concrete							
Sidewalk Repair	50	SF					
Sidewalk	115	SF					
Pad for Access to Roof Ladder	25	SF					
			Total			+ Total	
						Division 3 - Total	
Division 5 - Metals							
Ladder Access to Roof	1	EA					
			Total			+ Total	
						Division 5 - Total	

Division 9 - Finishes							
Ceramic Flooring		LS					
			Total			+ Total	
						Division 9 - Total	
Division 10 - Specialties							
Tissue Dispensers	3	EA					
Paper Towel Dispensers	2	EA					
HCP Mirror	2	EA					
HCP Bars	6	EA					
Toilet Partitions	3	EA					
			Total			+ Total	
						Division 10 - Total	
Division 22 - Plumbing							
Supply Piping		LS					
Drainage Piping		LS					
Water Closet	2	EA					
Urinal	1	EA					
Vent Piping		LS					
Lavatory	2	EA					

			Total		+ Total		
						Division 22 - Total	
Division 23 - HVAC							
Replace Return Air Filters	2	EA					
			Total		+ Total		
						Division 23 - Total	
Division 26.1 - Electrical							
Exterior Lighting Circuits		LS					
Verify Continuity in Circuits		LS					
Replace Wire Nuts		LS					
			Total		+ Total		
						Division 26.1 - Total	
Division 26.2 - Lighting							
Relocate Exit Signs	2	EA					
Room Lighting Fixtures		LS					
Exterior Pole & Light	3	EA					
			Total		+ Total		
						Division 26.2 - Total	
						SCHEDULE II - TOTAL BASE BID COST	

SCHEDULE II - WRITTEN IN WORDS:_____

_____

_____

TOTAL BASE BID OF SCHEDULE I & TOTAL BASE BID SCHEDULE II: _____$_____

WRITTEN IN WORDS:

_____

_____

_____

TOTAL BASE BID (LESS ALTERNATE NO. 1) OF SCHEDULE I
& TOTAL BASE BID SCHEDULE II: _____$_____

WRITTEN IN WORDS:

_____

_____

_____

In submitting this bid, it is understood that the right is reserved by the Owner to reject any or all bids. No bid shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of the Owner.

Upon receipt of written notice of the acceptance of this bid, Bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by Paragraph 22 of the General Conditions

The Bid Security attached in the sum of _____ _____ Dollars ($_____) 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 and additional expense to the Owner caused thereby.

Bidder agrees to list the names of the proposed separate subcontractors for work as provided for on the proposal form. Bidder shall also submit the amount of subcontractors for the types of work in a separate envelope to be opened only in the event of substitution of a subcontractor.

Respectfully submitted:

_____

By:_____

_____
(Title)

(SEAL - if bid is by a

_____ corporation)

_____
(Business Address & Zip Code)

_____
Contractor's Arkansas License No.

_____
Contractor's Telephone Number

BID BOND

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

_____, as Principal, and _____, as Surety, are held and firmly bound unto _____

_____, as Owner, in the penal sum of _____

_____Dollars ($_____), for payment of which sum well and truly to be made, we hereby jointly and severally bind ourselves, our successors and assigns.

SIGNED this _____ day of _____, 2025.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal has submitted to _____ a certain BID, attached hereto and made a part hereof, to enter into a contract in writing for the construction of:

INDEPENDENCE COUNTY BUILDING RENOVATION FOR USDA

NOW, THEREFORE,

(a) If said BID shall be rejected, or

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

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

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

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

_____
Principal

_____
Surety

By:_____

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

CONTRACT

THIS AGREEMENT, made and entered into this ____ day of _____, 2025, by and between the INDEPENDENCE COUNTY, ARKANSAS, hereinafter called "Owner," and _____, a corporation, of _____, Arkansas, hereinafter called "Contractor."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the Owner, the Contractor hereby agrees with the Owner to commence and complete the construction described as follows:

INDEPENDENCE COUNTY BUILDING RENOVATION FOR USDA

for Independence County, Arkansas, hereinafter called the project, for the sum of _____ Dollars ($_____) and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his (its or their) own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, Supplemental General Conditions and Special Conditions of the Contract, the plans, which includes all maps, plats, blueprints, and other drawings and printed or written explanatory matter thereof, the specifications and contract documents therefore as prepared by MILLER-NEWELL ENGINEERS, INC., NEWPORT, ARKANSAS, herein entitled the Engineer, all of which are made a part hereof and collectively evidence and constitute the contract.

The Contractor hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within Ninety (90) consecutive calendar days thereafter. The Contractor further agrees to pay, as liquidated damages, the sum of $500.00 for each day thereafter as hereinafter provided in the General Conditions.

The Owner agrees to pay the Contractor in current funds for the performance of the contract, subject to additions and/or deductions, as provided in the General Conditions, and to make payments on account thereof as provided in Paragraph 33, "Payments to Contractor," of the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this Contract in six (6) counterparts, each of which shall be deemed an original, on the day and year first above mentioned.

INDEPENDENCE COUNTY ARKANSAS
Owner

(SEAL)
ATTEST:

By:_____

_____ _____
Title

_____
Title

_____
Contractor

(SEAL)
ATTEST:

By:_____

_____ _____
Title Title

_____

_____
Business Address

NOTE: Secretary of the Owner should attest. If Contractor is a corporation, Secretary should attest.

ARKANSAS PERFORMANCE AND PAYMENT BOND
(14-604 Arkansas Statutes)

KNOW ALL MEN BY THESE PRESENTS, that we _____, a _____, hereinafter called "Principal" and _____, _____, of _____, hereinafter called the "Surety," are held and firmly bound unto _____, _____, hereinafter called "Owner," in the penal sum of _____ _____Dollars ($_____) in lawful money of the United States, for payment of which sum well and truly to be made, said principals and surety bind themselves, their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 2025 a copy of which is attached and made a part hereof, for the construction of:

INDEPENDENCE COUNTY BUILDING RENOVATION FOR USDA

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms and conditions, and agreement of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, and shall promptly make payment to all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, all amounts due for but not limited to, materials lubricants, oil, gasoline, coal and coke, repair on machinery, equipment and tolls, consumed or used in connection with the construction of said work, fuel oil, camp equipment, food for men, feed for animals, premium for bonds and liability and worker's compensation insurance, rentals on machinery, equipment and draft animals; also for taxes or payments due the State of Arkansas or any political subdivisions thereof which shall have arisen on account of or in connection with the wages earned by workmen covered by the bond; and for all labor, performing in such work whether by subcontractor or otherwise, then this obligation shall be void, otherwise to remain in full force and effect.

The Surety agrees the terms of this bond shall cover the payment by the Principal of not less than the prevailing hourly rate of wages as found by the Arkansas Department of Labor or as determined by the court on appeal to all workmen performing work under the contract.

PROVIDED, FURTHER, THAT THE SAID surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the

terms of the contract or to the work to be performed thereunder of the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract as 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 execution in six (6) counterparts, each of which shall be deemed an original, this _____ day of _____, 2025.

_____
Principal

ATTEST: By:_____

_____ _____
Secretary Address

_____ _____
Witness as to Principal

_____
Address

_____
Surety

ATTEST: By:_____
Attorney-In-Fact

_____ _____
Secretary Address
(SEAL)

_____

_____ _____
Witness

_____
Address

NOTE: (1) Date of Bond must not be prior to date of Contract.
(2) This bond must be filed with the Circuit Clerk of the County where the work is to be performed prior to the start of construction.

GENERAL CONDITIONS

1. DEFINITIONS

   A. The "Contract Documents" consist of the Advertisement for Bids, the Information for Bidders, the Proposal Form, the General Conditions, the Agreement of Contract, the Contract Bond, the Specifications and the Approved Plans, including all modifications to any of the above documents incorporated therein before their execution. All of these form the Contract.

   B. The "Owner" is understood to mean the individual for whom the work is being done.

   C. The "Engineer" is understood to mean the Registered Professional Engineer, registered in Arkansas, employed by the Owner to carry out the conditions of this contract. The Engineer is the duly authorized representative of the Owner. Where the term "Architect/Engineer" is used it is intended to mean "Engineer" and does not mean to imply the Engineer is an Architect.

   D. The "Work Order" or "Notice to Proceed" is the Contractor's authority to begin the work. It shall designate the day on which working time shall commence. The work order shall be deemed to have been delivered when mail to the Contractor at the address given in the Proposal. When a Contractor begins work before a work order is issued, his time begins on the day he commences.

   E. The term "Subcontractor," as employed herein, includes only those having direct contact with the Contractor and it includes one who furnished material worked to a special design according to the plans or specifications, but does not include one who merely furnishes material so worked.

   F. The term "Work," includes labor or material or both, equipment, or other facilities necessary to complete the work.

2. CONTRACTOR'S UNDERSTANDING OF CONDITIONS OF WORK

   It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this contract. No verbal agreement or conversation with any officer, agent or employee of the Owner, either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

3. MATERIALS, APPLIANCES, EMPLOYEES

   Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power and

transportation and other facilities necessary for the execution and completion of the work.

Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence, such as test reports, as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

4. ROYALTIES AND PATENTS

The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible when a particular process or product of a particular manufacturer is specified, but if the Contractor has information that the process or article specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer in writing.

5. SURVEYS, PERMITS AND REGULATIONS

The Engineer will provide the Contractor with the bench mark and alignment as may be necessary for the Contractor to layout the work correctly. The finished work must conform to the bench marks furnished by the Engineer.

The Owner shall furnish all right-of-way, easements and sites for the construction.

The Contractor shall furnish all permits and licenses required by law.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the plans and specifications are at variance therewith, he shall promptly notify the Engineer in writing and proper changes or adjustments shall be made in accordance with the contract provisions for changes in the work.

6. PROTECTION OF WORK AND PROPERTY

The Contractor shall continuously maintain adequate protection of all his work from damages and shall protect the Owner's property from injury of loss arising in connection with the work. He shall make good any such damage, injury or loss, except such as may be due directly to errors in the Contract Documents or caused by agents or employees of the Owner. He shall protect all private property adjacent to the work. He shall provide and maintain all passage ways, guard fences, lights and other facilities for protection required by law or local conditions.

The Contractor is hereby authorized to act in an emergency affecting loss of life or property without special authorization from the Engineer. Any compensation claimed by the Contractor on account of emergency work shall be determined by agreement or arbitration.

7. INSPECTION OF WORK AND TESTING OF MATERIALS

Inspection shall be provided by a representative of Miller-Newell Engineers, Inc. The Engineer, and his representatives, shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide proper facilities for such access and inspection.

The Contractor shall furnish to the Engineer certified laboratory testing on all material to be used on the project.

No work or preparation for work shall be covered up without consent of the Engineer. If such work is covered up, without consent of the Engineer, the Contractor, if required by the Engineer, shall uncover such work for examination and replace it at his own expense.

Re-examination of approved work may be ordered by the Engineer and if so ordered, the work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the Owner shall pay the cost of the reexamination and replacement. If such work is found not to be in accordance with the Contract Documents, the Contractor shall pay such cost, unless he shall show that the defect in the work was caused by another Contractor and, in that event, the Owner shall pay such cost.

8. SUPERINTENDENCE AND SUPERVISION

The Contractor shall keep on his work during its progress a competent superintendent and any necessary assistants, all satisfactory to the Engineer. The Superintendent shall not be changed without the consent of the Engineer, unless he proves to be unsatisfactory to the Contractor and ceases to be in his employ. The Superintendent shall represent the Contractor in his absence and instructions and directions given to him shall be binding on the Contractor. Important decisions shall be confirmed to the Contractor in writing.

If the Contractor, in the course of the work, finds any discrepancy between the plans and the physical conditions of the locality, or any errors of omissions in the drawings or in the layout as given by prints and instructions, it shall be his duty to immediately inform the Engineer, in writing, and the Engineer shall promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk.

9. CHANGES IN THE WORK

The Owner, without invalidating the Contract, may order extra work or make changes by altering, adding or deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract, except that

any claim for extension in time caused thereby shall be adjusted at the time of ordering such change.

In giving instructions, the Engineer shall have the authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purpose of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Engineer, and no claim for an addition to the Contract sum shall be valid unless so ordered.

The value of any such extra work or changes shall be determined in one or more of the following ways:

A. By estimate and acceptance in a lump sum;

B. By unit prices named in the Contract or subsequently agreed upon;

C. By cost and percentage or by cost and a fixed fee.

If none of the above methods is agreed upon, the Contractor, provided he receives an order as above, shall proceed with the work. He shall keep an accurate account of the cost of labor and materials, pending final determination of the value of the work.

10. CLAIMS FOR EXTRA COST

If the Contractor claims that any instructions in the plans or otherwise involves any extra cost under this contract, he shall give the Engineer written notice thereof within a reasonable time after the receipt of such instructions and, in any event, before proceeding to execute the work, except in an emergency endangering life or property. No such claims shall be valid unless so made.

11. DEDUCTIONS FOR UNCORRECTED WORK

If the Engineer deems it inexpedient to correct work injured or not done in accordance with the Contract, an equitable deduction from the Contract price shall be made therefore.

12. DELAYS AND EXTENSION OF TIME

If the Contractor be delayed at any time in the progress of the work by an act or neglect of the Owner or of his employees or by any other contractor employed by the Owner or by changes ordered in the work or by strikes, lockouts, fire, unusual delay in transportation, unavoidable casualties or any causes by the Engineer pending arbitration, or by any cause which the Engineer shall decide justifies the delay, then the time of completion shall be extended for such reasonable time as the Engineer may decide.

No such extension shall be made for delay occurring more than seven days before claim therefor is made in writing to the Engineer. In the case of the continuing cause of delay, only one claim is necessary.

This article does not exclude recovery of damages for delay by either party under provisions of the Contract Documents.

13. CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor shall promptly remove from the premises all materials condemned by the Engineer as failing to conform to the Contract, whether incorporated in the work, or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the Owner and shall bear all the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work and materials within a reasonable time, fixed by written notice, the Owner may remove them and may store the materials at the expense of the Contractor.

14. SUSPENSION OF WORK

The Owner may at any time suspend work, or any part thereof, by giving five days written notice to the Contractor. The work shall be resumed by the Contractor within ten days after the date fixed by the written notice from the Owner to the Contractor to do so. The Owner shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this contract as a result of such suspension.

But, if the work or any part thereof shall be stopped by the notice in writing aforesaid, and if the Owner does not give in writing notice to the Contractor to resume the work at a date within thirty days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work so suspended and he will be entitled to the estimates and payment for all work done on the portions so abandoned.

15. THE OWNER'S RIGHT TO DO WORK

If the Contractor should neglect to prosecute the work or fail to perform any of the provisions of this Contract, the Owner, after three days written notice to the Contractor, may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

16. THE OWNER RIGHT TO TERMINATE THE CONTRACT

If the Contractor should be adjudged a bankrupt, or he should make a general assigned for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or fail to make prompt payment to his subcontractors or for material or labor, or if he should persistently or repeatedly refuse or should fail, except in cases for which time is provided, to supply enough skilled workmen or proper materials, or if he should persistently disregard laws, ordinances

or the instructions of the Engineer, or otherwise be guilty of a substantial violation of any provision of the contract, then the Owner, upon the certification of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy and after giving the Contractor seven (7) days notice in writing, terminate the employment of the Contractor and take possession of the premises and all materials, tools and appliances thereon and finish the work by whatever method he may deem expedient. In such cases, the Contractor will not be entitled to any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expense of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided, and the damage incurred through the Contractor's default, shall be certified by the Engineer.

17. THE CONTRACTOR'S RIGHT TO TERMINATE THE CONTRACT

If the work should be stopped under the order of any court, or other public authority, for a period of three months, through no act or fault of the Contractor or of anyone employed by him, or if the Engineer should fail to issue any estimate for payment seven days after it is due, or if the Owner should fail to pay the Contractor within seven (7) days of its maturity and presentation, any sum certified by the Engineer or awarded by arbitrators, then the Contractor may, upon seven (7) days written notice to the Owner and the Engineer, stop the work or terminate this contract and recover from the Owner payments for all work executed and any loss sustained upon any plant or materials and reasonable profit and damages.

18. PAYMENTS WITHHELD

The Owner may withhold or, on account of subsequently discovered evidence, nullify whole or a part of any certificate to such extent as may be necessary to protect himself from loss on account of:

A. Defective work not remedied;

B. Claims or reasonable evidence that claims will be filed;

C. Failure of the Contractor to pay all bills properly;

D. A reasonable doubt that the Contractor can finish work on time; or

E. Damage to another contractor.

When the above grounds are removed, payment shall be made for the amounts withheld because of them.

19. CONTRACTOR'S LIABILITY INSURANCE

The Contractor shall maintain such insurance as will protect him for

claims under the Worker's Compensation Act and from other claims for damages for personal injury, including death, which may arise from operations under this Contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them. Certificates of insurance for liability and property damage shall be filed with the Engineer before the work is started and shall be subject to his approval for adequacy of protection.

As required above, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than $500,000.00 for injuries, including accidental death, to any one person, and subject to the same limit for each person, and in an amount not less than $500,000.00 on account of one accident, and Contractor's property damage insurance in an amount not less than $500,000.00.

The insurance certificate must contain the following verbiage: **"The insurance covered by this certificate will not be canceled or materially altered except after ten (10) days prior written notice has been received by the Owner."**

The Contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraphs, or (2) insure the activities of his subcontractors in his own policy.

20. INDEMNITY

The Contractor shall indemnify and save harmless the Owner from and against all losses and all claims, demands, suits, actions, recoveries and judgments of every nature and description brought or recovered against him by reason of any act or omission of the said Contractor, his agents or employees, in the execution of the work or in the guarding of it.

The Contractor shall, and is hereby authorized to, maintain and pay for such insurance, issued in the name of the Owner, as will protect the Owner from his contingent liability under this Contract, and the Owner's right to enforce against the Contractor any provisions of this article shall be contingent upon the full compliance by the Owner with terms of such insurance or policies, a copy of which shall be deposited with the Owner.

21. FIRE INSURANCE AND BUILDERS RISK INSURANCE

The Contractor shall secure in the name of the Owner, policies for fire insurance and builders risk insurance in the amount, form and from companies satisfactory to the Engineer, upon such structures and materials as shall be specified by the latter, payable to the Owner for the benefit of the Contractor or the Owner as the Engineer shall find their interest to appear.

22. GUARANTY BONDS

The Contractor shall furnish the Owner, where stipulated in the advertisement for bids, with a performance bond covering the faithful performance on the contract and payment of all obligations arising thereunder, in such form as the Owner may prescribe and with surety company or companies as the Owner may approve.

23. DAMAGES

Any claims for damages arising under this Contract shall be made in writing to the party liable within a reasonable time of the first observance of such damage and not later than the time of final payment, except as expressly stipulated by agreement or arbitration.

24. LIENS

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens arising out of this contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he had knowledge or information, the releases and receipts include all the labor and material for which the lien could be filed; but the Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Engineer, to indemnify the Owner against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all costs and a reasonable attorney's fee.

25. ASSIGNMENT

Neither party to the contract shall assign the contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to him hereunder without the previous written consent of the Engineer.

26. SEPARATE CONTRACTS

The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

27. SUBCONTRACTS

The Contractor shall, as soon as practicable after the signature of the contract, notify the Engineer in writing the names of the subcontractors proposed for the work and shall not employ any of the subcontractors that the Engineer may object to as incompetent or unfit.

The Contractor agrees that he is fully responsible to the Owner for

all work or omissions of his subcontractors, either directly or indirectly employed by him. Nothing in this contract shall create any contractual relations between the subcontractor or the Owner.

28. POINTS AND INSTRUCTIONS

The Contractor shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

29. ENGINEER'S STATUS

The Engineer shall observe the execution of the work. He has the authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the Contract. He shall also have the authority to reject all work and materials which do not conform to the contract, to direct application of the forces to any part of the work, as in his judgment is required, and to order the force increased or diminished, and to decide questions which arise in the execution of the work.

30. ENGINEER'S DECISIONS

The Engineer shall, within a reasonable time after their presentation to him, make decisions in writing on all claims of the Owner or Contractor and on other matters relating to the execution and progress of the work or the interpretation of the Contract Documents.

All such decisions of the Engineer shall be final except in cases where time and/or financial considerations are involved, which, if no agreement in regard thereto is reached, shall be subject to arbitration.

31. LANDS FOR WORK

The Owner shall provide the lands upon which the work under this Contract is to be done, except that the Contractor shall provide land required for the erection of temporary construction facilities and storage of his materials, together with right of access to same.

32. CLEANING UP

The Contractor, as directed by the Engineer, shall remove from the Owner's property and from all public and private property, at his own expense, all temporary structures and construction facilities, rubbish and waste materials resulting from his operations.

33. PAYMENTS TO CONTRACTOR

At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor will submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the work performed during the period covered by

the partial payment estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Owner, as will establish the Owner's title to the material and equipment and protect his interest therein, including applicable insurance. The Engineer will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Owner will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The Owner shall retain five (5) percent of the amount of each payment until final completion and acceptance of all work covered by the Contract Documents. When the work is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages, less authorized deductions.

The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

This Contract is a unit price contract. The Contractor will only be paid for the amount of material installed.

34. TIME OF COMPLETION - LIQUIDATED DAMAGES

The work shall be commenced at the time stipulated in the Notice to Proceed to the Contractor and shall be fully completed within ninety (90) consecutive calendar days thereafter.

As actual damages for any delay in completion are impossible to determine, the Contractor and his sureties shall be liable for and shall pay to the Owner the sum of $500.00 per day as fixed and agreed liquidated damages for each calendar day of delay until the work is completed and accepted.

