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10-22-1965

### Specifications for a Library Building Fort Hays Kansas State College

James C. Canole  
*State of Kansas*

Woods & Starr Associates

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Set #1 - R. U. Brooks  
#2 - W. E. Kauling  
#3 - Marc Campbell

Set #2 of 3  
Marc Campbell  
Library

NO. A-17809

SPECIFICATIONS

FOR A

## LIBRARY BUILDING

FORT HAYS KANSAS STATE COLLEGE  
HAYS, KANSAS

PROJECT - KANSAS - 4 - 0020

JAMES C. CANOLE  
STATE ARCHITECT  
TOPEKA, KANSAS

WOODS AND STARR  
ASSOCIATE ARCHITECTS  
HAYS, KANSAS

FORSYTH LIBRARY  
OFFICE OF THE LIBRARIAN

OCT 22 1965

FORT HAYS KANSAS STATE COLLEGE

WILSON BUILDING  
Fort Hays Kansas  
State College,  
Hays, Kansas

A-17803  
Project  
Kans-40020

Bids Taken:  
Oct. 14, 1965

Munter Const. Co. Inc. 10th & Milner Hays, Ks.	Hahner-Foreman-Gale, Inc. Box 429, Great Bend	L.R. Foy Const. Co., Inc. 234 W. 4th. Hutchinson	Paul Allison Inc. Box 53403 Okla. City, Okla.	Munroe & Lundberg Box 1027 Manhattan, Mo.	Abbott Const. Inc. Box 732 Salina	Johnson Builders Inc. 1203 West Salina	Harbison & Leach Box 557, Salina
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<u>Base Bid:</u>	\$669,400.00	\$695,280.00	\$723,100.00	\$726,832.00	\$735,000.00	\$755,900.00	\$769,300.00	\$792,495.00
Alt.#1 deduct	10,000.00	13,151.00	17,000.00	4,877.00	17,470.00	14,900.00	13,850.00	15,950.00
Alt.#2 deduct	700.00	651.00	400.00	416.00	400.00	270.00	300.00	100.
Alt.#3 deduct	7,400.00	7,800.00	7,800.00	8,042.00	8,100.00	5,200.00	5,500.00	4,995.00
Alt.#4 deduct	19,000.00	18,590.00	18,000.00	16,600.00	12,100.00	14,500.00	14,300.00	10,950.00
Conc. Pad.	7.95							
2'6" dia. lin. ft.	7.95	8.18	9.50	12.50	+9. - 8.	8.10	8.30	+11.50- 6.
3'6" dia. lin. ft.	11.47	11.79	12.00	16.65	+13. -11.50	11.70	11.90	+15.50- 3.
3'6" dia. lin. ft.	15.81	16.25	17.30	23.25	+18. -16.	15.10	16.20	+21.50-12.50
4'0" dia. lin. ft.	20.30	20.86	22.00	29.20	+23. -20.	20.65	20.30	+26.50-14.50

Work to commence on or before  
date specified in written  
Work Order & completed in  
300 calendar days.

Alt.#1-Basement floor slab  
Alt.#2-acoustical units  
Alt.#3-composition floor covering  
Alt.#4-exterior marble







ADDENDUM NO. 2

OFFICE OF STATE ARCHITECT  
TOPEKA, KANSAS

October 8, 1965

NOTICE TO ALL CONTRACTORS BIDDING ON CONSTRUCTION OF LIBRARY BUILDING, PROJECT NO. 40020, FORT HAYS KANSAS STATE COLLEGE, HAYS, KANSAS, NO. A-17809

Gentlemen:

Please take note of the following changes in the specifications and drawings for the above subject project:

ALL CONTRACTS

Item No. 1 (Additional Wage Rates)

(a) Contractor shall take note of the Minimum Hourly Wage Schedule issued October 7, 1965, that several crafts were not listed with minimum hourly prevailing wages. Additional rates will be certified at a later date, however this does not relieve the contractor of the responsibility of paying the minimum hourly prevailing rate, for the area in which this project is located, and shall take such into account in preparing his bid.

ELECTRICAL CONTRACT

Item No. 2 (Lighting Fixtures)

(a) On page 40-14, paragraph 40-33, subparagraph (h), add the following sentences to this subparagraph:

"The contractor may have the option of using 1/4 steel rods for lighting fixture suspension in lieu of the suspension systems specified. If rods are used, each row must have one rod for each 4 foot fixture plus one. Rods shall be anchored to ceiling with "Phillips Anchors", "Ramjet", or approved equal."

(b) On page 40-15, paragraph 40-33, subparagraph (j), fixture "J", add the following description:

Reflectors may be either 'Alzak' or porcelain.

Item No. 3 (Drawings)

(a) On drawing sheets #E-1 and #E-2, are shown empty conduit (3/4 inch) with a note in the upper right hand corner of each drawing sheet covering this work. There are 7 runs shown on each drawing sheet. All conduit and junction boxes are to be omitted from the contract except the conduit from the panel to the first junction box in each run.

(b) On drawing sheet #E-4 the power center indicate watt-hour meters, ammeters and voltmeters, shall be deleted from the contract.

(c) On drawing sheet #E-4 the primary cable shown supplying power to power center #2 is indicated as #6 this should be 350 MCM cable 5000 volt.

Item No. 4 (High Velocity Ductwork)

(a) On page 60-9, paragraph 60-14, subparagraph (b), the gauges and schedule of ductwork is indicated under this section. All fan, and filter sections and intake ductwork housings shall conform to this specification.

Item No. 5 (Insulation)

(a) On page 60-6, paragraph 60-08, subparagraph (e), line 6 in this subparagraph should be changed to read:

"with 1" thickness Gustin Bacon #300 "Ultra-Lite" 3-lb. per cubic."

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED ON THE PROPOSAL SHEET.  
JAMES C. CANOLE  
STATE ARCHITECT



ADDENDUM NO. 1

-1-

OFFICE OF STATE ARCHITECT  
TOPEKA, KANSAS

October 7, 1965

NOTICE TO ALL CONTRACTORS BIDDING ON CONSTRUCTION OF LIBRARY BUILDING, PROJECT NO. 40020, FORT HAYS KANSAS STATE COLLEGE, HAYS, KANSAS NO. A-17809

Gentlemen:

Please take note of the following changes in the specifications and drawings for the above subject project:

ALL CONTRACTS

Item No. 1 (Wage Rates)

(a) Attached to and becoming a part of this addendum and the contract documents is the Schedule of Minimum Hourly Wage Rates, Decision No. AE-6129, dated October 5, 1965, and expiring February 2, 1966.

Item No. 2 (General Conditions)

(a) Attached to and becoming a part of this addendum and the contract documents is Amendment No. 1 to the General Conditions modifying paragraphs No. 8, 28 and 56.

Item No. 3 (Bid Date)

(a) On page B-1, Instructions to Bidders, paragraph B-1 (a), the bid date October 7, 1965, should be corrected to October 14, 1965, to agree with the Notice to Bidders.

Item No. 4 (New Alternate No. 1)

(a) The general contractor shall state on his Proposal Sheet the amount to Deduct from his Base Bid if the basement floor slab and premolded membrane waterproofing in areas #11, 13 and 16 is omitted from the contract.

(b) Under floor drainage system and gravel sub-base shall remain in base bid.

(c) This new alternate shall be designated as Alternate No. 1 in order of preference and the existing alternate numbers shall be changed as follows:

- Alternate No. 2 - acoustical units
- Alternate No. 3 - composition floor covering
- Alternate No. 4 - exterior marble

(d) Revised page C-1 of the General Construction Work is included with this addendum showing revised order of alternates.



Item No. 5 (Approved Equal Clause)

(a) In the various divisions of the specifications where the clause "or approved equal" has been inadvertently omitted, paragraph 8 of the General Conditions shall govern or latest modifications.

Item No. 6 (Supplemental General Conditions)

(a) Included with this addenda is revised Division 1.1, Supplemental General Conditions, correcting paragraph headings to agree with cross references, as stated in the General Conditions.

GENERAL CONSTRUCTION

Item No. 7 (Millwork)

(a) All hardwoods specified in Division 19 and noted on the drawings as premium grade walnut shall be changed to rotary cut red birch.

Item No. 8 (Wall Covering)

(a) On page 24-1, paragraph 24-03 (a), the vinyl wall covering shall be changed to "Queens" quality in lieu of "Kings" quality as specified.

Item No. 9 (Marble Work)

(a) Exterior marble shall be Serpentine Verde Scuro as produced by Carthage Marble Corp., or Silvery Serpentine as produced by Locarni Marble Co.

Item No. 10 (Aluminum Windows)

(a) On page 15-3, subparagraph 15-09 (a), shall be deleted.

(b) All windows to be furnished under this contract shall conform to the following:

1. All windows units shall be inside bead glazed. Spandrel glazing shall be outside bead glazed.
2. All corners of both frame and operating sash shall be welded.
3. All weatherstripping shall be retained in dovetailed grooves extruded integrally with the ventilator members and shall be crimped in at each end to prevent movement.
4. Applied weathering legs will not be acceptable.
5. Window manufacturer must submit full size window sample for on the job comparison.

(c) Window shall be single web as specified in lieu of tubular as detailed.



Item No. 11 (Concrete Finish)

(a) On page 8-3, paragraph 8-15, shall be deleted. This work shall be covered under paragraph 8-16, grout cleaning.

(b) Delete all grout cleaning in the basement floor level.

ELECTRICAL CONTRACT

Item No. 12 (Drawings)

(a) The power center shown on drawings as 1000 K.V.A. should be 750 K.V.A. as specified.

Item No. 13 (Panels)

(a) On page 40-16, paragraph 40-34, subparagraph (a), the panels shall be changed as follows:

Type NY1B for 277/480

Type NQO for 120/208

Item No. 14 (Lighting Fixtures)

(a) Lighting fixture "Q" indicated in schedule (not shown on plan) should be installed in Room #104, on circuit #G-5 to light display cases.

(b) Air troffer fixtures require ceiling diffusers which are to be furnished by mechanical contractor(see page 60-11, paragraph 60-18, subparagraph (h)).

MECHANICAL CONTRACT

Item No. 15 (Special Conditions)

(a) This contractor shall consult Section 5 of the specifications concerning the water table.

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED ON THE PROPOSAL SHEET.  
JAMES C. CANOLE  
STATE ARCHITECT

DEPARTMENT, AGENCY, OR BUREAU HHFA, CF

300 West Vickery Blvd., Fort Worth, Texas 76104

DESCRIPTION OF WORK:

Kans. 4-0020, Fort Hays Kansas State College  
Library building and appurtenances including site  
improvements, incidental paving and utilities.

DECISION NO.

AE-6,129

LAW CODE

DATE OF DECISION

10-5-65

EXPIRES

2-2-66

SUPERSEDES DECISION NO.

Bid Opening Date

~~NO BIDDING~~

October 7, 1965

LOCATION (CITY OR OTHER DESCRIPTION)

Hays

STATE

Kansas

COUNTY

Ellis

	Basic Hourly Rates	Fringe Benefits Expenses				
		H & W	Pensions	Vacation	App. TR.	Others
Asbestos workers	4.40	.125	.15			
Boilermakers	4.55	.10	.20		.01	
Boilermaker's helpers	4.30	.10	.20		.01	
Bricklayers	4.25					
Carpenters	3.00					
Cement masons	2.25					
Electricians	4.50		.15		.15	
Glaziers	2.40					
Ironworkers, structural and ornamental						
Ironworkers, reinforcing						
Laborers:						
Laborers	1.50					
Air tool op. (jackhammer, vibrator)						
Mason tenders						
Mortar mixers						
Pipelayers (concrete & clay)						
Plasterers' tenders						
Lathers						
Marble & tile setters, terrazzo workers						
Marble, tile & terrazzo helpers						
Painters, brush						
Painters, structural steel						
Piledrivers						
Plasterers	3.75					
Plumbers	4.15					
Roofers	2.25					
Sheet metal workers						
Soft floor layers	4.15					
Steamfitters						
Welders—Rate for craft						
Truck drivers	1.50					
Power equipment operators						
BASIC HOURLY RATES						
Air compressors	1.625	Hoists	1.625	Rollers		
Bulldozers	2.05	Mixers		Scrapers		
Cranes, derricks, draglines	2.90	Oilers		Shovels		
Distributors		Piledrivers		Tractors		
Finishing machines		Pumps		Trenching machines		
Firemen						
Graders						



U.S. DEPARTMENT OF LABOR  
OFFICE OF THE SECRETARY  
WASHINGTON

DECISION OF THE SECRETARY

This case is before the Department of Labor pursuant to a request for a wage predetermination as required by law applicable to the work described.

A study has been made of wage conditions in the locality and based on information available to the Department of Labor the wage rates and fringe payments listed are hereby determined by the Secretary of Labor as prevailing for the described classes of labor in accordance with applicable law.

This wage determination decision and any modifications thereof during the period prior to the stated expiration date shall be made a part of every contract for performance of the described work as provided by applicable law and regulations of the Secretary of Labor, and the wage rates and fringe payments contained in this decision, including modifications, shall be the minimums to be paid under any such contract by contractors and subcontractors on the work.

The contracting officer shall require that any class of laborers and mechanics which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination, and a report of the action taken shall be sent by the Federal agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the contracting officer shall be referred to the Secretary for determination.

Before using apprentices on the job the contractor shall present to the contracting officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U.S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U.S. Bureau of Apprenticeship and Training.

The contractor shall submit to the contracting officer written evidence of the established apprentice-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

Fringe payments include medical and hospital care, compensation for injuries or illness resulting from occupational activity, unemployment benefits, life insurance, disability and sickness insurance, accident insurance (all designated as health and welfare), pensions, vacation and holiday pay, apprenticeship or other similar programs and other bona fide fringe benefits.

By direction of the Secretary of Labor,

  
Solicitor of Labor.

HOUSING AND HOME FINANCE AGENCY  
COMMUNITY FACILITIES ADMINISTRATION

ACADEMIC FACILITIES PROGRAM

GENERAL CONDITIONS

Amendment No. 1

1. Section 8 is hereby modified as follows:

8. "OR EQUAL" CLAUSE

Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufacturers' or vendors' names, tradenames, catalogue numbers, etc., it is intended merely to establish a standard; and, any material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the contractor without the Architect/Engineer's written approval.

2. Paragraph (f) of Section 28, "CONTRACTORS' AND SUBCONTRACTORS' INSURANCE," is hereby modified as follows:

(f) *Builder's Risk Insurance (Fire and Extended Coverage)*: Until the project is completed and accepted by the Owner, the Owner, or Contractor (at the Owner's option as indicated in the Supplemental General Conditions, Form CFA-238-N-1), is required to maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portion of the project for the benefit of the Owner, the Contractor, and subcontractors as their interests may appear. The Contractor shall not include any costs for Builder's Risk Insurance (fire and extended coverage) premiums during construction unless the Contractor is required to provide such insurance; however, this provision shall not release the Contractor from his obligation to complete, according to plans and specifications, the project covered by the contract, and the Contractor and his surety shall be obligated to full performance of the Contractor's undertaking.

3. Section 56 is hereby modified as follows:

56. SIGNS

The general contractor shall erect a sign at the project site identifying the project and indicating that the Government is participating in the development of the project.

The project sign shall be in accordance with the drawing shown on page 23, made from 3/4-inch plywood, placed in a prominent location, and maintained in good condition until completion of the project. After the name of the President there shall be inserted the name of the Governor of the State in the case of public institutions or the president of the college or university in the case of private institutions.

4. The project sign sketch which appears on page 23 is revised as shown on the reverse side of this page.







CERTIFIED CHECK MUST BE ATTACHED  
HERE, IF FURNISHED WITH THIS  
PROPOSAL IN LIEU OF BOND.

C-1  
Project No. Kans-40020  
No. A-17809

(Revised)  
PROPOSAL

GENERAL CONSTRUCTION WORK

State of Kansas  
H.H. Knauft, Director  
Purchasing Division  
Department of Administration  
State Office Building, Topeka, Kansas

Gentlemen:

The undersigned agrees to furnish all labor, materials, equipment and appliances and perform all operations in connection with the General Construction Work for the construction of a Library Building, Fort Hays Kansas State College, Hays, Kansas, in strict accordance with the plans and specifications issued by the State Architect for the sum of:

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

We will make deductions from the contract in accordance with the alternate specifications as follows: (See Division No. 2 for description.)

	<u>Deduct</u>
Alternate No. 1 - Basement Floor Slab	\$ _____
Alternate No. 2 - Acoustical Units	\$ _____
Alternate No. 3 - Composition Floor Covering	\$ _____
Alternate No. 4 - Exterior Marble	\$ _____
Alternate	\$ _____

The undersigned acknowledges receipt of the following addenda in connection with the work: \_\_\_\_\_

In the event that additions to or deductions from the work covered by the contract are required, the bidder hereby agrees the following unit prices will prevail for such additions or deductions; it being understood, however, that the owner may reject any or all of such unit prices at the time of acceptance of proposal.

<u>Description of Work</u>	<u>Unit</u>	<u>Price</u>
Concrete Pedestals per		
lineal foot 2'-6" diameter	lin. ft.	\$ _____
lineal foot 3'-0" diameter	lin. ft.	\$ _____
lineal foot 3'-6" diameter	lin. ft.	\$ _____

## 1.1 - SUPPLEMENTAL GENERAL CONDITIONS

- |  |   |
|--|---|
| (1) Enumeration of plans & specifications        | (6) Schedule of Minimum Hourly Wage Rates |
| (2) Stated Allowances                            |   |
| (3) Special Hazards                              | (7) Builders Risk Insurance               |
| (4) Public Liability & Property Damage Insurance | (8) Shop Drawings                         |
|  | (9) Safety                                |
| (5) Photographs of Project                       | (10) Statutory - Payment Bond             |

1.1-1. Enumeration of Drawings and Specifications:

- (a) Accompanying these specifications are the following drawings which are to become a part of these specifications, and are intended to coordinate the work of the contracts. Each bidder shall check the specifications and drawings and advise the Architect if any sheets are missing.
- (b) The drawings and specifications are to be construed according to their full intent and meaning, when taken either separately or together. The drawings and specifications taken conjointly shall be deemed to explain each other and be descriptive of the work to be performed under the contract.
- (c) Any discrepancy found between the drawings and specifications and any doubt that may exist as to the meaning of the drawings and specifications shall be referred to the Architect for his decision. Work or material called for by the drawings and not mentioned in the specifications, or vice versa, shall be as fully executed and performed the same as if mentioned in the specifications and shown on the drawings.
- (d) The figures on the drawings shall be taken in preference to the scale measurements; the larger scale drawings shall be followed in preference to the smaller scale drawings.
- (e) These specifications and drawings are divided into two parts and divisions for convenience, but do not place the Architect in the position of an arbitrator with respect to the extent of a Sub-Contractor's work. Refer to "Contents" page for division of work and enumeration of specifications.
- (f) Receipt of all addenda must be acknowledged on the proposal forms.
- (g) Schedule of drawings and specifications included in this contract is as listed below:

D R A W I N G S

Architectural drawings	<u>A-1</u>	thru	<u>A-14</u>
Structural drawings	<u>S-1</u>	thru	<u>S-3</u>
Electrical drawings	<u>E-1</u>	thru	<u>E-4</u>
Mechanical drawings	<u>M-1</u>	thru	<u>M-6</u>
Laboratory Equipment		thru	
Food Service Equipment		thru	
		thru	



## S P E C I F I C A T I O N S

General Construction	<u>Div. 3</u>	thru	<u>Div. 31</u>	inclusive
Laboratory Equipment	_____			
Food Service	_____			
Electrical Work	<u>Div. 40</u>			
Plumbing Work	<u>Div. 50</u>			
Heating & Ventilating Work	<u>Div. 60</u>			

- (b) Notice to Bidders, Instructions to Bidders, General Conditions, Supplemental and Special Conditions and Addenda apply to all divisions of work.

1.1-2. Stated Allowances:

In accordance with paragraph 36 of the General Conditions, the contractor shall include the following cash allowances in his proposal:

- (a) For Finish Hardware (Div. 28 of Specifications) \$ 10,000.00

- (b) For \_\_\_\_\_ (Div. \_\_\_\_\_ of Specifications) \$ \_\_\_\_\_

1.1-3. Special Hazards: (NONE)1.1-4. Contractor's Public Liability and Property Damage Insurance:

- (a) As required under paragraph 28 of the General Conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$100,000 for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$300,000 on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$100,000.
- (b) 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 paragraph, or (2) insure the activities of his subcontractors in his own policy.

1.1-5. Photographs of Project:

- (a) Progress photographs, 6" x 8" in size, shall be made of the project by the General Construction Contractor.
- (b) Photographs shall be taken when the work begins and each month thereafter as long as work is in progress on the outside of the building. Two exposures shall be made at each time and two sets of glossy prints shall be furnished the Architect.



1.1-6. Schedule of Occupational Classifications Minimum Hourly Wage Rates:

The schedule of occupational classifications minimum hourly wage rates for this project are determined by the Department of Labor. The minimum hourly wage rates of this schedule must be strictly adhered to for the construction of this building. Wage rates will be issued by Addenda.

1.1-7. Builders Risk Insurance:

(a) As provided in the General Conditions, Amendments No. 1, Section 28(f), the contractor shall maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portions of the project for the benefit of the Owner, the Contractor, and all sub-contractors, as their interests may appear.

1.1-8. Shop and Setting Drawings:

The contractor shall provide four (4) copies of all shop drawings and setting drawings in lieu of two (2) copies as requested in paragraph 4 of the General Conditions.

1.1-9. Safety:

Precaution shall be exercised at all times for the protection of persons including employees and property. The safety provisions of applicable laws, building and construction codes shall be observed. Machinery, equipment, and hazards shall be guarded, and all hazards shall be guarded or eliminated in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law.

1.1-10. Statutory - Payment Bond:

(a) The contractor shall provide one hundred percent (100%) Statutory Bond to conform to the General Statutes of Kansas in lieu of fifty percent (50%) as requested in paragraph 29 of the General Conditions.

(b) Additional copies of Bond Form 238E, 238G, and C-97 will be sent upon request to all contractors requiring additional forms for bidding and records.

CERTIFIED CHECK MUST BE ATTACHED  
HERE, IF FURNISHED WITH THIS  
PROPOSAL IN LIEU OF BOND.

C-1  
Project No. Kans-40020  
No. A-17809

### PROPOSAL

#### GENERAL CONSTRUCTION WORK

State of Kansas  
H.H. Knauft, Director  
Purchasing Division  
Department of Administration  
State Office Building, Topeka, Kansas

Gentlemen:

The undersigned agrees to furnish all labor, materials, equipment and appliances and perform all operations in connection with the General Construction Work for the construction of a Library Building, Fort Hays Kansas State College, Hays, Kansas, in strict accordance with the plans and specifications issued by the State Architect for the sum of:

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

We will make deductions from the contract in accordance with the alternate specifications as follows: (See Division No. 2 for description.)

#### Deduct

Alternate No. 1 - Acoustical Units	\$ _____
Alternate No. 2 - Composition Floor Covering	\$ _____
Alternate No. 3 - Exterior Marble	\$ _____
Alternate	\$ _____
Alternate	\$ _____

The undersigned acknowledges receipt of the following addenda in connection with the work:

In the event that additions to or deductions from the work covered by the contract are required, the bidder hereby agrees the following unit prices will prevail for such additions or deductions; it being understood, however, that the owner may reject any or all of such unit prices at the time of acceptance of proposal.

<u>Description of Work</u>	<u>Unit</u>	<u>Price</u>
Concrete Pedestals per		
lineal foot 2'-6" diameter	lin. ft.	\$ _____
lineal foot 3'-0" diameter	lin. ft.	\$ _____
lineal foot 3'-6" diameter	lin. ft.	\$ _____



<u>Description of Work</u>	<u>Unit</u>	<u>Price</u>
Concrete Pedestals per lineal foot 4'-0" diameter	lin. ft.	\$ _____

The above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

The undersigned hereby agrees to commence work under this contract on or before a date to be specified in written "Work Order" of the Owner and to fully complete the project within 365 consecutive calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of \$100 for each consecutive calendar day thereafter as hereinafter provided in paragraph 19 of the General Conditions.

The undersigned hereby declares that he has carefully examined the plans and specifications and visited the actual location of the work, together with the sources of supply, and has satisfied himself as to all quantities and conditions and understands that in signing this proposal, he waives all right to plead any misunderstanding regarding the same and agrees to be bound by the provisions of such specifications and all statements made therein by him.

Upon receipt of written notice of the acceptance of this bid, bidder shall execute the formal contract attached within 10 days and deliver a surety bond or bonds as required in paragraph 29 of the General Conditions and paragraphs 1.1-8 of the Supplemental General Conditions.

The undersigned hereby certifies that the bidder is not in arrears in taxes due the State of Kansas.

The undersigned hereby understands all materials and equipment purchased by the contractor to be used, consumed, and/or installed under the terms of this contract are subject to the Kansas Retailers Sales Tax Act and must include the cost of said tax in the installed price.