35. SAFETY STANDARDS AND ACCIDENT PREVENTION

With respect to all work performed under this Contract, the Contractor shall:

A. Comply with the safety standards provisions of applicable laws, building and construction codes, and the Manual of Accident Prevention in Construction: published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596 and the

requirement of Title 29 of the Code of Federal Regulations, Section 1518 as published in the Federal Register, Volume 36, No. 75, Saturday, April 17, 1971), and specifically OSHA's Standard for Excavation and Trenches Safety Systems, 29 CFR Part 1926, Subpart P.

B. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.

C. Maintain at his office or other well-known place at the job site, all articles necessary for giving first aid to the injured and shall make standing arrangements for the immediate removal to a hospital or doctor's care of persons (including employees) who may be injured on the job site.

SUPPLEMENTAL GENERAL CONDITIONS

REFERENCE DOCUMENT: These Supplemental General Conditions are included as a part of the Contract Documents for this project to supplement and/or amend the standard provisions of the General Conditions.

36. EXECUTION, CORRELATION, INTENT AND INTERPRETATIONS

Section 2 of the General Conditions is hereby supplemented as follows: The Drawings and Specifications are intended to agree and to be mutually explanatory. Should any discrepancy exist and not be clarified by addendum prior to bid opening, it will be presumed that the Contractor has based his proposal on the more expensive of the conflicting requirements. Before proceeding with any part of the work, Contractor shall report any such discrepancy to the Engineer, who shall rule on which of the conflicting requirements is to be followed. If the least expensive is directed, the Contractor shall refund to the Owner the difference in net cost.

Explanatory notes on Drawings shall be preferred to conflicting drawn out indications, if any. Large scale details will be preferred to small scale drawings, and figured dimensions to scale measurements. Where figures are lacking, scale measurements may be followed, but in all cases the measurements are to be checked from work in place, and should variations be found, such must be referred to the Engineer for instructions. Where on any of the Drawings a portion of work is drawn out and remainder is indicated in outline, the parts drawn out shall apply also to all other like portions of the work. Where the word "similar" occurs on Drawings, it shall be interpreted in its general sense and not as meaning identical, and all details shall be worked out in relationship to their location and their connection with other parts of the work.

37. PROTECTION AGAINST THEFT

Contractor shall take such precautions as he deems necessary to protect himself and the Owner from loss by theft. Contractor shall be responsible for the recovery or replacement of all materials or equipment lost by reason of theft during the entire course of the work, even though payment for same may have been received.

38. TOILET FACILITIES

General Contractor shall furnish, install and maintain ample sanitary facilities for workmen, including those of other contractors. Toilets shall be placed where indicated on the site as soon as work begins. They shall be housed in temporary enclosures and shall be maintained in a sanitary condition. They shall be removed from the premises upon completion of the work. They shall comply with all regulations of governmental agencies having jurisdiction.

39. GUARANTY

The Contractor shall guarantee all materials and equipment furnished and work performed for a period of one (1) year from the date of substantial completion. The Contractor warrants and guarantees for a period of one (1) year from the date of substantial completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects, including the repairs of any damage to other parts of the system resulting from such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

SECTION 02700

CLASS-7 AGGREGATE BASE COURSE

PART 1.00 - GENERAL PROVISIONS

1.1 DESCRIPTION

A. This work shall include the installation of aggregate base course for the apron.

PART 2.00 - MATERIALS

2.1 BASE COURSE

A. Crushed Stone Base. This material shall consist of crushed run stone or a mixture of crushed stone and natural fines uniformly mixed and so proportioned as to meet all the requirements hereinafter specified, with the further provision that a mixture of crushed stone and natural fines shall contain not less than 90 percent crusher produced material. The stone shall be hard and durable with a percent of wear of 45 by Los Angeles Test (AASHTO T 96). For the purpose of this specification, shale and slate are not considered to be stone. The material furnished shall not contain more than 5 percent by weight of shale, slate and other deleterious matter.

The class or classes of crushed stone base course material that may be used on any particular job will be those called for on the proposed schedule.

GRADING REQUIREMENTS

Size of Sieve	Percent Passing Class-7 SB-2
1 1/2"	100
1"	60-100
3/4"	50-90
No. 4	25–55
No. 40	10-30
No. 200	3-10

The fraction passing the No. 200 sieve shall not be greater than two-thirds the fraction passing the No. 40 sieve. The fraction passing the No. 40 sieve shall have a liquid limit not greater than 25 and a plasticity index of not greater than 6.

When it is necessary to blend two or more materials, each material shall be proportioned separately through mechanical feeders to insure uniform production. Premixing or blending in the pit to avoid separate feeding will not be permitted. Blending materials on the roadway in order to obtain a mixture that will comply with the above requirements will not be permitted.

PART 3.00 - APPLICATION

3.1 APPLICATION

A. Crushed Stone Base Construction. The base course material shall be placed on a completed and approved subgrade or existing base that has been bladed to conform to the grade and cross section shown on the plans.

The subgrade shall be prepared as specified and shall be free from an excess or deficiency of moisture at the time of placing the base course. The subgrade shall also comply, where applicable, with the requirements of other items that may be contained in the contract that provide for construction, reconstruction or shaping of the subgrade or the reconstruction of the existing base course.

Base course material shall not be placed on a frozen subgrade or subbase.

The crushed stone gravel shall be placed on the subgrade or other base course material and spread uniformly to such depth and lines that when compacted it will have the thickness, width and cross-section shown on the plans.

If required, the compacted depth of the base course exceeds six inches (6"), the base shall be constructed in two or more layers of approximate equal thickness. The maximum compacted thickness of any one layer shall not exceed six (6) inches. When vibrating or other approved type of special compacting equipment is used, the compacted depth of a single layer of the base course may be increased to 8 inches upon approval.

The spreading shall be done the same day that the material is hauled and it shall be performed in such manner that no segregation of coarse particles or nests or hard areas caused by dumping the gravel on the subgrade will exist. To insure proper mixing, the gravel shall be bladed entirely across the roadbed before being spread. Care must be taken to prevent mixing of subgrade or shoulder material with base course material in the blading and spreading operation.

Each course shall be compacted by any satisfactory method that will produce the density as required.

The compacted base course shall be tested for depth and any deficiencies corrected by scarifying, placing additional material, mixing, reshaping, and recompacting to specified density, as directed.

The Contractor shall maintain the base course in a satisfactory condition until accepted.

3.2 TESTING

A. The base material shall be compacted to 95% modified Proctor and within 2% of optimum moisture. Testing shall be provided and paid for by the contractor. If in-house testing is available then the contractor may use in-house personnel and equipment. All tests to comply with the latest ASTM or AASTHO standards. Two density tests shall be taken on the apron base course. Copies of the test results shall be provided to the Engineer. Testing shall be witnessed by the project inspector.

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specified cast-in-place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.

B. Concrete paving and walks are specified in Division 2.

C. Precast concrete is specified in Division 3 Sections.

D. Mechanical finishes and concrete floor toppings are specified in other Division 3 Sections.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by the Architect/Engineer.

C. Shop drawings for reinforcement, prepared for fabrication, bending and placement of concrete reinforcement, showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:

1. ACI 318, "Building Code Requirements for Reinforced Concrete."
2. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."

B. Concrete Testing Service: Engage a testing laboratory acceptable to Architect/Engineer to perform material evaluation tests and do design concrete mixes.

C. Materials and installed work may require testing and retesting at any time during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.

D. Pre-Construction Conference: Conduct conference at project site to comply with requirements of Division 1 Section "Project Meetings" and to be attended by the following:

1. Contractor's superintendent.
2. Laboratory responsible for field quality control.
3. Ready-mix concrete producer.
4. Concrete subcontractor.
5. Architect, Engineer, or Owner's representative.

PART 2 – PRODUCTS

2.1 FORM MATERIALS

A. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

B. Form Ties: Factory-fabricated, adjustable length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to exposed surface.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Supports for Reinforcement: Bolsters, chairs, spacers, and other devises for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

1. Use one brand of cement throughout project unless otherwise acceptable to Architect/Engineer.

B. Normal Weight Aggregates: ASTM C 33 and as herein specified. Provide aggregates from a single source for exposed concrete.

1. Local aggregates not complying with ASTM C 33 but that special tests or actual service have shown to produce concrete of adequate strength and durability may be used when acceptable to Architect/Engineer.

C. Water: Drinkable.

D. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

2.4 RELATED MATERIALS

A. Vapor Retarder: Provide vapor retarder cover over prepared base material where indicated below slabs on grade. Use only materials that are resistant to deterioration when tested in accordance with ASTM E 154, as follows:

1. Polyethylene sheet not less than 8 mils thicks.

B. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.

1. Available Projects: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

"Aquafilm," Conspec Marketing and Mfg. Co.
"Eucobar," Euclid Chemical Co.
"E-Con," L & M Construction Chemicals, Inc.
"Confilm," Master Builders, Inc.

C. Expansion joints in concrete slabs shall be 1 x 4 or 2 x 4 Redwood lumber.

D. Expansion joints using 1 x 4 Redwood shall be constructed with a 1 / 2" x 3 / 4" reservoir for sealant. The joints shall be sealed with Throseal Caulking, as manufactured by Sonneborne.

2.5 PROPORTIONING AND DESIGN OF MIXES

A. Submit written reports to Architect/Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by Architect/Engineer.

B. Design mixes to provide normal weight concrete with the following properties, as

indicated on drawings and schedules.

1. 3000 psi, 28 day compressive strength; W/C ratio 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained); with a minimum cement of 470# per cu.yd.

2. 4000 psi, 28 day compressive strength; with a minimum cement of 560# per cu.yd.

C. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect/Engineer. Laboratory test data for revised mix design and strength results must be submitted to an accepted by Architect/Engineer before using in work.

2.6 ADMIXTURES

A. Use water-reducing admixture or high-range water-reducing admixture (Superplasticizer) in concrete as required for placement and workability.

B. Use non-chloride accelerating admixture in concrete slabs at ambient temperatures below 50 deg. F (10 deg C).

C. Use high-range water-reducing admixture (HRWR) in pumped concrete, concrete for industrial slabs, architectural concrete, parking structures slabs, concrete required to be watertight, and concrete with water/cement rations below 0.50.

D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within following limits:

1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure: 6.0 percent (sever exposure) 3/4-inch max. aggregate.

2. Other concrete (not exposed to freezing, thawing, or hydraulic pressure) or to receive a surface hardener: 2 percent to 4 percent air.

E. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.

1. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:

Subjected to freezing and thawing: W/C 0.45.
Subjected to deicers/watertight: W/C 0.40.

Subjected to brackish water, salt spray or deicers: W/C 0.40.

F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing HRWR admixture (Superplasticizer): Not more than 8 inches after addition of HRWR to site-verified 2-inch to 3-inch slump concrete.
4. Other Concrete: Not more than 4 inches.

G. Fly ash is not acceptable as a substitute for cement.

2.7 CONCRETE MIXING

A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as specified.

1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL

A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

3.2 FORMS

A. General: Design, erect, support, brace, and maintain form work to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Construct form work so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain form work construction tolerances complying with ACI 347.

B. Construct forms to sizes, shapes, lines and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, recesses, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.

D. Provisions for Other Trades: Provide openings in concrete form work to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

E. Cleaning & Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten forms and bracing before concrete placement as required to prevent mortar leaks and maintain proper alignment.

3.3 VAPOR RETARDER/BARRIER INSTALLATION

A. General: Following leveling and tamping of granular base for slabs on grade, place vapor retarder/ barrier sheeting with longest dimension parallel with direction of pour.

B. Lap joints 6 inches and seal vapor barrier joints with manufacturer's recommended mastic and pressure-sensitive tape.

C. After placement of vapor retarder/barrier, cover with sand cushion and compact to depth as shown on drawings.

3.4 PLACING REINFORCEMENT

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as herein specified.

1. Avoid cutting or puncturing vapor retarder during reinforcement placement and concreting operations.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bong with concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect/ Engineer.

D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at lease one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect/Engineer.

B. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as otherwise indicated. Do not continue reinforcement through sides of strip placements.

C. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

3.6 INSTALLATION OF EMBEDDED ITEMS

A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.7 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.

B. General: Comply with ACI 304, "Recommended Practice of Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.

C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete to avoid segregation at its final location.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding

layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.

2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Bring slab surfaces to correct level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

3. Maintain reinforcing in proper position during concrete placement.

F. Cold-Weather Placing: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

G. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and mot more than 80 deg F (27 deg C) at point of placement.

1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

2. Do not us calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

H. Hot-Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Mixing water may be chilled, or chapped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

3. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.

4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, when acceptable to Architect/ Engineer.

3.8 MONOLITHIC SLAB FINISHES

A. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other film finish coating system.

1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of Ff20 - F1 17. Grind smooth surface defects that would telegraph through applied floor covering system.

B. Trowel and Fine Broom Finish: Sidewalks shall receive trowel and fine broom finish.

3.9 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

C. Curing Methods: Perform curing of concrete by curing and sealing compound, by

moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.

D. Provide moisture curing by following methods.

1. Keep concrete surface continuously wet by covering with water.

2. Use continuous water-fog spray.

3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.

E. Provide moisture-cover curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

F. Provide curing and sealing compound to exposed interior slabs and to exterior slabs walks, and curbs as follows:

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and

associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled.

3.11 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect/Engineer.

1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar before bonding compound has dried.

B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repairs to satisfaction of Architect/Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections of surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry-pack mortar, or precast cement cone plugs secured in place with bonding agent.

1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope.

1. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.

2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.

3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect/Engineer.

4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

3.12 QUALITY CONTROL TESTING DURING CONSTRUCTION.

A. General: Employ a testing laboratory to perform tests and to submit test reports.

B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect/Engineer.

C. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM D 94.

1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method of normal weight concrete; one for each day's pour of each type of air-entrained concrete.

3. Concrete Temperature: Test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27deg C) and above, and each time a set of compression test specimens is made.

4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.

5. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. more than the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

6. When frequency of testing will provide fewer than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

D. Test results will be reported in writing to Architect, Structural Engineer, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect/Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

SECTION 05120

STRUCTURAL STEEL

PART 1.00 - GENERAL

1.1 CONDITIONS

A. Requirements of the conditions of the Contract apply to all work under this Section.

1.2 SCOPE

A. Extent. The work required under this section consist of furnishing and installation of all structural steel and related items as necessary to make the work complete in every respect and related items necessary to complete the work indicated on the drawings and described in this specification, including, but not necessarily limited to the following:

1. Base plates, beams, girders, columns, trusses, open web steel joists, struts, hangers, bracing, brackets, angles, channels, stiffeners, separators, plates, clips, supports for steel deck at column beams and connections, bolts, connections, welding filler metal and electrodes.

2. Anchor bolts leveling plates, bearing plates and other items of structural steel required to be built into concrete or masonry, as indicated or specified, shall be furnished to the respective trades at the proper time with instructions, or templates, or both, for installation.

3. All structural steel members shall have assigned positions and identification mark or symbol, plainly indicated thereon near one end, which marks shall agree with those given on the shop drawings relating to or calling for the members.

B. Related Work. The following items of related work are specified and included in other sections of these specifications:

1. Prefabricated Metal Buildings & Components
2. Reinforcing Steel for Concrete
3. Miscellaneous Metal
4. Metal Doors, Frames and Thresholds
5. Grout Under Base Plates and Bearing Plates.
6. Touch-Up and Finish Painting

1.3 REQUIREMENTS OF REGULATORY AGENCIES

A. The Contractor shall, at all times, keep available at the site for reference the following codes, standards and specifications which are hereby made a part of this section, subject to the qualifications therein.

1. Southern Standard Building Code.
2. American Institute of Steel Construction, "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings."
3. American Institute of Steel Construction, "Code of Standard Practice for Steel Bridges and Buildings."
4. American Welding Society, "Code for Welding in Building Construction."
5. Industrial Fasteners Institute, "Handbook on Bolt, Nut and Riven Standards."
6. American Institute of Steel Construction, "Specifications for Structural Joints Using ASTM A325 or A490 Bolts."
7. Steel Structures Painting Council, "Painting Manual, Vol. 1, Good Painting Practice," and Painting Manual, Vol. 2, Systems and Specifications."
8. Steel Joist Institute, "Standard Specifications."

NOTE: Substitute the words "Architect/Engineer or his authorized representative" for "Building Official" or similar title of person charged with enforcement in all referenced specifications, etc.

B. All referenced codes, standards and specifications shall be of the latest issue in effect on date of invitation to submit proposal.

C. Any material or operation specified by reference to the published specifications of a manufacturer, The American Society for Testing Materials (ASTM), The American Institute of Steel Construction (AISC), or other published standard, shall comply with the standard listed. In case of conflict between the referenced specifications, etc., the one having the most stringent requirement shall govern. In case of conflict between any of the referenced specifications, etc., the project specifications, or the drawings, the most stringent requirement shall govern.

D. Unless otherwise noted, when compliance with the referenced specifications, etc., is specified for materials or a manufacturer or fabricated product, the Contractor shall furnish the Engineer with an affidavit from the manufacturer or fabricator certifying that the material or product delivered to the project meets the requirements of the Contract Documents.

1.4 INSPECTION, TESTING AND CONTROL

A. An independent inspection service, hereafter called the Inspector, approved by and under the supervision of the Engineer, will be selected and paid by the Contractor.

B. The materials and workmanship to be furnished under this section shall be subject to inspection in the mill, shop, and field by the Engineer or the Inspec-

tor. Such inspection shall not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with the requirements of the Contract Documents.

C. Certified copies in triplicate, of mill test reports, including names and locations of mills and shops and analysis of chemical and physical properties, of steel to be used on this project shall be submitted to the Engineer before delivery to the job site.

D. Manufacturer's certification in triplicate, of bolts, nuts, and filler metal for welding shall be submitted to the Engineer when requested by the Engineer.

E. Qualifications of high strength bolting procedures and operations shall be as specified under "Erection" in this section, and the following:

1. Each bolting crew working on the project shall be assigned an identification symbol or mark. Each bolting crew shall mark this identification on each joint worked.

2. The Inspector shall supervise, and keep appropriate records thereof, daily on-site calibration of all impact wrenches to be used in the actual installations.

3. Calibration of each impact wrench shall consist of tightening, in a hydraulic tension-measuring device, furnished by the Contractor, three bolts of the same size to be used, with a hardened washer under either the bolt head or nut, whichever is turned in tightening.

4. The Inspector shall use a manual torque-indicator wrench, furnished by the Contractor, to determine the torque-tension relationship for every combination of impact wrench and bolt size to be used in the work for the day. These torque values shall be used as the inspection standard in testing the actual installations.

5. The Inspector may require additional calibration whenever deficiencies occur.

F. Qualifications of welders and welding procedures and operations shall be as prescribed in "Standard Qualification Prodecure" of the American Welding Society.

1. All welding operators shall be qualified to perform the type of work required, except that this provision need not apply to tack welds not later incorporated into finished welds carrying calculated stress. Shop welding operators continuously employed as welders may be accepted on the basis of satisfactory reports dated not more than two years prior to award of this contract. All others must be requalified. Welding operators qualified

on the job shall use equipment that will be used during construction, under the direct supervision of the Inspector.

2. All welding operators working on the project shall be assigned an identification symbol or mark. Each welder shall mark or stamp his identification symbol on each weldment completed.

3. The Contractor shall maintain records of test results of welding procedures and records of welders employed, date of qualification, and identification symbol or mark. Such records shall be available for examination by the Engineer or Inspector, or certified copies submitted upon request, to the Engineer or Inspector.

G. The Inspector shall inspect and test (as required by the Engineer) all welded and bolted work.

H. Weldments and bolted connections that are required by the Inspector to be corrected, shall be corrected or redone as directed, at the Contractor's expense and to the satisfaction of the Inspector.

I. The Contractor shall notify the Engineer and Inspector five (5) days prior to the shipment of any structural steel so that a paint inspection can be made. At these inspections the dry mil thickness of the paint film will be checked. Also, all steel containing mill scale that can easily be removed with the blade of a pocket knife will be subject to recleaning and repainting at the expense of the Contractor.

J. Any material or workmanship which is rejected by the Engineer or Inspector, either in the mill, shop or field, shall be replaced promptly by the Contractor, at the Contractor's expense, to the satisfaction of the Engineer or the Inspector.

K. The fact that steel work has been accepted at the shop shall not prevent its final rejection at the job site, or even after it has been erected, if it is found to be defective in any way.

1.5 SUBMITTALS

A. Shop Drawings. Submit six copies of shop drawings of all items specified herein to the Engineer for approval in accordance with requirements described in the General Conditions. Obtain Engineer's approval of shop drawings in writing prior to proceeding with manufacturing.

1. To receive consideration by the Engineer, all drawings shall be accompanied by a letter of transmittal and each drawing shall contain the following information in the title block:

(a) Project identification

(b) Engineer's name
(c) Date of preparation or submission, and of revision if applicable
(d) Drawing number
(e) Contractor and subcontractor's names
(f) Names of person or firm preparing drawings
(g) Statement or stamp of approval by the Contractor which shall be deemed to certify that he has seen and examined it and that all requirements of the General Conditions have been complied with. The wording of this stamp shall be subject to the Engineer's approval.

2. Shop drawings shall be numbered consecutively and drawings relating to various units comprising a proposed assembly shall be submitted simultaneously so that said units may be checked individually and as an assembly.

3. Shop drawings shall clearly indicate all details, sectional views, arrangements, working and erection dimensions, kinds and quality of materials and their finishes, and other information necessary for the proper checking and for fabrication and installation of the items, and shall include all information required for making connections to other work.

4. If any information on previously submitted shop drawings, besides the notations made by the Engineer, is revised in any way, such revisions must be circled or otherwise brought to the Engineer's attention. If approved drawings are subsequently revised, they must be resubmitted tothe Engineer with all revisions clearly brought to the Engineer's attention. Whenever drawings are revised, the latest revisions shall be rung up in a manner to distinguish them clearly from all previous revisions (and from the information on the original drawing).