The undersigned hereby understands that all equipment, subject to Federal Excise Tax, which is purchased by the contractor to be installed under the terms of this contract, must include the cost of said tax in the installed price.

The undersigned hereby agrees to the following:

1. That an incomplete proposal, or other information not requested written on this proposal, may be cause for rejection.
2. No proposal will be considered complete and acceptable that includes a "No Bid" or similar language on any alternate requested for quotation. A price must be indicated in the space provided. The term "No Change" will be considered as a price.

C - 3  
Project No. Kans-40020  
No. A-17809

3. That he has read the Notice to Contractors and the Instructions to Bidders carefully.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 1965.

\_\_\_\_\_  
(Name of Bidder)

\_\_\_\_\_  
(Address of Bidder)

\_\_\_\_\_  
(Authorized Officer)

\_\_\_\_\_  
(Title)

CERTIFIED CHECK MUST BE ATTACHED  
HERE, IF FURNISHED WITH THIS  
PROPOSAL IN LIEU OF BOND.

D - 1  
Project No. Kans-40020  
No. A-17809

PROPOSAL

ELECTRICAL WORK

State of Kansas  
H.H. Knauff, Director  
Purchasing Division  
Department of Administration  
State Office Building, Topeka, Kansas

Gentlemen:

The undersigned agrees to furnish all labor, materials, equipment and appliances and perform all operations in connection with the Electrical Work for the construction of the Library Building, Fort Hays Kansas State College, Hays, Kansas, in strict accordance with the plans and specifications issued by the State Architect for the sum of:

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

We will make deductions from the contract in accordance with the alternate specifications as follows:

	<u>Deduct</u>
Alternate No. E-1 (Master Time & Program Control)	\$ _____
Alternate No. E-2 (Intercommunication System)	\$ _____
Alternate No.	\$ _____
Alternate No.	\$ _____

The undersigned acknowledges receipt of the following addenda in connection with the work: \_\_\_\_\_

The undersigned hereby agrees to commence work under this contract on or before a date to be specified in a written "Work Order" of the Owner and to fully complete the project within 365 calendar days thereafter as stipulated in the specifications. The bidder further agrees to pay as liquidated damages the sum of \$100 for each consecutive calendar day thereafter as hereinafter provided in paragraph 19 of the General Conditions.

The undersigned hereby declares that he has carefully examined the plans and specifications and visited the actual location of the work together with sources of supply and has satisfied himself as to all quantities and conditions, and understands that in signing this proposal, he waives all right to plead any misunderstanding regarding the same and agrees to be bound by the provisions of such specifications and all statements made therein by him.



The undersigned hereby certifies that the bidder is not in arrears in taxes due the State of Kansas.

The undersigned hereby understands all materials and equipment purchased by the contractor to be used, consumed, and/or installed under the terms of this contract are subject to the Kansas Retailer's Sales Tax Act and must include cost of said tax in the installed price.

The undersigned hereby understands all equipment, subject to Federal Excise Tax, which is purchased by the contractor to be installed under the terms of this contract, must include the cost of said tax in the installed price.

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 29 of the General Conditions and paragraph 1.1-3 of the Supplemental General Conditions.

The undersigned hereby agrees to the following:

1. That an incomplete proposal or other information not requested written on this proposal, may be cause for rejection.
2. No proposal will be considered complete and acceptable that includes a "No Bid" or similar language on any alternate requested for quotation. A price must be indicated in the space provided. The term "No Change" will be considered as a price.
3. That he has read the Notice to Contractors and the Instructions to Bidders carefully.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 1965.

\_\_\_\_\_  
(Name of Bidder)

\_\_\_\_\_  
(Address of Bidder)

\_\_\_\_\_  
(Authorized Officer)

\_\_\_\_\_  
(Title)

SPECIFICATIONS  
FOR  
A LIBRARY BUILDING  
FORT HAYS KANSAS STATE COLLEGE  
HAYS, KANSAS  
PROJECT - KANSAS-4-0020

Woods and Starr  
Associate Architects  
Hays, Kansas

Finnay and Turnipseed  
Structural Engineers  
Topeka, Kansas

James C. Canole	FHXSC:193
State Architect	8-10-65
Topeka, Kansas	No. A-17809



## LIBRARY BUILDING

Project -- KANSAS-4-0020

Fort Hays Kansas State College

Hays, Kansas

C O N T E N T S

	<u>Division</u>	<u>Number of Pages</u>
Notice to Bidders	A	1
Instructions to Bidders	B	4
Proposal - General Construction Work	C	3
Proposal - Electrical Work	D	2
Proposal - Plumbing, Heating, and Air Conditioning	E	2
Certification of Bidder	CFA-238-CD	1
Bid Bond	CFA-238-E	1
Form of Contract	CFA-238-F	1
Form of Performance and Statutory Bond	CFA-238-G C97	2
Certificate of Owner's Attorney	CFA-238-J	1
General Conditions of the Contract	CFA-238-T(AF)	22
Supplemental General Conditions of the Contract	1.1	4
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Site Preparation	3	1
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Concrete Pedestal Foundation	5	3
Structural Concrete	6	7
Reinforcing Steel	7	2
Cement Finishes	8	4
Masonry	9	8
Structural Steel	11	3
Waterproofing & Dampproofing	12	1
Miscellaneous Materials	13	2
Ornamental Metals	14	1
Metal Specialties	15	5
Sheet Metal	16	2
Vapor Barrier, Roof Insulation, and Roofing	17	2
Rough Carpentry	18	2
Finish Carpentry and Millwork	19	4
Caulking	20	2
Lathing and Plastering	21	4
Ceramic Tile, Marble, and Quarry Tile	22	3
Special Wall Covering	24	1
Composition Floor Covering	25	3
Glass and Glazing	26	3
Acoustical Tile Ceiling	27	2
Finish Hardware	28	1
Painting and Decorating	29	5
Miscellaneous Equipment	30	4
Elevator	31	9
Electrical	40	26
Plumbing	50	23
Heating and Air Conditioning	60	23

NOTE: Each bidder shall check the specifications and advise the State Architect if any pages are missing.

Project No. KANS-4-0020

NOTICE TO BIDDERS

No. A-17809

Sealed proposals will be received for the construction of The Library Building, Fort Hays Kansas State College, Hays, Kansas until 2:00 p.m., Central Standard Time, October 14, 1965, at the office of H. H. Knouff, Director of Purchases, Purchasing Division, Department of Administration, State Office Building, Room 173 N., Topeka, Kansas, and will be publicly opened and read aloud. Bids received after said time will be returned unopened.

Bids will be received for the following divisions of work which shall be accompanied by a certified check or bid bond in the amount of five per cent (5%) of the base bid.

General Construction Work  
Electrical Work  
Plumbing, Heating, and Ventilating Work

Certified checks will be made payable without condition to the State of Kansas.

Bid bond shall be accompanied by Power of Attorney dated the same day as bid opening. Bid bond shall be approved by the Director of Purchases prior to the opening of bids. (See Instructions to Bidders.)

Copies of the plans and specifications and other Contract Documents are on file for examination and may be obtained from the Office of the State Architect, State Office Building, Topeka, Kansas. One set of drawings and specifications will be sent upon request to General, Electrical, Plumbing, Heating and Ventilating, and Elevator Contractor. Additional sets of drawings may be obtained by paying the cost of blueprinting. Material suppliers and Sub-Contractors may obtain a set of drawings by paying the cost of blueprinting or may refer to drawings on file with Dodge Reports, Midwest Contractor, and Builders Association of Kansas City in Kansas City, Missouri, and Dodge Reports of Wichita, Kansas.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under the contract.

No bidder may withdraw his bid until 10 days after the actual date of the opening thereof.

The Director of Purchases reserves the right to reject any or all bids and to waive all technicalities, should it be in the best interest of the State.

H. H. Knouff  
Director of Purchases  
Purchasing Division  
Department of Administration



Project No. Kansas 46020

## INSTRUCTIONS TO BIDDERS

B-1. Receipt and Opening of Bids:

(a) The State of Kansas (herein called the "Owner") invites bids on the forms attached hereto, all blanks of which must appropriately be filled in. Bids will be received at the Office of H.H. Knouft, Director of Purchases, Purchasing Division, Department of Administration, State Office Building, Topeka, Kansas, until 2:00 P.M., Central Standard Time, October 7, 1965, and at the said office publicly opened and read aloud.

(b) The envelopes containing the bids must be sealed, addressed to and delivered to H.H. Knouft, Director of Purchases, Purchasing Division, Department of Administration, State Office Building, Topeka, Kansas, and identified as set forth in paragraph B-2 (b).

(c) The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any technicalities or reject any or all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 30 days after the actual date of the opening thereof.

B-2. Preparation of Bid:

(a) Each bid must be submitted on the prescribed form and accompanied by Certification by Bidder Regarding Compliance with Executive Orders 10925 and 11114, Form CFA-238-CD-1. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures, and the foregoing Certification must be fully completed and executed when submitted.

(b) Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

B-3. Subcontracts:

(a) The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract--

- (1) Must be acceptable to the Owner and the Community Facilities Administration, and,
- (2) Must submit Form CFA-238-CD-2, Certification by Proposed Subcontractor Regarding Compliance with Executive Orders 10925 and 11114. Approval 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 requirements to which it is or was subject.

B-4. Telegraphic Modification:

(a) Any bidder may modify his bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bid, provided such telegraphic communication is received by the Owner prior to the closing time, and, provided further, the Owner is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. If written confirmation is not received within two days from the closing time, no consideration will be given to the telegraphic modification.

B-5. Method of Bidding:

(a) The Owner invites the following bids:

General Construction Work (Specs. Div. 3 thru Div. 31)  
Electrical Work (Specs. Division 40)  
Heating & Air Conditioning Work (Specs. Div. 50 & 60)

(b) Notice to Bidders, Instructions to Bidders, General Conditions, Supplemental and Special Conditions and Addenda apply to all of the contracts.

B-6. Qualification of Bidders:

(a) The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves 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 obligation of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

B-7. Bid Security:

(a) Each bid must be accompanied by a certified check of the bidder, or a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of five percent (5%) of the Base Bid. Certified checks or bid bond shall be payable without condition to the State of Kansas. Such checks or bid bonds will be returned to all except the three lowest bidders within three days after opening of bids, and the remaining checks or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or, if no award has been made within 30 days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

(b) An annual bid bond on file with the Director of Purchases is not acceptable for this transaction. In the event of an award, the successful bidder shall enter into a contract and furnish performance and statutory bonds in such amount as is required by law and at such time as required by Director of Purchases. Failure to do so shall cause a forfeiture of the full amount of the certified check or bid bond submitted.



(c) The bid bond shall be accompanied by a power of attorney showing the authority of the person executing the bond on behalf of the surety company. All bid bonds submitted in connection with this proposal shall (must) be approved by the Director of Purchases prior to the opening of bids. Failure to do so shall be cause for rejection of bid.

B-8. Liquidated Damages for Failure to Enter into Contract:

(a) The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds 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.

B-9. Time of Completion and Liquidated Damages:

(a) Bidder must agree to commence work on or before a date to be specified in a written "Work Order" of the Owner and to fully complete the project within 365 consecutive calendar days thereafter. Bidder must agree also to pay as liquidated damages the sum of \$100 for each consecutive calendar day thereafter as hereinafter provided in paragraph 19 of the General Conditions.

B-10. Conditions of Work:

(a) Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all materials 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 of any other contractor.

B-11. Addenda and Interpretations:

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

(b) Every request for such interpretations should be in writing, addressed to James C. Canola, State Architect, 12th Floor, State Office Building, Topeka, Kansas, 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 interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed to all prospective bidders (at the respective address furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretations shall not relieve such bidder from obligation under his bid as submitted. All addenda so issued shall be acknowledged on the proposal and shall become a part of the contract documents.

B-12. Security for Faithful Performance:

(a) Simultaneously with his delivery of the executed contract, the contractor shall furnish a surety bond or bonds as security for faithful performance of this

contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in paragraph 1 of the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner.

**B-13. Power of Attorney:**

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

**B-14. Notice of Special Conditions:**

(a) Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

1. Inspection and testing of materials
2. Insurance requirements
3. Wage rates
4. Stated allowances

**B-15. Law and Regulations:**

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

**B-16. Method of Award - Lowest Qualified Bidder:**

(a) If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates applied in numerical order in which they are listed in the proposal, as produces a net amount which is within the available funds.

**B-17. Obligation of Bidder:**

(a) 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.

**B-18. Project Financing:**

(a) This project is financed thru State Appropriations and grant money thru the Higher Education Facilities Act. Construction advances to meet monthly estimates will be obtained from the Community Facilities Administration. A Supplemental Rider will be attached to the contract documents describing the availability of funds. The contractor will sign Supplemental Rider as well as contract form.



CERTIFIED CHECK MUST BE ATTACHED  
HERE, IF FURNISHED WITH THIS  
PROPOSAL IN LIEU OF BOND.

C-1  
Project No. Kans-40020  
No. A-17809

PROPOSAL

GENERAL CONSTRUCTION WORK

State of Kansas  
H.H. Knouft, Director  
Purchasing Division  
Department of Administration  
State Office Building, Topeka, Kansas

Gentlemen:

The undersigned agrees to furnish all labor, materials, equipment and appliances and perform all operations in connection with the General Construction Work for the construction of a Library Building, Fort Hays Kansas State College, Hays, Kansas, in strict accordance with the plans and specifications issued by the State Architect for the sum of:

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

We will make deductions from the contract in accordance with the alternate specifications as follows: (See Division No. 2 for description.)

Deduct:

Alternate No. 1 - Acoustical Units	\$ _____
Alternate No. 2 - Composition Floor Covering	\$ _____
Alternate No. 3 - Exterior Marble	\$ _____
Alternate	\$ _____
Alternate	\$ _____

The undersigned acknowledges receipt of the following addenda in connection with the work:

In the event that additions to or deductions from the work covered by the contract are required, the bidder hereby agrees the following unit prices will prevail for such additions or deductions; it being understood, however, that the owner may reject any or all of such unit prices at the time of acceptance of proposal.

Description of Work	Unit	Price
Concrete Pedestals per		
lineal foot 2'-6" diameter	lin. ft.	\$ _____
lineal foot 3'-0" diameter	lin. ft.	\$ _____
lineal foot 3'-6" diameter	lin. ft.	\$ _____

<u>Description of Work</u>	<u>Unit</u>	<u>Price</u>
Concrete Pedestals per lineal foot 4'-0" diameter	lin. ft.	\$ _____

The above unit prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

The undersigned hereby agrees to commence work under this contract on or before a date to be specified in written "Work Order" of the Owner and to fully complete the project within 365 consecutive calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of \$100 for each consecutive calendar day thereafter as hereinafter provided in paragraph 19 of the General Conditions.

The undersigned hereby declares that he has carefully examined the plans and specifications and visited the actual location of the work, together with the sources of supply, and has satisfied himself as to all quantities and conditions and understands that in signing this proposal, he waives all right to plead any misunderstanding regarding the same and agrees to be bound by the provisions of such specifications and all statements made therein by him.

Upon receipt of written notice of the acceptance of this bid, bidder shall execute the formal contract attached within 10 days and deliver a surety bond or bonds as required in paragraph 29 of the General Conditions and paragraphs 1.1-8 of the Supplemental General Conditions.

The undersigned hereby certifies that the bidder is not in arrears in taxes due the State of Kansas.

The undersigned hereby understands all materials and equipment purchased by the contractor to be used, consumed, and/or installed under the terms of this contract are subject to the Kansas Retailers Sales Tax Act and must include the cost of said tax in the installed price.

The undersigned hereby understands that all equipment, subject to Federal Excise Tax, which is purchased by the contractor to be installed under the terms of this contract, must include the cost of said tax in the installed price.

The undersigned hereby agrees to the following:

1. That an incomplete proposal, or other information not requested written on this proposal, may be cause for rejection.
2. No proposal will be considered complete and acceptable that includes a "No Bid" or similar language on any alternate requested for quotation. A price must be indicated in the space provided. The term "No Change" will be considered as a price.



C - 3  
Project No. Kans-40020  
No. A-17809

3. That he has read the Notice to Contractors and the Instructions to Bidders carefully.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 1965.

\_\_\_\_\_  
(Name of Bidder)

\_\_\_\_\_  
(Address of Bidder)

\_\_\_\_\_  
(Authorized Officer)

\_\_\_\_\_  
(Title)

CERTIFIED CHECK MUST BE ATTACHED  
HERE, IF FURNISHED WITH THIS  
PROPOSAL IN LIEU OF BOND.

D - 1  
Project No. Kans-40020  
No. A-17809

PROPOSAL

ELECTRICAL WORK

State of Kansas  
H.H. Knouft, Director  
Purchasing Division  
Department of Administration  
State Office Building, Topeka, Kansas

Gentlemen:

The undersigned agrees to furnish all labor, materials, equipment and appliances and perform all operations in connection with the Electrical Work for the construction of the Library Building, Fort Hays Kansas State College, Hays, Kansas, in strict accordance with the plans and specifications issued by the State Architect for the sum of:

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

We will make deductions from the contract in accordance with the alternate specifications as follows:

	Deduct
Alternate No. E-1 (Master Time & Program Control)	\$ _____
Alternate No. E-2 (Intercommunication System)	\$ _____
Alternate No.	\$ _____
Alternate No.	\$ _____

The undersigned acknowledges receipt of the following addenda in connection with the work:

The undersigned hereby agrees to commence work under this contract on or before a date to be specified in a written "Work Order" of the Owner and to fully complete the project within 365 calendar days thereafter as stipulated in the specifications. The bidder further agrees to pay as liquidated damages the sum of \$100 for each consecutive calendar day thereafter as hereinafter provided in paragraph 19 of the General Conditions.

The undersigned hereby declares that he has carefully examined the plans and specifications and visited the actual location of the work together with sources of supply and has satisfied himself as to all quantities and conditions, and understands that in signing this proposal, he waives all right to plead any misunderstanding regarding the same and agrees to be bound by the provisions of such specifications and all statements made therein by him.



The undersigned hereby certifies that the bidder is not in arrears in taxes due the State of Kansas.

The undersigned hereby understands all materials and equipment purchased by the contractor to be used, consumed, and/or installed under the terms of this contract are subject to the Kansas Retailer's Sales Tax Act and must include cost of said tax in the installed price.

The undersigned hereby understands all equipment, subject to Federal Excise Tax, which is purchased by the contractor to be installed under the terms of this contract, must include the cost of said tax in the installed price.

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 29 of the General Conditions and paragraph 1.1-3 of the Supplemental General Conditions.

The undersigned hereby agrees to the following:

1. That an incomplete proposal or other information not requested written on this proposal, may be cause for rejection.
2. No proposal will be considered complete and acceptable that includes a "No Bid" or similar language on any alternate requested for quotation. A price must be indicated in the space provided. The term "No Change" will be considered as a price.
3. That he has read the Notice to Contractors and the Instructions to Bidders carefully.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 1965.

\_\_\_\_\_  
(Name of Bidder)

\_\_\_\_\_  
(Address of Bidder)

\_\_\_\_\_  
(Authorized Officer)

\_\_\_\_\_  
(Title)

HOUSING AND HOME FINANCE AGENCY  
COMMUNITY FACILITIES ADMINISTRATIONCERTIFICATION BY BIDDER REGARDING COMPLIANCE WITH  
EXECUTIVE ORDERS NOS. 10925 AND 11114

## INSTRUCTIONS

Each bid must be supported by the certification below with respect to the Bidder's compliance with the reporting requirements of the President's Committee on Equal Employment Opportunity set forth in Chapter 60, Part 60-1, Federal Register, 28 F.R. 9812-9818, September 7, 1963, and of Executive Orders 10925 and/or 11114.

Where the certification shows that the Bidder has not complied, the Bidder must furnish the Owner with evidence of compliance within seven calendar days after bid opening or his bid will be rejected.

## CERTIFICATION BY BIDDER

BIDDERS NAME AND ADDRESS:

The person (or firm) identified above--

- A. ☐ Has NOT participated and is NOT now participating in any contract or subcontract subject to the requirements of the President's Committee on Equal Employment Opportunity, Chapter 60, Part 60-1, Federal Register, 28, F.R. 9812-9818, September 7, 1963 and of Executive Orders 10925 and/or 11114.
- B. ☐ Has participated (or) ☐ is now participating in any ☐ contract (or) ☐ subcontract subject to the said requirements, and
- ☐ Has filed ☐ has not filed all compliance reports required thereunder.
- C. For each such contract or subcontract, show name and address of--
- (1) Owner (2) Federal agency concerned (3) prime contractor and  
(4) subcontractor; continue on reverse of this sheet if necessary.

Certification -- The information above is true and complete to the best of my knowledge and belief.

\_\_\_\_\_  
Name and Title of Signer (please type)\_\_\_\_\_  
Signature\_\_\_\_\_  
Date



BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, \_\_\_\_\_  
 \_\_\_\_\_ as Principal, and  
 \_\_\_\_\_ as Surety, are hereby held  
 and firmly bound unto \_\_\_\_\_ as owner  
 in the penal sum of \_\_\_\_\_  
 for the payment of which, well and truly to be made, we hereby jointly and  
 severally bind ourselves, our heirs, executors, administrators, successors  
 and assigns.

Signed, this \_\_\_\_\_ day of \_\_\_\_\_, 19 \_\_\_\_.

The condition of the above obligation is such that whereas the Principal  
 has submitted to \_\_\_\_\_ a certain Bid,  
 attached hereto and hereby made a part hereof to enter into a contract in  
 writing, for the \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

NOW, THEREFOR,

- (a) If said Bid shall be rejected, or in the alternate,
- (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 day and year first set forth above.

\_\_\_\_\_  
Principal (L. S.)

\_\_\_\_\_  
Surety

SEAL

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



CONTRACT

THIS AGREEMENT, made this the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_  
 by and between (1) \_\_\_\_\_, acting herein  
 through its (2) \_\_\_\_\_, hereinafter  
 called "Owner" and (3) \_\_\_\_\_, an individual  
 doing business as a partnership, a corporation of the City of \_\_\_\_\_,  
 County of \_\_\_\_\_, and State of \_\_\_\_\_,  
 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:

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 the 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 include all maps, plats, blue prints, and other drawings and printed or written explanatory matter thereof, the specifications and contract documents therefor as prepared by \_\_\_\_\_, herein entitled the Architect/Engineer, and as enumerated in Paragraph I of the Supplemental General Conditions, 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 "Work Order" of the Owner and to fully complete the project within \_\_\_\_\_ consecutive calendar days thereafter. The Contractor further agrees to pay, as liquidated damages, the sum of \$ \_\_\_\_\_ for each consecutive calendar day thereafter as hereinafter provided in Paragraph 19 of the General Conditions.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the contract, subject to additions and deductions, as provided in the General Conditions of the Contract, and to make payments on account thereof as provided in Paragraph 25, "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, in the year and day first above mentioned.

(SEAL)  
ATTEST:

\_\_\_\_\_  
Owner

\_\_\_\_\_  
(Secretary) By \_\_\_\_\_

\_\_\_\_\_  
(Witness) \_\_\_\_\_  
(Contractor)

(SEAL)  
\_\_\_\_\_  
(Secretary) By \_\_\_\_\_

\_\_\_\_\_  
(Witness) \_\_\_\_\_  
(Address)

- (1) Corporate name of Owner.
- (2) Title of authorized official.
- (3) Strike out inapplicable terms. Secretary of the Owner should attest. If Contractor is corporation, Secretary should attest. Give proper title of each person executing contract.



PERFORMANCE-PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we (1) \_\_\_\_\_

\_\_\_\_\_ a (2) \_\_\_\_\_  
 hereinafter called "Principal" and (3) \_\_\_\_\_

of \_\_\_\_\_, State of \_\_\_\_\_, hereinafter

called the "Surety", are held and firmly bound unto (4) \_\_\_\_\_

\_\_\_\_\_, hereinafter called

"Owner" in the penal sum of \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and 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, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

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

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_.

ATTEST:

\_\_\_\_\_  
Principal  
By \_\_\_\_\_ (S)  
\_\_\_\_\_  
(Principal) Secretary  
(SEAL) \_\_\_\_\_  
(Address)

\_\_\_\_\_  
Witness as to Principal  
\_\_\_\_\_  
(Address)

ATTEST:

\_\_\_\_\_  
Surety  
By \_\_\_\_\_  
Attorney-in-Fact  
\_\_\_\_\_  
(Surety) Secretary  
(SEAL) \_\_\_\_\_  
(Address)

\_\_\_\_\_  
Witness as to Surety  
\_\_\_\_\_  
(Address)

NOTE: Date of Bond must not be prior to date of Contract.

- (1) Correct name of Contractor
- (2) A Corporation, a Partnership or an Individual, as case may be
- (3) Correct name of Surety
- (4) Correct name of Owner
- (5) If Contractor is Partnership, all partners should execute bond



STATUTORY PAYMENT BOND - STATE OF KANSAS  
(For Use in Kansas - Secs. 60-1412 to 1414, and 19-214,  
19-1511, 19-1538, Gen. Sts. Kans.)