5. If a shop drawing as submitted indicates a departure from the contract requirements which the Engineer deems to be in the Owner's interest, and to be so minor as not to involve a change in the contract price, or time for completion of the work, he may approve such drawing.

6. The Contractor shall be responsible for obtaining and distributing copies of approved shop drawings to his subcontractors and material suppliers needing the information, at no additional cost to the Owner.

7. Contractor shall keep on the site, in good order, a complete up to date set of all approved shop drawings.

8. Prepare erection drawings, detailed shop drawings and schedules, properly cross-referenced, checked and coordinated with other parts of the construction. Submit shop drawings in reasonable sequences and quantities allowing not less than two weeks for checking by the Engineer.

9. These drawings shall include all information necessary for the fabrication and erection of the component parts of the structure. They shall indicate distinguishing marks; type of steel; dimensions; size and weight of members; location and size of slots and holes; type and location of shop and field connections; type, size and extent of all welds; joint welding procedures; welding sequence; and painting requirements. The welding symbols used shall be as adopted by the American Welding Society.

10. Except as otherwise noted, the approval of shop drawings will be for size and arrangement of principal and auxiliary members and strength of connections. Any error in dimensions shown on the shop drawings shall be the responsibility of the Contractor.

11. Fabrication of any material or performance of any work shall not proceed until the shop drawings have been approved by the Engineer.

PART 2.00 - PRODUCTS

2.1 MATERIALS

A. Structural steel shall conform to ASTM A36, unless otherwise noted. Steel plates and bars shall conform to ASTM A284.

B. High strength steel bolts shall conform to ASTM A325 and ASTM A490.

C. Anchor bolts shall conform to ASTM A307.

D. Shear connectors and concrete stud anchors shall be headed 3/4" diameter studs or anchors, formed from cold finished low carbon steel conforming to ASTM A108, grade 1015 and 1020, containing a non-corroding flux, or approved equal.

E. Filler Metal for Welding.

1. Shielded metal-arc welding. Welding electrodes shall conform to the E60 or #70 series of ASTM A233.

2. Submerged arc welding in Gradw SAW-1 or Grade SAW-2.

3. In all cases, the welding electrodes and the filler metal shall be compatible with the steel to be welded.

F. Paint.

1. "Tnemec No. 99-G Green Metal Primer" by Tnemec Company, North

Kansas City, Missouri.

2. "DuPont 7771 Red Lead Primer" by DuPont DeNemours & Co., of Wilmington, Delaware.

3. "Rust-Oleum, 769 Damp-Proof Red Primer" by Rust-Oleum Corp., of Evanston, Illinois.

4. Approved equal.

2.2 FABRICATION

A. Applicable standards.

1. Except as otherwise indicated on the drawings or specified, the fabrication of structural steel shall be in accordance with AISC specifications.

2. Fabrication of open-web steel joist, H-Series and LH-Series, shall be in accordance with the AISC and Steel Joist Institute Specifications.

B. Provisions for attachment of other materials. Punch and drill steel for attachment of wood nailers and other materials indicated on the drawings or noted in the specifications to be attached to the steel.

C. Connections. End connections for beams, seated or framed, shall have a minimum capacity equal to the greater of the end reactions produced by either the total live and dead loads carried by the beam or a full uniform load stressing the beam to 24 ksi. In no case thall framed connections be less than those shown in Table I, Framed Beam Connections, of the current AISC manual. Connections for channels shall be the same as for beams of equal strength. Minimum size of bolts shall be 3/4" diameter high strength bolts, unless shown otherwise. Provide 3/4" web stiffeners for beams wherever they frame over columns or other supports. End moment and shear connections for end girders and trusses shall be designed for the moments and shears given on the structural drawings. The design details where shown on the structural drawings shall be strictly followed. All work shall conform to the applicable requirements of the specifications.

D. Shop Connections. Shop connections shall be welded or friction-type high strength bolted, installed by the turn-of-nut method, unless otherwise indicated. Filler beams shall have framed or seated beam connections using 3/4 inch diameter bolts, except as otherwise approved by the Engineer, fasteners in accordance with the requirements of the AISC "Manual of Steel Construction." Field connecitons for filler beams may be made with 3/4 inch diameter A-307 bolts.

E. Welding.

1. Quality control and qualification of welding procedures and operations shall be as specified under "Inspection, Testing and Control" in this section.

2. Shop welding shall be done by either shielded metal-arc welding or submerged arc welding.

3. All groove welds shall be complete penetration welds unless otherwise noted on the drawings.

4. Where structural joints are required to be welded, the details of all joints, the technique of welding employed, the appearance and quality of welds made, and the methods used in correcting defective work shall conform to the applicable requirements of the specifications.

5. The Contractor shall prepare joint welding procedures for all welded joints which shall be approved by the Engineer before any wleding is done. After approval, these welding procedures shall be followed without deviation unless specific approval for change is obtained from the Engineer.

6. The Contractor shall submit to the Engineer for approval a complete program of sequence of welding for each component and for welding joining components to each other. After approval, the welding sequence shall be followed without deviation unless approval for change is obtained from the Engineer.

F. Oxygen Cutting. Manual oxygen cutting shall be done only with a mechanically guided torch. Alternatively, an unguided torch may be used provided the cut is not within 1/2 inch of the finished dimension and the final removal is completed by chipping or grinding to produce a surface quality equal to that of the base metal edges. The use of oxygen cut holes for bolted connections will not be permitted. Components prepared in this manner will be rejected.

G. Openings in Structural Steel:

1. Additional openings required shall be provided at unit prices to be quoted by the Contractor.

2. No cutting of openings differing from or in addition to that shown on the drawings will be permitted without the written approval of the Engineer.

3. All openings shall be cut and reinforced by the structural steel contractor only.

PART 3.00 - EXECUTION

3.1 UNLOADING AND HANDLING

A. Handle and stack all materials carefully to prevent deformation or damage. Store all structural steel members carefully on substantial timiers and blocking so arranged that the steel will be free from the earth and properly drained, preventing any spattering with dirt or accumulation of water in or about the steel. Take care to prevent damage to the shop coat of paint and to prevent the accumulation of mud, dirt, or other foreign matter on the steel. Such accumulation shall be completely removed prior to erection.

3.2 ERECTION

A. Applicable Standards.

1. Except as otherwise indicated on the drawings or specified, the erection of structural steel shall be in accordance with the AISC specifications.

2. Erection of open web steel joists, H-Series and LH-Series shall be in accordance with AISC and Steel Joist Institute Specifications.

B. Method of Erection. Prior to starting work, the Contractor shall submit to the Engineer a description of the methods, sequence of erection, and type of equipment he proposes to use for erecting the structural steel work. This submission or approval shall not relieve the Contractor of his responsibility for providing the proper methods, equipment, workmanship, or safety precautions.

C. Temporary Floors. All temporary flooring, planking, and scaffolding necessary in connection with the erection of the structural steel, or the support of erection machinery, shall be provdided as a part of the erection work. The temporary floors shall be as required by Arkansas laws and governing safety regulations.

D. Field Connections. All field connections shall be welded or friction-type high strength bolted installed by the "modified turn-of-nut" method unless otherwise noted. Filler beams shall have framed or seated beam connections using 3/4 inch diameter, except as otherwise approved by the Engineer, high strength bolts in accordance with the requirements of the AISC "Manual of Steel Construction." Field connections for filler beams may be made with 3/4 inch diameter A-307 bolts.

E. High Strength Steel Bolts.

1. Installation shall be performed by using pneumatic powered impact wrenches with sufficient capacity and an adequate supply of compressed air.

2. Installation shall be performed in accordance with the turn-of-nut method outlined in the AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts," with the following modifications:

   (a) Use a hardened washer under either the bolt head or nut, whichever is turned in tightening.

   (b) Qualification of high strength bolting procedures and operation shall be as specified under "Inspection, Testing, and Control" in this section.

3. Joints shall be made without the use of erection bolts, the high strenth bolts required for the joint serving that purpose themselves.

F. Welding.

1. Field welding shall be executed in accordance with all the requirements under "Fabrication" in this section, excepting those requirements which manifestly apply to shop conditions only.

2. All field welding shall be done by manual shielded metal-arc welding only.

G. Oxygen Cutting. Oxygen cutting of steel in the field shall be executed in accordance with the requirements under "Fabrication" in this section.

H. Openings in Structural Steel. Openings through structural steel required in the field shall be executed in accordance with the requirements under "Fabrication" in this section.

I. Setting Plates. Column base plates, beam bearing plates, and leveling plates shall be set level to correct elevations and temporarily supported on steel wedges, shims, or as indicated by the drawings, until the supported members have been positioned, plumbed, anchor-bolted and grouted. The entire area under the plates shall be packed solidly with a non-shrink grout as specified in the "Concrete" section. Leveling devices shall be left in place until after the grout has attained the required strength, and then cut off flush with the top or edge of the base plate, or both.

J. Templates. Furnish templates for all anchor bolts. The Contractor shall furnish instructions for the setting of anchors and bearing plates and shall ascertain that the items are properly set during the progress of the work.

K. Framing. The framing shall be carried up true and plumb and temporary bracing shall be introduced whenever necessary to take care of all loads to which the structure may be subjected, including erection equipment and its operation. Such bracing shall be left in place as long as may be required for safety. It shall

finally be removed by the Contractor as part of his equipment. As erection progresses, the work shall be securely connected to take care of all dead load, wind, and erection stresses. Temporary bracing as required by OSHA shall be furnished and installed.

L. Cleaning Up. As erection progresses, remove all unneeded materials, rubbish, etc, and leave all surfaces in a condition as required by following or adjacent trades.

3.3 PAINTING

A. Applicable Standards. Except as otherwise indicated on the drawings or specified herein, the painting of structural steel shall be in accordance with the AISC specificatoins.

B. Steel to be Painted.

1. Unless specifically excluded, all structural steel shall receive one shop coat of primer paint.

2. Surfaces inaccessible after fabrication or creation shall receive two coats of primer paint. Second coat to be tinted a different color.

3. Thoroughly clean all steel to be painted of all loose mill scale, dirt and foreign matter.

C. Steel to be Left Unpainted.

1. Steel members and portions of members to be encased in concrete.

2. Surfaces to receive welded shear connectors and metal subfloor fastened by welding.

3. Contact surfaces (e.g. high strength bolted connections).

4. Surfaces requiring paint shall be painted only to within two inches of any field weld. If, for any reason, the surface to be field welded is painted, such paint shall be completely removed in the shop to within the stated limits before field welding.

5. After fabrication, the steel work referred to above shall be cleaned of oil or grease by solvent cleaners and be cleaned of dirt and other foreign material with a stiff fiber brush.

6. Finished surfaces. Machine finished surfaces (e.g. bearing surfaces of columns) shall be protected against corrosion by a rust-inhibiting coating that can be easily removed prior to erection or which has characteristics

that make removal unnecessary prior to erection.

D. Shop Painting.

1. After steel has been properly prepared as specified above, apply primer paint to dry steel surfaces in accordance with manufacturer's instructions by brush, spray or roller, assuring no running or sagging.

2. The coverage rate per coat shall not be more than 400 square feet per gallon, shall result in a wet film thickness of four (4) mils and shall provide a dry film thickness of two (2) mils.

3. Inspection of shop painting shall be as specified under "Inspection, Testing and Control" in this section.

E. Certification. The Contractor shall furnish the Engineer with certification that the requirements pertaining to shop painting have been performed as specified.

F. Touch-up.

1. After erection, clean and touch up field connections, bare spots, abrasions, and other surfaces required to be painted. Field connections shall not be painted until after inspection and approval by the Engineer.

2. Use the same type of paint as used for the shop coat, but tinted to a different color.

3. Paint for touch up painting shall be supplied to the painting contractor under this section.

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Wood blocking, cants and nailers
B. Plywood backing panels

1.2 SUBMITTALS

A. Material Certificates as applicable:
   1. Preservative treated wood.
   2. Metal framing anchors.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS LUMBER

A. Provide No. 2 Southern Yellow Pine or approved substitution for the following:
   1. Blocking
   2. Nailers
   3. Equipment bases and support curbs
   4. Cants
   5. Furring
   6. Grounds

2.2 PLYWOOD BACKING PANELS

A. Exterior, AC in thickness indicted, if not indicated, not less than ½ inch.

2.3 METAL FRAMING ANCHORS

A. Manufacturers:
   1. Simpson Strong-Tie Co., Inc. or approved equal.

B. For interior locations unless otherwise indicated use Hot-Dipped, zinc-coated Galvanized-Steel Sheet

C. For wood-preservative-treated lumber use Hot-Dipped, Heavy-galvanied Steel Sheet.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line and fitted.

B. Install Engineered Wood Products in compliance with manufacturer's written instructions and recommendations.

C. Install metal framing anchors and connectors in compliance with manufacturer's written instructions.

D. Apply field treatment to cut surfaces of preservative-treated materials.

3.2 PROTECTION

A. Protect all treated and untreated lumber from weather.

B. Protect installed material and systems from damage during following construction procedures.

SECTION 06 20 00

FINISH CARPENTRY

PART 1. GENERAL

1.1 CONDITIONS

A. Requirements of the conditions of the Contract apply to all work under this Section.

1.2 SCOPE

A. Related work specified elsewhere includes:

1. Furnishing metal doors and frames
2. Furnishing finish hardware
3. Rough Carpentry

1.3 ABBREVIATIONS

A.S.T.M. - American Society for Testing and Materials
A.W.I. - Architectural Woodwork Institute
P.S. - Product Standards
F.S. - Federal Specifications
D.F.P.A. - Douglas Fir Plywood Association

1.4 SUBMITTALS

A. Submit complete shop drawings for all items to be furnished by this Section.

B. Submit affidavits verifying conformance with flame spread rating indicated herein.

1.5 ENVIRONMENTAL CONDITIONS

A. Millwork items shall not be placed on the job site until building has dried out and 60 degrees F. minimum temperature is maintained.

PART 2.00 - PRODUCTS

2.1 MATERIALS

A. Softwood plywood shall conform to PS 1-66, Interior Type, Group 1, grade A-A

veneers.

B. Particle board shall be Duraflake, Novaply or Flakeboard, medium density.

C. Plastic laminate shall be 1/16" solid color, Formica, Wilson Art or Nevamar, solid color and finish as selected by the Engineer.

D. Plastic laminate adhesive shall be as required for AWI premium grade work.

E. Rough hardware and fasteners shall be good commercial quality as required for secure anchorage.

PART 3.00 EXECUTION

3.1 INSTALLATION

A. Doors and frames shall be set square, plumb, true to line and so that doors will operate without binding according to manufacturer's recommendations.

E. Finish hardware shall be installed without injuring other work and so that hardware works exactly as intended.

F. Millwork and counters shall be set level, plumb, square and secure. Replace surfaces damaged during installation.

SECTION 08 14 16

FLUSH LAMINATE CLAD WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with plastic-laminate faces.

1.2 SUBMITTALS

A. Product Data: For each type of door.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.

1.3 QUALITY ASSURANCE

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A ARCHITECTURAL WOOD FLUSH DOORS."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Graham Wood Doors
2. Mohawk Doors
3. Masonite.

2.2 PLASTIC-LAMINATE-FACED DOORS

A. Interior Solid-Core Doors:

1. Grade: Premium..
2. Plastic-Laminate Faces: Hight-pressure decorative laminates complying with NEMA LD 3
3. Colors, Patterns, and Finishes: Masonite Rolled Oats color or as selected by Owner from laminate manufacturer's full range of products.
4. Exposed Vertical Edges: Plastic laminate that matches faces..
5. Core: Manufacturer's standard..

2.3 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Openings: Cut and trim openings through doors in factory.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 08 Section "Glazing."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

B. Align in frames for uniform clearance at each edge.

C. Protect installed doors during remaining construcdtion operations..

SECTION 08 11 13

STEEL FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Steel frames.

1.2 RELATED SECTIONS

A. Section 08 14 16 - Flush Laminate Clad Wood Doors.

B. Section 08 71 00 - Door Hardware.

C. Section 09 21 16 - Gypsum Board Assemblies.

D. Section 09 22 00 - Non-structural metal framing.

E. Section 09 29 00- Gypsum Board Assemblies.

1.3 REFERENCES

A. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 1998.

B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames.

C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998.

D. ANSI A250.11, Recommended Erection Instructions for Steel Frames.

E. ASTM A 366/A 366M - Standard Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled; 1997.

F. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-coated (Galvannealed) by the Hot-Dip Process; 1998.

G. ASTM E-90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

H. DHI A115.1G - Installation Guide for Doors and Hardware; 1994.

1.4 SUBMITTALS

A. Required submittals are to be submitted to Architect/Engineer through the

General Contractor/Construction Manager.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Include schedule identifying each unit, with door marks or numbers referencing drawings. Show layout, profiles, product components and anchorages.

D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

E. Closeout Submittals: Provide manufacturers maintenance instructions that include recommendations for periodic checking and adjustment of cable tension and periodic cleaning and maintenance of all railing and infill components.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five years documented experience manufacturing products specified this Section.

B. Installer Qualifications: Minimum five years documented experience installing products specified this Section.

C. All products shall conform to the requirements of ANSI A250.8, "SDI 100 Recommended Specifications for Standard Steel Doors and Frames".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Handle, store and protect products in accordance with the manufacturers printed instructions and ANSI/SDI A250.10 and NAAMM/HMMA 840.

B. Store frames in an upright position with heads uppermost under cover. Place on 4 inch (102 mm) high wood sills to prevent rust and damage. Store assembled frames five units maximum in a stack with 2 inch (51 mm) space between frames to promote air circulation.

C. Do not store under non-vented plastic or canvas shelters.

D. Remove wrappers immediately if they become wet.

1.7 SEQUENCING

A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Republic Doors and Frames an Allegion Brand, which is located at: 11819 N. Pennsylvania St.; Carmel, IN 46032; Toll Free Tel: 888-868- 8943; Email: request info (contactus@allegion.com); Web: www.republicdoor.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 MATERIALS

A. Uncoated Steel Sheet: Cold rolled commercial steel sheet complying with ASTM A 366/A 366M.

2.3 FRAMES

A. Frames: Formed steel sheet, with 2 inch (50 mm) wide face jambs and heads unless otherwise indicated; complying with ANSI A250.8.
   1. Frame Depth: Fixed, as indicated on drawings.
   2. 16 gage (1.5 mm) frames.
   3. Material: Cold Roll steel sheet.
   4. Corners: Mitered; face welded and ground smooth.
   5. Provide 3 silencers for single doors, 2 silencers on head of frame for pairs of doors.
   6. Finish: Factory prime finish.

B. Reinforcements for Frames:
   1. Hinge, Strike and Closer: Manufacturer's standard.

C. Frame Anchors: Minimum of six wall anchors and two base anchors. Provide with an additional anchor for every 30 inches (760 mm) over 90 inches (2286 mm).

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that substrate conditions are acceptable for installation of doors and frames in accordance with manufacturer's installation instructions and technical bulletins.

C. Verify door frame openings are installed plumb, true, and level.

D. Select fasteners of adequate type, number, and quality to perform intended functions.

E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install frames plumb, level, rigid and in true alignment in accordance with ANSI A250.11, "Recommended Erection Instructions for Steel Frames" and ANSI A115.IG, "Installation Guide for Doors and Hardware".

C. All frames other than slip-on types shall be fastened to the adjacent structure to retain their position and stability. Drywall slip-on frames shall be installed in prepared wall openings, and shall use pressure type and sill anchors to maintain stability.

D. Where grouting is required in masonry installations, frames shall be braced or fastened to prevent the pressure of the grout from deforming the frame members. Grout shall be mixed to provide a 4 inch (102 mm) maximum slump and hand troweled into place. Grout mixed to a thin "pumpable" consistency shall not be used.

E. Install doors to maintain alignment with frames to achieve maximum operational effectiveness and appearance. Adjust to maintain perimeter clearances as required. Shim as needed to assure the proper clearances are achieved.

F. Install hardware as specified in Section 08 71 00 in accordance with the hardware manufacturer's recommendations and templates. ANSI A115.IG, "Installation Guide for Doors and Hardware" shall be consulted for other pertinent information.

3.4 CLEARANCES

A. Clearance between the door and frame head and jambs for both single swing and pairs of doors shall be 1/8 inch (3.2 mm).

B. Clearance between the meeting edges of pairs of doors shall be 3/16 inch plus or minus 1/16 inch (5 mm plus or minus 1.6 mm). For fire rated applications, the clearance between the meeting edges of pairs of doors shall be 1/8 inch plus or minus 1/16 inch (3.2 mm plus or minus 1.6 mm).

C. Bottom clearance shall be 3/4 inch (19 mm). (Standard)

D. The clearance between the face of the door and door stop shall be 1/16 inch to 1/8 inch (1.6 mm plus or minus 3.2 mm).

E. All clearances shall be, unless otherwise specified, subject to a tolerance of plus or minus 1/32 inch (.4 mm).

3.5 ADJUSTING AND CLEANING

A. Adjust doors for free swing without binding.

B. Adjust hinge sets, locksets, and other hardware. Lubricate using a suitable lubricant compatible with door and frame coatings.

C. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions before owner's acceptance.

D. Remove from project site and legally dispose of construction debris associated with this work.

3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Door hardware for doors specified in "Hardware Sets" and required by actual conditions. Include screws, bolts, expansion shields, electrified door hardware, and other devices for proper application of hardware.

B. Products supplied but not installed under this Section:
   1. Hardware for aluminum doors will be furnished under this Section, but installed under Division 08 Openings.
   2. Electrified hardware will be furnished under this Section, but installed by the security contractor.
   3. Final replacement of cylinder cores shall be installed by Owner.
   4. Hold open wall magnets.

1.2 RELATED DIVISIONS

A. Division 08 - Openings.

1.3 REFERENCES

A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI): All applicable

B. International Code Council/American National Standards Institute (ICC/ANSI)/ADA:
   1. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities 2003.
   2. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities 2009.
   3. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

C. Underwriters Laboratories, Inc. (UL):
   1. UL 10C Positive Pressure Fire Test of Door Assemblies.
   2. UL 1784 Air Leakage Test of Door Assemblies.
   3. UL/ULC Listed.

D. Door and Hardware Institute (DHI): All applicable.
   1. DHI Publication - Keying Systems and Nomenclature (1989).
   2. DHI Publication - Abbreviations and Symbols.
   3. DHI Publication - Installation Guide for Doors and Hardware.
   4. DHI Publication - Sequence and Format of Hardware Schedule (1996).

E. National Fire Protection Agency (NFPA): All applicable.
   1. NFPA 70 National Electrical Code.
   2. NFPA 80 Standard for Fire Doors and Other Opening Protective's.
   3. NFPA 101 Life Safety Code.

F. Building Codes
   1. 2012 AFPC Arkansas Fire Prevention Code.
   2. Local Building Code.

1.4 SUBMITTALS

A. Submit in accordance with Conditions of the Contract and provisions of Section 01 30 00 - Administrative Requirements.

B. Shop Drawings: Hardware schedule shall be organized in vertical format illustrated in DHI Publications Sequence and Formatting for the Hardware Schedule. Include abbreviations and symbols page according to DHI Publications Abbreviations and Symbols. Complete nomenclature of items required for each door opening as indicated
   1. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of hardware.
   2. Architectural Hardware Consultant (AHC), as certified by DHI, who shall affix seal attesting to completeness and correctness, shall review hardware schedule prior to submittal.

C. Submit manufacturer's catalog sheet on design, grade and function of items listed in hardware schedule. Identify specific hardware item per sheet, provide index, and cover sheet.

D. Coordination: Distribute door hardware templates to related divisions within fourteen days of receiving approved door hardware submittals.

E. Maintenance Tool and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, removal and replacement of door hardware.

F. Closeout Submittals: Submit to Owner in a three ring binder or CD if requested.
   1. Warranties.
   2. Maintenance and operating manual including list of maintenance tools.
   3. Maintenance service agreement.
   4. Record documents.
   5. Copy of approved hardware schedule.
   6. Copy of approved keying schedule with bitting list.
   7. Door hardware supplier name, phone number and fax number.

1.5 QUALITY ASSURANCE

A. Hardware supplier shall employ an Architectural Hardware Consultant (AHC) as certified by DHI and a member of the seal program who shall be available at reasonable times during course of work for Project hardware consultation.

B. Door hardware shall conform to ICC/ANSI A117.1. Handles, Pulls, Latches, Locks and operating devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.

C. Door hardware shall be certified to ANSI/BHMA standards as noted, participate and be listed in BHMA Certified Products Directory.

D. Pre-installation Meeting: Comply with requirements in Division 1 Section "Project Meetings".
   1. Convene meeting seven days before installation. Participants required to attend:
   2. Contractor, installer, material supplier, manufacturer representatives, electrical contractor, security consultant and fire alarm consultant.
   3. Include in conference decisions regarding proper installation methods and procedures for receiving and handling hardware.
   4. Review sequence of operation for each type of electrified door hardware, inspect, and discuss electrical roughing-in and other preparatory work performed by other trades.
   5. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

E. Within fourteen days of receipt of approved door hardware submittals contact Owner with representative from hardware supplier to establish a keying conference. Verify keyway, visual key identification, number of master keys and keys per lock. Provide keying system per Owners instructions.

F. Installer Qualifications: Specialized in performing installation of this Section and shall have five years minimum documented experience.

G. Hardware listed in Par.: Hardware Schedule is intended to establish a type and grade.

1.6 DELIVERY, STORAGE AND HANDLING

A. Provide a clean, dry and secure room for hardware delivered to Project but not yet installed.

B. Furnish hardware with each unit marked and numbered in accordance with approved finish hardware schedule. Include door and item number for each type of hardware.

C. Pack each item complete with necessary parts and fasteners in manufacturer's original packaging.

D. Deliver permanent key, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to Owner shall be established at "Keying Conference."

E. Waste Management and Disposal: Separate waste materials for reuse or recycling in accordance with Division 1.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

A. General Warranty: Owner may have under provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by Contractor under requirements of the Contract documents.

B. Special Warranty: Warranties specified in this article shall not deprive Owner of other rights. Contractor, hardware supplier, and hardware installer shall be responsible for servicing hardware and keying related problems.
   1. Ten years for manual door closers.
   2. Five years for mortise, auxiliary and bored locks.
   3. Five years for exit devices.

C. Products judged defective during warranty period shall be replaced or repaired in accordance with manufacturer's warranty at no cost to Owner. There is no warranty against defects due to improper installation, abuse and failure to exercise normal maintenance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Hager Companies, which is located at: 139 Victor St.; St. Louis, MO 63104; Toll Free Tel: 800-325-9995; Tel: 314-772-4400; Fax: 800-782-0149; Email: request info (bwilkins@hagerco.com); Web: www.hagerco.com

B. Requests for substitutions will be considered.

2.2 HINGES

A. Hinges shall be of one manufacturer as listed for continuity of design and consideration of warranty and shall be certified and listed by the following:
   1. Butts and Hinges: ANSI/BHMA A156.1
   2. Template Hinge Dimensions: ANSI/BHMA A156.7
   3. Self-Closing Hinges: ANSI/BHMA 156.17

2.3 LOCKS AND LATCHES

A. Locks and latches shall be of one manufacturer as listed for continuity of design and consideration of warranty.

2.4 EXIT DEVICES (GRADE 1)

A. Acceptable Manufacturer: Hager Companies, which is located at: 139 Victor St.; St. Louis, MO 63104; Toll Free Tel: 800-325-9995; Tel: 314-772-4400; Fax: 800-782-0149; Email: request info (bwilkins@hagerco.com); Web: www.hagerco.com
   1. Hager Companies: 4500/4600 Series.

2.5 CYLINDERS AND KEYING

A. Cylinders shall be of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Manufacturer shall meet the following:
   1. Auxiliary Locks: ANSI/BHMA A156.5
   2. DHI Handbook "Keying systems and nomenclature" (1989)

C. Cylinders:
   1. Manufacturer's standard tumbler type, seven-pin IC core and seven-pin conventional core supported by the Hager H1 keyway.
   2. Shall be furnished with cams/tailpieces as required for locking device that is being furnished for project.

D. Keying:
   1. Copy of Owners approved keying schedule shall be submitted to Owner and Architect with documentation of which keying conference was held and Owners sign-off.
   2. Provide a bitting list to Owner of combinations as established, and expand to twenty five percent for future use or as directed by Owner.
   3. Key into Owner's existing keying system if applicable.
   4. Keys to be shipped to Owner's representative, individually tag per keying conference.
   5. Provide visual key control identification on keys.
   6. Provide interchangeable cores with construction cores as required per hardware schedule.
   7. Single seven-pin key shall operate both conventional cores and SFIC small format interchangeable cores.

E. Acceptable Manufacturer: Hager Companies, which is located at: 139 Victor St.; St. Louis, MO 63104; Toll Free Tel: 800-325-9995; Tel: 314-772-4400; Fax: 800-782-0149; Email: request info (bwilkins@hagerco.com); Web: www.hagerco.com
   1. Hager Companies: 3900 Series H1 keyway.

2.6 CLOSERS

A. Shall be product of one manufacturer. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendation for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating. Manufacturer to be certified and or listed by the following:
   1. BHMA Certified ANSI A156.4 Grade 1.
   2. ADA Compliant ANSI A117.1.
   3. UL/cUL Listed up to 3 hours.
   4. UL10C Positive Pressure Rated.
   5. UL10B Neutral Pressure Rated.

B. Mounting:
   1. Out swing doors shall have surface parallel arm mount closers except where noted on hardware schedule.
   2. In swing doors shall have surface regular arm mount closers except where noted on hardware schedule.
   3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
   4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.

C. Size closers in compliance with requirements for accessibility (ADDAG). Comply with following maximum opening force requirements. Interior hinged openings: 5.0 lb (2.25 Kg) Fire rated and exterior openings shall have minimum opening force allowable by authority having jurisdiction.

D. Fasteners: Provide self-reaming and self-tapping wood and machine screws and sex nuts and bolts for each closer.

E. Acceptable Manufacturer: Hager Companies, which is located at: 139 Victor St.; St. Louis, MO 63104; Toll Free Tel: 800-325-9995; Tel: 314-772-4400; Fax: 800-782-0149; Email: request info (bwilkins@hagerco.com); Web: www.hagerco.com
   1. Hager Companies: 5100 Series.

2.7 STOPS AND HOLDERS

A. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted in concrete floor or masonry walls shall have stainless steel machine screws and lead expansion shields. Manufacturer shall meet requirements for Auxiliary Hardware: ANSI/BHMA A156.16.

B. Acceptable Manufacturer:
   1. Hager Companies 232W convex, 236W concave.

C. Overhead Stops and Holders: Provide overhead stop and holders for doors that open against equipment, casework sidelights and other objects that would make wall stops/holders and floor stops/holders inappropriate. Provide sex bolt attachments for mineral core wood door applications.

D. Standards: Manufacturer shall be certified by the following: Overhead Stops and Holders: ANSI/BHMA A156.8 Grade 1.

E. Acceptable Manufacturer:
   1. Hager 7000 SRF Series, heavy duty surface, 7000 CON Series heavy duty concealed.

2.8 DOOR GASKETING AND WEATHERSTRIP

A. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide non-corrosive fasteners for exterior applications.
   1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
   2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
   3. Door bottoms: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
   4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.
   5. Drip Guard: Apply to exterior face of frame header. Lip length to extend 4 inches (102 mm) beyond width of door.

B. Standards: Manufacturer shall meet requirements for:
   1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22.
   2. Shall be BHMA certified for door sweeps, automatic door bottoms, and adhesive applied gasketing. (721).

C. Acceptable Manufacturer: Hager Companies, which is located at: 139 Victor St.; St. Louis, MO 63104; Toll Free Tel: 800-325-9995; Tel: 314-772-4400; Fax: 800-782-0149; Email: request info (bwilkins@hagerco.com); Web: www.hagerco.com
   1. Perimeter Gasketing: Hager Companies: 721S/720 x 724, adhesive applied, 881S stop applied.
   2. Sound Seal: Hager Companies: 864S.
   3. Meeting Stile Weather-strip: Hager Companies: 872SN.
   4. Door Bottom Sweeps: Hager Companies: 750S.
   5. Automatic Door Bottoms: Hager Companies: 740S.
   6. Overhead Drip Guard: Hager Companies: 810S.

2.9 THRESHOLDS

A. Set thresholds for exterior and acoustical openings in full bed of sealant with lead expansion shields and stainless steel machine screws complying with requirements specified in Division 7 Section "Joint Sealants". Notched in field to fit frame by hardware installer. Refer to Drawings for special details. Manufacturer to be certified by the following:
   1. Thresholds: ANSI/BHMA A156.21.
   2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

B. Acceptable Manufacturer:
   1. Hager Companies: 413S/520S.

2.10 FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples.

B. Comply with base material and finish requirements indicated by ANSI/BHMA A156.18 designations in hardware schedule.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install hardware per manufacturer's instructions and in compliance with the following as applicable:
   1. NFPA 80; NFPA 105; ICC/ANSI A117.1; ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames; ANSI/BHMA A156.115W Hardware Preparation in Wood Doors with Wood or Steel Frames; DHI Publication - Installation Guide for Doors and Hardware; UL10C/UBC7-2; Local building code.
   2. Approved shop drawings.
   3. Approved finish hardware schedule.

B. Do not install surface mounted items until finishes have been completed on substrates involved. Set unit level, plumb and true to line location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

3.3 FIELD QUALITY CONTROL

A. Material supplier to schedule final walk through to inspect hardware installation ten business days before final acceptance of Owner. Material supplier shall provide a written report detailing discrepancies of each opening to General Contractor within seven calendar days of walk through..

3.4 ADJUSTMENT, CLEANING AND DEMONSTRATING

A. Adjustment: Adjust and check each opening to ensure proper operation of each item of finish hardware. Replace items that cannot be adjusted to operate freely and smoothly or as intended for application at no cost to Owner.

B. Cleaning: Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no cost to Owner.

C. Demonstration: Conduct a training class for building maintenance personnel demonstrating the adjustment, operation of mechanical and electrical hardware. Special tools for finished hardware to be turned over and explained usage at this meeting.

3.5 PROTECTION

A. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from the manufacture until Owner accepts Project as complete.

3.6 HARDWARE SET SCHEDULE

A. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from the manufacture until Owner accepts Project as complete.

3.7 PROTECTION

A. Guide: Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, performance,

exposure, and like characteristics of door hardware, and may not be complete. Provide door hardware required to make each set complete and operational.

B. Hardware schedule does not reflect handing, backset, method of fastening and like characteristics of door hardware and door operation.

C. Review door hardware sets with door types, frames, sizes and details on drawings. Verify suitability and adaptability of items specified in relation to details and surrounding conditions.

SECTION 09 22 00

NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-structural metal framing:
   1. Cold-formed metal framing for walls.
   2. Accessories.

1.2 RELATED SECTIONS

A. Section 09 21 16. - Gypsum Board Wall Assemblies.

1.3 REFERENCES

A. ASTM International (ASTM):
   1. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   2. ASTM C 645 - Standard specification for non-structural steel framing members.
   3. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

B. American Iron and Steel Institute (AISI) - Standard for Cold-Formed Steel Framing General Provisions.

C. American Iron and Steel Institute (AISI) - North American Specification for the Design of Cold-Formed Steel Structural Members.

D. American Welding Society (AWS) D.1.3 - Structural Welding Code - Sheet Steel.

E. Gypsum Association (GA) 600 - Fire Resistance Design Manual.

1.4 SUBMITTALS

A. Required submittals are to be submitted to Architect/Engineer through the General Contractor/Construction Manager.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Manufacturer's certification of product compliance with codes and standards.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.

1.5 QUALITY ASSURANCE

A. Contractor shall provide effective, full time quality control over all fabrication and erection complying with the pertinent codes and regulations of government agencies having jurisdiction.

B. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

C. Welding Standards: Comply with applicable provisions AWS D1.1 "Structural Welding Code - Steel" and AWS D1.3 "Structural Welding Code-Sheet Steel."

D. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

1.6 PRE-INSTALLATION MEETINGS

A. General Contractor will schedule an on-site meeting. prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handling: Handle materials to avoid damage.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Steel Structural Products, which is located at: 1195 Port Rd.; Jeffersonville, IN 47130; Toll Free Tel: 877-369-4252; Tel: 812-670-4195; Fax: 812-640-4196; Email: request info (bhughes@steelstructuralsystems.com); Web: www.steelstructuralproducts.com

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 NON-STRUCTURAL STUDS

A. Design Requirements:
   1. Design steel in accordance with American Iron and Steel Institute Publication "Specification for the Design of Cold-Formed Steel Structural Members", except as otherwise shown or specified.
   2. Design loads: As indicated on the Architectural Drawings. 5 PSF minimum design lateral load is required for interior walls per the building code.
   3. Design framing systems to withstand design loads without deflections greater than the following:
      a. Interior Non-Load Bearing Walls: Lateral deflection of: L/120.
      b. Interior Non-Load Bearing Walls: Lateral deflection of: L/180.
      c. Interior Non-Load Bearing Walls: Lateral deflection of: L/240.
      d. Interior Non-Load Bearing Walls: Lateral deflection of: L/360.
   4. Design framing system to accommodate deflection of primary building structure and construction tolerances.

B. Recycled Content of Steel Products: Post-consumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

C. Framing Members, General: Comply with ASTM C645 for conditions indicated.
   1. Steel Sheet Components: Comply with ASTM C645 requirements for metal unless otherwise indicated.
   2. Protective Coating: Comply with ASTM C645; roll-formed from hot-dipped galvanized steel, complying with ASTM A653/A653M G40 (Z120) or having a coating that provides equivalent corrosion resistance. A40 galvannealed products are not acceptable.
      a. Coatings shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to the authority having jurisdiction.
      b. "EQ" (Equivalent Gauge Thickness) Steel Studs and Runners: Members that can show certified third party testing with gypsum board in accordance with ICC ES AC86 - 2010 (Approved May 2012) need not meet the minimum thickness limitation or minimum section properties set forth in ASTM C 645. The submission of an evaluation report is acceptable to show conformance to this requirement.

D. Steel Studs: ASTM C645.
   1. Notice Of Compliance Certification (SFIA):
      a. for Structural, Nonstructural, and Nonstructural Proprietary Cold-Formed Framing Products (ProSTUD - 15, 19, 22, 30, and 33 mils) by the Steel Framing Industry Association.
   2. Non-Structural Studs: Cold-formed galvanized steel C-studs, ProSTUD as manufactured by Steel Structural Products, LLC:
      a. Flange Size: 1-1/4 inches (32 mm).
      b. Stiffening Lip: 1/4 inch (6.4 mm).
      c. Web Depth: As called for on drawings.

E. Non-Structural Track: Cold-formed galvanized steel runner tracks, ProTRAK as manufactured by Steel Structural Products, LLC:
   1. Drywall track, in conformance with ASTM C 645 for conditions indicated below:
      a. Flange Size: 1-1/4 inches (32 mm).
      b. Web Depth: Track web to match stud web size.

c. Minimum Base-Steel Thickness: Track thickness to match wall stud thickness or as designed.

2.3 ACCESSORIES

A. Sheet steel accessories as manufactured by Steel Structural Products, LLC

B. U Channel: Cold-formed galvanized steel.
1. Designation and size as indicated on the drawings.

C. Metal Trims: Cold-formed galvanized steel corner angle.
1. Size: 1.5 inches by 1.5 inches (38 mm by 38 mm).

D. Furring Channel: Cold-formed galvanized steel in conformance with AISI's North American Specifications for Design of Cold-Formed Steel Structural Members.
1. Designation and size as indicated on the drawings

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 NON-STRUCTURAL FRAMING INSTALLATION

A. Install cold-formed framing in accordance with requirements of ASTM C 754.

B. Framing Installation:
1. Erect framing and panels plumb, level and square in strict accordance with approved drawings.
2. Handle and lift prefabricated panels in a manner to not cause distortion in any member.
3. Anchor runner track securely to the supporting structure. Install concrete anchors only after full compressive strength has been achieved.
4. Butt all track joints. Securely anchor abutting pieces of track to a common structural element, or splice them together.
5. Align and plumb studs, and securely attach to the flanges or webs of both upper and lower tracks.
6. Attach wall stud bridging when required in a manner to prevent stud rotation. Space bridging rows according to manufacturer's recommendations.
7. Provided temporary bracing until erection is completed.
8. Where indicated in the drawings, provide for structural vertical movement using means in accordance with manufacturer's

recommendations.

9. Cut all framing components square for attachment to perpendicular members or as required for an angular fit against abutting members.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 09 29 00

GYPSUM BOARD

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Standard Gypsum Board.

1.2 RELATED SECTIONS

A. Section 09 22 00 Non-Structural Metal Framing.

1.3 REFERENCES

A. ASTM International (ASTM):
1. ASTM C 473 - Standard Test Methods for Physical Testing of Gypsum Panel Products.
2. ASTM C 475 - Standard Specification for Joint Compound and Joint Tape for Finishing.
3. ASTM C 514 - Standard Specifications for Nails for the Application of Gypsum Board.
4. ASTM C 639 - Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants.
5. ASTM C 681 - Standard Test Method for Volatility of Oil- and Resin-Based, Knife-Grade, Channel Glazing Compounds.
6. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board.
7. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications.
8. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
9. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
10. ASTM C 1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
11. ASTM C 1178 - Standard Specification for Coated Glass Mat Water Resistant Gypsum Backing Panel.
12. ASTM C 1280 - Standard Specification for Application of Gypsum Sheathing.
13. ASTM C 1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
14. ASTM C 1396 - Standard Specification for Gypsum Board.
15. ASTM C 1629 - Standard Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products and Fiber reinforced Cement Panels.
16. ASTM C 1658 - Standard Specification for Glass Mat Gypsum Panels.
17. ASTM D 750 - Standard Test Method for Rubber Deterioration in Carbon-Arc Weathering Apparatus.
18. ASTM D 925 - Standard Test Methods for Rubber Property-Staining of Surfaces (Contact, Migration, and Diffusion).

19. ASTM D 2202 - Standard Test Method for Slump of Sealants.
20. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
21. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
22. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
23. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
24. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
25. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
26. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 176; C.
27. ASTM E 695-03 - Standard Test Method of Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.
28. ASTM E 2126-02a - Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Walls for Buildings.
29. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

B. Gypsum Association (GA):
1. GA-214 - Recommended Levels of Gypsum Board Finish.
2. GA-216 - Application and Finishing of Gypsum Panel Products.
3. GA-231 - Assessing Water Damage to Gypsum Board.
4. GA-238 - Guidelines for the Prevention of Mold Growth on Gypsum Board
5. GA-253 - Application of Gypsum Sheathing.
6. GA-801 - Handling and Storage of Gypsum Panel Products: A Guide For Distributors, Retailers, and Contractors.

1.4 SUBMITTALS

A. Refer to Section 01 33 00 - Administrative Requirements Submittal Procedures

B. Product Data: Submit manufacturer current technical literature for each component.

C. Quality Assurance Submittals:
1. Provide products manufactured in North America only.
2. Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with indicated requirements.
3. Manufacturer Instructions: Provide manufacturer's written installation instructions

1.5 QUALITY ASSURANCE

A. Installer shall have experience with installation of gypsum board under similar conditions.

1.6 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic and other causes in accordance with GA-238 and manufacturer recommendations. Stack product flat to prevent sagging. In addition, follow guidelines found in GA-801.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 or GA-216 requirements, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

1.8 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturers: American Gypsum, Certainteed Corporation, Georgian-Pacific, PABCO Gypsum, USG Corporation.