KNOW ALL MEN BY THESE PRESENTS: That we \_\_\_\_\_  
of \_\_\_\_\_, as Principal, and \_\_\_\_\_  
a corporation organized and existing under the laws of the State of \_\_\_\_\_  
as Surety, are hereby held and firmly bound unto the STATE OF KANSAS in  
the sum of \_\_\_\_\_ Dollars  
(\$ \_\_\_\_\_) lawful money of the United States of America, for the use  
and benefit of all persons entitled thereto, for the payment of which well and  
truly to be made, we hereby bind ourselves, our successors, heirs, executors  
and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, That whereas, the said  
\_\_\_\_\_ has entered into a written contract with the  
\_\_\_\_\_ dated \_\_\_\_\_ for the  
\_\_\_\_\_ according to the contract and  
specifications attached hereto and made a part hereof.

NOW, THEREFORE, if the said \_\_\_\_\_ Contractor,  
or the subcontractors of said Contractor shall pay all indebtedness incurred  
for supplies, materials or labor furnished, used or consumed in connection  
with or in or about the construction of said building or in making such improve-  
ments, including gasoline, lubricating oils, fuel oils, greases, coal and simi-  
lar items used or consumed directly in furtherance of such improvement, then  
this obligation to be null and void; otherwise to remain in full force and effect,

The said surety for value received hereby agrees that no change, extension  
of time, alteration or addition to the terms of the contract or to the work to be  
performed thereunder or the specifications accompanying the same shall in any  
wise affect its obligations on this bond, and it does hereby waive notice of any  
such change, extension of time, alteration or addition to said contract, work  
or specifications.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to  
be executed and delivered this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

\_\_\_\_\_  
Principal

By \_\_\_\_\_

\_\_\_\_\_  
Surety

By \_\_\_\_\_

## CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, \_\_\_\_\_, the  
duly authorized and acting legal representative of \_\_\_\_\_  
\_\_\_\_\_, do hereby certify as  
follows:

I have examined the foregoing contract and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Date: \_\_\_\_\_



## GENERAL CONDITIONS

1. Contract and Contract Documents
2. Definitions
3. Additional Instructions and Detail Drawings
4. Shop or Setting Drawings
5. Materials, Services and Facilities
6. Contractor's Title of Materials
7. Inspection and Testing of Materials
8. "Or Equal" Clause
9. Patents
10. Surveys, Permits and Regulations
11. Contractor's Obligations
12. Weather Conditions
13. Protection of Work and Property - Emergency
14. Inspection
15. Reports, Records and Data
16. Superintendence by Contractor
17. Changes in Work
18. Extras
19. Time for Completion and Liquidated Damages
20. Correction of Work
21. Subsurface Conditions Found Different
22. Claims for Extra Cost
23. Right of Owner to Terminate Contract
24. Construction Schedule and Periodic Estimates
25. Payments to Contractor
26. Acceptance of Final Payment As Release
27. Payments by Contractor
28. Contractors' and Subcontractors' Insurance
29. Contract Security
30. Additional or Substitute Bond
31. Assignments
32. Mutual Responsibility of Contractors
33. Separate Contracts
34. Subcontracting
35. Architect/Engineer's Authority
36. Stated Allowances
37. Use of Premises and Removal of Debris
38. Quantities of Estimate
39. Lands and Rights-of-Way
40. General Guaranty
41. Conflicting Conditions
42. Notice and Service Thereof
43. Required Provisions Deemed Inserted
44. Protection of Lives and Health
45. Minimum Wages
46. Withholding of Payments
47. Payrolls and Payroll Records
48. Apprentices
49. Compliance with Copeland Regulations
50. Subcontracts
51. Contract Termination
52. Overtime Requirements
53. Equal Employment Opportunity
54. Interest of Member of Congress
55. Other Prohibited Interests
56. Signs
57. Photographs
58. Use and Occupancy Prior to Acceptance by Owner
59. Suspension of Work

## 1. CONTRACT AND CONTRACT DOCUMENTS

The Plans, Specifications and Addenda, hereinafter enumerated in Paragraph 1 of the Supplemental General Conditions shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

## 2. DEFINITIONS

The following terms as used in this contract are respectively defined as follows:

- (a) "Contractor": A person, firm or corporation with whom the Contract is made by the Owner.
- (b) "Subcontractor": A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with, the Contractor.
- (c) "Work on (at) the project": Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any Subcontractor.

## 3. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Architect/Engineer will prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment, and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the work.

## 4. SHOP OR SETTING DRAWINGS

The Contractor shall submit promptly to the Architect/Engineer two copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with two corrected copies. If requested by the Architect/Engineer, the Contractor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer the Contractor will nevertheless be responsible for the accuracy of such drawings and for their



conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

## 5. MATERIALS, SERVICES AND FACILITIES

- (a) It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.
- (b) Any work necessary to be performed after regular working hours, on Sundays or Legal Holidays, shall be performed without additional expense to the Owner.

## 6. CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

## 7. INSPECTION AND TESTING OF MATERIALS

- (a) All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The Owner will pay for all laboratory inspection service direct, and not as a part of the Contract.
- (b) Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for uses intended.

## 8. "OR EQUAL" CLAUSE

Whenever a material or article required is specified or shown on the plans by using the name of the proprietary product or of a particular manufacturer or vendor, any material or article which will perform adequately the duties imposed by the general design will be considered equal and satisfactory providing the material or article so proposed is of equal substance and function in the Architect/Engineer's opinion. It shall not be purchased or installed without his written approval.

## 9. PATENTS

- (a) The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.



- (b) License or Royalty Fee: License and/or Royalty Fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the Contractor.
- (c) If the Contractor uses any design, device or materials covered by letters, patent or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, that, without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

#### 10. SURVEYS, PERMITS AND REGULATIONS

Unless otherwise expressly provided for in the Specifications, the Owner will furnish to the Contractor all surveys necessary for the execution of the work.

The Contractor shall procure and pay for all permits, licenses and approvals necessary for the execution of his contract.

The Contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to the performance of the work, the protection of adjacent property, and the maintenance of passageways, guard fences or other protective facilities.

#### 11. CONTRACTOR'S OBLIGATIONS

The Contractor shall and will, in good workmenlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings covered by this contract and any and all supplemental plans and drawings, and in accordance with the directions of the Architect/Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract and specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Architect/Engineer and the Owner.

#### 12. WEATHER CONDITIONS

In the event of temporary suspension of work, or during inclement weather, or whenever the Architect/Engineer shall direct, the Contractor will, and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the



Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his subcontractors so to protect his work, such materials shall be removed and replaced at the expense of the Contractor.

### 13. PROTECTION OF WORK AND PROPERTY - EMERGENCY

The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work, and that of adjacent property, for damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the Owner, or his duly authorized representatives.

In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Architect/Engineer, in a diligent manner. He shall notify the Architect/Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Architect/Engineer for approval.

Where the Contractor has not taken action but has notified the Architect/Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized by the Architect/Engineer.

The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Paragraph 17 of the General Conditions.

### 14. INSPECTION

The authorized representatives and agents of the Housing and Home Finance Administrator shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

### 15. REPORTS, RECORDS AND DATA

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

### 16. SUPERINTENDENCE BY CONTRACTOR

At the site of the work the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Architect/Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll.



## 17. CHANGES IN WORK

No changes in the work covered by the approved contract documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

- (a) Unit bid prices previously approved.
- (b) An agreed lump sum.
- (c) The actual cost of:
  - 1. Labor, including foremen;
  - 2. Materials entering permanently into the work;
  - 3. The ownership or rental cost of construction plant and equipment during the time of use on the extra work;
  - 4. Power and consumable supplies for the operation of power equipment;
  - 5. Insurance;
  - 6. Social Security and old age and unemployment contributions.

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen per cent (15%) of the estimated cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

## 18. EXTRAS

Without invalidating the contract, the Owner may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the Surety being first obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the Owner or its Architect/Engineer, acting officially for the Owner, and the price is stated in such order.

## 19. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the Contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the work order.

The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the



Contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract. Provided, That the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

- (a) To any preference, priority or allocation order duly issued by the Government;
- (b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; and
- (c) To any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article: Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

## 20. CORRECTION OF WORK

All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at his own expense. Rejected material shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.



## 21. SUBSURFACE CONDITIONS FOUND DIFFERENT

Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, he shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans or indicated in the Specifications, he will at once make such changes in the Plans and/or Specifications as he may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

## 22. CLAIMS FOR EXTRA COSTS

No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the owner, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17 (c) of the General Conditions, the Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

## 23. RIGHT OF THE OWNER TO TERMINATE CONTRACT

In the event that any of the provisions of this contract are violated by the Contractor, or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the contract, such notices to contain the reasons for such intention to terminate the contract, and unless within ten (10) days after the serving of such notice upon the Contractor, such violation of delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination the Owner shall immediately serve notice thereof upon the Surety and the Contractor, and the Surety shall have the right to take over and perform the contract; Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account for the account and at the expense of the Contractor and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefor.

## 24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs



employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

## 25. PAYMENTS TO CONTRACTOR

- (a) Not later than the 15th day of each calendar month the Owner shall make a Progress payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this contract, but to insure the proper performance of this contract, the Owner shall retain ten per cent (10%) of the amount of each estimate until final completion and acceptance of all work covered by this contract: Provided, That the Owner at any time after 50% of the work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining Progress payments in full: Provided, Further, that on completion and acceptance of each separate building, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made in full, including retained percentages thereon, less authorized deductions.
- (b) In preparing estimates the material delivered on the site and preparatory work done may be taken into consideration.
- (c) All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all of the terms of the contract.
- (d) Owner's Right to Withhold Certain Amounts and Make Application Thereof: The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the Contractor fails so to do, then the Owner may, after having served written notice on the said Contractor, either pay unpaid bills, of which the Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his Surety. In paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner, shall be considered as a payment made under the contract by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payment made in good faith.



## 26. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this contract or the Performance and Payment Bond.

## 27. PAYMENTS BY CONTRACTOR

The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of 90% of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the 30th day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used, and (c) to each of his subcontractors, not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractors to the extent of each subcontractor's interest therein.

## 28. CONTRACTORS' AND SUBCONTRACTORS' INSURANCE

The Contractor shall not commence work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved.

- (a) Compensation Insurance: The Contractor shall procure and shall maintain during the life of this contract Workmen's Compensation Insurance as required by applicable State or territorial law for all of his employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workmen's Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance for the protection of such of his employees as are not otherwise protected.
- (b) Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance, Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amounts specified in Paragraph 4 of the Supplemental General Conditions.
- (c) Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: 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 Insurance and Vehicle Liability Insurance of the type and in the amounts specified in Paragraph 4 of the Supplemental General Conditions specified in subparagraph (b) hereof, or, (2) insure the activities of his subcontractors in his policy, specified in subparagraph (b) hereof.

- (d) Scope of Insurance and Special Hazards: The insurance required under subparagraphs (b) and (c) hereof shall provide adequate protection for the Contractor and his subcontractors, respectively, against damage claims which may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards which may be encountered in the performance of this contract as enumerated in Paragraph 3 of the Supplemental General Conditions.
- (e) Proof of Carriage of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be cancelled or materially altered, except after ten (10) days written notice has been received by the Owner."
- (f) Builder's Risk Insurance (Fire and Extended Coverage): Until the project is completed and is accepted by the Owner, the Owner is required to maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent basis on the insurable portion of the project for the benefit of the Owner, the prime contractor, and subcontractors as their interests may appear. The contractor shall not include any costs for Builder's Risk Insurance (fire and extended coverage) premiums during construction. However, this provision shall not release the contractor from his obligation to complete, according to plans and specifications, the project covered by the contract, and the contractor and his surety shall be obligated to full performance of the contractor's undertaking.

## 29. CONTRACT SECURITY

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract prices as security for the faithful performance of this contract and also a payment bond in an amount not less than fifty percent (50%) of the contract price or in a penal sum not less than that prescribed by State, territorial or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law. Before final acceptance each bond must be approved by the Housing and Home Finance Agency.

## 30. ADDITIONAL OR SUBSTITUTE BOND

If at any time the Owner for justifiable cause, shall be or become dissatisfied with any surety or sureties than upon the Performance or Payment Bonds, the Contractor shall within five (5) days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums



on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Owner.

### 31. ASSIGNMENTS

The Contractor shall not assign the whole or any part of this contract or any moneys due or to become due hereunder without written consent of the Owner. In case the Contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the work called for in this contract.

### 32. MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts of neglect on the part of the Contractor, any other Contractor or any subcontractor shall suffer loss of damage on the work, the Contractor agrees to settle with such other Contractor or subcontractor by agreement or arbitration if such other Contractor or subcontractors will so settle. If such other Contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

### 33. SEPARATE CONTRACTS

The Contractor shall coordinate his operations with those of other Contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractors, shall keep informed of the progress and the detail work of other Contractors and shall notify the Architect/Engineer immediately of lack of progress or defective workmanship on the part of other Contractors. Failure of a Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

### 34. SUBCONTRACTING

- (a) The Contractor may utilize the services of specialty Subcontractors on those parts of the work which, under normal contracting practices, are performed by specialty Subcontractors.
- (b) The Contractor shall not award any work to any subcontractor without prior written approval of the Owner, which approval 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.
- (c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.



- (d) The Contractor shall cause appropriate provisions to be inserted in all sub-contracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the contract documents.
- (e) Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

### 35. ARCHITECT/ENGINEER'S AUTHORITY

The Architect/Engineer shall give all orders and directions contemplated under this contract and specifications relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Architect/Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work which may arise between the Contractor under this contract and other Contractors performing work for the Owner shall be adjusted and determined by the Architect/Engineer.

### 36. STATED ALLOWANCES

The Contractor shall include in his proposal the cash allowances stated in Paragraph 2 of the Supplemental General Conditions. The Contractor shall purchase the "Allowed Materials" as directed by the Owner on the basis of the lowest and best bid of at least three competitive bids. If the actual price for purchasing the "Allowed Materials" is more or less than the "Cash Allowance", the contract price shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowed Materials" shall be included in the applicable sections of the Contract Specifications covering this work.

### 37. USE OF PREMISES AND REMOVAL OF DEBRIS

The Contractor expressly undertakes at his own expense:

- (a) to take every precaution against injuries to persons or damage to property;
- (b) to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors;



- (c) to place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;
- (d) to clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;
- (e) before final payment to remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition;
- (f) to effect all cutting, fitting or patching of his work required to make the same to conform to the plans and specifications and, except with the consent of the Architect/Engineer, not to cut or otherwise alter the work of any other Contractor.

#### 38. QUANTITIES OF ESTIMATE

Wherever the estimated quantities of work to be done and materials to be furnished under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

#### 39. LANDS AND RIGHTS-OF-WAY

Prior to the start of construction, the owner shall obtain all land and rights-of-way necessary for the carrying out and completion of work to be performed under this contract.

#### 40. GENERAL GUARANTY

Neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness.

#### 41. CONFLICTING CONDITIONS

Any provision in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.



42. NOTICE AND SERVICE THEREOF

Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor at his last given address, or delivered in person to said Contractor or his authorized representative on the work.

43. REQUIRED PROVISIONS DEEMED INSERTED

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

44. PROTECTION OF LIVES AND HEALTH

In order to protect the lives and health of his employees under the contract, the Contractor shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the contract.

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance, or operation.

45. MINIMUM WAGES

(a) All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amounts due at time of payment computed at wage rates not less than those contained in the wage determination decision of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics; and the wage determination decision shall be posted by the contractor at the site of the work in a prominent place where it can be easily seen by the workers. For the purpose of this clause, contributions made or costs reasonably anticipated under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv). Also for the purpose of this clause, regular contributions made or costs incurred for more than a weekly period under plans, funds, or programs, but covering the particular weekly period, are deemed to be constructively made or incurred during such weekly period.



- (b) The Housing and Home Finance Agency shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination, and a report of the action taken shall be sent by the Housing and Home Finance Agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the Housing and Home Finance Agency shall be referred to the Secretary for final determination.
- (c) The Housing and Home Finance Agency shall require, whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly wage rate and the contractor is obligated to pay a cash equivalent of such a fringe benefit, an hourly cash equivalent thereof to be established. In the event the interested parties cannot agree upon a cash equivalent of the fringe benefit, the question, accompanied by the recommendation of the Housing and Home Finance Agency, shall be referred to the Secretary of Labor for determination.
- (d) The contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, or any bona fide fringe benefits not expressly listed in section 1(b)(2) of the Davis-Bacon Act or otherwise not listed in the wage determination decision of the Secretary of Labor which is included in this contract, only when the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. Whenever practicable, the contractor should request the Secretary of Labor to make such findings before the making of the contract. In the case of unfunded plans and programs, the Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

#### 46. WITHHOLDING OF PAYMENTS

The Housing and Home Finance Agency may withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics employed by the contractor or any subcontractor on the work the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic employed or working on the site of the work, all or part of the wages required by the contract, the Housing and Home Finance Agency may, after written notice to the contractor or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

#### 47. PAYROLLS AND BASIC RECORDS

- (a) Payrolls and basic records relating thereto will be maintained during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records will contain the name and address of each such employee, his correct classification, rates of pay (including rates of contributions or costs



anticipated of the types described in section 1(b)(2) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1) (iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

- (b) The contractor will submit weekly a copy of all payrolls to the Owner, for transmission to the Housing and Home Finance Agency. The copy shall be accompanied by a statement signed by the employer or his agent indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Secretary of Labor and that the classifications set forth for each laborer or mechanic conform with the work he performed. A submission of a "Weekly Statement of Compliance" which is required under this contract and the Copeland regulations of the Secretary of Labor (29 CFR, Part 3) and the filing with the initial payroll or any subsequent payroll of a copy of any findings by the Secretary of Labor under 29 CFR 5.5(a)(1)(iv) shall satisfy this requirement. The prime contractor shall be responsible for the submission of copies of payrolls of all subcontractors. The contractor will make the records required under the labor standards clauses of the contract available for inspection by authorized representatives of the Housing and Home Finance Agency and the Department of Labor, and will permit such representatives to interview employees during working hours on the job.

#### 48. APPRENTICES

Apprentices will be permitted to work as such only when they are registered, individually, under a bona fide apprenticeship program registered with a State apprenticeship agency which is recognized by the Bureau of Apprenticeship and Training, United States Department of Labor; or, if no such recognized agency exists in a State, under a program registered with the Bureau of Apprenticeship and Training, United States Department of Labor. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ratio permitted to the contractor as to his entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The contractor or subcontractor will be required to furnish to the Housing and Home Finance Agency written evidence of the registration of his program and apprentices as well as of the appropriate ratios and wage rates, for the area of construction, prior to using any apprentices on the contract work.

#### 49. COMPLIANCE WITH COPELAND REGULATIONS (29 CFR Part 3)

The contractor shall comply with the Copeland Regulations (29 CFR, Part 3) of the Secretary of Labor which are herein incorporated by reference.



## 50. SUBCONTRACTS

The contractor will insert in any subcontracts the Sections 45 through 49 and 51 contained herein and such other clauses as the Housing and Home Finance Agency may, by instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

## 51. CONTRACT TERMINATION; DEBARMENT

A breach of Sections 45 through 50 may be grounds for termination of the contract, and for debarment as provided in 29 CFR 5.6.

## 52. OVERTIME REQUIREMENTS

- (1) No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic in any workweek in which he is employed on such work to work in excess of eight hours in any calendar day or in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of eight hours in any calendar day or in excess of forty hours in such workweek, as the case may be.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1), the contractor and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the clause set forth in subparagraph (1), in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in subparagraph (1).
- (3) Withholding for unpaid wages and liquidated damages. The Housing and Home Finance Agency may withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor such sums as may administratively be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2).
- (4) Subcontracts. The contractor shall insert in any subcontracts the clauses set forth in subparagraphs (1), (2), and (3) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.



### 53. EQUAL EMPLOYMENT OPPORTUNITY

"Unless exempt in accordance with Executive Order 10925, dated March 6, 1961, as amended, during the performance of this contract, the Contractor agrees as follows:

- (a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Housing and Home Finance Agency setting forth the provisions of this nondiscrimination clause.
- (b) The Contractor will, in all solicitations or advertisements for employers placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.
- (c) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Housing and Home Finance Agency, advising the said labor union or workers' representative of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (d) The Contractor will comply with all provisions of Executive Order No. 10925 of March 6, 1961, as amended, the rules, regulations, and relevant orders of the President's Committee on Equal Employment Opportunity created thereby, and the related rules and regulations of the Housing and Home Finance Agency.
- (e) The Contractor will furnish all information and reports required by Executive Order No. 10925 of March 6, 1961, as amended, by the rules, regulations, and orders of the said Committee, and by the Housing and Home Finance Agency, pursuant thereto, and will permit access to his books, records and accounts by the Housing and Home Finance Agency and the Committee for purpose of investigation to ascertain compliance with such rules, regulations, and orders.
- (f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts and Federally assisted construction contracts, in accordance with procedures authorized in Executive Order No. 10925 of March 6, 1961, as amended, including Executive Order No. 11114 of June 22, 1963, and such other sanctions may be imposed and remedies invoked as provided in the said Executive Order No. 10925, as amended, or



by rules, regulations, or orders of the President's Committee on Equal Employment Opportunity, or as otherwise provided by law.

- (g) The Contractor will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the President's Committee on Equal Employment Opportunity issued pursuant to Section 303 of Executive Order No. 10925 of March 6, 1961, as amended, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Housing and Home Finance Agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Housing and Home Finance Agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States. "

54. INTEREST OF MEMBER OF OR DELEGATE TO CONGRESS, OR RESIDENT COMMISSIONER

No Member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

55. OTHER PROHIBITED INTERESTS

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

56. SIGNS

The general contractor will erect a sign at the project site identifying the project and indicating that the Government is participating in the development of the project.

The project sign shall be in accordance with the drawing shown on page 23, made from 3/4-inch plywood, placed in a prominent location, and maintained in good condition until completion of the project.

57. PHOTOGRAPHS OF THE PROJECTS

If required by the Owner, the Contractor shall furnish photographs of the project, in the quantities and as described in Paragraph 5 of the Supplemental General Conditions.



58. USE AND OCCUPANCY PRIOR TO ACCEPTANCE BY OWNER

The Contractor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the owner, provided the owner:

- (a) Secures written consent of the contractor except in the event, in the opinion of the Architect/Engineer, the contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements.
- (b) Secures endorsement from the insurance carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction; or,
- (c) When the project consists of more than one building, and one of the buildings is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of the surety must also be obtained.

59. SUSPENSION OF WORK

Should the owner be prevented or enjoined from proceeding with work or from authorizing its prosecution either before or after its prosecution, by reason of any litigation, the contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable time as the owner may determine will compensate for time lost by such delay with such determination to be set forth in writing.





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LIBRARY BUILDING

Fort Hays Kansas State College

Hays, Kansas

1.1:01. Supplemental General Conditions of the Contract:

- (A) Enumeration of drawings and specifications
- (B) Stated allowances
- (C) Special hazards
- (D) Public liability and property damage insurance
- (E) Photographs of project
- (F) Shop drawings
- (G) Safety
- (H) Statutory - Payment bond
- (I) Schedule of prevailing hourly wage rates

1.1:02. Enumeration of Drawings and Specifications:

- (A) Accompanying these specifications are the following drawings which are to become a part of these specifications, and are intended to coordinate the work of the contracts. Each bidder shall check the specifications and drawings and advise the Architect if any sheets are missing.
- (B) The drawings and specifications are to be construed according to their full intent and meaning, when taken either separately or together. The drawings and specifications taken conjointly shall be deemed to explain each other and be descriptive of the work to be performed under the contract.
- (C) Any discrepancy found between the drawings and specifications and any doubt that may exist as to the meaning of the drawings and specifications shall be referred to the Architect for his decision. Work or material called for by the drawings and not mentioned in the specifications, or vice versa, shall be as fully executed and performed the same as if mentioned in the specifications and shown on the drawings.
- (D) The figures on the drawings shall be taken in preference to the scale measurements; the larger scale drawings shall be followed in preference to the smaller scale drawings.
- (E) These specifications and drawings are divided into two parts and divisions for convenience, but do not place the Architect in the position of an arbitrator with respect to the extent of a Sub-Contractor's work. Refer to "Contents" page for division of work and enumeration of specifications.
- (F) Receipt of all addenda must be acknowledged on the proposal forms.
- (G) Schedule of drawings included in this contract is as listed below;



ARCHITECTURAL DRAWINGS

<u>SHEET</u>	<u>TITLE</u>
1 - (A-1)	Architectural and Mechanical Roof and Plot Plan
2 - (A-2)	Basement Floor Plan
3 - (A-3)	First Floor Plan
4 - (A-4)	Second Floor Plan
5 - (A-5)	Elevations; Room Finish Schedule; Window Schedule; Marble and Precast Concrete Details
6 - (A-6)	Elevations; Window Details
7 - (A-7)	Wall Sections; Flashing and Fascia Details; Base and Floor Condition Details
8 - (A-8)	Stair Details
9 - (A-9)	Elevator Details; Door Schedule and Frame Details
10 - (A-10)	Large Scale Toilet Plans; Aluminum Entrance Material Details; Entrance Area Plan and Details
11 - (A-11)	Interior Elevations and Details; Millwork Details
12 - (A-12)	Millwork Details; Miscellaneous Details
13 - (A-13)	First Floor Reflected Ceiling Plan
14 - (A-14)	Second Floor Reflected Ceiling Plan and Details

STRUCTURAL DRAWINGS

15 - (S-1)	Basement and Foundation Plan
16 - (S-2)	First Floor Plan
17 - (S-3)	Second Floor Plan
18 - (S-4)	Roof Plan
19 - (S-5)	Column and Pedestal Schedules and Details
20 - (S-6)	Foundation Wall Schedule and Details
21 - (S-7)	Beam Schedule and Details; Stair Details
22 - (S-8)	Flat Slab Schedule and Details

ELECTRICAL DRAWINGS

23 - (E-1)	Basement Floor Plan
24 - (E-2)	First Floor Plan
25 - (E-3)	Second Floor Plan
26 - (E-4)	Electrical Distribution Diagrams and Details

MECHANICAL DRAWINGS

27 - (M-1)	Basement Floor Plan
28 - (M-2)	First Floor Plan
29 - (M-3)	Second Floor Plan
30 - (M-4)	Equipment Room Piping Diagram
31 - (M-5)	Equipment Room Duct Plan; Air Unit Details; Temperature Control Diagrams
32 - (M-6)	Toilet Room Plumbing Plans; Sheet Metal Details; Plumbing Diagrams

1.1:03 Stated Allowances:

- (A) The General Contractor shall include in his Base Bid an allowance for the purchase of Finish Hardware as specified in Division 28.