2.2 STANDARD GYPSUM BOARD

A. Basis of Design: Regular Gypsum Board.
   1. Panel Physical Characteristics:
      a. Core: Regular Gypsum Core.
      b. Surface Paper: 100 percent recycled content paper on front, back and long edges.
      c. Long Edges: Tapered.
      d. Overall Thickness/ Weight: 1/2 inch (15.9 mm) 1.5lbs/ft2.
      e. Panel complies with requirements of ASTM C 1396.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture

damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840, GA-216 or GA-214.

B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

D. Form control and expansion joints with space between edges of adjoining gypsum panels.

E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4 to 3/8 inch (6 to 9 mm) wide joints to install sealant.

F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4 to 1/2 inch (6 to 12 mm) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

G. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:
1. Regular Type: Vertical or horizontal surfaces, unless otherwise indicated.

B. Single-Layer Application:
1. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

2. On furring members, apply gypsum panels vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members..

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings and if not shown, according to ASTM C 840 or GA-216 and in specific locations approved by Owner's Representative for visual effect.

C. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners, unless otherwise indicated.
2. LC-Bead: Use at exposed panel edges.

D. Exterior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners.
2. LC-Bead: Use at exposed panel edges.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840, GA-216 or GA-214:
1. Level 4 finish (all joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints): All flat and eggshell paints, light textures, or wall coverings.

3.6 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited

to, fuzzy or splotchy surface contamination and discoloration.

SECTION 093100

CERAMIC TILE

PART 1.00 - GENERAL

1.1 CONDITIONS

A. Requirements of the conditions of the Contract apply to all work under this Section. Tile shall include replacement of restroom floors with 1"x1" ceramic tile. In addition work shall consist of cleaning existing wall tile and grouting where required.

1.2 SCOPE

A. Related work specified elsewhere includes, but is not necessarily limited to the following:

1. Toilet and bath accessories
2. Cleaning existing tile

1.3 QUALITY STANDARDS

A. American National Standards Institute Specification for Ceramic Tile A137.1 - 1967; for glazing ceramic wall tile installed with Portland cement mortar, A108.1 - 1967; and for ceramic tile installed with water-resistant organic adhesive use Material Specifications for Thin Set Method, organic adhesive ANSI A136.1; metal studs ASTM C-645; water resistant gypsum board ASTM C-630; grout-latex-Portland cement ANSI A118.6.

1.4 QUALIFICATIONS

A. Manufacturer of tile shall be a member of the Tile Council of America, Inc.

B. Acceptable manufacturers of tile are as follows:

1. American Olean Tile Company, Inc.
2. Mosaic Tile Company
3. Mannington Tile Company

1.5 SUBMITTALS

A. Submit two samples of each of the following materials. Each sample shall be not less than the size or quantity indicated.

1. Floor tile, 1"x1", mounted, of each pattern and each color.

2. Water-resistant organic adhesive, one pint.

B. Furnish affidavit certifying that materials delivered to job conform to requirements of these specifications.

C. Submit for approval a complete list of materials to be used with manufacturer's name, descriptive literature and instructions.

1.4 DELIVERY

A. Deliver all materials in manufacturer's original, unbroken labeled containers. All tile cartons shall bear the certification mark of the Tile Council of America.

B. Store materials so as to avoid intrusion of any items which might reduce effectiveness.

PART 2.00 - PRODUCTS

2.1 MATERIALS

A. Existing wall tile to remain clean and regrout as necessary. Caution should be used in attaching new fixtures, grab bars and partitions to the existing walls. Floor tile shall be ceramic tile 1" x 1". Provide bullnose units and special shapes for outside corners and coved base units. Color shall match existing tile.

PART 3.00 - EXECUTION

3.1 CONDITION OF SURFACES

A. All surfaces shall be clean, dry, free of oily or waxy films, and firm.

3.2 INSTALLATION

A. Installation of wall tile shall be by the thin set method in accordance with the manufacturer's recommendations.

1. Do not use acid solutions for cleaning.

2. Installation specifications:

Tile - ANSI A108.4
Grout - ANSI A108.1
Gypsum Board - GA-216
Durock Cement Board

3.3 REPLACEMENT TILE

A. Replacement tile shall equal existing tile in color and size and be installed as herein described.

3.4 CLEAN AND GROUT EXISTING CERAMIC TILE

A. Tile and grout shall be cleaned of all stain and mold with a compatible solution. Joints shall be re-grouted.

SECTION 09 51 00

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Suspended acoustical ceilings including the following:
   1. Acoustical panels (suspended).
   2. Exposed tee metal grid ceiling system and perimeter trim.

1.2 REFERENCES

A. ASTM International (ASTM):
   1. ASTM E84 - Surface Burning Characteristics.
   2. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.
   3. ASTM C 635 - Standard Specification for the manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

B. Underwriters Laboratory (UL):
   1. UL - Fire Resistance Directory.
   2. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.3 DESIGN / PERFORMANCE REQUIREMENTS

A. Suspension System: Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1:360.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Dimensions, load carrying capacity, and performance standards compliance.
   3. Storage and handling requirements and recommendations.
   4. Installation and maintenance instructions.

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, actual size of acoustical units, and two samples minimum size 12 inches (300 mm) long of main tees and cross tees square, representing actual product, color, finish and patterns.

E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

F. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of all components.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing Work of this section with minimum three years documented experience.

C. Pre-installation Conference: To be scheduled by General Contractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver in unopened bundles and store in a dry place with adequate air circulation. Do not deliver material to building until wet conditions such as concrete, plaster, paint, and adhesives have been completed and cured.

B. Store products in manufacturer's unopened packaging until ready for installation.

C. Protect system components from excessive moisture in shipment, storage, and handling.

1.7 SEQUENCING

A. Sequence Work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities and wet work have terminated, and overhead work is completed, tested, and approved.

B. Install acoustic units after interior wet work is dry.

C. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 WARRANTY

A. Warranty: Provide manufacturer's standard warranty against manufacturing defects in material or workmanship when installed in accordance with the current CISCA Handbook and ASTM C367.
   1. Warranty Period: 30 years when installed with Armstong World Industries System.

1.10 EXTRA MATERIALS

A. Deliver extra acoustical units for Owner's use in maintenance. Label and store where directed by the Owner including codes used on the Drawings. Do not deliver to the Project site until the Owner is prepared to receive and store maintenance materials.
   1. Panels: Furnish 5 percent of total acoustic unit area of extra panels to Owner.
   2. Suspension System Components: Furnish 5 percent of each exposed component of the quantity installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer shall include but not be limited to: Armstrong World Industries, Inc.

B. Substitutions: Not permitted without prior approval.

2.2 ACOUSTICAL PANELS

A. Acoustic Ceilings: Provide Mineral based, factory painted ceiling panels, similar to Armstrong Cirrus.
   1. ASTM E1264 Classification: Type III, Nodular.
   2. Color: White.
   3. Texture: Non-directional.
   4. Edges: Angled Tegular for 15/16 inch grid.
   5. Size: 24 by 24 inch (609 by 609 mm).
   6. Thickness: 7/8 inch (22 mm).
   7. Lbs/Sq.ft: 0.69-0.84
   8. Noise Reduction Coefficient (NRC): 0.75.
   9. Ceiling Attenuation Class (CAC): 35.
   10. Articulation Class (AC): 170.
   11. Fire Class: Class A.
   12. Fire Performance UL 723 (ASTM E84) Flame Spread / Smoke Developed: 0/0.
   13. Light Reflectance (LR): 0.85.
   14. Sag Resistance: Dimensionally stable up to 100% relative humidity/32 degreesF to 104 degreesF.
   15. Recycled Content: Up to 75 percent.
   16. R Value (BTU Units): 1.9.
   17. RSI Value (Watts Units): 0.33.

2.3 SUSPENSION SYSTEM COMPONENTS - GENERAL

A. Provide suspension system components from the same manufacturer as the acoustical ceiling components unless approved by the ceiling manufacturer in writing to comply with manufacturer's installation and warranty requirements.

B. Performance Standards: Suspension system manufacturer's standard direct-hung metal suspension system and attachment devices complying

with project requirements and applicable building codes and regulations applicable at the location of the project.
1. Suspension components shall comply with ASTM C635.

2.4 SUSPENSION SYSTEM COMPONENTS

A. 15/16 inch (23.8 mm) Exposed Grid:
1. Armstrong World Industries, Inc.' Prelude Exposed Grid System.
2. Chicago metallic Corporation; 200 Snap Grid.
3. USG Interiors, Inc.; Donn Suspension Systems.
4. Intermediate duty.
5. Main Tees and cross tees:
   a. Roll formed from cold-rooled steel sheet, prepainted, electrolytically zinc coated with prefinished 15/16 inch wide metal caps on flanges.
6. Color: White.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify layout of hangers will not interfere with other work.

C. Verify acoustical unit layout conditions, which will adversely affect installation.

D. If layout or substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Verify wet work such as plastering and concrete is complete and dry. Verify building is enclosed and under standard occupancy conditions prior to start of installation.

F. Commencement of installation constitutes Installer's acceptance of substrate conditions.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction, including the following:
1. Comply with ASTM C636 and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook".
2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

3. Additional Hanger Wires: Wrapped tightly 3 full turns to structure and component at locations where imposed loads could cause deflection exceeding 1/360 span or tolerances specified below.

B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders.

C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Acoustic Units:
1. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
2. Install units after above ceiling work is complete.
3. Install acoustic units level, in uniform plane, and free from twist, warp, and dents. Press panels from above to set into grids. Do not pull from face.
4. Cutting Acoustic Units:
   a. Cut to fit irregular grid and perimeter edge trim.
   b. Cut square reveal edges to field cut units.
   c. Cut bevel edges to field cut units.
5. Where bullnose or round corners or obstructions occur, install preformed closures to match perimeter molding.

3.4 ERECTION TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.5 PROTECTION AND CLEANING

A. Protect installed products until completion of project.

B. Clean adjacent surfaces and remove unused materials and debris from site.

C. Clean exposed surfaces in accordance with manufacturer's written instructions.

D. Remove and reinstall improperly installed material.

E. Remove damaged components, replace with undamaged components.

F. Touch-up, repair or replace damaged units until satisfactory results are obtained.

G. Clean with non-solvent based non-abrasive commercial cleaning solution.

END OF SECTION

SECTION 09 65 00

RESILIENT AND LVT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Luxury vinyl tile and plank flooring.

1.2 REFERENCES

A. ASTM International (ASTM):
   1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   2. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
   3. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Not required

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.

B. Installer Qualifications: Trained journeymen with a minimum of three years successful experience in the installation of resilient flooring.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Owner's Representative.
   2. Do not proceed with remaining work until workmanship is approved by Owner's Representative.

3. Refinish mock-up area as required to produce acceptable work.

1.5 PRE-INSTALLATION MEETINGS

A. To be arranged by General Contractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handle materials to avoid damage.

1.7 PROJECT CONDITIONS

A. Temperature Requirements: Maintain materials and areas of work at temperatures between 70 degrees F and 90 degrees F for not less than 48 hours before, during and 48 hours after installation. Maintain a minimum temperature of 55 degrees F thereafter.

1.8 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 WARRANTY

A. Plank Flooring:
1. Manufacturer's standard commercial warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Armstrong World Industries, Mannington Mills.

B. Substitutions: Submit for approval prior to bidding.

2.2 LVT PLANK AND TILE FLOORING

A. LVT Performance:
1. Meet ASTM E 84.
2. Meet ASTM E-648 Fire Resistance: Class 1.
3. Meet ASTM E-662 Smoke: <450 smoke developed index.

B. Product:
1. Thickness: 3.0 mm (1/8 inch).
2. Wear Layer: 20 mil (0.5 mm). Urethane finish.
3. 6x36 inches (152 x 914 mm).

2.3 ACCESSORIES

A. Adhesive: Product to be approved by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Owner's Representative of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent materials.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

SECTION 09 65 19.19

STATIC DISSIPATIVE RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Static Dissipative Resilient Flooring and accessories.

1.2 REFERENCES

A. Flooring manufacturer's technical manuals and installation instructions.

B. ASTM International

1. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor- Covering Systems unisng a Radiant Heat Energy Source.
2. ASTM E 662 Test Method for Specific Optical Density of Smoke Generated by Solid MaF1066 sTAterials.
3. ASTM 1066 Standard Specification for Vinyl Composition Tile.

C. National Fire Protection Association (NFPA)

1. NFPA 253 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
2. NFPA 258 Standard Test Method for Measuring the Smoke Generated by Solid Materials.

D. ANSI/ESD Standards

1. ANSI/ESD STM 7.1 Floor Materials-Resistive Characterization of Materials.
2. ANSI/ESD STM 97.1 Floor Materials and Footwear-Resistance in Combination with a Person.
3. ANSI/ESD STM 97.2 Floor Materials anmd Fotwear Voltage Measurement in Combination with a Person.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide flooring which has been manufactured, fabricated and installed to performance criteria certified by manufacturer without defects, damage or failure.

B. Administrative Requirements: An on-site pre-installation meeting will be scheduled by the General Contractor to verify project requirements, substrate conditions, manufacturer' installation instructions and manufacturer's warranty requirements.

C. Sequencing and Scheduling

1. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close space to traffic during the installation of flooring.
2. Inspect substrate to insure that it is sufficiently prepared to receive the adhesive, in accordance with manufacturer's recommendations.

1.4 SUBMITTALS

A. Submit shop drawings, seaming plan, and manufacturer's technical data, installation and maintenance instructions for flooring and accessories.

B. Submit manufacturer's standard samples and/or charts of available standard offerings showing the flooring colors and application accessories.

C. Submit Safety Data Sheets for adhesives, moisture mitigation systems, primers, patching/leveling compounds, cleaning agents and Product Information sheets to insure that the product satisies the Owners anti-static requirements.

D. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data. Include methods for maintaining installed product and precautions agains cleaning materials and methods detriment to finishes and performance.

E. Warranty: Manufacturer's Standard Warranty.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility: Provide flooring and accessories supplied by one manufacturer, including moisture mitigation systems, primers, leveling and patching compounds and adhesives.

B. Select an installer who is experienced and competent in the installation of Static resistant resilient flooring. Engage installers who are certified by the flooring manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING.

A. Comply with manufacturer's ordering instructions and lead time requiements to avoid construction delays.

B. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification and shipping and handling instructions.

C. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.7 PROJECT CONDITIONS

A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65 degrees F and a maximum temperature of 85 degrees F for at least 48 hours before, during and for not less than 48 hours after installation. Thereafter, the temperature should never rise above 100 degrees F nor fall below 55 degrees F. The performance of the flooring material and adhesives can be adversely affected outside this temperature range. Protect all materials from the direct flow of heat from hat-air gresters, radiators or other heating fixtures and appliances, Refer to product installation recommendations for a complete guide to project conditions.

1.8 LIMITED WARRANTY

A. Resilient Flooring: Submit a written warranty executed by the manufacturer, agreening to repair or replace resilient flooring that fails within the warranty period.

B. Limited Warranty Period: 5 years.

C. Limited Warranty shall not deprive the Owner of other rights they may have under other provisions of Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor unter the requirements of the Contract Documents.

D. For the Limited Warranty to be valid, this product is required to be installed using the appropriate Armstrong Flooring Guaranteed Installation System.Product installed not using the specific instructions from the Guaranteed Installation System will void the warranty.

1.9 EXTENDED SYSTEM LIMITED WARRANTY

A. Resilient Flooring System: Submit a written warranty executed by the manufacturer, agreeing to repair or replace system (subfloor preparation products, adhesive and flooor covering that fails within the warranty period.

B. Limited Warranty Period: 10 years on top of the Resilient Flooring Limited Warranty.

C. S-463 Level Strong™ cement based self-leveling compound, S-466 Patch Strong™ flexible patching and smoothing compound, S-464 Prime Strong™ acrylic primer for porous substrates, S-465 NP Prime Strong™ epoxy primer for non-porous substrates, S-462 Seal Strong™ two part moisture mitigation system.

D. The installation of an Armstrong Flooring product along with the recommended Armstrong Flooring adhesive, as well as any one of the Strong System subfloor preparation products listed above, provides 10 additional years of limited warranty coverage. The Strong System limited warranty covers the installation integrity for the length of the flooring product warranty plus 10 years. In order to qualify for the Strong Sysem Warranty, any subfloor preparation product needed for installation must ge an Armstrong Flooring product.

E. For the System Limited Warranty to be valid, this product is required to be installed using the appropriate Armstrong Flooring Guaranteed Installation System. Product installed not using the specific instructions from the Guaranteed installation System will void the warranty.

F. When Armstrong Flooring Strong System subfloor preparation products are used with other manufacturers' floor coverings, adhesives, or other subfloor preparation products, Armstrong Flooring warrants our products to be free from manufacturing defects from the date of purchase through the limited warranty period of 15 years.

1.10 MAINTENANCE

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials from same production run as products installed. Packaged with protective covering for storage and identified with appropriate labels.

1. Quantity: Furnish quantity of flooring units equal to minimum 5% of amount installed.
2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra material.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Resilient tile flooring, wall base, adhesives and subloor preparation products and accessories:

Armstrong Flooring Inc., 1770 Hemstead Road, Lancaster, PA 17605, www.armstrongflooring.com/commercial.

1. Manufacturer must have a headquarters in the United States of America.

2.2 RESILIENT TILE FLOORING MATERIALS

A. Provide Excelon SDT Static Dissipative Tile manufactured by Armstrong Flooring, Inc.

1. Description: Static dissipative vinyl tile composed of polyvinyl chloride resin, plasticisers, fillers, pigments and antistatic additive with colors and texture dispersed uniformly throughout its thickness.
2. Tile shall meet size, thickness, indentation, impact, deflection, dimensional stability, resistance to chemicals, squareness and resistance to heat requirements of ASTM F 1066 Standard Specification for Vinyl Composition Tile, Class 2, through pattern.
3. Pattern and Color: Coler selected from the range currently available from Armstrong Flooring, Inc.
4. Size: 12 in. X 12 in.
5. Thiskness: 1/8"/0.125 in.

2.3 PRODUCT SUBSTITUTION

A; Substitutions: No substitutions permitted because of the specific attributes listed in Section 2.2.

2.4 WALL BASE MATERIAL

A. For top set wall base: Provide 1/8 in. Thick, 4 in. high Armstrong Flooring Color-integrated Wall Base with a matte finish, conforming to ASTM F1861m Type TP - Rubber, Thermoplastic, Group 1-Solid, Style B-Cove.

2.5 ADHESIVES

A. Provide Armstrong S-202 Static Dissipative Tile Adhesive with 2 in. wide x 24 in. Long copper ground-connection strips for under the tile and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer.

2.6 ACCESSORIES

A. Provide Armstrong S-392 Static Dissipative Tile Polish for application as initial and on-going static dissipative maintenane finish.

B. For patching, smoothing and leveling monolithic subfloors (concrete), provide Armstrong S-194 Cement-Based Patch, Underlayment and Embossing Leveler / S-195 Underlayment Additive.

C. For priming non-porous substrates, provide S-465 NP Prime Strong™ epoxy primer for non-porous substrates].

D. For creating a moisture barrier (if needed), provide S-462 Seal Strong™ two part moisture mitigation system.

E. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.

F. Provide transition/reducing strips tapered to meet abutting materials.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufactuer's product data, including technical bulletins. Product catalog, installation instructions, and product carton instructions for insallation and maintenance procedures as needed.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions (i.e. moisture tests, bond test, pH test, etc.)

B. Visually inspect flooring materials, adhesives and accessories prior to installation. Flooring material with visual defects shall not be installed and shall

not be considered as a legitimate claim.

C. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

D. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold or mildew.

E. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

F. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.3 PREPARATION

A. [Subfloor Preparation: Smooth concrete surfaces, removing rough areas, projections, ridges and bumps, and filling low spots, control or construction joints and other defects with Armstrong Flooring. Refer to Armstrong Flooring Guaranteed Installation Systems and ASTM, F 710 Stqndard Practice for Preparing Concrete Floors to Receive Resilient Flooring for information on subfloor preparation.

B. Subfloor Cleaning: The surface shall be free of dust, solvents, varnish, paint, wax, oil, grease, sealers, release agents, curing compounds, residual adhesive, adhesive removers and other foreign materials that might affect the adhesion of resilient flooring to the concrete or cause a discoloration of the flooring from below. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents. Spray paints, permanent markers and other indelible in markers must not be used to write on the back of the flooring material or used to mark the concrete slab as they will bleed through, telegraphing up the surface and permanently staining the flooring material. If these contaminants are present on the substrate they must be mechanically removed prior to the installation of the flooring material. Refer to Armstong Flooring Guaranteed Installation Systems and ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional

information on subfloor preparation.

D. Perform subfloor moisture testing to determine if surfaces are dry; free of curing and hardening compounds, old adhesive and other coatings; and ready to receive flooring. Relative humidity shall not exceed 75% ..

3.4 INSTALLATION OF FLOORING

A. Install fooring in strict accordance with the latest edition of Armstrong Flooring Guaranteed Installation Systems. Failure to comply may result in voiding the manufacturer's warranty listed in Section 1.8.

B. Install flooring wal to wall before the installation of floor-set cabinets,casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, foor recesses, closets and similar openings as shown on the drawings.

C. Install flooring with adhesives, tools and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.5 INSTALLATION OF ACCESSORIES

A. Apply stop set wall base to walls columns, casework and other permanent fixtures in areas where top-set base is required. Install base in length as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to veritical substrate with continuous contact at horizontal and vertical surfaces.

B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.

3.6 CLEANING

A. Perform initial and on-going maintnance according to the latest edition of the maintenance recommendations for Static Dissipative Tile.

3.7 PROTECTION

A. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades or placement of fixtures and furnishings.

SECTION 09 90 00

INTERIOR PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior paint including surface preparation.

1.2 SUBMITTALS

A. Required submittals are to be submitted to the Architect through the General Contractor/Construction Manager.

B. Product Data: For each paint system indicated, including.
   1. Product characteristics.
   2. Surface preparation instructions and recommendations.
   3. Primer requirements and finish specification.
   4. Storage and handling requirements and recommendations.
   5. Application methods.
   6. Cautions for storage, handling and installation.

C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.

D. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Paint exposed surfaces. If a color of finish, or a surface is not specifically mentionedthe Owner's representative will select from standard products, colors and sheens available.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels unless indicated.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish surfaces for verification of products, colors and sheens.
   2. Finish area designated by Owner's representative.
   3. Provide samples that designate primer and finish coats.
   4. Do not proceed with remaining work until the Owner's representative approves the mock-up.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.
   1. Product name, and type (description).
   2. Application and use instructions.
   3. Surface preparation.
   4. VOC content.
   5. Environmental handling.
   6. Batch date.
   7. Color number.

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

D. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.6 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

B. Furnish Owner with an additional one percent of each material and color, but not less than 1 gal (3.8 l) or 1 case, as appropriate.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: Benjamin Moore, Sherwin-Williams, Farrell-Calhoun.

B. Substitutions: Submit for approval prior to bidding.

2.2 APPLICATIONS/SCOPE

A. Interior Paints and Coatings
   1. Metal: Factory primed hollow metal doors and frames.
   2. Wood: Trim and similar items.
   3. Drywall: Drywall board, Gypsum board.

2.3 PAINT MATERIALS - GENERAL

A. Paints and Coatings:
   1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
   2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color. Or follow manufactures product instructions for optimal color conformance.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

D. Color: To be selected from manufacturer's standard selections.

2.4 INTERIOR PAINT SYSTEMS

A. METAL - (Factory Primed).
   1. Latex Systems:
      a. Semi-Gloss Finish:
         1) 1st Coat: Touch-up factory primer as required with acceptable primer product.
         2) 2nd Coat: Latex Semigloss.
         3) Topcoat: Latex Semigloss to cover.

B. WOOD - (Trim):
   1. Latex Systems:
      a. Semi - Gloss Finish:
         1) 1st Coat: Acrylic Latex Wood Primer.
         2) 2nd Coat: Acrylic Latex Semigloss to match topcoat.
         3) 3rd Coat: Acrylic Latex Semiglass to cover.

C. DRYWALL - (Walls, Ceilings, Gypsum Board).
   1. Latex Systems:
      a. Eg-Shel/Satin Finish:
         1) 1st Coat: Latex Primer.
         2) 2nd Coat: Latex to match topcoat.
         3) Topcoat: Acrylic eggshell to cover.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared; notify Owner's representative of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify Owner's representative of unsatisfactory preparation before proceeding.

B. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

3.2 SURFACE PREPARATION

A. General: Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
   1. Prior to attempting to remove mildew, it is recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions are advised.
   2. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
   3. Remove items including but not limited to thermostats, electrical outlets, switch covers and similar items prior to painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Wood: Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

3.3 INSTALLATION

A. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendations.

B. Do not apply to wet or damp surfaces. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days. Test new concrete for moisture content. Wait until wood is fully dry after rain or morning fog or dew.

C. Apply coatings using methods recommended by manufacturer.

D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

E. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.

F. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.

G. Inspection: The coated surface must be inspected and approved by the Owner's representative just prior to the application of each coat.

3.4 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

SECTION 10 21 00

TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Solid plastic partitions.

1.2 REFERENCES

A. ASTM International (ASTM):
   1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. National Fire Protection Association: NFPA 286 - Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Literature indicating typical panel, pilaster, door, hardware and fastening.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods.

C. Shop Drawings:
   1. Dimensioned plans indicating layout of toilet compartments.
   2. Dimensioned elevations indicating heights of doors, pilasters, separation partitions, and other components; indicate locations and sizes of openings in compartment separation partitions for toilet and bath accessories to be installed in partitions; indicate floor and ceiling clearances.
   3. Details indicating anchoring components (bolt layouts) and methods for project conditions; indicate components required for installation, but not supplied by toilet compartment manufacturer.

D. Selection Samples: For each finish product specified, one complete set of color selection guides representing manufacturer's full range of available colors, textures and patterns.

E. Verification Samples: For each finish product specified, two samples representing actual product, color, texture and pattern.

F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.

B. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.

C. Lay cartons flat, with adequate support to ensure flatness and to prevent damage to pre-finished surfaces.

D. Do not store where ambient temperature exceeds 120 degrees F (49 degrees C).

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at a minimum of 60 degrees F (15.6 degrees C).

1.6 WARRANTY

A. Manufacturers Standard Warranty: For Solid Plastic HDPE Material: Against breakage, corrosion, and delamination for 15 years.

1.7 COORDINATION

A. Coordinate Work with placement of support framing and anchors in walls and ceilings.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: ASI Accurate Partitions; 160 Tower Drive, Burr Ridge, IL 60527; Tel: 708-442-6800; Email: info@asi-accuratepartitions.com; Web: http://www.asi-accuratepartitions.com.
   1. Other Acceptable Manufacturer: ASI Global Partitions; Eastanollee, GA; Tel: 706-827-2700; Web: www.asi-globalpartitions.com.
   2. No other manufacturer will be accepted without ASTM performance compliance.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 COMPARTMENTS AND SCREENS

A. Toilet Compartments: Floor anchored/overhead braced solid plastic.
   1. Compartment Depth and Width: As scheduled and indicated on Drawings.
   2. Door Width: 24 inches (610 mm), minimum; at ADA accessible compartments 36 inches (915 mm) minimum.
   3. Height Above Floor: 12 inches (305 mm).
   4. Door/Panel Height: 58 inches (1473 mm).
   5. Pilaster Height: 82 inches (2083 mm).

2.3 SOLID PLASTIC TOILET COMPARTMENTS

A. Doors, Panels, Screens, and Pilasters: Single sheet solid, homogenous HDPE plastic material formed from waterproof, non-absorbent, high-density polyethylene resins; mark-resistant self-lubricating surface; edges finished smooth.
   1. Material: Solid, homogenous HDPE; 1 inch (25 mm) thick.
   2. Rating: Class "B" Fire Rated per ASTM E 84.
   3. Rating: Meets the standard acceptance criteria per Annex C of NFPA 286.
   4. Edges: 1/4 inch (6 mm) radius machined edges.
   5. Heat Sink: Aluminum heat sink, to dissipate heat from incendiary devices used by vandals, attached to bottom of doors and panels.

B. Finish: Pebble-textured homogenous color throughout material.
   1. Color: As selected from manufacturer's standard colors.

C. Door Hardware: 8 inches (203 mm) Aluminum Wrap-around hinge.
   1. Hinges: Hinges shall be 8 inches (203 mm) and fabricated from heavy-duty extruded aluminum (6463-T5 alloy) with a brushed anodized finish with wrap-around flanges, surface mounted and through bolted to doors and pilasters. Hinges operate and are field set with adjustable nylon cams. Cams can be set in 30 degree increments.
   2. Latch: Anodized extruded aluminum, with housing, slide bolt and button.
   3. Strike and Keeper: 6 inch (152 mm) wrap-around flanges fabricated from heavy-duty extruded aluminum (6463-T5 alloy) with a brushed anodized finish.
   4. Coat Hook and Bumper: Non-ferrous, chrome-plated, with black rubber tip for doorstop.
   5. Fastening Hardware: Manufacturer's standard, Type 304 stainless steel, No. 4 satin finish, theft-resistant barrel nuts and machine screws.
   6. Door Pulls: Non-ferrous, chrome-plated. Standard on ADA compartments. Two per ADA door.

D. Mounting Brackets: Provide optional stainless steel continuous bracket with theft resistant barrel nuts and shoulder screws.

E. Pilaster Shoes: Type 304 Stainless Steel, No. 4 satin finish. Easy Stall shoe shall be of a one piece design and integral to the mounting system and formed from 304 stainless steel 3 inch (76 mm) high with a No. 4 satin finish. Pilaster shoes are anchored to the pilaster with No. 10 stainless steel, vandal-resistant screws.

F. Headrail: Manufacture's standard anodized aluminum rail with anti-grip profile.

G. Pilaster Anchors, Floor Anchored/Overhead Braced:
   1. Easy Stall shoe system. 1/4 by 2 inch (6 by 51 mm) steel screws attach Easy Stall shoe to floor.
   2. Pilaster to be inserted into shoe and secured after height adjusted. Leveling adjustment to be concealed by pilaster shoe.
   3. Height/leveling adjustment to be made via machine thread bolts inserted into factory installed threaded insert in bottom of pilaster.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Inspect and prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Clean surfaces thoroughly prior to installation.

B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.

C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
   1. Verify dimensions of areas to receive compartments.
   2. Verify locations of built-in framing, anchorage, bracing, and plumbing fixtures.

3.2 INSTALLATION

A. Install in accordance with approved shop drawings and manufacturer's instructions.

B. Fasten components to adjacent materials and to other components using purpose-designed fastening devices.

C. Adjust pilaster anchors for substrate variations; conceal anchors with pilaster shoes.

D. Equip each compartment door with hinges and door latch.

E. Install door strike keeper on pilasters in alignment with door latch.

F. Equip each compartment door with one coat hook and bumper.

G. Installation Tolerances:
   1. Maximum variations from plumb or level: 1/8 inch (3 mm).
   2. Clearance between wall surface and panels or pilasters: 1-1/2 inch (38 mm) maximum.

3.3 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors.

B. Adjust adjacent components for consistency of line or plane.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

C. Remove factory protective coverings and clean finish surfaces in accordance with manufacturer's instructions before substantial completion.

SECTION 22 00 00

MECHANICAL - GENERAL

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. The General Conditions and other pertinent documents issued by the Engineer are a part of these Specifications and shall be complied with in every respect. In addition, the accompanying Architectural, Structural, Mechanical, Electrical and other Drawings shall be complied with in every respect. It shall be the responsibility of the Mechanical and Electrical Contractors to avail themselves of a complete set of Drawings and Specifications and be familiar with all parts thereof. Failure to do so shall not relieve any responsibility in the fulfillment of the Contract in any respect.

1.2 INTENT

A. The intent of the Mechanical and Electrical Drawings and Specifications is that the Contractor shall furnish all labor and materials, equipment and transportation necessary for the proper execution of the work. The work required as related to other trades is shown in it majority in the drawings, but thoroughly examine the Drawings and Specifications relating to other trades in order to include all necessary work. No additional compensation shall be considered for failure to properly interpret the responsibilities to other trades. The Contractor shall do all the work shown on the Drawings and described in the Specifications and all incidental work considered necessary to complete the project. The Engineer reserves the right to make any reasonable change in the locations indicated without additional compensation to the Contractor.

1.3 CONFLICT

A. If there is a conflicting variance between the Drawings and Specifications, the provisions of the most stringent shall control. In case of conflict between the General Provisions of the Contract or any modifications thereof, the Mechanical and Electrical Specifications shall control. The Drawings and Specifications are complementary and any work required by one, but not by the other, shall be performed as though required by both.

1.4 SCOPE

A. The work contemplated and included under this Section of the Specifications consists of the furnishing of all labor, materials and supervision necessary for the installation of complete mechanical and electrical systems, as specified herein or shown on the Drawings, together with all necessary auxiliaries and appurtenances for same.

B. Furnish and install all systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the Drawings or mentioned in these Specifications.

1.5 RELATED SECTIONS

A. Section 221113 - Plumbing
B. Section 260800 - Heating, Ventilation and Air Conditioning
C. Section 260000 - Electrical

1.6 INSPECTION OF SITE

A. The Contractor, before submitting his proposal, shall inspect the site of the proposed construction and become fully informed as to the facilities, difficulties and restrictions attending the execution of the work. No additional compensation will be granted for work or items omitted from his proposal due to his failure to inform himself of the conditions affecting the performance of the work included in the Contract, or necessary to carry on and satisfactorily complete the work included herein.

B. Locations and elevations of the various utilities included within the scope of this work are offered separate from the Contract Documents as a general safety guide only without guarantee as to accuracy.

1.7 CODES, STANDARDS AND REGULATIONS

A. All workmanship and materials herein specified shall meet in every respect the codes, standards and regulations having jurisdiction of the work. In case of difference between the various standards and other regulations, the matter will be brought to the attention of the Engineer and either the most stringent shall govern or the regulation or standard selected by the Engineer shall govern.

B. Should the Contractor perform any work that does not comply with the requirements of the applicable codes, standards and regulations, he shall bear all costs arising from the deficiencies.

C. The following codes, standards and regulations in effect on the date of bid invitation shall be considered a part of this Specification:

a. State Public Health Department Regulations
b. State Plumbing Code and HVACR Code
c. National Fire Protection Association
d. American Society of Mechanical Engineers
e. American Society for Testing Materials
f. Air Conditioning and Refrigeration Institute
g. National Electrical Code
h. National Electrical Safety Code
i. Local, City, State and Federal Codes and Standards
j. Underwriters' Laboratories
k. Local Utilities Requirements
l. National Electrical Manufacturers Association
m. OSHA - Occupational Safety and Health Standards

1.8 PERMITS AND FEES

A. Provide all necessary notices, obtain all permits, pay all taxes, file all necessary plans

and obtain all necessary approvals in connection with the mechanical and electrical work required for the project.

1.9 CONTRACTOR DEFINITION

A. Where the word "Contractor" is used in connection with the work included under the Mechanical and Electrical Sections of these Specifications, reference is thereby made to the Contractor who is engaged to execute the work included under that Section of the Specifications only, notwithstanding the fact that this Contractor may be either the prime contractor, general contractor or his subcontractor.

1.10 DRAWINGS

A. The accompanying Mechanical and Electrical Drawings in general indicate approximately the locations of equipment and devices, except in those cases where specified notes appear. Exact locations of outlets and apparatus shall be determined by reference to the general plans and to detailed shop drawings, by measurements at the building and in cooperation with other contractors and the Engineer.

B. Exact locations are subject to approval by the Engineer and may differ a reasonable amount from the approximate locations shown on the Drawings without additional compensation to the Contractor.

C. Major changes resulting in a savings in labor or material shall be made only in accordance with a Change Order. Major deviations shall be made only where necessary to avoid interference and only after drawings showing the proposed deviations have been submitted to and approved by the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide materials and equipment which are new and in perfect condition. Where the Underwriters' Laboratories have established standards and issued labels for a particular group, class or type of equipment, the Underwriters' label shall be required on all equipment in that category. Each component shall have a nameplate giving the name and address of the manufacturer, catalog number and designation.

B. Where the words "or equal" are used in the Specifications or on the Drawings, it shall be understood that the Engineer will be the sole judge in the matter. In all cases where more than one manufacturer or material is specified, the Contractor shall be permitted to furnish any of those specified, however, power equipment, panels, transformers and safety switches should be of the same manufacturer. It is not the intention to discriminate against any "equal" product of other manufacturers, but rather to definitely set a standard of quality and shall not be construed to limiting competition. Any proposed substitution will be assumed to be acceptable without specific authorization from the Engineer. Should a substitution be accepted and should the substitution prove defective or otherwise unsatisfactory for the intended service within the warranty period, the Contractor shall replace the substitution with the equipment or material originally specified, and on which the Specification required him to base his proposal, at no

additional compensation.

2.2 TEMPORARY CONSTRUCTION POWER

A. Furnish and install temporary power, water, heating, gas and lighting as the needs require for construction and safety purposes. It shall be the responsibility of the General or Prime Contractor to obtain and be responsible for all utility charges.

PART 3 - EXECUTION

3.1 WORKMANSHIP - GENERAL

A. All work shall be installed in a neat, careful, safe and workmanlike manner by craftsmen skilled in the trade.

3.2 STANDARDS

A. Perform all work in such a manner that the many components will function as a complete workable system, including any accessories required to accomplish such installations. Perform all work in accordance with acceptable industry standards except where other standards or procedures are herein specified.

3.3 COORDINATION AND COOPERATION

A. Coordinate all mechanical and electrical work with general, structural and other grades to insure proper execution of the work and general progress for the entire project and to avoid delaying any other Contractor. Cooperate with all other trades so that the entire project will not be handicapped, hindered or delayed. Assist other trades in working out space conditions to permit all work to be installed satisfactorily. No extra compensation will be allowed the Contractor for any remedial work required to eliminate interferences due to lack of coordination and cooperation.

3.4 STORAGE OF MATERIALS

A. Protect all mechanical and electrical materials and apparatus to prevent any damage to them. Unless approved, no material or apparatus shall be stored outside or exposed to the elements. Cover apparatus with tarpaulins or other protective coverings, provide pallets or other methods to raise materials above the floor, and where directed, provide barriers or guard rails to protect the materials. Failure on the part of the Contractor to comply with the above to the complete satisfaction of the Engineer or his representative will be sufficient cause for rejection of the piece of apparatus in question.

3.5 DAMAGED AND DEFECTIVE WORK

A. Remove and replace damaged and defective work or materials as directed by the Engineer with no extra compensation. All repairs to the work shall be made with new materials or a complete new piece of equipment shall be provided as directed by the Engineer.

3.6 ACCESSIBILITY

A. Install all equipment and devices in an accessible location or in a location where they can be made accessible with removable panels. Provide Milcor or approved equal access panels as required for access to concealed equipment which requires servicing and testing. Equipment and devices shall be "readily accessible" where required by the National Electrical Code. In non-removable ceilings, the removal of a lighting fixture or air device is not an approved access panel.

3.7 SAFETY

A. Provide necessary precautions for the safety of life or property. All construction work shall conform to the standards of the Occupational Safety and Health Act. Provide approved ground fault interrupter devices on all electrical construction devices consuming power and including temporary lighting systems.

3.8 CLEAN-UP

A. The Contractor shall keep his work area clean at all times. Upon completion of work in any area, remove all equipment, excess materials and debris from the area and leave area broom clean. Protect all equipment during operations of painting, plastering, cutting or drilling and any like operation which might damage the equipment. Upon completion of the project, remove all equipment, excess material, scrap and debris from the job site. The job site shall be left clean and finished.

3.9 CONTRACTOR FURNISHED DATA

A. Submit to the Engineer shop drawings for all equipment and materials to be installed on the project. No equipment or materials shall be installed until the shop drawings have been approved, even if the material submitted is identical to that originally specified. Consideration for substitution of materials will not be allowed if shop drawings are not received within 30 days after award of Construction Contract.

B. Rough-in materials including pipe, wire, conduits, connectors and boxes may be submitted in a list form including the names of manufacturers and catalog type or number. All other equipment and materials shall be submitted with detailed prints or drawings. Prints or drawings shall be permanent reproductions and not Thermofax copies. The total number of shop drawings and lists shall be not less than six.

C. Should the Contractor propose to submit items other than those specified, he shall include cuts of both the specified item and the proposed "equal item" in the brochures. The "originally specified product" and the "proposed substitution" shall be clearly marked.

D. Where the Specifications or Drawings call for the work to be installed in accordance with the manufacturer's specifications, recommendations or directions, copies of the same shall be submitted to the Engineer for review and surveillance.

E. Provide the Engineer four (4) copies of hard bound manuals for the project ten (10) days prior to final acceptance of the completion of the project. The manuals shall include copies of all corrected and approved shop drawings, schedules, catalog data, illustrations, performance curves and rating data, wiring and control diagrams,

manufacturer's recommendations, operating and maintenance instructions, including safe operating procedures and requirements, spare parts lists and other pertinent information for the specified equipment and systems. The manual shall include a typewritten schedule of each motor, giving nameplate data, switch and fuse or breaker sizes and voltage and phase at motor terminals.

3.10 TESTS

A. Test and demonstrate each and every system in the presence of and to the complete satisfaction of a representative of the Engineer. Prior to demonstration, start all equipment and make necessary tests and adjustments to place the system in first class operating conditions.

B. Furnish all services, instruments, equipment and personnel required for the tests; in addition, submit a typewritten test report, where applicable and recorded data is taken or required for approval prior to final acceptance.

C. Test all electrical conductors after installation but prior to termination with a 500 volt meggar. Conductors shall test free of grounds and shorts, and their insulation resistance shall be recorded for all feeders and circuits where the conductor size is size 8 and larger.

D. No piping work, fixtures or equipment shall be concealed or covered until they have been inspected and approved. Engineer's representative shall be notified one week prior to when the work is ready for inspection. All work shall be completely installed, tested as required by the Section and the State Ordinances and State Safety Orders, and shall be leak-tight before inspection if requested. All tests shall be repeated upon request to the complete satisfaction of those making the inspection.

E. All domestic water piping shall be flushed out, tested and shall be left under pressure of supply main or a minimum of 40 psi for the balance of the construction period.

3.11 AS-BUILT DRAWINGS

A. Before the project will be finally accepted, a set of permanent as-built drawings must be submitted to the Engineer. The Contractor must certify accuracy by endorsement. The as-built drawings must be correct in every detail so that the Owner can properly operate, maintain and repair exposed and concealed work.

B. All underground work shall be dimensioned. All change orders, field changes, equipment, circuit numbers, motors, feeders, breakers and starters shall be clearly indicated on the drawings. As-built drawings shall be submitted on tracings or other reproducible forms.

3.12 GUARANTEE

A. Furnish to the Engineer a typewritten guarantee, countersigned by the General Contractor, to the effect that all work or equipment installed by him under this Contract shall be free from any or all mechanical and electrical defects for a period of one (1) year from the date of final acceptance. Should any mechanical or electrical defect develop in any of the systems or equipment within the period, due to faulty equipment,

poor installation or workmanship, this Contractor shall agree to repair or replace same with new and like material without additional compensation. Lamps in all fixtures shall be guaranteed for 100 percent of manufacturer's published life data.