1.1:04 Special Hazards: (NONE)

1.1:05 Contractor's Public Liability and Property Damage Insurance:

- (A) As required under paragraph 28 of the General Conditions, the Contractor's Public Liability Insurance and Vehicle Liability Insurance shall be in an amount not less than \$100,000 for injuries, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than \$300,000 on account of one accident, and Contractor's Property Damage Insurance in an amount not less than \$100,000.
- (B) 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 paragraph, or (2) insure the activities of his subcontractors in his own policy.

1.1:06 Photographs of Project:

- (A) Progress photographs, 6" x 8" in size, shall be made of the project by the General Construction Contractor.
- (B) Photographs shall be taken when the work begins and each month thereafter as long as work is in progress on the outside of the building. Two exposures shall be made at each time and two sets of glossy prints shall be furnished the Architect.

1.1:07 Shop and Setting Drawings:

- (A) The contractor shall provide four (4) copies of all shop drawings and setting drawings in lieu of two (2) copies as requested in paragraph 4 of the General Conditions.

1.1:08 Safety:

- (A) Precaution shall be exercised at all times for the protection of persons including employees and property. The safety provisions of applicable laws, building and construction codes shall be observed. Machinery, equipment, and hazards shall be guarded, and all hazards shall be guarded or eliminated in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law.

1.1:09 Statutory Bond:

- (A) The contractor shall provide one hundred percent (100%) Statutory Bond to conform to the General Statutes of Kansas in lieu of fifty percent (50%) as requested in paragraph 29 of the General Conditions.



- (B) Additional copies of Bond Form 238E, 238G, and C-97 will be sent upon request to all contractors requiring additional forms for bidding and records.

1.1:10. Schedule of Prevailing Hourly Wage Rates:

- (A) The Schedule of Prevailing Hourly Wage Rates for this project are determined by the Department of Labor. The minimum hourly wage rates of this schedule must be strictly adhered to for the construction of the Library Building, Project No. KANS-4-0020, Fort Hays Kansas State College, Hays, Kansas. Wage rates will be issued by Addenda.

## DIVISION NO. 2

Special Conditions of the Contract and Alternates2:01. Scope of Project:

- (A) Furnish all labor, materials, equipment, and appliances and perform all operations in connection with the provisions of the General Conditions, specifications, and drawings as issued by the Office of the State Architect for the construction of a Library Building on the grounds of Fort Hays Kansas State College, Hays, Kansas.
- (B) A work order will not be issued by the Assistant State Architect in charge of construction until he has received a duplicate copy of receipt from the Clerk of the District Court in the county where the project is located showing that the Statutory Bond has been filed.
- (C) In case of conflict between the Special Conditions and the General Conditions, (Government Form CFA-238 TAF), the General Conditions shall govern this contract.

2:02. Separate Bids:

- (A) The Owner will take separate bids for the following divisions of the work:
  - 1. General Construction Work (Division No. 1 through Division No. 31)
  - 2. Electrical Work (Division Nos. 1, 2, and 40)
  - 3. Plumbing, Heating, and Ventilating Work (Division Nos. 1, 2, 50, and 60)
- (B) Notice to bidders, instructions to bidders, General Conditions, Supplemental and Special Conditions, and Addenda apply to all of the contracts.

2:03. Layout of Work:

- (A) The General Construction Contractor shall employ an experienced and competent civil engineer to establish all lines and grades for the work to be done under this contract. He shall keep on the job at all times a complete level and transit, in good working condition, and allow the Architect the use of same. Other Contractors shall establish their grades and lines, coordinated with those of the General Construction Contractor.

2:04. Construction Schedule:

- (A) As soon as practicable, the General Contractor shall prepare and deliver to the Architect a construction progress schedule showing the proposed dates of commencement and completion of each of the various sub-divisions of work embraced by the contract.



2:05. Cost Schedule:

- (A) Each Contractor shall prepare and submit to the Architect a schedule of the principal items of construction under this contract with the estimated cost of each item. The items of construction listed on the schedule shall be as directed by the Architect. The cost of each item of work shall be taken from the Contractor's estimate sheets and must conform to his lump sum bid.
- (B) Periodical estimates of work completed shall be correlated with the cost schedule and furnished to the Architect with requests for partial payments.

2:06. Field Offices:

- (A) The General Contractor shall erect, where directed on the premises, maintain in good condition and remove when directed, a temporary weathertight field office for use of the General Contractor and the Architect's representative. The office shall be provided with heat, electric lights, telephone, and janitor's service.
- (B) The building shall be painted two coats on the outside and stained on the inside. It shall have a room of approximately 120 square feet of floor space for architect's representative, provided with doors with locks, one desk and two chairs, a 3 x 8 foot plywood table attached to the wall and racks for drawings.

2:07. Temporary Toilet:

- (A) The General Contractor shall provide for the use of all his workmen, and those of any Sub-Contractor, where directed, ample temporary sanitary toilet accommodations, and keep such clean and free from flies. Where possible, connections shall be made to existing sewer. Prior to the completion of the contract, all connections and appliances connected therewith are to be removed and the premises left perfectly clean.

2:08. Barricades:

- (A) Furnish and maintain all necessary guard rails, barricades, canvasses, etc., as needed to protect the passers-by and building. Guard rails and barricades shall be kept properly lighted at night.

2:09. Storage of Materials:

- (A) All materials delivered to the project shall be stored in such a manner as to keep them in a first-class condition and free from deterioration. Cement, lime, plaster, etc., shall be stored in watertight storage sheds mentioned above. Stone, brick, tile, and block shall be carefully stacked and shall be kept clean. Lightweight concrete block shall be covered and kept dry. All aggregates shall be piled so as to prevent mixing with earth and other foreign substances. Reinforcing steel shall be stored on racks at least 6" from the ground, and shall be protected from the weather.

2:10. Temporary Water:

- (A) The General Contractor shall provide and pay for all preliminary piping, connections, etc. from the nearest fire hydrant, required to make water available at the work for all Contractors, until permanent water lines are available at the site. Remove all temporary lines when no longer required. Water will be furnished by the State at no cost to the Contractors.

2:11. Temporary Electric Energy:

- (A) The Electrical Contractor shall make all necessary applications, pay all fees and charges in connection with providing and maintaining temporary electrical energy for power and light required during the course of construction as specified under Division No. 40. Temporary electric energy will be furnished by the State at no cost to the Contractor.

2:12. Temporary Heat:

- (A) The General Contractor shall provide protective local heating to prevent injury of his work from dampness or cold at all times. After the building is enclosed, the Plumbing and Heating Contractor shall be responsible for temporary heating of the building. The General Contractor shall have the building enclosed with permanent or temporary enclosures on or before 180 days after work order is issued.
- (B) The Plumbing and Heating Contractor shall furnish temporary heat as required to maintain a minimum temperature of 50 F. throughout the building after it is enclosed. The method of furnishing this temporary heat shall be as specified in Division No. 50 of this specification. The Plumbing and Heating Contractor shall operate and maintain this temporary heating system until the building is completed with the Owner paying all fuel costs.
- (C) The General Contractor and Plumbing and Heating Contractor shall coordinate their work such that the provisions for temporary heating can be accomplished as provided in the preceding paragraphs.

2:13. Cutting, Patching, and Fitting:

- (A) The General Contractor shall do all cutting, fitting, or patching of his work, which may be required to make its several parts come together properly, and fit it to receive, or to be received by the work of other contractors, shown upon or reasonably implied by the drawings and specifications for the completed structure, and he shall make good after them as the Architect may direct.

2:14. Closing-In Work:

- (A) The General Contractor shall notify his Sub-Contractors and any and all Sub-Contractors or Contractors under the Owner, when he is



ready for them to install their portion of the work. Should any Sub-Contractor fail to install their work within a reasonable length of time, the General Contractor shall notify the Architect in writing and shall receive written instructions as to proceeding with the work. No piping, wiring, ducts, and equipment, etc., shall be enclosed or covered until the proper tests and inspections have been made by the Architect.

2:15. Contract Termination in the Event of War:

- (A) If the work under this contract should be stopped under authorization of a public authority for a period of three months, through no account or fault of the Contractor or anyone employed by him, due to the lack of proper allocations, priorities or other materials under government controls, the Contractor may, upon seven days written notice to the Owner and State Architect, stop work or terminate the contract. Payment to the Contractor will be on the basis of material and labor incorporated in the project together with such overhead, costs and legitimate profits as would cover the extent of the work performed.

2:16. Special Conditions:

- (A) All contract documents shall be prepared in not less than eight sets, completely executed.
- (B) The State Architect will furnish the successful Contractors each ten sets of drawings and specifications free of charge. Additional sets may be obtained for the cost of blueprinting.

2:17. Burning of Trash and Hauling Debris:

- (A) Burning of trash or debris on college property is prohibited.
- (B) Any surplus earth excavation shall be disposed of by filling, blading, and leveling such low lying areas of the campus, or along creek banks, or elsewhere on college property as directed by grounds department of the college.
- (C) Haulage roads or routes for the transport of surplus earth excavations shall be approved prior to use by grounds department of the college.

2:18 Alternates:

- (A) Work contemplated under the different alternates shall include all labor, materials, equipment, and services necessary for and incidental to the completion of all work under each alternate.
- (B) Each bidder shall furnish separate bids for each alternate applicable to his proposal, stating the amount to be added to or deducted from the base bid in case the alternate is accepted. He shall require that all Sub-Contractors to furnish separate bids for each alternate.
- (C) Each contractor shall examine such separate alternate and fully inform himself exactly how each alternate affects his part of that work. He shall submit to the contractor a separate bid for each alternate that contains any addition to or deduction from the base bid.

GENERAL CONTRACTAlternate No. 1 - Acoustical Units:

If the acoustical units as called for in Division No. 27 are deleted entirely and in lieu thereof the area painted as called for in Division No. 29, I or we will change our base bid in the amount as stated on the proposal form.

Alternate No. 2 - Composition Floor Covering: (Vinyl Asbestos)

If all rubber tile as called for on the drawings and indicated in the room finish schedule is deleted and in lieu thereof provide and install 9" x 9" x 1/8" vinyl asbestos floor tile conforming to Interim Federal Specification L-5-00345 (COM-NBS) dated August 28, 1959, and Amendment No. 1 dated September 30, 1959, in colors as selected by the State Architect, I or we will change our base bid in the amount as stated on the proposal form.

Alternate No. 3 - Exterior Marble:

If the exterior marble, dovetail slots, anchors, etc., are deleted and the exposed concrete is treated as architectural concrete with open joints caulked with thiolok and control joints located as directed by the Architect, and with this exposed concrete painted as called for in Division No. 29, I or we will change our base bid in the amount as stated on the proposal form.

ELECTRICAL CONTRACTAlternate No. E-1

- (A) This contractor shall state in his proposal the amount to deduct from the base bid if the following equipment is deleted:
- (B) All equipment specified for the master time and program control and secondary clocks as specified on pages 40-23 and 40-25, paragraph 40-44, sub-paragraph (c), item #1 and sub-paragraph (d), items #1 and #2.



(c) All conduit and wall boxes shall remain in the contract.

Alternate No. E-2.

(a) This contractor shall state in his proposal the amount to deduct from the base bid if the following equipment is deleted:

(b) All equipment specified for the intercommunication system as specified on pages 40-24 and 40-25, paragraph 40-44, sub-paragraph (c), item #3, sub-paragraph (d), item #7.

(c) All conduit and wall boxes shall remain in the contract.

## DIVISION NO. 3

Site Preparation3:01. Scope of Work:

- (A) Furnish all labor, materials, equipment and appliances, and perform all operations in connection with the provisions of preparatory work in strict accordance with the specifications and drawings and subject to the terms and conditions of the contract.

3:02. Clearing the Site:

- (A) The Contractor shall remove trees, stumps, pavement, walks, etc., as required to clear building site.
- (B) See plot plan for the location and amount of known existing structure and trees to be removed. Those items to be removed by the Owner are noted as such on the plot plan.

3:03. Protections:

- (A) The Contractor shall protect all existing work, including adjacent buildings, walks, and roadway liable to damage under this contract. Such protection shall be of suitable materials and form. All necessary repairs shall be made at the expense of the Contractor.
- (B) Trees and shrubs within the radius of the building operations, except where they are required to be removed shall be adequately protected from damage.

3:04. Temporary Drainage:

- (A) Construct and maintain all necessary temporary drainage and do all pumping necessary to keep the excavation and basement free from water.
- (B) Excavations, trenches, and buildings shall be protected at all times from damage by water. The Contractor shall provide all pumps, equipment, and enclosures necessary to provide this protection.

3:05. Damage:

- (A) Any property damaged through lack of proper precautions or by failure to provide adequate protection shall be repaired or replaced with new work at the expense of this Contractor.

3:06. Cleaning Premises:

- (A) The Contractor shall keep the site clean and in orderly condition. At least once each week remove accumulated debris. Stack materials in an orderly manner.



## DIVISION NO. 4

Excavation, Grading, and Site Work4:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

4:02. Protection of Property:

- (A) The General Contractor shall protect all adjoining property, and shall at his own expense make good all damage to properties arising out of any operation connected with this project.

4:03. Scope of Work:

- (A) Furnish all labor, equipment, services, and material and related items required for excavation, filling, back-filling and grading necessary to complete work shown on the drawings and herein specified.
- (B) The bases of bidding shall be that all material to be removed is earth. Material which is practicable to remove and handle with pick and shovel, by hand, or to loosen and remove with a power shovel shall be classed as earth.

4:04. Excavations:

- (A) All excavations of footings, pilings, walls, piers, etc., as shown on plans shall be down to levels indicated. Bottom of all excavations shall be level and true.
- (B) Where footings project beyond the outside of foundation walls, piers, etc., more than 12", the excavation shall be increased to the face of the footing.
- (C) Excavations for footings may be cut to accurate sizes and form omitted, if concrete is poured in clean-cut trenches without cave-in.
- (D) Protect bottom of excavation from frost. Do not place foundation, footings, slabs, on frozen ground. Shore and brace excavations, protect slopes and earth banks and provide sheet piling before backfilling is completed, but not until permanent supports are in place.
- (E) Any abandoned piping encountered in excavating shall be cut off and capped 3'-0" outside of excavation.
- (F) Trees and shrubs on the site of the building shall be removed by the General Contractor, except those specified to be removed by the Owner. Trunks and roots shall be removed completely. All other trees and shrubs indicated on the plot plan shall be protected from damage by heavy wood barricades. The General Contractor shall be responsible for damage of these trees.

- (G) If soft earth or loose sand is encountered in trench or footing bottoms, it is to be reported immediately to the Architect.
- (H) The General Contractor shall furnish the necessary pumps to keep the excavations free from standing water at all times.
- (I) In no case shall banks be used as forms for concrete wall construction.
- (J) Top soil shall be stripped from areas to be excavated and stockpiled for use in finish grading. Other soil and excavated material shall be stockpiled for use in other types of fillings.

#### 4:05. Backfilling:

- (A) At the proper time, backfill around piers, walls, areaways, and elsewhere where required to bring the earth to proper levels and grades for subsequent work compacted to 100% of Mod. AASHO (T-49(A). Use only earth without rubbish.
- (B) All fillings shall be well tamped down using hand tampers or power equipment. Backfill shall be placed in 6" to 12" layers depending on type of tamping equipment and tamped.
- (C) Flooding will not be permitted.

#### 4:06. Interior Grading and Fill:

- (A) The sub-grade shall be compacted to 100% of Mod. AASHO (T-49(A) using pneumatic tired rollers. Sheep foot will not be approved for compaction.
- (B) Fill shall be of similar material to existing soil and placed in 6" compacted lifts.
- (C) Pure sand fill will not be permitted except as called for under slabs on grade.
- (D) UNDER NO CONDITIONS WILL ANY FILL BE FLOODED INTO PLACE.
- (E) Fill below basement floor slab with River-Run Gravel. See Division No. 13

#### 4:07. Exterior Grading:

- (A) All grading shall be to contours shown and shall be checked with the Architect. Grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given and existing finish grades.
- (B) Suitable top soil on the site shall be separated in piles and used for surfacing the top 6" of the graded areas. If sufficient soil suitable for top soil is not available on the site, the Contractor shall procure and transport to the site the best loam obtainable.
- (C) The finish surfaces of the graded area shall be raked smooth and shall be free from clods, stone, or gravel, and be left in such shape that it will be suitable for the planting of grass seed.

#### 4:08. Work Excluded From this Division:

- (A) The General Contractor is not responsible for trenches, ditches, or other excavations required by Plumbing, Heating, and Electrical Contractors.



4:09. Temporary Drainage:

- (A) Construct and maintain all necessary drainage and do all pumping necessary to keep the excavation and basement free from water.
- (B) Excavation, trenches, and buildings shall be protected at all times from water drainage. The General Contractor shall provide all pumps, equipment and enclosures necessary to provide this protection.

4:10. Sub-Surface Soil Data:

- (A) Sub-surface soil investigations have been made and results indicated on the drawings. Data shown is for general information of bidders. Bidders are to examine the site and the record of investigation.

## DIVISION NO. 5

Concrete Pedestal Foundation5:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

5:02. Scope of Work:

- (A) The Contractor shall furnish all labor, materials, and equipment for concrete pedestals and bells, including drilling, casing shafts as required, reinforcing, placing of concrete, and extraction of casings.
- (B) Reinforcing steel and concrete shall be furnished and placed in the drilled shafts by the General Contractor under the direction of the Drilling Sub-Contractor.
- (C) Extraction of the casings shall be done by the Drilling Sub-Contractor.
- (D) Prior to commencement of pedestal work a meeting shall be held with the General Contractor, the Drilling Sub-Contractor and the Architect or his representative to outline the procedure for this portion of the work. The General Contractor shall notify the Architect three days prior to the starting pedestal work.

5:03. Proof of Ability:

- (A) The Drilling Sub-Contractor shall be required to furnish satisfactory proof of his competence as evidenced by at least three successfully completed contracts requiring the use of watertight casings below a water table level, with similar soil conditions, shaft sizes, depths and volume of work contained in this project.
- (B) This proof shall be provided to the Architect and must be approved by the Architect prior to any pedestal work.

5:04. Test Borings:

- (A) A foundation investigation has been made and the location of the test boring holes are shown on the plot plan. The report and the test boring logs are included as a separate supplement to the specifications.
- (B) Bidders are responsible for examining the site and test hole data and determining for themselves the character of the materials to be encountered during pedestal excavation.

5:05. Pedestal Excavations:

- (A) The excavation for pedestal foundations shall be done by means of power driven auger equipment of suitable size and design to permit normal progress through the anticipated materials. The type of equipment used on this project is subject to the Architect's approval. The equipment shall be operated at all times by men experienced in this field and supervised by personnel with



proven experience. It is anticipated that considerable draw down pressure will be required in the Blue Hills shale.

- (B) The drilling of shafts shall be done in such a manner as to allow no caving of the sub-surface soils.
- (C) The pedestals shall bear on hard unweathered Blue Hills shale capable of sustaining a safe allowable bearing pressure of 40,000 pounds per square foot.
- (D) Bottom of holes shall be dry, level, and clean of all loose earth and debris prior to depositing concrete. Any holes in which the shale has been subjected to water from the drilling operation or leakings of the casing shall be deepened to dry hard shale at no cost to the owner. Machine cleaning of pedestals will not be permitted.
- (E) Open holes shall be covered for protection of workmen and to keep out foreign materials until concrete is placed.
- (F) The Architect will provide a qualified engineering geologist to verify the proper depth, quality of bearing material and condition of bottom of hole for each pedestal prior to placing of concrete.

#### 5:06. Water Table:

- (A) A true water table was found to exist on this site. Although it will fluctuate with seasonal precipitation, it was found to be at about elevation 81-6 at the time of the foundation investigation in late February of 1964. There was some wetting of the upper materials through capillary action to an elevation of about 86-0 at this time.

#### 5:07. Casings:

- (A) Watertight casings will be required below the water table. It is anticipated that the holes will stand open down to just above the water table.
- (B) Before removal of caving material or any of the water bearing soils, the casing must be set in place and sealed watertight into the Blue Hills shale.
- (C) The fine grained nature of the soils above the shale could cause considerable capillary action.

#### 5:08. Pedestal:

- (A) The pedestals shall be installed from an elevation sufficiently above the water table to prevent difficulty in moving heavy drilling equipment.
- (B) Each pedestal shall be installed in a plumb condition. The maximum acceptable tolerance from vertical in any shaft shall be  $1\frac{1}{2}"$  for the first 10 feet of depth and  $\frac{1}{2}"$  for each additional 10 feet.
- (C) The maximum variance for the center of the base of the pedestal from design location shall be 3 inches.

- (D) Should this tolerance be exceeded, the pedestal shall be replaced or an additional pedestal installed with a beam to distribute the column load.
- (E) The cost of replacement or redesign and the additional cost of labor, materials, etc., required as a result of the redesign shall be paid for by the Contractor.

5:09. Pedestal Bell:

- (A) To secure adequate bearing area, it will be necessary to bell most of the pedestals.
- (B) It will be necessary to accomplish all of this bellling in the shale.
- (C) The bells shall be cut to accurate dimensions as shown on the drawings.

5:10. Concrete:

- (A) Concrete shall conform to Division No. 6 of these specifications except that the placement slump shall be between 4 inches and 6 inches.
- (B) The placing of concrete shall be done with care to prevent the formation of voids or segregation and shall be placed by use of a tremie.
- (C) Where pedestal excavation starts at scheduled top of pedestal, the pedestal excavation shall be overfilled a minimum of 6" and struck off to proper elevation after the bleeding process is completed and prior to final set of concrete. Where the pedestals are drilled through the overburden, the pedestals shall be overfilled a minimum of 3 inches; this top 3 inches shall be chipped off prior to pouring column above.
- (D) The placement of concrete in the cased shafts shall be continuous and shall proceed until the concrete level is near the surface before initial "breaking of the seal" is permitted. Extraction of the casing shall be accomplished by a vertical lift, continually plumb, and shall proceed in such a manner as to allow continuous observation of the interior slumping of the concrete. The concrete surface within the casing shall never be allowed to slump before the casings external water level.

5:11. Information for Bidding:

- (A) The elevation bottom of pedestals as given on the structural drawings is for bidding purposes only.
- (B) The contract sum will be adjusted from the base proposal on the basis of the unit price per lineal foot as quoted on the proposal form. This adjustment will be made on the difference between the actual total length required of each diameter pedestal and the total bid length for that diameter as given on the structural drawings.
- (C) The unit price per lineal foot listed on the proposal form will include all required excavation, casing, and concrete.
- (D) No extra payment will be made for the cost of over-excavating the holes for the installation of casings or extra concrete required because of such over excavations.



## DIVISION NO. 6

Structural Concrete6:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

6:02. Scope of Work:

- (A) Furnish all labor, materials, equipment, and appliances and perform all operations in connection with the installation of concrete work, complete in strict accordance with the specifications and drawings.
- (B) All the work must be done under the supervision of a capable foreman, experienced in concrete construction.
- (C) Cooperate with other trades for the proper positioning and setting all built-up and embedded items.
- (D) Hangers for attached and suspended ceilings.
- (E) Inserts and pipe sleeves for mechanical and electrical work.
- (F) Provide all bases for mechanical and electrical equipment.