3.13 GENERAL CONSTRUCTION WORK FOR MECHANICAL AND ELECTRICAL FACILITIES - SLEEVES

A. Provide 22 gauge galvanized sheet iron sleeves where pipes and conduits pass through interior masonry walls. Sleeves shall be trimmed flush with each finished surface. Sleeves shall be sufficient size to allow insertion of pipe or conduit passing through concrete beams and walls, masonry exterior walls and all floors. Sleeves shall be sized at least 1/2 inch greater than the outside diameters of the pipes or conduits. Floor sleeves shall extend 1 inch above floors. After conduits/pipes are installed, seal the space between the conduits/pipes and sleeves with a filler to provide a non-runable watertight joint.

3.14 ROOF FLASHING

A. Provide complete watertight flashing and counter-flashing for all roof penetrations. All flashings shall be made to the complete satisfaction of the Engineer.

3.15 PAINTING

A. All exposed mechanical and electrical equipment in finished areas shall be painted.

B. Provide a prime coat to all unfinished equipment or material and all ferrous metal subject to rusting and corrosion during construction.

C. All duct work visible through registers, grilles and diffuser openings shall be given two coats of dull black paint.

3.16 FASTENING DEVICES AND METHODS

A. Provide fastening devices which are permanent, non-corroding, high strength type using threads or tightening. Minimum size bolt shall be 3/16 inch, and medium size screw shall be No. 10. Cement or glue type fasteners shall not be used. Driven studs may be used for fastening only in steel.

B. In concrete and solid masonry, use threaded inserts secured in drilled holes or cast into the concrete. Conduits 1 inch and larger, junction boxes 12 inches and larger, and all equipment subject to motion, operation or vibration shall be fastened with lead tamped or wedge type expanding shield secured threaded inserts.

C. In hollow masonry, plaster or plaster board, toggle bolts or expanding lag anchors shall be used with excess hole area covered with washers. Whenever possible, fastening in plaster or plaster board shall be into studs or structural supports.

D. In wood construction, wood screws and lag bolts may be used. Screws shall not be hammered into wood.

E. In steel construction, driven threaded studs, welded threaded studs, drilled threaded or

through holes, or threaded clamps shall be used.

F. In light weight applications on sheet metal, self-threading screws or bolts may be used.

3.17 PIPING

A. Cut pipe accurately to measurements established at the site, work into place, without springing or facing and clear all windows, doors and other openings. Ream all piping to remove burrs and install so as to permit free expansion and contraction without causing damage. Make all changes in direction with fittings.

B. Provide, whether shown or not, sufficient awing joints, expansion loops and devices necessary for a flexible piping system. Provide union shut off valves suitable located to facilitate maintenance and removal of all equipment or apparatus. Install drain valves at all low points of each system to enable complete drainage, and air vents at all high points in the piping system to enable complete air venting.

C. Pipe all drains from condensate pans, and relief valves, to spill over an open sight drain, floor drain or other acceptable discharge points, and terminate with a plain end (unthreaded pipe) 6 inches above the drain. Rigidly support all drains.

D. Weld-O-Let type fittings may be used for branch take offs where size of take off does not exceed 3 inch IPS and the take off is at least two standard pipe sizes smaller than the main size. Standard welding steel shall be used in all other locations. Copper piping shall have soldered joints with 95-5 solder. Galvanized piping shall have screwed joints.

E. Joints in copper tubing shall be made using sweat fittings and tin-antimony solder and non-corrosive flux. For soldered joints, the outside surface at end of pipe and inside surface of fitting shall be thoroughly cleaned with steel wool or emery cloth and all burrs shall be removed. After cleaning, surfaces to be joined shall be evenly and completely covered with flux. Solder joints shall be well supported during the heating process and shall not be strained during the cooling period. Excess solder shall be removed while in a plastic state, leaving a fillet around the cup of the fitting as it cools.

F. All pipe and fittings with screwed ends shall have its threads cut clean and true and in conformance with the ASA Specification B2-1 for taper threads. Screwed pipe and fitting of brass shall be made up without marring or damaging pipe and fitting surfaces. All screwed pipe joints, except where specified otherwise, shall be made up with non-soluble, non-toxic, approved thread compound, applied to male threads only.

G. Connections between pipe fittings, hangers and equipment of dissimilar metals shall be avoided wherever practical. Wherever such connections are unavoidable, they shall be insulated against direct contact, using a high grade dielectric insulating material of Teflon, Milarta, asbestos fiber, neoprene, or equal.

H. Hangers: Furnish and install suitable hangers and supports for all horizontal lines. Hangers and supports shall be Grinnel, Fee and Mason, or equal. Heavy pipes shall be carried by pipe hangers supported by rods secured to slab or by approved design. No piping shall be hung from other piping. In no case shall hangers be supported by means of vertical expansion bolts.

I. Horizontal steel piping shall be supported in accordance with the following schedule:

PIPE SIZE	MAX. HANGER SPACING	ROD SIZE
1" & smaller	6 ft. 0 inches	3/8 inch
1 1/2" to 2"	9 ft. 0 inches	3/8 inch
2 1/2" to 4"	10 ft. 0 inches	1/2 inch
Larger than 4"	12 ft. 0 inches	1/2 inch

J. All lines of copper tubing shall be supported by approved type hangers. Hangers for uncovered lines shall be especially designed for copper tubing. Hangers for covered tubing shall have broad scraps fitting outside of covering with insulation protection. Horizontal copper tubing shall be installed in accordance with the following schedule.

PIPE SIZE	HANGER HORIZONTAL SPACING	ROD SIZE
½"	6'	3/8 inch
3/4" & 1"	8'	3/8 inch
1 1/4" & Larger	10'	3/8 inch

3.18 ESCUTCHEONS

A. Escutcheons shall be installed on pipes and conduits wherever they pass through floors, ceilings, walls or partitions in finished areas.

B. Escutcheons shall be chrome plated brass.

3.19 RELOCATION OF GAS LINE

A. Trenches for gas line shall be excavated to the required depth.

B. The bottom of the trenches shall be tamped hard and graded to secure all available fill. Bell holes shall be excavated to ensure pipe resting for its entire length on solid ground. If rock is encountered, it shall be excavated to a depth of 6 inches below the bottom of the pipe, and before laying the pipe, the space between the bottom of the pipe and the rock surface shall be filled with gravel and shall be well tamped. No extra compensation will be made for rock excavation.

C. After the gas line has been tested, inspected and approved by the Engineer and utility company representative, the trenches shall be backfilled with approved fill material, in 12 inch layers, firmly compacted, flooded if necessary, and thoroughly tamped.

3.20 NAMEPLATES AND IDENTIFICATION

A. Provide nameplates and identification on all major mechanical and electrical equipment.

B. Exposed or surface mounted panel boards, cabinets, starters, contactors, time clocks, fans, motors, air handling units, shall be coded and painted with one inch high stenciled black letters across the front.

C. The above equipment where flush mounted, shall be coded on the inside of the cover.

D. Stencils shall be made from heavy waxed cardboard with all letters in capitals and of the same size. At the completion of the project, the stencils shall be turned over to the Owner.

E. In lieu of stencils, engraved bakelite nameplates may be used; nameplates shall be minimum one inch high with 1/4 inch high capital letters permanently fastened to equipment.

3.21 PIPE VIBRATION AND NOISE ISOLATION

A. Insert 1 inch strip of hair felt to isolate all piping, conveying fluids, from direct contact with building walls, framing and sleeves. Pipe isolation shall be installed at all ring hangers consisting of 1 inch felt. Separate cold and hot water piping by 6 inches.

B. All rotating equipment, piping, hangers, supports and tank connections to rotating equipment shall be vibration isolated from beams, columns, floors, ceilings, joists and walls using isolation equipment as specified in other sections of this specification or as shown on the Drawings.

3.22 CONTROL WIRING

A. The Electrical Contractor shall furnish and install all control and interlock wiring for electrical equipment furnished. All wiring shall be in conduit and shall be in conformance with Section 16. Where control voltage is greater than 48 volts, wire shall be minimum 14 gauge AWG and shall have 600 volt insulation. Motors, starters, heaters, thermostats, and other control devices shall be furnished and delivered from the Mechanical Contractor to the Electrical Contractor for installation by the Electrical Contractor. The Mechanical Contractor shall furnish complete wiring diagrams to the Electrical Contractor for each and every piece of equipment to be installed and interconnected if necessary. The Mechanical Contractor shall notify the Electrical Contractor concerning any changes in the electrical requirements due to substitution of equipment or variations in the equipment. Control raceways and boxes exposed to the elements shall be NEMA 3R or weatherproof.

SECTION 22 11 13

PLUMBING

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. Furnish all labor, materials, equipment and services to complete the plumbing work as shown on the drawings or as specified. Refer to the General Conditions, Supplemental General Conditions, Mechanical, Electrical, and other sections as they apply.

1.2 RELATED SECTIONS

A. Section 220000 - Mechanical General

1.3 SCOPE

A. Furnish and install all plumbing systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each item or accessory is shown on the drawings or mentioned in these specifications.

B. The work shall consist of, but is not limited to the following general items.

1. Plumbing fixtures and related drainage and water supply systems.

2. Hot water heater system.

3. Floor drains, cleanouts and hose bibbs.

1.4 SUBMITTALS

A. Submit shop drawings for:

1. Fixtures.
2. Water heaters.
3. Drains, cleanouts, and hose bibbs.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fixtures: As scheduled on Drawings and as manufactured by American Standard, Kohler, Crane, Bradley, or equal.

B. Trim as for fixtures, plus Delta Faucet, or equal.

C. Seats: Olsonite or Church.

D. Hot water heater system: Refer to Plumbing Fixture Schedule on Drawings for manufacturer and model number.

E. Hose bibbs: Josam, Chicago Faucet, Speakman, Zurn, or equal, with vacuum breaker. Material rough brass outside, chrome plated brass inside.

F. Floor drains and cleanouts: Josam, Zurn or Wade.

2.2 PIPE AND FITTINGS

A. Hot and cold water piping above slab shall be crosslinked polyethylene (PEX) or Type "L" copper with wrought copper fittings, or equal. Piping below slab shall be crosslinked polyethylene (PEX) or Type "K" copper tubing. Exterior piping shall be Schedule 40 PVC or Type "K" or "L" copper.

B. Soil and storm drainage piping shall be Schedule 40 PVC, or Schedule 40 ABS DWV plastic pipe, or service weight cast iron with service weight fittings or no hub. Pipe and fittings to be coated with hot coal tar pitch inside and out.

C. Vent piping 2 1/2 inch and under may be Schedule 40 galvanized steel pipe with banded cast iron fittings or galvanized victaulic couplings and fittings. Three inch and larger pipe shall be service weight cast iron, no hub. Copper DWV with copper drainage fittings may be used for all size vent piping. Vent pipe may be Schedule 40 PVC or ABS DWV plastic pipe.

D. Gas piping shall be Schedule 40 black steel assembled with M.I. or welded fittings. Piping below grade coated and wrapped. Straight lengths furnished with factory coating. Fittings and damaged coatings shall be wrapped with tape-coat applied according to manufacturer's instructions.

2.3 VALVES AND STRAINERS

A. Gate and globe valves shall be bronze with a steam working pressure of 125 psi as manufactured by Jenkins, Stockham or Wellworth, or equal.

B. Valves 2" and smaller shall have screwed ends. Valves 2 1/2" and larger shall be

iron body bronze mounted 125 psi ASA flanged.

C. Strainer shall be "Y" pattern Sarco, or equal, and furnished with stainless steel baskets.

D. Ball valves shall be full flow round port with teflon seats and seals.

E. Pet cocks shall be brass and rated 125 lb. W.P.

F. Check valves shall be all brass, swing check, screwed ends and suitable for 150 lb. W.P.

G. Gas cocks 1" and below - Crane No. 272 low pressure, 1 1/4" and above and all medium pressure, Rockwell No. 114 or 116.

H. Under water service valves shall be Mueller H-15200 curb stop with cast iron curb box with lid, plug and footpiece for sizes 1 1/2" and smaller, and Mueller A-2380-5, 200 psi, AWWA, iron body, non-rising stem gate valve with H-10360 cast iron valve box for sizes 2" and larger. Four 12" x 12" x 6" thick concrete pads around each box. Furnish key for each valve size.

2.4 BACKFLOW PREVENTERS

A. Connections not permitted between potable water and a non-potable water or waste sources.

B. Air gaps or approved backflow preventers shall always be used when required by code or as necessary to prevent backflow.

C. Backflow preventers shall be installed with any supply fixture when the outlet end may at times be submerged, such as hoses, sprays, direct flushing valves, aspirators and under-rim connections to a fixture in which the surface of water in the fixture is exposed at all times to atmospheric pressure.

PART 3 - EXECUTION

3.1 INSULATION

A. All cold and hot water supply and return piping except exposed connections to plumbing fixtures, flanges and unions shall be insulated with 3/4" wall thickness Gustin-Bacon "snap-on," Owens-Corning "PF," or standard thick 85% magnesia.

B. All exposed piping shall have a fire retardant jacket applied.

C. Fittings and valves shall be insulated with insulating cement. In exposed areas a fire retardant jacket shall be applied.

D. Cold water piping shall have a vapor barrier jacket applied.

E. Hot water piping under floors, 1" foamglas covered with glass cloth and mastic.

F. Pipe insulation shall have a protective shield of 14 gauge galvanized steel placed centrally between the insert section at all hangers. Shield shall cover one-half of the insulation.

3.2 ROOF FLASHING

A. A waterproof flashing shall be provided for each pipe or vent passing through the roof.

B. Flashing shall be one piece 26 gauge FHA flashing assembly with the joint between flashing and pipe sealed with waterproof compound.

C. Approved equal 3 pound lead, copper or Semco assembly may be used in lieu of FHA flashing.

3.3 STERILIZING WATER SUPPLY PIPES

A. After the hot and cold water systems are complete, they shall be flushed out completely and filled with water and a solution of sodium hypochlorite added to the system. The solution shall consist of 1 gallon of 5% sodium hypochlorite, Purex or other bleach to 200 gallons of water. Check residual chlorine by ortho-tolidin test. Allow solution to remain in the system for 24 hours, after which the entire system shall be flushed.

B. The Engineer shall be notified 24 hours prior to testing so his representative can witness test.

3.4 WATER HAMMER ARRESTERS

A. Water hammer arresters shall be provided on all supply piping, both hot and cold, where indicated on the Drawings.

3.5 LAYING SUPPLY LINES

A. Exterior water supply lines shall be laid with a minimum cover of 36". Installation shall be in accordance with Arkansas Department of Health Regulations and local codes and ordinances.

3.6 T & P VALVE

A. The T & P valve on the water heater shall be run to outside of building.

SECTION 23 08 00

HEATING, VENTILATION & AIR CONDITIONING

PART 1 - GENERAL

1.1 CONDITIONS

A. Furnish all labor, materials, equipment and services to complete the work as shown on the Drawings or as specified. Refer to the General Conditions, Supplemental General Conditions, Electrical, and other Sections as they apply.

1.2 RELATED SECTIONS

A. Section 220000 - Mechanical General

1.3 SCOPE

A. Furnish all HVAC systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the Drawings or mentioned in these Specifications.

B. The work shall consist of but is not limited to the following items:

1. Sheet metal duct work
2. Diffusers and grilles

1.3 SUBMITTALS

A. Submit shop drawings for:

1. Diffusers and grilles

1.4 BALANCE REPORT

A. Contractor shall balance existing system. Contractor shall provide balance report to engineer.

PART 2 - PRODUCTS

2.1 DIFFUSERS

A. Diffuser and grills shall be as shown in mechanical equipment schedule.

PART 3 - EXECUTION

3.1 DUCTWORK

A. Ductwork shall be galvanized fabricated and installed in accordance with the latest publication of SMACNA standards, for low pressure ductwork.

B. Duct sizes shown on the drawings are actual sizes requried and do not include allowance for internal insulation. Rectangular duct for units must be increased in size from that shown on the drawings to allow for insulation.

C. Air foil turning vanes shall be installed in all abrupt elbows. Connection to diffusers, grille and register faces shall be made absolutely air tight.

D. Furnish flexible connections between all duct work and fans or fan coil units. Connections shall be flame proof and waterproof 16 ounce canvas of not less than 4" in length and secured in an airtight manner.

3.2 DIFFUSERS

A. Diffusers, grilles and registers are scheduled on the drawings. Center all diffusers to coordinate with reflected ceilings, lighting, speakers, etc. All wall mounted outlets shall be prime coated. All ceiling mounted outlets and returns shall be natural aluminum satin finished; air testing in accordance with SMACNA standards.

B. Furnish opposed blade volume controls to provide control of the air flow for all supply and return diffusers and registers. Operation shall be from face of the grille with a removable key.

C. Door grilles shall be slight tight core and vision proof from any angle. Grilles shall be prime coated unless otherwise shown on the drawings. Center the door fixed fanel.

D. Diffusers, grilles and registers as manufactured by Titus, Barber Coleman, Kruger, Carnes or Grillmaster.

E. Contractor to balance the airflow as indicated on the drawings in accordance with ASHRAE Standards.

3.3 INSULATION

A. Rectangular duct work, both supply and return, shall be insulated with 1" thick 2 pound density duct liner with vinyl sprayed surface to the air side. The liner shall be installed in accordance with duct liner standards of SMACNA. Return duct insulated only if indicated on the plans.

B. Round duct work shall be insulated with 2" thick fiberglass insulation with fire resistive vapor barrier jacket.

SECTION 26 00 00

ELECTRICAL

PART 1 - GENERAL

1.1 CONDITIONS

A. Furnish all labor, materials, equipment and services to complete the electrical work as shown on the drawings or as specified. Refer to the General Conditions, Supplemental General Conditions and other sections below, as they apply.

1.2 RELATED SECTIONS

A. Section 220000 - Mechanical General

1.3 SCOPE

A. Furnish and install all electrical systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the drawings or mentioned in these specifications.

B. The work shall consist of, but is not limited to the following general items:

1. Lighting Fixtures and Lamps
2. Raceways
3. Wiring Devices and Plates
4. Branch Circuits
5. Control Wiring
6. Panelboards

1.4 SUBMITTALS

A. Submit under provisions of Section 013300

B. Submit shop drawings for:

1. Lighting Fixtures and Lamps
2. Wiring Devices and Plates
3. Safety Disconnect Switches
4. Control Wiring for all Mechanical Systems
5. Panelboards

PART 2 - PRODUCTS

2.1 MATERIALS

A. Submit material lists for all raceways and connectors, conductors and their connectors,

boxes and grounding facilities.

PART 3 - EXECUTION

3.1 RACEWAYS

A. GENERAL: Provide raceways for all wiring systems, minimum 3/4 inch. Raceways shall include rigid galvanized steel, conduit, rigid aluminum conduit, (EMT) electrical metallic tubing, flexible metallic conduit, surface metal raceways, wire ways and troughs. Raceways shall be mechanically and electrically continuous from service entrance to final outlet. Raceways shall be run perpendicular and parallel to building construction. Except in Mechanical Rooms or as otherwise noted, all raceways shall be concealed. All breaks and turns with exposed raceways shall be made with malleable iron cadmium or hot dipped galvanized conduit fittings and covers. Raceways shall be rigidly supported with malleable iron conduit clamps or trapeze supports and clamps at intervals not exceeding 7 feet with 12 inches of all outlet boxes, elbows, and changes or direction. Concealed raceways shall be supported from structural members and not furring. All raceway systems shall be completely installed and secured and swabbed out, and all work in the area shall have progressed sufficiently to prevent injury to cables, before any conductors are installed. Provide caps and plugs on ends of raceways and openings in boxes to prevent foreign material from entering during construction. Provide double locknuts where 1 1/2 inch and larger conduits terminate, where No. 4 and larger conductors are installed, and where required by NEC. Do not use running threads. Leave No. 12 pull wire (identified at both ends) in all empty raceways. Provide plastic insulating busing on all conduit connections and fiber inserts on all tubing connections. Surface metal raceways, surface wiremold and surface metal troughs shall be installed only where shown on the drawings.

B. RIGID CONDUIT: Provide rigid galvanized steel conduits for service entrance, panel feeders and all motor feeders. Threadless fittings, all thread and running threads shall not be used. Rigid conduits shall be provided for all raceway systems run underground or embedded in concrete or solid masonry. Rigid conduit shall be as manufactured by Youngstown, Allied, Triangle, or equal. Conduits located underground shall be PVC or shall be rigid galvanized steel and have an additional coat or polyvinylchloride and shall be manufactured by Robroy, or equal.

C. ELECTRICAL METALLIC TUBING (EMT): Electrical metallic tubing (EMT) may be used for conduits concealed in furred ceilings or walls, run exposed in the building, or embedded in hollow masonry construction above grade. EMT shall be as manufactured by Triangle, Allied, Republic, or equal. EMT fittings shall be ferrous metal galvanized or plated to resist corrosion and shall be of the compression-ring type, rain-tight and concrete-tight. Set screw, indenter or friction type fittings will not be allowed. All fittings shall be wrench tight and shall have insulated throats. Fittings shall be as manufactured by Steel City, Raco, Appleton, or equal.

D. FLEXIBLE CONDUIT: Provide flexible conduit for all connections to motors and other equipment subject to vibration or motion with a maximum length of 18 inches. Flexible conduit may be used for final connection to lighting fixtures in lay-in ceilings. Conduit shall be rigidly supported where connection to flexible conduit is made. Conduit and fittings shall be self-grounding and, in addition, copper bonding jumpers shall be used.

Flexible conduit shall be as manufactured by Republic, Anaconda, Pittsburg, or equal. Connectors shall be ferrous metal, galvanized or plated to resist corrosion, of the two (2) screw clamp type, or the squeeze type, as manufactured by Raco, Appleton, Steel City, or equal. Flexible conduit and fittings used outdoors or in other areas subject to moisture shall be of the liquid-tight type with connectors having an O-ring assembly. Liquid tight connectors shall be Raco type 3500, Appleton STB, or equal.

E. CONDUIT HANGERS AND SUPPORTS: All conduits shall be rigidly supported and securely fastened to structural members. Perforated iron straps or wire shall not be used for support. Maximum support spacing shall be five (5) foot for one (1) inch and smaller conduits, and seven (7) foot for conduits larger than one (1) inch. All conduit shall be installed to permit expansion and contraction, and type hanger, method of support, location of support, etc. shall be governed in part by this consideration.

3.2 OUTLET, JUNCTION AND PULL BOXES

A. Provide outlet and junction boxes where shown on the drawings or as required by Code. Boxes shall be independently rigidly supported and accessible. All outlet boxes shall be minimum of two (2) inches deep. Provide a four (4) inch square box with plaster ring and cover at each switch and receptacle location. Wiring device boxes located in brick, block or concrete walls shall be approved for the type of installation being at mortar joints. Multi-gang boxes shall be installed for more than two (2) adjacent devices; sectional boxes will not be allowed. All exposed cover plates as manufactured by Crouse Hinds, or equal. Outlets exposed to the weather shall be type FD with weatherproof gaskets and covers. Pull boxes shall be constructed of code gauge galvanized steel and shall be sized not less than 1 1/2 times all dimensions as recommended by the NEC. All conductors in pull boxes shall be identified with tags.

3.3 CONDUCTORS

A. All conductors shall be rated 600 volts, and shall be copper with type THHN insulation. Minimum size shall be No. 12 and No. 8, and larger shall be stranded. All conductors shall be color coded, with sizes through No. 10 being of the solid compound coating. Stripes, bands or hash marks with respective color coding may be used for conductors No. 8 and larger. Color coding shall be phase A - black, phase B - red, phase C - blue, neutral - white, and ground - green. All conductors shall be by the same manufacturer and shall be Triangle, Simplex, Anaconda, General, Okonite, or equal.

B. Mains and feeders shall be run continuous without joints or splices. Branch circuit splices shall be made with 3M "Scotchloks," or equal. In panelboards and boxes, conductors shall be neatly placed in phase groups and supported away from all enclosure sides. Lacing shall be done at intervals not greater than six (6) inches and shall be done with linen cord or T & B self-locking "Ty-Raps," or equal.

3.4 LIGHTING FIXTURES

A. Provide all lighting fixtures as noted on the drawings. Fixtures shall be suspended from structural members or from ceiling structural members, by standard bar hangers, or other approved means. Structural steel necessary to support fixtures shall be furnished and installed under this Section. Provide plaster frames as required. All fixtures shall be grounded. Fixtures shall be completely wired and lamped and shall be in perfect

condition and operating at the time of completion. New building fixtures shall not be used for construction lighting.

B. Fixture locations shall be coordinated with ceiling patterns or other details or notes as shown on the drawings.

C. If a lighting fixture for a specific location is not clearly noted, the Contractor shall bring it to the attention of the Engineer prior to bidding, or the Contractor shall furnish and install a fixture similar and comparable in cost to that specified for other like location.

3.5 LAMPS

A. Provide and install lamps in lighting fixtures.

3.6 WIRING DEVICES AND PLATES

A. Furnish and install all wiring devices and plates where shown on the drawings and herein specified. All devices shall be NEMA rated specification grade, with all parts except terminals totally enclosed, and with each device separately packaged upon arrival at job site. Height of wiring device shall work with brick joints and concrete block joints, but in general, lighting switches shall be mounted 4'-0" above floor, and receptacles and telephone outlets shall be mounted 12" above floor. Adjacent wiring devices shall be mounted as close to each other as possible. All wiring devices shall be side wired.

B. In general, wiring devices and plated located in finished unpaneled areas shall be ivory. Wiring devices and plates located in finished paneled areas shall be brown. In unfinished areas, plates shall be 302 stainless steel.

3.7 SAFETY DISCONNECT SWITCHES

A. Furnish and install safety disconnect switches where shown on the Drawings or as required by NEC. Switches shall be NEMA heavy duty, horsepower rated, with padlocking provisions and with a nameplate identifying equipment served. In wet or exterior locations, switches shall be in NEMA 3R enclosures. Switches shall be as manufactured by Square "D", General Electric, Westinghouse, ITE, or equal.

3.8 GROUNDING

A. The entire electrical system and the building structure shall be grounded, or as indicated on the drawings. The electric service, equipment and enclosures, conduits and raceways, switches, breakers and panels, motors, controllers, lighting fixtures and receptacles shall be grounded. Each branch or power circuit shall have an independent grounding conductor whether shown or not, with the exception of lighting switches.

B. Bonding jumpers shall be installed to maintain continuity at water meters, connections shall be made with approved clamps as manufactured by Burndy.

3.9 GROUND FAULT CIRCUIT INTERRUPTERS

A. Conformance with UL Std. 943, Class A.

B. Temperature tolerance level of -31° to 158°F.

C. Equal to Leviton Suregard V, NEMA 5-15R, Model 6598-W with indicator light, 15A, 125 volt.

3.10 EXISTING CIRCUITS

A. Contractor to verify continuity between break panel and point of service for each circuit.

B. It has been reported that there are some wires in the ceiling space with bare wire cords exposed. It is assumed these are abandoned circuits. Contractor to verify and either dismantle and pull wires out or protect the ends of the bare wires with wire nuts securely fastened or wrap the wire ends with electrical tape. If left in place, provide color coded tape on the end of each circuit.

SECTION 28 21 00

SECURITY CAMERA SYSTEM

PART 1 - GENERAL

1.1 CONDITIONS

A. Furnish design, layout, all labor, materials, equipment and services to complete the security system system as specified. Refer to the General Conditions, Supplemental General Conditions, Mechanical, Plumbing, Electrical, and other sections as they apply.

1.2 SCOPE

A. Design, layout, furnish and install all security camera systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each item or accessory is shown on the drawings or mentioned in these specifications. The Contractor is responsible for design, layout, and all system components.

B. The work shall consist of, but is not limited to the following general items.

1. Interior exterior security cameras
2. Video recording device.

C. Submit shop drawings for:

1. Interior security cameras
2. Video recording device.

1.3 SYSTEM DESIGN

A. The Contractor shall be responsible for design, layout and installation of a security camera system for the proposed building. The security camera system shall have recording capability. The security camera system layout drawings shall be submitted to the owner and the Engineer for approval.

B. The security camera system contractor shall coordinate locations of security camera components to provide a complete view of the exterior of the building and all interior rooms shown on the plans with cameras. The contractor shall coordinate the camera placement with the proposed structural, mechanical and electrical components. All wiring shall be concealed unless otherwise authorized by the owner. Obstructions to cameras must be considered during shop drawing production and installation. Additional cameras may be required at no additional expense to the Owner to provide total coverage of the area. At project completion, present the Owner with as-built drawings indicating installed location of all components. Contractor shall provide to the Owner copies of six (6) Operation and Maintenance Manuals.

D. Training shall be provided for each individual zone in the building. Training shall include a minimum of 2 hours and shall be conducted at a time that is mutually agreeable to both the contractor and owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Security Camera: The security cameras shall be equal to Alibi HNC14-UAI-0, indoor/outdoor camera.

B. Provide a NVR , monitor, and all items necessary for a complete working system.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All components and equipment shall be installed in accordance with manufactures recommendations.

SECTION 28 30 00

SECURITY SYSTEM

PART 1 - GENERAL

1.1 CONDITIONS

A. Furnish design, layout, all labor, materials, equipment and services to complete the security system system as specified. Refer to the General Conditions, Supplemental General Conditions, Mechanical, Plumbing, Electrical, and other sections as they apply.

1.2 SCOPE

A. Design, layout, furnish and install all security systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each item or accessory is shown on the drawings or mentioned in these specifications. The Contractor is responsible for design, layout, and all system components.

B. The work shall consist of, but is not limited to the following general items.

1. Security system control panels
2. Door Switches
3. Motion sensors
4. Key Pads

C. Submit shop drawings for:

1. Security system control panels
2. Door Switches
3. Motion sensors
4. Key Pads

1.3 SYSTEM DESIGN

A. The Contractor shall be responsible for design, layout and installation of a security system for the proposed building. The security system shall be monitored. The first year of monitoring shall be included in the security system bid. The security system drawings shall be submitted to the owner and the Engineer for approval.

B. The security system shall integrate with facility doors, windows, and departments.

C. The security system contractor shall coordinate locations of security system components including all door sensors, motion sensors, key pads, control panels, etc. with the proposed structural, mechanical and electrical components. All wiring shall be concealed unless otherwise authorized by the owner. Obstructions to sensors must be considered

during shop drawing production and installation. Additional sensors may be required at no additional expense to the Owner. At project completion, present the Owner with as-built drawings indicating installed location of all components, including all sensors, key pad, control panels, etc. Contractor shall provide to the Owner copies of six (6) Operation and Maintenance Manuals.

D. Training shall be provided for each individual zone in the building. Training shall include a minimum of 2 hours per zone and shall be conducted at a time that is mutually agreeable to both the contractor and owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. System Power: The security system shall operate using standard 120 volts AC, 60 HZ power. Backup power shall be provided by a rechargeable 12 VDC, gwl type, lead acid backup battery. The battery shall be rated between 7 and 34-ampere hours (AH).

B. Keypad shall be color graphic touch screen display equal to Honeywell Vista 6280 keypad.

C. Control Panel shall be enclosed ina metal cabinet, suitable for wall mounting.

D. Door Sensor shall be concealed, conventional equal to Honeywell Model 947-75T concealed sensor equipped with the steel door adapter. The sensor shall monitor the open and closed position of the door.

E. Motion Detector shall be Honeywell Model IS280CM Celing mounted passive infrared motion detector.

F. Siren shall be indoor/outdoor in enclosure and shall monitor the status of protected openings and areas in the armed and disarmed state. Siren shall be equal to Honeywell Model 719 siren and mounted inside Honeywell Model 742BE enclosure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All components and equipment shall be installed in accordance with manufacturers recommendations.

SECTION 32 01 13.62

ASPHALT PAVEMENT SEALCOATING FOR PARKING LOTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Asphalt Pavement Sealcoating

1.02 REFERENCE STANDARDS

A. American Society for Testing Materials (ASTM)
   1. D 2939-03 Standard Test Methods for Emulsified Bitumens Used as Protective Coatings
   2. The following ASTM test methods: D140, D466, D529, D244, C88, C131, C117, C127, C123, D1310, D2170, D95, D402, D2171, D5, D113, D2042, D711, D969, D1475, D3960, D2486, E70, D562, D3583, D3236, D5249, D6690, B117, D977
   3. Polymer Modified MasterSeal meets ASTM D8099/D8099M-17 Standard Specification for Asphalt Emulsion Pavement Sealer and FAA Item P-623 Specification for Emulsified Asphalt Spray Sealcoat.

B. Federal Specifications for Waterborne Traffic and Airfield Marking Paints
   1. TT-P-1952E Types I, II, and III
   2. TT-P-1952D
   3. TT-P-1952B

1.03 SUBMITTALS

A. Product Data
   1. Submit manufacturer's Product Data Sheet.

1.04 PROJECT/SITE CONDITIONS

A. Ambient Conditions
   1. Both surface and ambient temperature must be a minimum of 50°F and rising before applying cold applied crack fillers, oil spot primers, pavement sealers or traffic paints (materials). Ambient and surface temperature shall not drop below 50°F for a 24 hour period following application of materials.
   2. Apply materials during dry conditions when rain is not imminent or forecast for at least 24 hours after application.

B. Pavement/Surface Conditions
   1. Newly placed (paved) asphalt pavement surfaces should be allowed to cure a minimum of four (4) weeks under ideal weather conditions (70°F) before applying coatings.
   2. New pavement surfaces shall be free of residual oils or chemicals associated with the placement of new asphalt pavement.

3. Aged pavement surfaces shall be cleaned and prepared as recommended in this specification under PART 3 Sections 3.1 thru 3.7 of this specification.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. SealMaster Pavement Products and Equipment or equal.

2.02 MATERIALS

A. SealMaster Petro Seal Oil Spot Primer (Concentrate).
   1. Acrylic co-polymer latex emulsion
   2. Seals oil spots prior sealcoating
   3. Helps prevent oil spots from "bleeding through" freshly applied sealer
   4. Mix on-site with water prior to application
   5. Apply by brush or spray to properly cleaned oil spot
   6. Non-volatiles (%): 27% Min.
   7. Specific Gravity: 1.04
   8. Color: Dries translucent to clear

B. SealMaster CrackMaster Parking Lot Grade (Hot Pour Rubberized Crack Sealant)
   1. Premium Rubberized Asphalt hot pour crack sealant
   2. Designed for filling and sealing cracks up to 1" wide in asphalt or concrete pavement
   3. Provides a protective barrier against moisture intrusion into cracks
   4. Designed to be melted in oil-jacketed kettles or direct-fire kettles with agitation
   5. Recommended pour temperature: 370-390°F
   6. Penetration (150 gr/5 sec.): 35 Max.
   7. Resiliency: 60%
   8. Flow at 140°F: 0 mm
   9. Softening Point: 200°F Min
   10. Viscosity @ 375°F: 25 ± 10 poise
   11. Specific gravity: 1.15 Min.

C. SealMaster Polymer Modified MasterSeal
   1. Polymer modified, clay-stabilized, mineral filled asphalt emulsion sealcoat
   2. Designed for protecting, renewing and beautifying asphalt pavement surfaces
   3. Protects pavement against weather, UV rays, and environmental distress
   4. Designed to mixed on-site with silica sand or other approved aggregate
   5. Applied to properly cleaned asphalt surface by spray, brush or squeegee
   6. Non-volatiles (%): 43% Min.
   7. Ash content of non-volatiles (%): 42% Min.
   8. Specific Gravity @ 25°F: 1.12 Min.
   9. Drying Time: 8 hours Max.
   10. Adhesion & resistance to water: No penetration or loss of adhesion
   11. Resistance to heat: No blistering or sagging
   12. Flexibility: No cracking or flaking
   13. Resistance to impact: No chipping, Flaking or Cracking

D. SealMaster TTP-1952B Traffic Paint (White and Yellow)
   1. 100 % Acrylic Water-based Traffic Paint
   2. Meets Federal Specification TT-P- 1952B
   3. Apply with standard cold-applied traffic marking spray equipment
   4. Do not dilute.
   5. Volatile Organic Content (VOC): <50g/l
   6. Viscosity (KU): 70-110 KU
   7. Solids by Weight (%): 60% Min.
   8. Scrub Resistance: 1,000 cycles Min.
   9. Dry Opacity: .965
   10. Directional Reflectance (%): White 86%; Yellow 50%
   11. Drying Time for no Pick-up, minutes: <30 minutes

E. SealMaster Handicap Blue Traffic Paint
   1. 100 % Acrylic Water-based Traffic Paint for Handicap markings on pavement
   2. Apply with standard cold-applied traffic marking spray equipment, brush or roller
   3. Do not dilute
   4. Volatile Organic Content (VOC): <50g/l
   5. Viscosity (KU): 70-110 KU
   6. Solids by Weight (%): 50% Min.
   7. Scrub Resistance: 1,000 Cycles Min.
   8. Drying Time for no Pick-up, minutes: <30 minutes

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine pavement surface prior to performing work

B. Notify project engineer of any adverse or unacceptable conditions that would affect successful repair efforts or application of materials

C. Do not commence work until unacceptable conditions are corrected

3.02 SURFACE PREPARATION

A. Surface must be clean and free from all loose material and dirt. Remove grass along edge of pavement to find true edge of pavement.

3.03 CRACK REPAIR

A. Hot Applied Crack Sealant/Filling Materials and Methods
   1. Cracks must be free from dust, dirt, vegetation and moisture. Clean cracks with mechanical wire brush followed by a compressed air heat lance to remove loose debris and moisture.
   2. For all cracks up to 1" wide apply either SealMaster CrackMaster Parking Lot Grade crack sealant or SealMaster Crackmaster Supreme crack sealant.
   3. SealMaster CrackMaster Parking Lot Grade crack sealant shall be melted in a conventional oil-jacketed unit equipped with an agitator.

4. Apply heated CrackMaster Parking Lot Grade crack sealant using a pump and wand system, a crack banding unit or a pour pot.
5. Contractor or other Entity Responsible for performing work shall refer to Manufacturer's Product Data Sheet for more detailed application instructions for CrackMaster Parking Lot Grade Crack Sealant.

3.04 OIL SPOT PRIMING

A. Prime Oil Spots with SealMaster Prep Seal or SealMaster Petro Seal
   1. Wipe or scrape excessive build-up of oil, grease, and gasoline spots. A torch may be used to burn away any residual.
   2. Apply oil spot primer with brush, roller or sprayer.
   3. Allow to dry before sealcoating.
   4. Contractor or other Entity Responsible for performing work shall refer to Manufacturer's Product Data Sheet for more detailed application instructions for SealMaster Prep Seal or SealMaster Petro Seal.

3.05 POLYMER-MODIFIED MASTERSEAL (PMM) APPLICATION

A. Applying SealMaster Polymer-Modified MasterSeal
   1. Remove all loose material and dirt from pavement surface. Remove grass along edge of pavement to find true edge of pavement. Power blowers, mechanical sweeping devices and push brooms are acceptable cleaning methods.
   2. Equipment used to apply Polymer-Modified MasterSeal shall have continuous agitation or mixing capabilities to maintain homogeneous consistency of pavement sealer mixture throughout the application process. Spray equipment shall be capable of mixing and spraying pavement sealer with sand added. Self-propelled squeegee equipment with mixing capability shall have at least 2 squeegee or brush devices (one behind the other) to assure adequate distribution and penetration of sealer into pavement surface. Hand squeegees and brushes shall be acceptable in areas where practicality prohibits the use of mechanized equipment.
   3. Polymer-Modified MasterSeal (PMM) shall be mixed in accordance with the following mix design (based on 100 gallons of PMM for ease of calculation):
      - Polymer-Modified MasterSeal (PMM).....100 gallons
      - Sand (40 to 70 mesh AFS fineness gradation).....200-400 lbs.

      Note: If required, a small amount of water may be added to facilitate application of mixed material.
   4. Apply two coats of mixed PMM and Sand at a rate of .11 to .13 gallon per square yard per coat to entire pavement area. Allow first coat to dry thoroughly before applying second coat.
   5. Apply a third coat of mixed PMM and Sand at a rate of .11 to .13 gallon per square yard to high traffic areas including parking area entrances, exits and drive lanes (or as specified in additional diagrams or drawings). Allow second coat to dry thoroughly before applying a third coat to these areas.
   6. Allow final coat of pavement sealer to dry 24 hours prior to applying SealMaster 100 % Acrylic Water based Traffic Paint.

3.06 TRAFFIC MARKINGS/LINE STRIPING

A. Applying SealMaster Traffic Paint

1. Remove all loose material and dirt from existing pavement. Freshly applied pavement sealer shall be allowed to cure for a minimum of 24 hours prior to applying Traffic paint.
2. Apply SealMaster Traffic Paint with pressurized line striping spray equipment at wet thickness of 15 to 20 mils.
3. Apply SealMaster Handicap Blue to all handicap parking spots.
4. Allow paint to dry thoroughly prior to opening to traffic.

SECTION 32 31 13

GALVANIZED CHAIN LINK FENCING

FENCING

Where shown on the plans, the Contractor shall furnish and install chain link fencing.

Fabric material shall be six (6) feet in height and shall be composed of individual wire pickets helically wound and interwoven from No. 9 gauge wire with 2-inch mesh. Posts shall be six (6) feet above ground with 42-inches set in ground with Class B concrete.

Corner posts and gate posts shall be hot-dip galvanized pipe and shall be 4-inch O.D. and shall weigh not less than 9.11 pounds per linear foot. Line posts shall be 2" diameter and weigh not less than 3.65 pounds per linear foot. The chainlink fabric shall be tied to the line posts with No. 9 gauge soft annealed galvanized tie wire every 14 inches.

All posts shall be set no farther than ten (10) feet center to center.

Top rails shall be of the same grade and quality specified for line posts. Rails shall have an overall diameter of one and five-eights inch (1 5/8") fabric and weigh 2.27 pounds per linear foot. The chainlink fabric shall be tied to the rails at intervals of twenty-four inches (24") with No. 9 gauge soft annealed galvanized steel or aluminum.

Bracing shall be provided for all corner and gate posts. Bracing shall be by means of a horizontal compression member of the same materials as the top rail and shall be securely attached to the terminal and first line post with malleable iron fittings, beveled edge bands and truss braced from first line post to bottom of terminal post by 1/2 inch rod and turnbuckle. Corner posts to be so braced in each direction.

GATES

Gates of the sizes and quantity shown on the plans shall be provided. Gate frames shall be made at 2-inch O.D. hot-dip galvanized pipe weighing not less than 2.72 pounds per linear foot.

Corner fittings shall be malleable iron castings or heavy pressed steel.

Fabric shall be No. 9 gauge wire and be the same grade and quality specified for line fencing. Gates are to be cantilever with rollers top and bottom. Provide guide/keeper at gate end when fully closed.

When specified to be furnished, barbed-wire supporting arms shall be at an angle of approximately 45 degrees and vertical as specified, and shall be fitted with clips or other means for attaching three strands of barbed wire. With 45 degree arms, the top wire shall be approximately twelve inches horizontally from the fence line and the other wires spaced uniformly between the top of the fence fabric and the outside strand. Barbed wire arm shall be of sufficient strength to withstand a weight of 200 pounds applied at the outer strand of barbed wire.

Barbed wire shall consist of three strands of 12 1/2 gauge wire with 14 gauge 4 point barbs spaced approximately 5 inches apart. All wire shall be zinc-coated with a minimum coating of .80 ounces per square foot of surface area on 12 1/2 gauge wire and .60 ounces per square foot of surface area on 14 gauge wire.