6:03. Portland Cement:

- (A) Portland cement shall conform to the standard specifications and tests for portland cement, (A.S.T.M. Designation C-150) and shall be Type I, except as otherwise specified. The use of other types of portland cement is subject to the approval of the architect.
- (B) For sidewalks and other exterior concrete, use air entraining portland cement, Type IA conforming to A.S.T.M. C-175 latest issuance.

6:04. Coarse Aggregate:

- (A) Furnish dry, hard durable, uncoated crushed stone conforming to A.S.T.M. Specifications C-33-59, after acceptance of a grading, a variation in the amount passing any sieve size of more than 10% of the total will not be permitted and grading within the following percentage by weights:

Passing 1" sieve	95% to 100%
Passing 3/4" sieve	35% to 70%
Passing 3/8" sieve	10% to 30%
Passing No. 4 sieve	0% to 10%
Passing No. 8 sieve	0% to 5%

- (D) Maximum size aggregate allowed is 1/5 of narrowest dimension between forms of concrete members of 3/4 minimum clear spacing between reinforcing bars.

6:05. Fine Aggregate:

- (A) Sand for fine aggregate shall be dry, clean, hard, durable, uncoated grains free from silt, loam, and clay conforming to A.S.T.M. C-33-59.
- (B) Sand shall be uniformly graded from fine to coarse within the following percentages by weight:

Passing No. 4 sieve-----	95% to 100%
Passing No. 8 sieve-----	80% to 95%
Passing No. 16 sieve-----	50% to 85%
Passing No. 30 sieve-----	25% to 60%
Passing No. 50 sieve-----	15% to 30%
Passing No. 100 sieve-----	2% to 10%

6:06. Water:

- (A) Water used in mixing concrete shall be clean and free from deleterious amounts of acids, alkalis, oil, or organic materials.

6:07. Strength, Proportions, and Mixes of Concrete:

- (A) Concrete strength shall be 4,000 pounds or more per square inch at 28 days verified by test reports, but it is anticipated that the specified mix will produce concrete of considerably higher strength. A design mix and test of the concrete mix shall be made at least two weeks prior to placing concrete. Tests shall be conducted as specified in Paragraph 6:08, Concrete Control Tests.
- (B) Mix per cubic yard of concrete:

<u>All Concrete Except</u>	<u>Concrete Floor</u>	<u>White Portland</u>	
<u>Floor Slab on Grade</u>	<u>Slab on Grade</u>	<u>Cement Concrete</u>	
5	6	6	Sacks of cement
1,616	2,563	1,616*	Pounds of sand
1,645	608	1,645*	Pounds of gravel
			or crushed stone
6	6	6 +	Gallons of water
			per sack

\* Sand, gravel or crushed stone as well as all equipment used in mixing, transporting, and working the white portland cement concrete shall be thoroughly cleaned just prior to using same in the field and shall be inspected by the Architect or his superintendent and receive their approval to proceed.

+ Water shall be clean and free from all discoloration and foreign matter.



- (C) Proportions of aggregate to cement for any water-cement ratio shall produce concrete that will work readily into form corners and around the reinforcement without excessive puddling and without segregation of materials.
- (D) Slump test for consistency shall vary from 2" to 4" for concrete used in various sections of the building as directed by the Architect.
- (E) Weigh all concrete aggregate over suitable aggregate scales and equip concrete mixes with water measuring device so that concrete materials and proportions of water to cement can be accurately controlled during the progress of the work and easily checked at any time.
- (F) Mix concrete in a power mixer until there is a uniform distribution of materials. Discharge mixer completely before recharging. Rotate mixer at speed recommended by the manufacturer and continue mixing for at least one minute after all materials are in the mixer.
- (G) The General Contractor shall submit to the State Architect a 6" cube of white portland cement concrete he proposes to use on this project and after approval shall submit same to his pre-cast concrete supplier as the color and shade of white portland cement concrete being used on this project and informing him that he is to match same in his work.

#### 6:08. Concrete Control Tests:

- (A) Make one set of four test cylinders from the design mix as set forth in Section 6:07 prior to placing any concrete. Payment for same shall be made by the Owner.
- (B) The Architect or his authorized representative will instruct the Contractor when and where to take the concrete for cylinder testing, and only the cost of these cylinders, which are authorized to be taken, will be paid for by the Owner.
- (C) Test specimens shall be taken by the Contractor and tested by an approved laboratory at the Owner's expense and in accordance with A.S.T.M. standard method C-39-56T for testing. Results of test shall immediately be submitted to the Architect in duplicate.
- (D) Where the ultimate 28 days compressive strength of concrete in any test cylinder falls below the strength specified for the class of concrete tested or below the proportional minimum 7 day strengths, the proportions, water content, or temperature conditions shall be changed to secure the required strength.

#### 6:09. Storage of Materials:

- (A) Store cement on platforms off ground and protect from elements. Handle and store aggregates separately in manner to prevent deterioration or intrusion of foreign matter. Protect all reinforcement. Frozen materials or hardened cement shall not be used in concrete.

6:10. Placing Concrete:

- (A) Place no concrete until foundations, forms, reinforcing steel, pipes, conduits, sleeves, hangers, anchors, inserts, waterproofing and other work required to be built into the concrete have been inspected and approved by the Architect. Before pouring footings or foundations, see that bottoms of excavations are undisturbed earth, free from frost, properly leveled off and tamped. Wet wood form prior to placing concrete.
- (B) Concrete shall be thoroughly compacted by rodding, puddling, and vibrating with suitable tools, during the operation of placing and shall be thoroughly worked around the reinforcement, around imbedded features and into corners of the forms.
- (C) Concrete shall be mixed and placed only when the temperature is at least 50 F. and rising, unless permission is obtained from the Architect in which event materials shall be heated. When the temperature of the surrounding area is below 50 F., concrete shall have temperatures of between 60 F. and 90 F. after being placed in forms. Method of heating materials and protecting concrete shall be approved by the Architect.
- (D) Concrete shall be handled from the mixer to the place of final deposit as rapidly as practical by methods which will prevent separation or loss of ingredients. Under no circumstances shall concrete that has partially hardened be deposited in the work.
- (E) When concreting is once started, it shall be carried on as continuously as possible until the placing of the section or panel is completed.
- (F) Depositing large quantities at one point in the forms and running and working it along the forms will not be permitted. Concrete shall be placed in continuous horizontal layers, not over one foot in thickness.
- (G) A record shall be kept on the work of the time and date of placing the concrete in each portion of the structure. Such record shall be kept until the completion of the structure, and shall be open to inspection of the Architect.
- (H) Foundations shall not be poured on new footings for a minimum of 5 days.

6:11. Curing and Protection:

- (A) Exposed surfaces of concrete shall be kept moist for a period of at least three days after being deposited. In hot weather, exposed concrete shall be kept continuously wet during the first week.
- (B) Protect concrete against frost and rapid drying and keep moist for at least five days after placing. During this period, concrete shall be maintained above 70 F. for at least three days; or 50 F. for at least five days. Concrete from which forms are removed within five days after pouring and cement finished shall be sprayed during the curing period as frequently as drying conditions may require and if necessary protected by suitable temporary coverings.
- (C) Footings shall not be loaded for a minimum of five days.



6:12. Type of Forms and Finishes:

- (A) All exposed concrete surfaces on exterior of building and occupied spaces in the building shall be smooth finish. Construct form of metal pans, or new  $3/4"$  thick moisture-resistant plywood. These new plywood forms may be re-used a maximum of four times for exposed concrete forming providing the forming surface has not been damaged prior to this time. Sheets shall be large as possible with smooth even edges and install with close joists. Vibrate forms as required to obtain smooth finish surfaces. Joint marks and fins shall be smoothed off and surfaces left smooth, dense, and free from honeycombing. Common grain marking and bulges or depressions more than  $3/16"$  in  $4'-0"$  will not be permitted.
- (B) Forms for concealed concrete surfaces may be constructed with clean straight lumber or metal forms; metal pan forms shall be flange type similar to Myer. Patch honeycombing and minor defects.
- (C) All exposed concrete surfaces on exterior and interior of the building shall be finished as follows:
  1. Plug all tie rod holes with portland cement sand mortar forced into holes with pressure.
  2. Wet wall and rub with abrasive stone.
  3. Paste worked up on surface during rubbing shall be scraped off with edge of steel trowel.
  4. Spread remaining paste evenly with a wood float.
  5. Before paste has thoroughly hardened, rub with burlap pad to insure smooth and even texture.
  6. Keep walls wet for several days after the rubbing operation is completed.

6:13. Construction of Forms:

- (A) Construct forms to conform to the shape, lines, and dimensions shown, plumb, and straight and sufficiently tight to prevent leakage of mortar, securely brace and shore forms to prevent the displacement and to safely support construction loads; provide access opening for cleaning, inspection of forms, reinforcing prior to placing concrete. Coat forms with material that will not stain or cause injury to exposed concrete surfaces. Provide  $1/2"$  vinyl corner-formers by Serviced Products on external corners of exposed concrete beams, girders, columns, and pilasters. Construct forms for beams, girders and lintels so that sides may be removed without disturbing bottom of form or its support.
- (B) Form ties for exposed concrete shall be break-back type. Locate ties level and plumb in horizontal rows and vertical tiers. Remove tie to a depth of  $1"$  from exposed faces to concrete; fill holes as hereinafter specified.
- (C) All forms shall be painted with colorless oil before placing concrete. Drain oil will not be accepted. Care should be taken to prevent any oil from coming in contact with the reinforcing steel as contractor will be required to clean oil from steel before using.

6:14. Construction and Expansion Joints:

- (A) The rate and method of placing concrete and arrangement of construction joint bulkheads shall be such that the concrete between construction joints shall be placed in one continuous operation. Location of construction joints shall be shown on drawings or as approved by the Architect.
- (B) Before depositing new concrete on or against concrete which is set, the existing surfaces shall be thoroughly roughened and cleaned of all laitance, foreign matter and loose particles. Grout existing concrete surfaces with thin coat of neat cement before joining the new concrete.
- (C) Construct expansion joints at locations and of design as shown. Install expansion joint material as indicated subject to the Architect's approval. Mastic joint material and metal water stops are specified under other sections. In no case shall the reinforcement or other fixed metal items, bonded into the concrete, run continuous through an expansion joint.

6:15. Removal of Forms:

- (A) Time for removal of forms shall be as listed below subject to weather conditions and Architect's approval. Remove forms in manner to insure complete safety of structure. Avoid spoiling of concrete surfaces. All shoring for concrete beams and girders may be removed after a minimum of 14 days. Shoring removal may start after seven days but only to the extent that supports every 4'-0" must remain for the full 14 days.
- (B) Forms may be removed from concrete walls in less than five days providing the Contractor keeps the concrete wet for a period of five days by using wet burlap or other suitable methods. Approval of the Architect is required to remove forms from walls in less than five days. In no case shall the forms be removed in less than three days.

6:16. Expansion Joint Fillers:

- (A) Provide preformed expansion joint filler similar to Coitex Company's "Flexcell" and composed of fiberboard impregnated with asphalt. Joint material shall be for full thickness of slab or joint, and unless otherwise indicated  $\frac{1}{2}$ " thick. Expansion joint filler shall be furnished as indicated on the drawings and in every location where concrete slab or fill abuts foundation walls.

6:17. Inserts and Fastening Devices:

- (A) Provide for installation of inserts, hangers, metal ties, anchors, bolts, angle guards, dowels, thimbles, slots, nailing strips, blocking, grounds, and other fastening devices required for



attachment of other work. Properly locate in cooperation with other trades and secure in position before concrete is poured. Do not install sleeves in any concrete beams, joists, or columns except upon approval of the Architect.

- (B) This Contractor shall set masonry anchors in concrete forms for all brick ties or anchors, stone anchors, beam anchors, bolts for lintels, shelf and base plates, etc., as required to properly construct the job. Dove-tail anchors shall be placed at all spandrel beams and on columns which are covered with masonry.
- (C) This Contractor shall set all finish anchors into forms as required and necessary dove-tailed wood blocks of correct sizes to anchor or attach all grounds, furring, finish trim, etc.

#### 6:18. Concrete Walks:

- (A) Construct concrete walks in widths and locations shown on the drawings, 5" thick, reinforced as indicated, and over 2" layer of sand.
- (B) Contraction joints shall be approximately 2 to 6 feet apart and expansion joints approximately 36 feet apart. Spacing of contraction joints shall be equal to the width of the walk.
- (C) Form expansion joints with 1/2" premoulded non-extruded filler of fiber bituminous material. Place top of expansion joint material 1/4" below finish surface of pavement. Cut reinforcing mesh at expansion joints.
- (D) Crown or slope walk surfaces as directed to provide drainage.

#### 6:19. Concrete Curbs and Gutters:

- (A) Curbs and gutters shall be constructed in accordance with the provisions of Articles 66.10 to 66.39 inclusive to the Standard Specifications of the State Highway Commission of Kansas, edition of 1955.
- (B) Make expansion joints at approximately 60 foot intervals and construct curbs as detailed.

#### 6:20. Control Joints:

- (A) All concrete control joints as called for on the drawings shall be as indicated in the detail.
- (B) All vertical and horizontal control joints shall be located as called for on the drawings.

## DIVISION NO. 7

Reinforcing Steel7:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

7:02. Scope of Work:

- (A) Furnish all labor, materials, equipment, and appliances, and perform all operations in connection with the installation of reinforcing steel work, complete in strict accordance with the specifications and drawings.

7:03. Metal Reinforcement:

- (A) Metal reinforcement shall conform to the requirements of the "Standard Specifications for Billet-Steel Concrete Reinforcement Bars" of intermediate grade, A.S.T.M. Designation A-15-58. Deformation shall conform to "Specifications for Minimum Requirements", A.S.T.M. Designation A-305-56T and subsequent revisions thereto. There shall be certified mill tests for twenty-five (25) tons and over of reinforcing steel.
- (B) When delivered to the site, all metal reinforcement shall be properly bundled and clearly marked with at least one metal and one linen tag to each bundle. Furnish reinforcement for stairs, curbs, precast concrete and other concrete work in addition to that shown on structural drawings.
- (C) Wire for concrete reinforcement shall conform to the requirements of the tentative specifications for "Cold-Drawn Steel Wire for Concrete Reinforcement" as last adopted by the American Society of Testing Materials.

7:04. Metal Accessories:

- (A) Provide all spacers, chairs, ties, and other devices necessary for properly placing, spacing, supporting, and fastening reinforcement in place.

7:05. Placing Reinforcement:

- (A) Place reinforcement accurately in position shown, securely fastened and supported to prevent displacement before and during pouring. Before placing, thoroughly clean reinforcement of rust, mill scale, or any coatings which would reduce or destroy the bond. Splices in reinforcement, where permitted, shall provide a sufficient lap to transfer the stress between bars by bond and shear.



- (B) Unless otherwise shown, concrete covering over reinforcement shall be  $1\frac{1}{2}"$  for beams and girders,  $\frac{3}{4}"$  for solid slabs, 2" for walls, and 3" for footings. Clear spacing between reinforcement shall not be less than  $1\frac{1}{2}"$ .
- (C) Support reinforcement in slabs and beams with chairs and supports of sufficient size and number to carry reinforcement in position shown without sag. Tie reinforcement at all intersections and splices with #18 gauge black annealed wire. Point wire tie ends away from forms. Bend reinforcement in accordance with approved bending diagrams. Bars with kinks or bends not shown shall not be used. Heating of reinforcement for bending will not be permitted.

7:06. Bending Diagrams:

- (A) Bending diagrams shall be prepared by a competent structural engineer selected by the Architect for this work. Payment for this service shall be at standard rates and paid to the engineer by the Contractor furnishing the reinforcing steel.

7:07. Concrete Slabs:

- (A) Sidewalk slabs shall be reinforced as noted on drawings, or if not so noted, shall have one layer of 6 x 6/1010 welded wire mesh.
- (B) All interior concrete slabs shall be reinforced as noted on drawings, or if not so noted shall have one layer of 6 x 6/1010 welded wire mesh.

## DIVISION NO. 8

Cement Finishes8:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

8:02. Scope of Work:

- (A) Furnish all labor, materials, and equipment and perform all operations in connection with the installation of cement topping, cement base, architectural concrete and integral cement finish on floors and stairs, in strict accordance with the specifications and drawings.

8:03. General:

- (A) Floor topping shall be  $1\frac{1}{2}$ " thick unless otherwise shown on the drawings. Topping under floor covering shall finish at the required height so that the surface of the floor covering material shall be flush with the adjacent floor finish.

8:04. Preparation:

- (A) Just prior to placing topping, roughen slab as required to provide mechanical bond. Remove loose particles of sand and dirt with stiff broom or wire brush. Remove oil and grease spots by washing with 10% solution of muriatic acid or strong washing soda. After cleaning hose down slab with pressure hose and keep wet for at least six hours. Allow slab to dry until surface water has disappeared.

8:05. Mix for Topping and Base:

- (A) Mix for cement topping and cement base shall be composed of one part cement and three parts of sand and not more than  $4\frac{1}{2}$  to 5 gallons of water per sack of cement to produce the stiffest mortar that can be troweled. Mixer shall be operated for full two minutes after the batch is in the mixer.

8:06. Placing Topping and Base:

- (A) On the wet slab surface, apply a thin neat cement grout, broomed into surface a short distance ahead of topping mixture. Spread topping over slab evenly and work into place by tamping, rolling, floating and troweling. Slope floors to drains as required. See that metal divider strips are properly installed before placing topping.



- (B) Run base in place to profile shown and trowel smooth. Provide temporary screeds as necessary. Top of cove base shall finish flush with finished floor.
- (C) Provide No. 4 expansion casing bead at top of base & polish with steel wool.

8:07. Topping Finish and Curing:

- (A) Screed topping to a true and even surface, then float and trowel smooth. Do not float or trowel surface while wet or sloppy. After topping has set sufficiently to ring trowel, give surface second troweling to a smooth, but not glassy finish.
- (B) Cement topping shall be properly cured by keeping wet for four days and then allowed to dry slowly.

8:08. Monolithic Float Finish:

- (A) All exterior concrete platforms, aprons, ramps, and steps shall have monolithic float finish. Tap with special tools to force aggregate from surface. Then screed with straight-edges to bring surfaces to elevations shown. While concrete is green, but hardened sufficiently to bear cement finisher's weight, float surfaces with wood float to a true and uniform plane with no coarse aggregate visible. Dusting to absorb surface water will not be permitted.

8:09. Monolithic Smooth Finish:

- (A) All interior floors scheduled for monolithic finish shall have smooth troweled finish. After surface has been screeded and floated as specified for monolithic float finish, hand-trowel to produce a smooth impervious surface free from trowel marks. After concrete has set sufficiently, give surface second troweling to a smooth but not glassy finish.

8:10. Power Machine Finish:

- (A) Cement floors may be finished with power machines in lieu of hand finishing if machine is approved by the Architect. Method of finishing by machine shall conform with the directions of the power machine manufacturer.

8:11. Metal Edging Strips:

- (A) Provide white metal edging strips where floor covering abutts against terrazzo/cement floors at borders, door openings, and other locations. Edging strips shall be Type "K" 1 $\frac{1}{4}$ " wide, 1/8" thick top with recess to receive thickness of floor covering.
- (B) Manufactured by American Terrazzo Company, Manhattan Terrazzo Brass Company, Rudel Floor Strip Company, or approved equal.

8:12. Sidewalks:

- (A) Finish surface of walks with float and brush lightly to form non-slip lines perpendicular to walk edges. Finish edges with curbing tool to make 1" wide smooth borders and rounded edges.

8:13. Concrete Floor Treatment:

- (A) To be used on all floors noted "Concrete" on the Finish Schedule.
- (b) Treatment to be Cem-Seal as manufactured by Hillyard Chemical Company.
- (C) Applied according to manufacturer's instructions.
- (D) One coat required on all concrete floors not receiving floor coverings.

8:14. Protection and Cleaning:

- (A) Smooth finished cement floors not scheduled for floor covering shall be covered and protected with stainproof paper after being treated with floor hardener. Where cement finish is soiled, clean with linseed oil soap as required to place floors in a first-class condition.

8:15. Structural Concrete Finish:

- (A) All structural concrete exposed on the first and second floors & stair-walls shall receive a skim coat of Triko Fill & Finish Nyl-type joint filler as manufactured by Proko Company, Dallas, Texas. Approved manufacturer of similar type product is Tripple-Duty Joint Filler by Davis Paint Company.
- (B) Apply according to manufacturers directions leaving a smooth surface to receive paint.
- (C) Before applying this finish, rub concrete to smooth finish and fill all holes with concrete and rub smooth. See grout cleaning.

8:16. Grout Cleaning:

- (A) Provide grout cleaning for sight exposed concrete (excluding concrete slabs, treads, and risers).
- (B) Cleaning operations shall not be started until all the concrete surfaces shall have been entirely completed, including all patching and filling of holes.
- (C) The grout clean-down shall not be undertaken when the temperature is below 50°F.
- (D) Grout shall be a mixture of one part cement and two parts sand, which will pass a No. 16 sieve. Cement shall be a blend of white and/or gray as required to match the color of the concrete or precast concrete work as directed by the Architect.
- (E) Grout shall be paint consistency.
- (F) Before the start of any work, satisfactory full scale samples shall be prepared for approval by the Architect or his representative. They shall be properly cured and finished in accordance with these specifications.
- (G) The following procedure shall be used on any given area and shall be completed in one day's operations:
  1. Wet the surface of the concrete.
  2. Brush on grout, filling all air bubbles and holes.
  3. Immediately after applying the grout, scour the surface vigorously with a cork float.
  4. Permit the grout to partially set and then remove the excess with a sponge rubber float, when the operation does not pull grout from the holes.



5. Permit the surface to dry and then rub it vigorously with dry burlap to remove all dried grout from the surface.
- (h) When working with white portland cement, all equipment and sand shall be thoroughly washed and cleaned and approval granted by the Architect or his representative to proceed.

## 9 - MASONRY WORK

9-1. Scope:

(a) Furnish all labor, materials, equipment and appliances and perform all operations in connection with the construction of all masonry walls of lightweight concrete units, brick, stone and other materials in strict accordance with the specifications and drawings, and subject to the terms and conditions of the contract.

9-2. Building Brick: (Common Brick)

(a) Furnish building brick in accordance with ASTM Designation C62, Grade SW for walls against earth and grade NW for backup.

9-3. Lightweight Concrete Masonry Units:

(a) Lightweight concrete masonry units shall be made of Buldex, Haydite, or other lightweight aggregate approved by the State Architect. Masonry units shall be Grade A quality at least equal to that required by Specifications for Hollow Load Bearing Concrete Masonry Units, ASTM Designation C-90. Maximum allowable shrinkage shall not exceed .03% as measured by ASTM Designation C-426.

(b) Block sizes shall be modular in depth, height, and length having an actual dimension  $3/8$  inch less than the nominal dimension 8" x 16" face and may not weigh more than 26 lbs. (maximum) for nominal 8" x 8" x 16" unit.

(c) Provide lightweight concrete lintel units over opening in interior partitions except where steel angles are shown. Lintels shall be reinforced with one #4 reinforcing rod top and bottom for each 4 inches of width of lintel.

(d) Delivered units must be protected from the soil and precipitation prior to use.

(e) Provide such special units as may be required to form all corners, returns, header blocks and all precast lintels.

(f) Prior to acceptance, concrete masonry units shall be tested in accordance with ASTM Designation C-140. Sampling and testing shall be at the expense of the general contractor.

(g) The manufacturer shall furnish three copies of test reports and certify that concrete masonry units delivered to the project site will be manufactured, cured and dried in the same or equally effective manner as were the samples on which acceptance was based.

(h) Quarterly test reports and certification of compliance of the Quality Control Program as administered by the Kansas Concrete Masonry Association may be substituted in lieu of the above test requirements.



(i) At the Architect's option, additional tests of twenty concrete masonry units, ten for compressive strength and ten for absorption, will be made at periodic intervals as directed by the State Architect, to insure uniformity and compliance with ASTM specifications.

9-4. Split Face Stone:

(a) Split face stone in areas shown and noted on drawings shall be Silverdale, Cottonwood Onaga, or approved equal.

(b) Sizes of stone shall be 2-1/4", 50%; 5", 35%; and 7-3/4", 15%. Ends shall be cut with random lengths up to 34".

(c) Split face stone shall be laid in an irregular random ashlar pattern or as detailed.

(d) All ends of stone forming jambs shall be cut square and smooth.

(e) Stone at main entrance shall be as noted on the drawings.

9-5. Cut Stone:

(a) Cut stone shall be Chase County Cottonwood, top ledge of building stock and free from defects that mar the stones appearance or durability. The stone color shall be white and variation shall be within the limits as established by approved samples.

(b) All limestone exposed surfaces shall have a smooth machine finish without tool marks.

(c) Cut stone accurately to slope and dimensions with joints and bonding as shown. Cut exposed faces straight and true with sharp lines and arrises. Beds and joints shall be straight and at right angles to face. Except where otherwise shown, backs shall be sawn or dressed parallel to face of walls. Stones coming in contact with structural work shall be checked out to fit with ample clearance.

(d) Exterior sill stones, covering, and similar stones with exposed top surfaces shall be cut with a wash. Provide a raised fillet at back for stone under windows. Drip grooves in stone sills shall be continuous from end to end. Cut holes and sinkages for all anchors, cramps, and dowels as required.

9-6. Sand:

(a) Sand for masonry mortar shall be clean, sharp washed river sand graded from coarse to fine with fine grains predominating. Gradation shall be as follows:

1. For joints 1/2" or thicker, 100% of sand shall pass through #4 sieve and no more than 10% to 30% through a #50 sieve.

2. For joints of average thickness, such as brick, 100% of sand shall pass through #8 mesh sieve and no more than 15% to 35% through #50 sieve.
3. For thin joints for units of cut or ground edges, 100% of sand shall pass through #16 mesh sieve and no more than 20% to 40% through a #50 mesh sieve.

9-7. Lime:

(a) Hydrated lime for masonry purposes shall conform to the requirements of ASTM Designation C-207 Type S.

(b) Quicklime for masonry purposes shall be pulverized to pass a #20 mesh sieve and conform to the requirements of ASTM Designation C-5.

9-8. Lime Putty:

(a) Lime putty shall be a stiff mixture of lime and water and kept moist until used. Putty made from pulverized quicklime shall be slacked until action has ceased, then add part of all of sand required and store for a minimum of 24 hours. Putty made from hydrated lime may be used immediately after mixing.

9-9. Waterproofing Admixture:

(a) Water proofing admixture for masonry mortar shall be "Omicron" manufactured by Master Builders Co., or "Hydratite Plus" manufactured by A.C. Horn Company.

(b) Mortar in all exterior masonry walls shall be waterproofed with one pound of admixture for each sack of cement and one pound of admixture for each cubic foot of lime putty.

9-10. Types of Mortar:

(a) Mortar for masonry walls below grade shall be 1 part Portland cement, 1/4 parts lime putty and 3 parts sand by volume or 1 part masonry cement and 6 parts sand.

(b) Mortar for setting and back plastering stone shall be 1 part white non-staining waterproof Portland cement, 1 part lime putty and 6 parts sand by volume. Mix to stiff consistency. Retempering of mortar not permitted.

(c) Mortar for pointing shall be 1 part white non-staining waterproof Portland cement, 1 part lime putty and 3 parts clean white sand by volume. Add limeproof mortar color as required to match color of stone. Mix in small batches and to as stiff consistency as can be worked into joints. Retempering of mortar not permitted.

(d) Mortar for grouting shall be 1 part white non-staining waterproof cement and 1-1/2 parts of fine white sand. Mix in small batches and to thick consistency as can be poured into joints.



(e) Mortar for all other masonry work under this section shall be one part Portland cement, 1 part lime putty and six parts sand by volume or one part masonry cement and three parts sand. Use non-staining cement for mortar in contact with cut stone.

(f) Incorporate waterproofing admixture in cement lime mortar as before specified.

(g) Masonry cement shall conform to the current requirements of ASTM Designation C-91 Type II.

#### 9-11. Precautions:

(a) Do not lay masonry in freezing weather unless suitable means are provided to heat materials, protect work from cold and frost and insure that mortar will harden without freezing. No anti-freeze ingredient shall be used.

(b) Protect facing material against staining and keep top of walls covered with non-staining waterproof coverings when work is not in progress. When work is resumed, top surface of work shall be cleaned of all loose mortar and in drying weather, thoroughly wet. Brace walls as required to protect from injury.

#### 9-12. Laying Split Face Stone:

(a) All split face stone shall be carefully laid. So far as possible, all stone shall lay on their natural beds and shall be dressed to clean, true lines. All facing stone shall be free from tool marks.

(b) Facing stone shall be laid up with 1/2" joints. Keep all faces free from mortar.

(c) Stones must be fully bedded in mortar and all vertical joints or spaces slushed completely full of mortar.

(d) All stone shall be thoroughly bonded to the backing with metal anchors as indicated on drawings or as called for in Section 9:11.

(e) The front of the back-up units shall be plastered with not less than 3/8" of mortar before the facing stones are laid. Before the back-up units are plastered, however, the joints on the back-up units shall be cut flush. The back plaster shall not be done over mortar protruding from the joints.

#### 9-13. Laying Concrete Units:

(a) All lightweight concrete masonry walls shall be true and plumb and built to the thickness shown on drawings. Wall shall be laid in straight uniform courses, with the units in the courses directly above courses below. Bond each course at corners and intersections of walls.

(b) Contractor shall provide and place such special units (precast lintels, corner block, door and window jamb block, fillers, veneer block, etc.) as may be required to form all corners, returns, and offsets using the required shapes and sizes to work to corners and openings and maintain proper bond throughout the length of the wall.

(c) Reinforce every second horizontal joint with "Blok-Mesh" or "Dur-O-Wall" standard wall reinforcement.

(d) Bond room partitions to corridor partitions and exterior walls with galvanized metal anchors in every third horizontal joint. Fill in with brick where units cannot be used. Provide recesses for built-in radiators and other items.

(e) Mortar joints shall not exceed 1/2" thick with full mortar coverage on vertical and horizontal face shells. Vertical joints shall be shoved right.

(f) In all rooms where the masonry units form the finished surface of walls, care shall be exercised to obtain the neatest possible effect. All horizontal and vertical joints on finished surface of walls shall be tooled to give a slightly concave finish. Face of walls shall be kept clean of mortar. All brick size units appearing in interior face of wall and in partitions shall be of lightweight concrete.

(g) All lightweight concrete lintels shall be notched as shown on drawings and reinforced with one #4 reinforcing rod top and bottom for each 4" of width of the lintel.

(h) Bond and pattern of concrete masonry units shall be as detailed. All finished areas to be stack bond.

#### 9-14. Setting Cut Stone:

(a) Cut stone shall be set by experienced masons. Set with markings horizontal. Thoroughly clean stone, then sponge with clean water just before setting; when setting in cold weather, clean stone by brushing instead of sponging.

(b) Set each stone plumb, level and true to line in a full bed of mortar, and tap to even bearing. Sawing through mortar joints to correct bearing and adjust joint will not be permitted. Do not use pinch bar on exposed face of stone.

(c) Lead buttons or soft wood wedges, soaked in water, may be used where necessary to prevent crushing of mortar; wedges must be removed when dry and before painting. Keep face of stone free from mortar.

(d) Make joints 1/4 inch wide unless otherwise shown. Fill joints except on wash surfaces, full depth with mortar; before mortar has set, rake joints back 3/4 inch from face to allow for pointing.

#### 9-15. Pointing and Caulking Stone:

(a) Brush joints clean, carefully remove any wedges so that pointing will be continuous. After thorough setting, point all joints (except those specified to be left open or caulked) flush with pointing mortar. Leave building expansion joints open except where shown on the drawings to be filled with mastic. No pointing shall be done when temperature is below 35 degrees F. Joints in expansion joints and on wash surfaces shall be filled flush or slightly above the surface with caulking compound. Compound shall be applied with knife.



9-16. Shipping, Storing and Protection of Stone:

(a) Deliver stone from plant to job in accordance with schedule and in proper setting sequence. Stone when stored shall be clear of the ground and adequately protected to prevent staining. During construction tops of walls shall be covered at end of each days work and in bad weather. Protect wall's at all times from drippings and heavy rains.

(b) Cover sills and projecting stones with non-staining board covering secured with galvanized nails and maintain until building is complete. Protect other work as necessary to prevent damage. Replace damaged or defective stones.

9-17. Built-In Work:

(a) Consult other trades in advance and make provisions for installation of their work in order to avoid cutting and patching. Build in all work specified under other sections of the specifications and the work of other contractors as the work progresses.

(b) Set steel lintels in beds of mortar. Fill mortar around jams and heads of metal door bucks and frame. Point around all sides of metal window frames with mortar.

(c) Build in all wooden nailing strips when necessary for wood finish. Strips shall not be continuous. Install anchor strips or blocks for plumbing fixtures as directed by the plumbing contractor.

9-18. Anchors and Wall Ties:

(a) Furnish and place special anchors, hanger, bolts, or rods as shown on the drawings or required in securing brick, stone or other materials together or to the backing. Where masonry walls occur against concrete work, including beams and columns, provide approved type dovetail slotted masonry anchors. Bond to be at approximately 16 inch centers vertically.

(b) Provide shelf angles where called for on elevations and shown in detail.

(c) Corrugated masonry ties shall be used with inside partitions of masonry between facing and back-up and shall be spaced horizontally every 16" o.c. Vertical anchors shall be spaced every second course.

9-19. Wall Protection and Framed Openings:

(a) All masonry shall be covered after each days work and when deemed necessary by the Architect. Injury to wall by weather shall be taken down by the contractor and rebuilt.

(b) This contractor shall brace all walls during construction to protect them from injury.

(c) Framed openings: All doors, windows, and other framed openings shall be set plumb and true.

9-20. Wall Mesh Reinforcing:

(a) Dur-O-Wall, as manufactured by Cedar Rapids Block Company, Cedar Rapids, Iowa, or approved equal.

(b) Continuous in all masonry block, brick, stone, and glazed tile walls and partitions.

(c) Located as shown on the drawings and where not shown, by the following schedule:

- 9 courses in walls up to 12'-0" high
- 14 courses in walls up to 18'-8" high

9-21. Recesses, Plumbing, Pipes, Conduits, Etc.:

(a) Leave recesses for plumbing, steam pipes, electric light or power conduits, cabinets, and other recesses necessary to complete the work or required by other contractors.

(b) Close up any recesses after pipes are in and do all patching after other trades have completed their work.

(c) No plumbing, pipe, conduits, or ducts shall be enclosed until inspected by the superintendent. The contractor shall take out any work that is built to the contrary and will replace it at his own expense.

9-22. Pointing and Cleaning:

(a) On completion, point up all exposed masonry, fill all holes and joints, remove loose mortar, cut out defective joints and repoint where necessary. Masonry surfaces to be exposed, either painted or unpainted shall be thoroughly cleaned. Do not use acid to clean sill stone. Leave surfaces free from mortar and other stains at completion of work.

9-23. Silicone Water Repellent:

(a) All exterior masonry walls shall receive silicone invisible water repellent containing not less than 5% silicone.

(b) All masonry surfaces shall be clean and thoroughly dry.

(c) One application of silicone sprayed on the surface of the masonry using one gallon for not more than 160 square feet.

(d) All glass shall be cleaned of silicone within one hour.

(e) Silicone invisible water repellent shall be manufactured by Murdock Chemical Company, St. Louis 9, Missouri, or approved equal.

9-24. Sample Walls:

(a) Prior to starting masonry work, build walls of stone to show required type of facing material, range of colors, and type and color of mortar joints. Approved wall samples shall be representative of proposed material, method of



laying and workmanship. Build wall approximately 3 x 4 feet.

9-25. Concrete Block Screen Tile:

(a) Concrete block screen tile as used in conjunction with the condensing unit shall be #313 as manufactured by Hays Concrete Products, Hays, Kansas, Carter Block Company, Russell, Kansas, or approved equal.

(b) Size shall be 6" x 8" x 16".

9-26. Setting Drawings:

(a) Prepare and submit cutting and setting drawings to State Architect for his approval. Do not cut stone until drawings have been approved. Drawings shall show jointing, bonding connection with other work, typical and special anchoring, dimensions and setting number of each stone. Each piece of stone when delivered shall have corresponding setting number marked on back of unexposed edges.

9-27. Samples:

(a) Before proceeding with any stone work, submit two (2) sets of samples in duplicate of the stone to show the extremes in color and texture that the contractor proposes to furnish. Samples of cut stone shall be 3-1/2 inches by 7 inches by 3/4 inches thick and shall show all the finishes required.

(b) Prior to pointing cut stone, the contractor shall point a small section of stone work as directed with several different colors and let colors dry thoroughly. From these samples the mortar color to be used throughout will be selected by the State Architect. If directed, remove sample pointing and replace with pointing of color selected.

## DIVISION NO. 11

Structural Steel11:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

11:02. Scope of Work:

- (A) Furnish all labor, materials, equipment, and appliances, and perform all operations in connection with the structural steel, complete in strict accordance with the specifications and drawings.

11:03. General:

- (A) All steel shall be designed, fabricated, and erected in accordance with the Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings amended to date, and the Code of Standard Practice, latest edition, as adopted by the American Institute of Steel Construction, Inc., unless herein specified to the contrary.
- (B) Welding shall be in accordance with the Standard Code for Arc and Gas Welding in Building Construction of the American Welding Society.
- (C) Anchor bolts and other incidental items of structural steel required to be built into concrete and masonry shall be furnished to respective trades at proper time and shall include instructions or templates for their installation.
- (D) Columns shall be furnished under this section.
- (E) Corruform floor system where called for or permitted.
- (F) Structural steel work shall include only those items called for and sized on the structural drawings.
- (G) Steel bar joist shall conform to Code of Standard Practice of Joist Instit

11:04. Materials:

- (A) Structural steel shall conform to the latest edition of the A.S.T.M. Structural Steel Specification A-7 entitled "Steel for Bridges and Buildings" and all rivet steel shall conform to A.S.T.M. Specification A-141 entitled "Structural Rivet Steel". The manufacturer shall make chemical and physical tests and furnish reports of tests to the Architect.
- (B) All steel shall be new and free from rust.

11:05. Corruform:

- (A) Furnish and install standard galvanized corruform .0510" thickness with 2-3/8" pitch and 9/16" depth, where called for on the plans.



- (B) Erection shall conform to the manufacturer's specifications.
- (C) Manufacturer shall be Granco Steel Products Company or approved equal.
- (D) Furnish and install heavy duty corrugum of 26 gauge, 90,000 psi. tensile strength  $3\frac{1}{2}$ " pitch and  $7/8$ " depth where called for on the plans.

#### 11:06. Fabrication:

- (A) All structural steel shall be fabricated as detailed and in accordance with the best practice in modern structural shops.
- (B) Provision shall be made in the fabrication of structural steel for the connections of other work including all necessary cutting, drilling, punching, or tapping of the structural members where shown on the drawings or where information is furnished prior to or at the time of approval of the shop drawings.
- (C) The several pieces forming built-up sections shall be straight and fit close together and finished members shall be free from twists, bends, or open joists.
- (D) Bevels for field welds may be flame cut provided such cutting is not done manually.
- (E) Corrective measures for errors in cutting, shop fabricating, or erection shall be approved by the Architect.
- (F) Unless otherwise shown on the drawings, all field bolts shall be  $3/4$ " and all open holes shall be  $13/16$ ". Steel bolts shall be furnished by the fabricator.
- (G) Bar joists accessories and bridging where indicated on the drawings.
  1. Bar joists shall have welded horizontal bridging as specified by the Steel Joist Institute.
  2. Built-in wall type anchors at ends and sides.
  3. Bottom chord extensions to wall for attachment of ceiling.
  4. Bar joists are to receive prime coat of paint in accordance with standard practice of manufacturer.

#### 11:07. Handling of Materials:

- (A) The loading, transportation, unloading and storing of structural steel shall be conducted so that the metal will be kept clean and free from injury.

#### 11:08. Erection:

- (A) All steel work shall be erected true and in its designed location. Members shall be plumb and level where so designed. Temporary bracing or shoring shall be installed wherever necessary to take care of loads to which the structure may be subjected. Including erection of equipment and the operation of same, such bracing shall be left in place as long as may be required for safety.
- (B) The Contractor shall do all cutting and fitting required to make all parts to fit accurately to their places in the building. Where necessary to cut into masonry or other parts of the building to set steel parts accurately, the Contractor shall do so in such a manner so as not to damage the adjoining parts and he shall repair such adjoining parts, thoroughly and neatly, where such cutting is done.

11:09. Shop Painting:

- (A) All faying surface of steel, the surfaces within  $\frac{1}{4}$ " of a field weld point and all steel work to be encased in concrete shall be left unpainted.
- (B) All other steel work shall be thoroughly cleaned and given a shop coat of Tnemec #99 red metal primer or approved equal.
- (C) All mill scale to be removed prior to application of shop coat. Items delivered to site showing evidence of mill scale will be rejected.

11:10. Shop Drawings:

- (A) The Contractor shall prepare and furnish to the Architect complete shop and erection drawings in accordance with the Paragraph 41 of the General Conditions.



## 12 - Waterproofing &amp; Dampproofing

12:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of these specifications, and shall be consulted as to detail.

12:02. Scope of Work:

- (A) Furnish all labor, materials, equipment and appliances and perform all operations in connection with provisions of waterproofing and dampproofing, complete, in strict accordance with the specifications and drawings.

12:03. General:

- (A) All exterior concrete walls below grade shall be waterproofed using the premolded membrane method.
- (B) All floor slabs on grade shall be waterproofed using premolded membrane.

12:04. Materials:

- (A) Membrane waterproofing shall be of premolded type as manufactured by W.R. Meadows, Inc.; Carey; or approved equal.
- (B) Wall dampproofing shall be Barrett, "Hydronon"; Sonneborn, "Hydrocide" #600 or approved equal.
- (C) Plaster bond shall be Barrett No. 10, liquid, Sonneborn "Hydrocide" #633, or approved equal.

12:05. Workmanship:

- (A) Waterproofing contractor shall have had successful experience in the application of waterproofing and dampproofing and shall be approved by the manufacturer.
- (B) Manufacturer's recommendations for application shall be followed.

12:06. Preparation of Surface:

- (A) Remove fins and loose material from surface to be waterproofed or dampproofed. Fill wire holes and cracks with mortar and clean down before applying coatings. Surfaces must be dry when coatings are applied. Caulk with plastic cement around all pipe anchors and other items that penetrate waterproofing and dampproofing.

12:07. Membrane Waterproofing:

- (A) Where required by the specifications install premolded membrane vapor seal of weathercoated plastic core board as manufactured by W.R. Meadows, Inc., or approved equal.

- (B) Material shall be furnished in sheets 48" wide, 8 feet long and nominally 1/8" thick. Membrane shall have a rate of water transmission not greater than .0048 grains per square foot per hour as measured in accordance with ASTM Designation E-96-53T, Procedure A. Weight shall be 70 lbs. per hundred square feet plus or minus 5%.
- (C) Installation shall be in accordance with manufacturer's recommendations using adhesives supplied by the manufacturer of the membrane for application to concrete surfaces.

12:08. Dampproofing:

- (A) All areaway walls below grade shall receive two coats of dampproofing by either brush or spray.

12:09. Guarantee:

- (A) All waterproofing and dampproofing shall be guaranteed by the General Contractor to be free from defects of materials and workmanship for a period of one (1) year from date of final acceptance of the building.



## DIVISION NO. 13

Miscellaneous Materials13:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of these specifications and shall be consulted as to detail.

13:02. Scope of Work:

- (A) Furnish and install all miscellaneous steel, iron and metal work, bolts, anchors, concrete inserts, structural steel not shown on the drawings, and all other work of this nature. Provide all necessary labor, materials, equipment and incidentals.

13:03. Steel Pipe Railings:

- (A) Steel pipe railings shall be 1" x 2" x .120 rectangular heavy wall steel tubing and standards shall be 1" x 1" solid steel bar. See drawings for style desired.
- (B) All connections shall be welded and all welds shall be ground smooth.
- (C) All railing and standards shall have one coat of shop paint; final finish as stated in the color schedule.
- (D) Shop drawings shall be submitted to the Architect for approval.

13:04. Sound and Thermal Insulations:

- (A) Sound and thermal insulation shall be expanded extruded polystyrene similar to "FR" brand as manufactured by the Dow Chemical Company meeting Federal Specification K11-1-524, Type II, Class 2, of thickness indicated in details.
- (B) Insulation laid in air space within cavity walls shall be laid loose.
- (C) Insulation applied to the ceiling shall be adhered with a mastic as recommended by the manufacturer of the expanded polystyrene used.
- (D) Insulation where applied in areas visible to the eye shall be kept clean and undamaged or where not so kept shall be replaced prior to acceptance of the building.

13:05. Sheet Cork:

- (A) Sheet cork as called for on the drawings shall be 1/4" off white sheet cork in 6'-0" height and continuous length.
- (B) Locate where indicated on the drawings.
- (C) Adhere sheet cork to wall using adhesive as recommended by the manufacturer of whose product is used.
- (D) Approved manufacturers of the sheet cork is Claridge, Loxit, Gotham, or Son-Nel Products Company.

- (E) Upon completion and before final acceptance of the building, clean down sheet cork leaving it in perfect condition.

13:06. Batt Insulation:

- (A) Insulation as called for in the details shall be 1" Batt insulation, without paper backing.
- (B) Manufacturers shall be Owens-Corning Fiberglas or approved equal.

13:07. River-Run Gravel:

- (A) Gravel as used in conjunction with the underfloor drainage system beneath the basement floor slab shall be river-run gravel in sizes from 1/4" to no larger than 5/8".
- (B) Compact this gravel sub-base to 90% of compacting prior to pouring the basement floor slab.
- (C) This same gravel shall be used in the crawl space area where called for or indicated on the drawings.



## DIVISION NO. 14

Ornamental Metals14:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

14:02. Scope of Work:

- (A) This Contractor shall furnish and install all items specified under this division.

14:03. Aluminum Edge Strips:

- (A) Trimedge aluminum strips as called for on the drawings shall be as manufactured by William L. Bonnell Company or approved equal.
- (B) All aluminum cove trim shall be furnished with end caps where cove does not abut a perpendicular surface.

14:04. Aluminum Floor Divider Strips:

- (A) Provide white metal edging strips where floor covering abuts against another material such as at borders, door opening, and other locations. Edging strips shall be Type "K" or "N" 1 1/4" wide, 1/8" thick top with recess to receive thickness of floor covering.
- (B) Manufactured by American Terrazzo Company, Manhattan Terrazzo Brass Company, Rudel Floor Strip Company, or approved equal.

## DIVISION NO. 15

Metal Specialties15:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

15:02. Scope of Work:

- (A) The items listed in this section shall be furnished and installed by the General Contractor. Shop drawings shall be furnished to the Architect on all items under this division.

15:03. Metal Door Frames:

- (A) Metal door frames shall be unit steel frames as manufactured by Tex-Steel, Richmond, Williamsburg, Elco Metal Products, Trussbilt, American Metal Works, Inc., Builders Manufacturing Company, Atlantic Metal Products or approved equal. BYMOCO Metal Fabricators, Fire Door Corporation, Williams Manufacturing Company, or approved equal.
- (B) Frame design shall be as detailed.
- (C) Frames shall be manufactured of 16 gauge cold rolled steel with all angles, moulds, returns, and miters neatly welded and ground smooth.
- (D) Hardware reinforcement shall be as called for by manufacturer. Templates shall be furnished for all holes to be drilled and tapped for hinges and lock strips.
- (E) For non-labeled frames, slip anchors shall be provided with each frame at intervals not to exceed 2'-6" O.C. of each jamb.
- (F) Labeled frames shall be used where all labeled doors are used. Labeled frames shall be furnished with adjustable anchors of not less than 14 gauge steel spot welded to the inside of the jamb at not more than 2'-6" O.C.
- (G) Each jamb shall be provided with sill clips welded to the frame and punched with two 3/8" holes for anchoring to floor.
- (H) All frames shall have one shop coat of primer before shipment and final finish as called for in the color schedule.

15:04. Hollow Metal Doors:

- (A) Doors shall be as manufactured by Ceco, Truscon, Mesker, Richmond, American Metal Works, Inc., Williamsburg, Elco Metal Products, Trussbilt, Tex-Steel, Builders Manufacturing Company, Atlantic Metal Products, Fire Door Corporation, or approved equal.



- (B) Doors shall be constructed of 16 gauge stiles and rails and all joints shall be welded. Butt and lock reinforcements are to provide for hardware cut-outs. 20 gauge rolled steel mouldings are to be provided around sash openings.
- (C) See door schedule for size and type of doors. All doors shall be 1-3/4" thick.
- (D) All doors shall receive shop coat of paint.
- (E) Labeled metal doors shall be by the above manufacturers.
- (F) Final finish as called for in the color schedule.

15:05. Aluminum Handrail (Interior):

- (A) All interior handrailing shall be NB-4, post No. 15, bracket BR-3A, rail ends RE-4B, and floor flange FL-15 Econo-Rail as manufactured by Newman Brothers, Inc., Blumcraft, Inc., Architectural Art Manufacturing, Inc., Livers Bronze, Michel and Pfeiffer Iron Works, or approved equal.
- (B) Material shall be extruded aluminum 6063-T5 alloy not less than 1/8" in thickness for posts and rails.
- (C) Fittings and fasteners shall be of non-ferrous metals.
- (D) Joints between vertical and horizontal members shall be accurately machined and free from discolorations.
- (E) Finish shall be brushed-satin and waxed.
- (F) Railings shall be factory assembled and complete with necessary fastenings ready to erect.

15:06. Building Expansion Joint Covers (Interior):

- (A) Furnish and install aluminum expansion joint cover assembled where building expansion joints are shown and/or noted on the drawings.
- (B) Style shall be as noted on the drawings.
- (C) Manufacturer shall be Architectural Art Manufacturing, Inc., Metalines, Inc., Metallic Engineering Company, Inc., or approved equal.

15:07. Plumbing Access Doors:

- (A) Plumbing access doors whether in wall or ceiling shall be of the type to accommodate the material in which it is installed.
- (B) Size shall be as noted on the drawings.
- (C) Frame shall be heavy #11 gauge extruded aluminum 6063-T5, and door #14 gauge aluminum 1100-H14.
- (D) Hinge shall be continuous hinge pin housing reinforcing hinge side of door.
- (E) Lock shall be cylinder lock with all access doors keyed alike.
- (F) Finish shall be caustic etched and lacquered natural.
- (G) Manufacturer shall be Newman Brothers, Inc., Birmingham Ornamental Iron Company, or approved equal.

15:08. Roof Hatch:

- (A) Roof hatch shall be B-D easy access hatch, size 2'-6" x 3'-0" model number 6-101 as manufactured by Babcock-Dabis Associates, Inc., or similar hatch by Bilco Company, or approved equal.
- (B) Roof hatch shall be factory assembled and shipped complete ready for installation.
- (C) Roof hatch unit shall be prime coated after fabrication.
- (D) Final finish as called for in color schedule.

Aluminum Windows:15:09. General:

- (A) Furnish and install aluminum windows as detailed and scheduled on drawings. Windows shall be Kawneer "Sealair" series, Ceco series 530, Wausau Series 1000, Marmet 5142 Series.
- (B) Aluminum windows shall be projected and fixed windows as detailed and scheduled. Windows shall be furnished for inside glazing with aluminum channel glazing beads for single glazing as indicated on the details.
- (C) Glass and glazing is specified under Division 26. Type of glass is shown on window details.
- (D) Furnish all necessary mullions, clips, anchors, inserts, fastenings, etc., required for complete installation.
- (E) The contractor shall bid one (1) of the windows specified above in the base bid. Should the contractor desire to bid an optional or alternate window he may do so by writing in on his proposal in the blank space provided for future alternates. In bidding this alternate window, the contractor shall write in the new alternate number, the amount to deduct, and the name of the window manufacturer and the series designation.

15:10. Aluminum Windows:

- (A) All window units, fixed or ventilated, shall be as detailed and shall be furnished complete with all necessary hardware, weather stripping and other miscellaneous items.
- (B) All window members shall be special extrusions of commercial quality 6063-T5 aluminum alloy, free from defects. All projected ventilators shall be of single web construction. Frame sections shall not be less than 1-1/2" deep, with web thickness not less than 3/32".
- (C) All windows shall be assembled in a secure workmanshiplike manner to assure weathertight construction and satisfactory operation. Corners of all frames and ventilators shall be mitered, butt welded, and exposed surplus metal removed. Intersecting meeting rails and muntins shall be tenon jointed to the frame and securely air hammer riveted. Windows shall be designed for inside glazing with aluminum channel glazing beads for single glazing as indicated on the details.
- (D) Projected ventilators shall be balanced on two (2) heavy aluminum arms 3/16" thick with stainless steel or delrin bushings on bearing holes. The bearing rivets of the arms shall be riveted to a bracket for fastening to ventilators and frames. The sliding mechanism of each ventilator shall consist of two (2) sliding shoes in tubular housing with compression spring and securely attached to ventilator bar. Ventilator shall be free from bind when disengaging from frames and shall open approximately 90 degrees.



- (E) All hardware shall be solid bronze, satin finish.
- (F) All operating window sash shall receive metal insect screens, rewirable. Screen cloth shall be manufacturer's standard mesh aluminum wire. Screens shall have same finish as windows.

15:11. Weatherstripping:

- (A) All ventilators shall have outside and inside contacts fitted with resilient, vinyl plastic weatherstrip, retained in grooves extruded integrally with the ventilator members.
- (B) Infiltration shall meet the requirements of Aluminum Window Manufacturers Association Specifications P-A2.

15:12. Finish of Windows:

- (A) All aluminum parts of windows shall receive a treatment equal to Alumilite 204R1 with a minimum film thickness of 0.0004 inch and a minimum coating weight of 17 milligrams per square inch. Protect finish with one coat of clear methacrylate lacquer before shipment.
- (B) Where aluminum work comes in contact with steel lintels, steel structural members or steel sub-frames, the steel shall be insulated from direct contact with aluminum by a heavy coat of alkali-resistant bituminous paint or zinc-chromate primer.

15:13. Erection:

- (A) The aluminum windows shall be erected in the walls after masonry work is completed and before interior finish is begun. The erection of the windows shall be a part of the window manufacturer's contract and shall not be sub-contracted by the General Contractor without window manufacturer's and the State Architect's written approval. The window frames shall be set true, plumb and square without distortion. Operating panels are to be adjusted after windows are in place.

15:14. Shop Drawings and Samples:

- (A) The window contractor shall, before proceeding with the manufacturing of any item, prepare and submit complete manufacturing and installation drawings and samples for the State Architect's approval, and no work shall be performed until approval is obtained.
- (B) Shop drawings shall show all portions of the work fully dimensioned and contain full size sections of all members, indicating thickness of metal, details of construction, hardware, and method of anchoring.
- (C) The State Architect's approval of shop drawings shall not relieve the contractor from responsibility for any errors in dimensions which may be contained therein, nor for any departures from the requirements of the contract drawings and specifications, unless such departures have been fully set forth in writing to the State Architect's prior to approval.
- (D) Contractor shall furnish a certificate of conformance of samples for mechanical tests and chemical analysis.

15:15. Guarantee:

- (A) All aluminum windows shall be guaranteed for a period of one year from final acceptance of the work to be watertight installation. All opening sash shall be guaranteed in operation, locking devices, and weatherstripping for a tight installation.

15:16. Aluminum Coping:

- (A) Extruded aluminum coping shall be used at the head of all aluminum windows as indicated in detail.
- (B) Coping shall be Type G-8 (66611) as manufactured by Aluminum Company of America. Should manufacturers of a similar type extruded aluminum coping desire to obtain approval of their product, they shall submit literature of a comparative nature to the base specification to the State Architect's Office for approval.
- (C) Installation shall be according to details.
- (D) Finish shall be methacrylate lacquer after aluminum surfaces have been degreased, alkali-etched, rinsed, de-oxidized in acid, rinsed, and oven dried.

15:17. Steel Ladder:

- (A) Steel ladder shall be as detailed on the drawings.
- (B) Final finish as called for in color schedule.



## DIVISION NO. 16

Sheet Metal16:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

16:02. Scope of Work:

- (A) Furnish all labor, materials, equipment, and perform all operations in connection with the provisions of sheet metal work complete in strict accordance with the specifications and drawings. Exhaust fans and ductwork specified under "Heating and Ventilating" division.

16:03. General:

- (A) The sheet metal work shall be installed at the proper time and as rapidly as the progress of the surrounding work warrants. Provision shall be made for the attachment of adjoining work, verifying all dimensions, sizes, and similar information necessary for proper installation. Sheet metal Contractor shall do all cutting, drilling, tapping, and fitting required.

16:04. Flashing:

- (A) Flash at all points with 16 ounce cold-rolled copper where needed or shown as metal flashing to make a thoroughly waterproofed job. All flashing shall be with 16 ounce cold-rolled copper unless otherwise specified.

16:05. Metal Cap Flashing and Fascia:

- (A) Provide metal cap flashing and fascia of 16 ounce cold-rolled copper wherever base flashing and fascia is used and elsewhere as indicated on the drawings.
- (B) Form flashing in 8'-0" lengths except where shorter pieces are required and lap joints  $\frac{1}{4}$ ", making flashing at angles continuous. Fold exposed bottom edge back  $\frac{1}{2}$ " under side for stiffness and crease longitudinal at center of exposed surface just enough to produce a spring action that will hold the bottom edges of flashing firmly against the base flashing. Make the cap flashing overlap base flashing  $\frac{1}{4}$ ".
- (C) Extend cap flashing into masonry walls not less than  $\frac{1}{4}$ " where cap flashing is terminated in raked joints or in prepared masonry or stone reglets. Fasten flashing with wedges every 12" and fill reglet on vertical continuous with plastic cement.
- (D) Fascia shall be in as long lengths as permissible and to design as shown on the drawings.

16:06. Galvanized Sheet Metal Sleeves:

- (A) Furnish and install sheet metal sleeves for setting pipe railing in top of concrete. Sleeves to be of 26 gauge galvanized sheet metal.

16:07. Guarantee:

- (A) Written guarantee signed by the General Contractor and Sheet Metal Contractor to be furnished to the Owner guaranteeing sheet metal work under this specification against leaks for a period of two years from date of final inspection and acceptance.



## DIVISION NO. 17

Vapor Barrier, Roof Insulation, and Roofing17:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

17:02. Scope of Work:

- (A) Furnish all labor, materials, and appliances and perform all operations in connection with the provisions of this division.

17:03. Vapor Barrier: (Steel Deck Only)

- (A) Vapor barrier shall be Class 1 noncombustible, nontoxic, and may be the membrane type or brushed or sprayed on type as clarified below.
- (B) Approved membrane barrier manufacturers are Owens-Corning (Pyro-Kure), Luxsue, Inc., and Reflecto-Barrier Sales Company, or approved equal.
- (C) Approved brushed or sprayed on barrier shall be as manufactured by Flintkote Company, if Flintkote Gold-N-Kote insulation is used, and applied according to manufacturer's instructions.
- (D) Application of any of the above vapor barriers shall be according to manufacturer's instructions for a rated installation, by experienced workmen in this type of work.

17:04. Insulation:

- (A) Roof deck insulation shall be rigid type to dimensions indicated on the drawings, and with a "C" factor of 0.19 or less.
- (B) Manufacturers and insulation approved is Johns-Manville Fesco Board, Owens-Corning Fiberglas, Flintkote Gold-N-Kote, or approved equal.
- (C) Application of any of the above roof insulations shall be according to manufacturer's instructions for a rated installation, by experienced workmen in this type of work.

17:05. Precautions:

- (A) It shall be the responsibility of the General Contractor to protect the roof deck prior to the installation of the vapor barrier and/or insulation. Once the roofing sub-contractor commences laying the vapor barrier or insulation, he accepts the roof as being satisfactory for his portion of the work and the protection of the roof becomes his responsibility during and up to the time of completion of the roofing material wherein the responsibility reverts back to the General Contractor.

17:06. Built-Up Roof:

- (A) Built-up roof shall be a gravel surface, asphalt felt built-up roof by Ruberoid Specification 203A-INS. Approved manufacturers are Johns-Manville Specification 601, Bird and Son, Inc. specification 707, or Philip Carey Manufacturing Company, Specification 1-AZ.
- (B) Roofing shall be applied according to manufacturer's specifications, and by an approved Roofing Contractor.
- (C) Material required per square shall depend on the specification for the roofing material used, but essentially it shall consist of:

Universal Base Sheet, 1 ply  
Roofing Asphalt  
Asphalt Felt, 3 plies  
Roofing Bitumen  
Dry Gravel  $\frac{1}{4}$ " to  $\frac{5}{8}$ "

17:07. Bond:

- (A) A 20-year bond certificate shall be given the owner by the Roofing Contractor to show he has complied with all items governing a bonded roof.



## DIVISION NO. 18

Rough Carpentry18:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

18:02. Scope of Work:

- (A) Furnish all labor and materials and perform all operations in connection with the provisions for rough carpentry, complete in strict accordance with the specifications and drawings.

18:03. General:

- (A) The Contractor for this section of the specifications shall do all the necessary work in his line as is usually required by other mechanics about the buildings, such as cutting away and rebuilding, fitting to other work, etc.

18:04. Wood Centers and Forms:

- (A) Construct all wood forms and supports for reinforced concrete as specified under Section No. 6.

18:05. Grounds:

- (A) All wood trim, unless otherwise shown, have wood grounds. In general, plaster grounds are to be 3/4" thick or as noted.  
(B) Put up the necessary grounds for securing all finish throughout the building. Grounds are to be fastened to walls, same to be plumb and straight. Grounds fastened with plaster only will not be acceptable. Where impracticable to build in blocks, plug walls securely or use toggle bolts.

18:06. Scaffolds:

- (A) Build and furnish all necessary scaffolds for proper progress of the work. These are to be same and well constructed. At all times, furnish proper access, scaffolds, etc. for the purpose of the superintendent's inspection of the progressing work.

18:07. Rough Hardware:

- (A) Furnish and install all nails, spikes, screws, bolts, anchors, ties, and other accessories shown on the drawings, or as properly required to secure the woodwork.





## DIVISION NO. 19

Finish Carpentry and Millwork19:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

19:02. Scope of Work:

- (A) Furnish all labor, materials, equipment, and appliances, and perform all operations in connection with the provisions of finish carpentry and millwork, complete in strict accordance with the specifications and drawings.

19:03. General:

- (A) Stack lumber and plywood to insure proper ventilation and drainage. Protect millwork against dampness during and after delivery. Store under cover in a well-ventilated building and where not exposed to extreme changes of temperature or humidity. Do not store or install millwork in any part of the building until concrete, masonry, and plaster work is dry.
- (B) All glazing shall be done at the building by the Glazing Contractor as specified under section of Glass and Glazing.

19:04. Grading Requirements:

- (A) Moisture contents: Not to exceed 18% for framing lumber and 11% for millwork.
- (B) Grade and trademark: Required on each piece of lumber (or bundle in bundled stock). Use only the recognized official marks of association under whose rules it is graded. Grade and trademark will not be required if each shipment is accompanied by a certificate of inspection issued by the association.
- (C) Quality: Lumber must be sound, thoroughly seasoned, well-manufactured and free from warp that cannot be corrected in the process of bridging or nailing. Woodwork exposed to view on outside of building or finished interior spaces shall be dressed.
- (D) Definition of white pine: Where referred to herein, it shall include northern pine, western white pine, and sugar pine.

19:05. Grades and Species of Woods:

- (A) Grades and species of lumber and millwork shall be as follows except that grades and species hereinafter specified under specific items shall govern.

- (B) All hardwoods shown in details and specified herein shall be plain sawed, unless otherwise noted, conforming to commercial standard CS-76339.
- (C) Where the word "hardwood" appears in the specification, it shall mean rotary cut premium grade walnut.
- (D) Walnut shall be used where noted.

19:06. Wood Preservative:

- (A) See Section 18:12 for preservative treatment.

19:07. Flush Wood Doors and Transom Panels:

- (A) Doors and panels shall be solid and/or hollow core of size, design, and thickness indicated on the drawings. Solid core doors and panels shall be custom grade and hollow core doors and panels premium grade.
- (B) The face veneer shall be walnut of standard commercial thickness, but not less than 1/2" thick before sanding. Use walnut veneer or solid walnut on exposed edges of doors and panels to match veneer used.
- (C) All doors so scheduled shall be furnished for glazing and with louvers as detailed. Stops shall be constructed of solid material of the same kind of wood as the face veneer.
- (D) All doors are to be sanded down smoothly at the mill and hand sandpapered thoroughly after being installed.
- (E) Doors must not be stored in damp warehouses or brought into the building until the building has thoroughly dried out. The manufacturer shall be responsible for the proper moisture content of the doors. Doors shall be guaranteed against checking, warping, twisting and such defects as would mar the appearance of the door. In approving doors, a warp or twist of 1/8" or less will not be considered a defect.
- (F) Doors shall be as manufactured by Mengel, Curtis, Hardwood Products Corporation, Ipik Door Company, Inc. (without trademark), Meyerhaeuser Company (Reddis) or approved equal.
- (G) Doors shall have lifetime guarantee against delamination and two-year guarantee against warpage and manufacturing defects.

19:08. Millwork and Trim:

- (A) Exterior and interior millwork and trim shall conform to design and details shown. In general, all woodwork listed in the Color Schedule to be painted shall be white pine. Kind of hardwood for millwork and trim shall be walnut. Where practicable work shall be finished smooth with slightly rounded edges and free from machine or tool marks that will show through the finish. All nail heads shall be set to receive putty.
- (B) All joints shall be tight and formed to conceal shrinkage. Shop miters 4" or more from heel to point shall be glued and locked. Make dovels and tenons to a driving fit. Make outside joints to exclude water and set in white lead paste or waterproof glue. Make shop joints of interior work with waterproof glue under pressure.



- (C) Trim shall be single lengths without splicing; corners shall be mitered. Running finish shall be in long lengths and joined only where solid fastenings can be made. End joints in corners and cope interior angles.
- (D) All cabinet work including counters, cabinets, etc., shall be walnut and made complete and finished at the mill in sections of size that will allow for transportation and assembled together with bolts or as detailed and shall be well provided with cleats and blocking for protection while shipping.
- (E) Open shelving in cabinet work shall be 3/4" walnut. Shelving covered by doors shall be 3/4" A-B grade of fir plywood with walnut glued to shelving. Shelving not in cabinet shall be 3/4" white pine. Wood shelving shall be glued up and set into ends unless shelves are to be adjustable.
- (F) Exposed sides and dividing partitions in cabinet work shall be 3/4" A-B grade walnut plywood with backs of 1/4" A-C grade walnut.
- (G) Drawer fronts shall be walnut, sides and backs shall be white pine, bottoms shall be 1/4" plywood. Drawers shall have fronts routed to receive sides. Sides shall be applied to the back with a butt joint. Groove front, between routed areas, sides, and back to receive bottom. Center hardwood wood oak guide strips shall be as shown and applied to bottom of each drawer. Drawer construction shall be glued as well as nailed.
- (H) The cabinet work includes all rough and finished woodwork as shown on the drawings and as required for a complete and rigid installation. Cabinet work shall be specially and carefully constructed and finished by expert cabinet makers and shall have as much hand work done thereon as may be required to secure perfect results. Cabinet work shall not be brought into the building until the building is complete and thoroughly dried.
- (I) All trim including door, cabinet, ceiling mould and tackboards, insofar as applicable to this job, shall be walnut as indicated in details.

19:09. Plastic Covered Countertops:

- (A) Furnish and install plastic covered countertops as shown on the drawings and herein specified. Plastic covering shall be sheets of laminated plastic under the trade name of Formica, Textolite, or Micarta. Countertops shall be constructed of 3/4" thick plywood with surface plies of philippine mahogany or other close grain wood suitable to receive plastic covering.
- (B) Plastic covering for countertops and counter edges shall be 1/16" thick. Plastic sheets shall be applied to plywood cores under pressure and glued with resin glues by applicators approved by the manufacturer.
- (C) See Color Schedule for color of plastic covering.
- (D) Plastic on countertops shall be in as long lengths as possible to keep the butt joints to a minimum, but in no case shall the joints occur in less than an 8'-0" length of laminated plastic unless approved by the Architect.

19:10. Shop Drawings:

- (A) Submit shop drawings covering cabinet work items in accordance with the General Conditions.



## 20 - CAULKING

20:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

20:02. Scope of Work:

- (A) Furnish all labor, materials, equipment and appliances and perform all operations in connection with the provisions of caulking, complete, in strict accordance with the specifications and drawings and subject to the terms and conditions of the contract.

20:03. General:

- (A) See drawings and details for items requiring caulking. Completely seal with caulking compound joints around frames of doors and other openings in exterior masonry walls, and all other joints or spaces noted on the drawings to be caulked or pointed with mastic.
- (B) Marble installation is by marble supplier but caulking is by General Contractor.
- (C) All top and wash joints in cap stone and aluminum coping shall be caulked.

20:04. Caulking Materials:

- (A) All exterior caulking compounds shall be an elastomeric rubber sealant of polysulfide or silicone polymer. Sealants shall be "Pecora GC9"; "Weatherban #101"; "PRC 5000"; "Dow #780"; General Electric's Silicone Construction Sealant or approved equal. Approval of sealants other than those listed above will be based upon compliance of Federal Specifications TT-S-00227 (a) (CSA-FSS) to be conducted by an independent laboratory selected by the Owner and paid for by the contractor.
- (B) Rope yarn shall be revealed strands of non-staining rope fiber of cotton wicking.
- (C) Caulking primer shall be a quick drying and of type recommended by manufacturer of compound or sealant.

20:05. Caulking Application:

- (A) Joints and spaces to be caulked shall be clean, free from dust and dry. When gun consistency compound is used, prime stone and brick surfaces that are in contact with caulking before caulking is applied. Joints more than 3/4" deep and joints where a suitable back stop has not been provided shall be packed with rope yarn to within 1/2" of surface, before applying caulking. Joints in stone and pre-cast work shall be filled slightly convex. Caulk joints before final coat of paint is applied to adjacent work.
- (B) Apply compound with gun having proper size nozzle or with knife as required. Use sufficient pressure to fill all voids and joints solid;

superficial pointing of joints with a skin bead will not be accepted. Remove excess caulking and leave surfaces neat, smooth and clean. Upon completion, caulking shall have a smooth even finish. All caulked joints shall be watertight.

20:06. Guarantee:

- (A) All caulking shall be guaranteed by the General Contractor to be free from defects of materials and workmanship for a period of one (1) year from date of final acceptance of the project.



## DIVISION NO. 21

Lathing and Plastering21:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

21:02. Scope of Work:

- (A) Furnish all labor, materials, equipment and appliances and perform all operations in connection with the provision of metal furring, lathing, plastering, complete in strict accordance with the specifications and drawings.

21:03. General:

- (A) Work of other trades shall not be concealed by work of this section until it has been inspected and accepted by the Architect.
- (B) See Finish Schedule for type of plaster to be used.

21:04. Thickness and Number of Coats:

- (A) The minimum thickness of plaster shall be  $3/4"$  on metal lath,  $1/2"$  on concrete,  $3/4"$  acoustical plaster on concrete, or as indicated in detail.
- (B) Plaster shall be three coat work.
- (C) See Finish Schedule for type of plaster to be used.

21:05. Plaster Materials:

- (A) Gypsum plaster shall be standard quality conforming to A.S.T.M. specification C-20-59 for gypsum plaster. On concrete surfaces, use U. S. Gypsum Company's bondcrete. Similar material by National Gypsum Company or approved equal. Keene's cement shall be used for the finish coat where so specified or scheduled. All manufactured materials shall be delivered in the original packages, containers, or bundles bearing the name of the manufacturer and brand. Hydrated lime must be at least 92% hydrated.
- (B) Sand shall be clean, sharp and free from organic matter with grains from fine to coarse meeting the standard specification for plastering sand of the A.S.T.M. C-35-59 latest edition. Screen through a #16 mesh screen.

21:06. Metal Furring:

- (A) Unless otherwise shown, metal furring shall consist of  $3/4"$  channels spaced as required for type of lath used. Provide all furring, clips, crimped band irons, wiring and other attachments necessary to bring plaster to lines indicated.

21:07. Furring Channel:

- (A) All furring channels to be cold-rolled painted stock. Runner channels shall be placed not to exceed 4'-0" centers, and shall be not less than 1½", weighing not less than 475 pounds per 1,000 lineal feet. Runner channels shall be hung from 12 gauge galvanized steel wire spaced 2'-0" O.C. Anchor to deck above.
- (B) Furring channels shall be not less than 3/4" with a minimum weight of 300 pounds per 1,000 lineal feet. They shall be erected at right angles to the runner channels and shall be securely tied to them by at least three strands of galvanized annealed wire No. 12 at each crossing. Furring channels shall have a maximum spacing of 16" O.C. for walls and 12" O.C. for ceiling.

21:08. Metal Lath:

- (A) All metal lath shall be flat diamond mesh lath painted black and weighing not less than 3.4 pounds per square yard equal to U. S. Gypsum "Color-rite" red. Similar product by National Gypsum Company.
- (B) Secure lath to metal supports and adjacent lath with No. 18 gauge galvanized annealed tie wire or No. 12 gauge spring steel clips, galvanized or painted. Secure lath to masonry by nailing into joints with galvanized staples and secure to concrete by wire or other inserts placed in forms.
- (C) Lap flat expanded lath ½" at sides and 1" at ends.

21:09. Beads:

- (A) All exposed horizontal and vertical plaster corners, except where otherwise detailed, are to have No. 1 Milcor expanded continuous corner beads, or equal by Penn Metal, Boswick, or Wheeling. Corner beads shall have 2½" flanges, and are to be run to a straight line and be rigidly and securely fastened to the construction square with the corners and plumb.
- (B) Where plaster abuts a different material or has exposed end, use No. 66 casing bead. See (A) above.

21:10. Mixing Procedure:

- (A) Store all plaster at the site in a dry place, raised above the bare ground. Provide clean, watertight mixing boxes. Clean mixing boxes after each mix. Machine mixing is permitted providing the machine is kept clean and free from set plaster.
- (B) Tools shall be kept clean and shall not be rinsed in mixing water.
- (C) Do not mix more material than can be applied in one hour nor mix one batch with another. Plaster shall not be retempered after it has commenced to set.



- (D) In hand mixing gypsum plaster, sand shall be added at the job. Plaster and sand shall be mixed to a uniform color at one end of the box, hoed into water at the other end, and thoroughly mixed to proper consistency. In machine mixing, sand shall be added at the job and the following cycle shall be followed while mixer is in continuous operation:
1. Put in approximate amount of water.
  2. Add approximately half of the sand.
  3. Add all of the plaster.
  4. Add remaining sand.
  5. Mix to proper consistency, adding water if necessary.
  6. Dump the entire batch and use.

21:11. Standard Sand Plaster:

- (A) The scratch or first coat over all lath shall be mixed in the proportions of one part gypsum plaster to not more than two parts sand by weight (13 No. 2 shovels of damp sand per 100 pound bag of plaster).
- (B) The brown or second coat over all lath and the scratch and brown coat over masonry surfaces (except monolithic concrete) shall be mixed in proportions of one part gypsum plaster to not more than three parts sand by weight (20 No. 2 shovels of damp sand per 100 pound bag of plaster).
- (C) Apply first a scratch coat, uniformly over all lath and masonry, forcing the plaster well into the joints to form perfect keys. Thoroughly and deeply cross-rake the surface before setting.
- (D) After the scratch coat is set firm and hard, but before it is dry, apply a second coat bringing it to a straight and even surface with rod and darby, ready to receive the finishing coat.
- (E) Smooth coat of prepared gypsum trowel finish (white) in scheduled rooms, shall be applied in two coats to a total thickness of not more than 1/8" over a set, half green, gypsum base coat, filling out to a true and even surface. Trowel to a smooth finish free of rat faces and other blemishes. Use water sparingly during troweling.
- (F) Sand float finish shall be mixed in the proportions of 50 pounds of dry hydrated lime, 100 pounds of Keene's cement and 400 pounds of sand in lieu of prepared mixes.

21:12. Patching:

- (A) The plasterer will be required by do all necessary patching after other mechanics are through with their work, and will be required to replace any plaster that shows signs of cracking or peeling and considered unsatisfactory.

21:13. Grounds:

- (A) Proper grounds are to be provided for all plaster work and walls are to be kept true and straight. In case grounds are not found plumb and true in every respect, the plasterer will correct the defect and see that same are made straight before beginning the plastering. The plasterer will be held responsible for the work.

- (B) All angles and corners must be plumb and straight and the plaster surfaces must be carefully rodged and darbied and finished perfectly straight and true.

21:14. Cleanings:

- (A) Clean off all metal or woodwork in a thorough and neat manner. Clean up all trash resulting from this work.

21:15. Scaffolding:

- (A) Provide all scaffolding needed to carry on the work of lathing, furring, and plastering.

21:16. Portland Cement Plaster:

- (A) Apply portland cement plaster in areas where shown on the drawings.  $3/4$ " thick on metal lath and  $1/2$ " thick on concrete.
- (B) Scratch coat of one part cement and three parts sand with hydrated lime in proportion of 10% by weight of cement shall be applied with sufficient force to form good keys. The scratch coat shall be cross-scratched upon attaining its initial set.
- (C) Brown coat of the same mix as the scratch coat shall be applied after scratch coat has set, but not less than 24 hours after the application of the scratch coat. Brown coat shall be lightly scratched and broomed.
- (D) Finish coat of one part cement and two parts of sand with hydrated lime in proportion of 10% by weight of cement shall be applied not less than seven days after brown coat is applied. The finish coat shall be wetted and the entire finish plastering job moist cured for two days and then allowed to dry. Finish shall match sand finish plastered ceiling in Rooms 101, 102, and 103 and shall be painted.

21:17. Precautions:

- (A) Maintain a minimum temperature of 50 F. in spaces to receive gypsum board and/or plaster and protect from freezing and too rapid drying. After plaster has set hard, provide free circulation of air.

21:18. Keene's Cement Plaster:

- (A) Keene's Cement Plaster shall be applied as a skim coat behind all sheet cork where sheet cork is to be applied directly to a lightweight masonry wall.
- (B) Maximum thickness of skim coat shall be  $1/8$ ".
- (C) Finish shall be smooth.
- (D) Only the area covered by the sheet cork shall be skim coated.



## DIVISION NO. 22

Ceramic Tile, Marble, and Quarry Tile22:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

22:02. Scope of Work:

- (A) Furnish all labor, materials, equipment, and appliances, and perform all operations in connection with the provisions of ceramic and quarry tile and marble, complete in strict accordance with the specifications and drawings.

22:03. General:

- (A) Before setting tile, furnish Architect with Tile Manufacturer's Association standard form of plaster certificate signed by contractor and manufacturer and stating grade, kind of tile, and identification marks for packages of tile delivered to the job.

22:04. Ceramic Mosaic Floor Tile:

- (A) Provide standard grade unglazed ceramic mosaic floor tile as manufactured by the Mosaic Tile Company or approved equal.
- (B) Color shall be as indicated in the color schedule.

22:05. Ceramic Tile:

- (A) Ceramic tile shall be standard grade as classified in the U. S. Department of Commerce simplified practice recommendation of R-61 and/or Federal Specification SS-5-308. Wall tile shall be  $\frac{1}{4}$ " x  $\frac{1}{4}$ " x  $\frac{1}{4}$ " and the base shall be  $\frac{1}{4}$ " x  $\frac{1}{4}$ " x  $\frac{1}{4}$ " with  $\frac{3}{8}$ " cove.
- (B) Color shall be as indicated in the color schedule.

22:06. Setting Method:

- (A) Ceramic mosaic tile and ceramic tile shall be installed in a portland cement mortar meeting Standard Specification A108.1 of the latest edition by the Tile Council of America, Inc.

22:07. Pointing Mortar:

- (A) Pointing mortar for all joints  $\frac{1}{8}$ " or smaller in width, pointing mortar shall be 1 part waterproofed portland cement and 1 part sand.
- (B) Sand shall be sharp, washed, and uniformly graded from fine to coarse as follows: 100% passing No. 30 screen and not more than 5% passing No. 100 screen.

22:08. Cleaning:

- (A) After the pointing has sufficiently set, all tile work shall be thoroughly cleaned.

22:09. Damaged Tile:

- (A) After all cleaning of tile, the Tile Contractor shall inspect all tile surfaces for broken or damaged tile and shall replace these tile. Tile damaged after the Tile Contractor has completed his work shall be the responsibility of the General Contractor.

22:10. Marble:

- (A) Marble for window stools shall be Ozark Tavernelle with all exposed edges and top surface polished and to size indicated in details.
- (B) Marble for toilet threshold shall be Ozark Tavernelle with exposed surfaces honed, and to size indicated in detail.
- (C) Marble for exterior paneling shall be Serpentine Verde Scuro with polished exposed surface and to size indicated in details.
- (D) Marble window stools and thresholds shall be set in mortar approved by the Marble Institute of America.
- (E) Exterior marble paneling shall be installed as indicated on the drawings using dovetail two-way strap, U cramp strap, and wire cramp of rust-resistant and corrosion-resistant metal as recommended by the Marble Institute of America.
- (F) Each panel of exterior marble shall be set rigidly against spots of non-staining cement mortar with accelerator, located at or near the anchors and spaced not further than 18" apart over the back of each piece.
- (G) Marble joints shall be 1/8" maximum in width unless otherwise noted.
- (H) Joints shall be buttered or filled solidly with a non-staining mortar. Weight bearing joints shall be maintained by plastic or aluminum cushions.
- (I) Joints shall be caulked by the General Contractor as specified in Division No. 20.
- (J) Supplier of marble shall be Carthage Marble Corporation, Carthage, Missouri.

22:11. Quarry Tile:

- (A) This sub-contractor shall furnish and install standard grade quarry tile of uniform size and color as manufactured by the Mosaic Tile Company or approved equal. Tile shall conform to National Bureau of Standards S.P.R.-61 and Federal Specification SS-5-308.
- (B) Color shall be as called for in the color schedule.
- (C) Tread nosings shall be abrasive surface bullnose 6" x 6" x 3/4" and field tile 6" x 6" x 1/2" with joints no wider than 1/4".



- (D) Install tile in a manner conforming with the best current practice for the industry, by skilled craftsmen. Form all intersections and turns in a neat and workmanlike manner. Grind and joint carefully all cut edges, bordering trim, built-in fixtures, etc. Thoroughly back up with mortar, all coves, curbing gutters, flat tile, trimmers, etc., and secure firmly in place.
- (E) All mortar shall be thoroughly mixed to the exact proportion and shall be placed within a reasonable time interval after mixing.
- (F) Joint grouting and pointing and leveling tile on mortar setting bed.
  - 1. Immediately prior to the application of either leveling coat or mortar setting bed, wet the surface of the preceding coat thoroughly, but do not saturate. Attach temporary screeds with blobs of mortar to provide a true and plumb plane at proper distance back from finished wall line. Apply, rod, and float over areas no greater than will be covered by the tile.
  - 2. Surfaces must be clean, free from oil or grease, rust and scale, without projections, depressions, holes, joints, loose or freeable particles, and must be deemed suitable by the Contractor for the tile work before the mortar setting bed is placed.
  - 3. Proportions:
    - Setting bed - one part portland cement  
 $\frac{1}{10}$  or less hydrated lime  
 six parts sand
    - Pointing mortar - one part portland cement  
 $\frac{1}{5}$  part hydrated lime  
 two parts sand
- (G) Curing: Apply laminated and reinforced kraft paper having a bituminous binder of a polyethylene (.002" minimum thickness) sheet over the floor as soon as pointing or grouting is completed. Lap sheet  $\frac{1}{4}$ " minimum and seal laps against the escape of moisture with weights or planks. Leave in place for three full days.

## 22:12. Guarantee

- (A) The General Contractor and his surety shall, upon signing this contract, guarantee all ceramic tile, quarry tile, and marble installed hereunder against defects consisting of cracks, chipping of surface, friability or poor finish which may appear within one year after date of final acceptance. He further agrees to remove and replace without additional cost to the Owner, any parts which may show such defects within the period stated, providing such defects are not caused by misuse, poor maintenance, or the like in the opinion of the Architect.

## 24 - SPECIAL WALL COVERING

24:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

24:02. Scope of Work:

- (A) Furnish all labor, materials, and equipment and perform all operations in connection with the installation of special wall coverings in strict accordance with the specifications and drawings.

24:03. Vinyl Wall Covering:

- (A) Vinyl wall covering shall be Guard, Kings quality, as manufactured by the Columbus Coated Fabrics Company, Division of the Borden Chemical Company, Columbus, Ohio, or equivalent materials as manufactured by Gilford, Inc., L.E. Carpenter and Company, Inc., "Vicrotex" or approved equal. Colors shall be as selected by the Architect. The fabric base shall be composed of cotton cloth weighing not less than 3.50 ounces per square yard. The minimum total coating weight not less than 12 ounces, per square yard of vinyl surface. The total weight per square yard not less than 15 ounces. The material shall meet ASTM E84-59T specification, flame spread rating of 20, smoke factor of 5, and shall withstand at least 1000 cycles of a Taber Abrader with CS-17 wheel and 1000 gram load with no more than .080 weight loss. It shall withstand 150 hours of a Fade-O-Meter with no color loss.
- (B) The wall covering applicator shall examine all surfaces to receive wall covering, to see that they present a true, smooth, level finish, free from cracks, irregularities, rough spots and indentations, and that they are thoroughly dry before starting application. Dry wall shall be primed as recommended by the manufacturer. The wall covering applicator shall report, in writing, to the Architect if any surfaces are not in proper condition. Starting work shall imply acceptance of surface by this contractor.
- (C) Adhesive as recommended by the wall covering manufacturer shall be used by the wall covering contractor and shall be used in strict accordance with manufacturer's written instructions. All seams to be butted. Do not overlap. Notify supplier if defective material is discovered.
- (D) After hanging, all surfaces must be cleaned immediately of all trace of paste and dirt by washing with clean water. Do not use carbon tetrachloride or lacquer solvent.
- (E) The contractor shall protect all decorated surfaces until the building is completed and accepted.



## DIVISION NO. 25

Composition Floor Covering25:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

25:02. Scope of Work:

- (A) Furnish all labor, materials, equipment, and appliances and perform all operations in connection with the provisions of this division.

25:03. General:

- (A) Slab topping should be left down thickness of the floor coverings. Metal strips at joints where composition floors abutt the finish of other floors. See Division No. 14.

25:04. Materials:

- (A) Rubber floor tile shall conform to the Interim Federal Specification L-F-00450 (COM-NBS) dated August 25, 1959, Amendment No. 1 dated November 20, 1959.
- (B) Size of composition floor tile shall be 9" x 9" x 1/8" or 12" x 12" x 1/8" factory waxed, in colors selected by the Architect.
- (C) Rubber cove base shall be top-set type to size indicated on the drawings and 1/8" thick in colors selected by the Architect. Base shall be run in as long length as possible using pre-formed corner pieces.
- (D) Adhesive for composition floor tile and base shall be as recommended by the manufacturer of whose tile and base is used and as to location of use.
- (E) Manufacturers shall be Kentile, Inc., Armstrongs or American Biltrite Rubber Company, or approved equal.
- (F) Do not mix runs of tile in the same area.
- (G) Approved manufacturers must have their substitute tile patterns and colors approved by the State Architect prior to submitting their bids.

25:05. Conditions Preparatory to Laying Composition Flooring:

- (A) Before the Flooring Contractor shall lay any composition floor tile, he shall make an appropriate moisture test to determine if the concrete floor is dry for the proper adherence of tile or sheet goods.
- (B) This test shall be conducted in the presence of the Architect or his representative.
- (C) This type of test to be used shall be submitted to the Architect by the Flooring Contractor for the Architect's approval.

- (D) The General Contractor shall be fully responsible for the condition of the concrete floor and surface prior to the acceptance by the Flooring Sub-Contractor for installation of the composition material.
- (E) The General Contractor shall see that in any 10'-0" radius there shall be no more than  $\frac{1}{4}"$  difference from the noted floor slab elevation. Should the above tolerance be exceeded, the General Contractor shall grind the floor to elevation or fill with floor stone and grind to elevation. Floor stone for use with slab on grade shall be Universal Kenpatch #14 and slab above grade Fast Patch by Kentile.
- (F) After the Flooring Sub-Contractor accepts the floor, it will become his responsibility to repair any damages or imperfections occurring prior to the installation of his flooring material.
- (G) Before any composition flooring material is laid, the Flooring Sub-Contractor shall sand the concrete surface with 80 grit sandpaper using an electric sander making surface of floor completely smooth with dull finish. Sweep floor to broom clean and just prior to laying composition flooring material, use an industrial type vacuum cleaner and vacuum the entire floor area to be covered at that time. Should the area vacuumed not be completely covered by the flooring material at the end of the day's work, vacuum remaining area before laying remainder of floor covering material.
- (H) At the completion of the area being covered, the responsibility of the floor care reverts back to the General Contractor, with exception of cleaning with a neutral cleaner which shall remain with the Flooring Sub-Contractor.
- (I) Maintain a 70 F. minimum temperature in rooms for 24 hours before, during, and 48 hours after laying floor tile or sheet goods. Stack floor covering in rooms at room temperature for 24 hours before laying.

#### 25:96. Laying Flooring:

- (A) Lay tile and base in accordance with the recommendations of the manufacturer for the Tile Institute. Use only experienced workmen. Lay tile with joints tight and in true alignment. Heat tile on under side if necessary to obtain bond. Lay tile to patterns indicated with grain reversed in alternate tile.
- (B) Cut tile to fit accurately at joints with other materials. Lay tile symmetrically about center lines of rooms or spaces with tile against walls not less than 6" wide. Tile against wall shall be same width on each side of room when possible.
- (C) Should the Flooring Contractor find fault with the laying surface of the sub-floor, they shall notify the General Contractor who shall make the necessary repairs.
- (D) The Flooring Contractor approves the sub-floor surface as being satisfactory once they start laying flooring.
- (E) Set base straight and true and in accordance with the manufacturer's directions. Internal and external corners shall be formed at the job by hasting and bending the tile around corners.



25:07. Cleaning Composition Floor Covering:

- (A) After floor covering has set for a minimum of five days, or sufficiently to become sealed, wash with a liquid neutral solution similar to Hillyard Chemical Company's Super Shine-All and thoroughly buff.
- (B) Upon completion, leave floors and base clean and dry smooth and free from buckles, cracks, and projecting edges.
- (C) Waxing shall be done by the owner.

25:08. Feature Strips:

- (A) Feature strips by manufacturer of the tile used, or approved equal, shall be 1" wide and thickness for floor tile being used. Locate beneath door, at threshold point, where one color of tile abuts another color of tile in rooms and doorways.
- (B) Color to be selected by the Architect.

25:09. Cracked Tiles:

- (A) All cracked, pitted, chipped, or uneven tile to be removed and replaced with perfect tile.
- (B) Before final acceptance, all tile must lay flat and smooth.
- (C) Nothing in the above intends or implies that this guarantee shall apply to work abused or neglected by the owner or his successor in interest.

25:10. Guarantee:

- (A) This Contractor shall provide a written guarantee against defects in workmanship and materials for a period of one year from the date of acceptance.

## DIVISION NO. 26

Glass and Glazing26:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

26:02. Scope of Work:

- (A) This Contractor is to furnish and install all articles, materials, operations or methods of quality according to qualifications noted, prescribed, and to provide all necessary labor, materials, equipment and incidentals.

26:03. Flat Drawn Glass:

- (A) DSG  
(B) Manufacturer to be Pittsburgh Plate Glass Company, Libbey-Owens-Ford Glass Company, American Window Glass Company, or approved equal.  
(C) Each light, when delivered, is to bear manufacturer's label.  
(D) To be used in all locations requiring glazing except as otherwise noted.

26:04. Polished Plate Glass:

- (A) Manufacturer to be Pittsburgh Plate Glass Company or Libbey-Owens-Ford Glass Company.  
(B) All polished plate glass shall be 1/4" thick.

26:05. Obscure Glass:

- (A) Obscure glass shall be grey rough plate polished one side 3/4" thick.  
(B) Rough plate grey shall be of the same manufacturer supplying the heat absorbing glass in order to maintain the same shading of grey.  
(C) Install with rough side to the interior, and according to manufacturer's directions.

26:06. Wire Glass:

- (A) Polished wire glass as called for on the drawings shall be 1/4" thick Georgian as manufactured by Libbey-Owens-Ford; Nuwold mesh 1/4" thick glass as manufactured by American Saint Gobain Corporation; polished mesh 1/4" thick glass as manufactured by Mississippi Plate Glass Company; or approved equal.



26:07. Heat Absorbing Glass:

- (A) Heat absorbing glass shall be Solargray plate glass 1/8" thick as manufactured by Pittsburgh Plate Glass Company. Approved manufacturers of a similar type glass is Libbey-Owens-Ford and American Saint Gobain.
- (B) Heat absorbing glass shall meet the Federal Specification DD-G-451a (December 19, 1959) for heat absorbing glass with a radiant transmittance for energy from the sun of not more than 0.50 (50%).
- (C) Install according to manufacturer's directions.

26:08. Opaque Glass:

- (A) Opaque glass shall be Spandrelite #EG 6401 to match the Solargray plate heat absorbing glass specified in 26:07. Approved manufacturers of a similar glass matching their own heat absorbing glass is Libbey-Owens-Ford and American Saint Gobain.
- (B) Install glass with opaque covering to the interior and according to manufacturer's directions.

26:09. Mirrors:

- (A) Mirrors where called for or indicated on the drawings shall be as manufactured by Architectural Metal Craft Industries.
- (B) Face frame shall be constructed of 6063-T6 aluminum anodized and polished to a code designation of 214-13-C1.
- (C) Where a shelf is called for, it shall be constructed of the same material and finished as the face frame forming an integral part of the mirror frame assembly.
- (D) Glass shall be 1/4" #1 quality polished plate glass with back silvered hermetically sealed with a uniform coating of electrolytic copper plating and the copper plating protected by a coat of oil base paint.
- (E) Size shall be as indicated on the drawings.
- (F) Manufacturers of a similar type mirror may submit literature of a comparative nature when requesting approval to bid their product.

26:10. Broken Glass:

- (A) Glass cracked or broken during setting or after setting due to quality of glass or imperfect setting to be replaced by this Contractor.

26:11. Glazing:

- (A) All glass well bedded with plastic glazing compound set with aluminum snap-in beads.
- (B) Glass in wood doors to be set with wood beads.
- (C) All compound streaks and spots to be thoroughly cleaned from all sash.
- (D) Compound manufacturers to be H. B. Fred Kuhls Company, Brooklyn, N. Y., Pecora Paint Company, Hertzog Roofing Products Company, or approved equal.

26:12. Aluminum Entrance Doors and Frames:

- (A) Aluminum entrance frames and door Model "J" with modifications where shown shall be extruded aluminum sections as detailed and manufactured by Amarlite. Approved manufacturers of similar type entrance is Pittsburgh Plate Glass Company and Kawneer, or approved equal.
- (B) Units shall be completely factory assembled, including doors and hardware, except lock cylinders and heavy duty closer which shall be furnish by the finish hardware supplier.
- (C) All exterior aluminum doors shall have panic devices operable by means of a cross-bar with centerline of bracket 38-15/64" above the floor, 4" aluminum threshold 10041 with 10038 panic step, and bottom rail weatherstrip 25047.
- (D) All doors to have "2 point" offset pivots.
- (E) Hardware for doors marked (4/L) shall have items in (C) above plus pull 25138, centerline 38-3/8" above bottom of door.
- (F) Hardware for doors marked (5/L) shall be as listed in (C) above.
- (G) Hardware for doors marked (6/L) and (7/L) shall be pull 25138 and push 26264, centerline 38-3/8" above bottom of door. These doors shall not be punched for lock cylinders nor frames punched to receive dead bolts.
- (H) Doors marked (4/L) and (5/L) shall be prepared to receive lock cylinders mounted 40-5/32" to centerline, which shall be furnished by the finish hardware supplier.
- (I) Door and frame shall be finished in accordance with AIAA Specification 204 A-1. Doors and frames shall be to the design on the drawings. 1/8" plate at 4/L entrance shall be finished as above.
- (J) Entrance units shall be installed in prepared openings and set plumb, square, level, at their proper elevation and in their proper plane and alignment with all work. They shall be securely anchored and ready for operation in every respect.
- (K) Entrance units shall be adequately protected from damage during construction work. The General Contractor shall be responsible for this protection.
- (L) Glazing shall be by the Glazing Contractor. See door schedule for type of glass to be used.
- (M) Shop drawings required.



## DIVISION NO. 27

Acoustical Tile Ceilings27:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

27:02. Scope of Work:

- (A) This work includes the furnishing and installations of all acoustical ceilings and wall mouldings throughout the building.

27:03. Installation:

- (A) It shall be the responsibility of the Acoustical Contractor to inform the Architect and the General Contractor of any conditions, including moisture content, which will affect the proper installation of their work. Installation shall be in strict accordance with manufacturer's instructions.

27:04. Acoustical Materials:

- (A) Acoustical tile or board shall be mineral fiber of the figured pattern as manufactured by Simpson. Approved manufacturers of a similar type is figured Minaboard by Armstrong, natural figured by Celotex, and figured solidite by Gold Bond. Manufacturers of a similar type material may submit literature of a comparative nature when requesting approval to bid their product for this project.
- (B) Size shall be as noted on the reflected ceiling plan.
- (C) Material shall be rated as Class "A" (incombustible) under the flame resistance section of Federal Specification 53-A-1183.
- (D) The Acoustical Contractor shall, upon completion of his work, furnish the Owner, via the General Contractor, one typewritten carton of each type, size, and/or style of acoustical material used on the project.
- (E) Provide four (4) hold-down clips per ceiling board.

27:05. Suspension System: (Type "A")

- (A) Suspension system shall be exposed tee grid as manufactured by Donn Products, Inc. Manufacturers of a similar type suspension system is Eastern Products, Chicago Metal Sash Company, or approved equal. NOTE: All manufacturers listed above shall verify the loads superimposed on this suspension system by items of the mechanical and electrical contractors to make certain their members will support the weight involved.
- (B) Main beams shall be double web bulb steel section  $1\frac{1}{2}$ " high and bottom flange faced with a continuous 1" roll formed cap.
- (C) Cross tees shall be double web bulb steel section  $1\frac{1}{2}$ " high and bottom flange shall be faced with a continuous 1" roll formed cap. Tees shall automatically engage, level and lock to main beams.
- (D) Provide necessary wall angle or channel moulding where acoustical material comes in contact with walls or any vertical surface.
- (E) Ends of tees shall be cut flush with exposed edge using a cut-off die and interlocking with wall moulding.

- (F) Attach main beams suspended and level at 48" on center, utilizing No. 12 gauge galvanized wire spaced 24" on centers. Main beams shall also be used on all four sides of a 48" x 48" lighting fixture and shall parallel both sides of the long dimension on lighting fixtures less than 48" in width. The suspension system for lighting fixtures will be furnished and installed by the electrical contractor.
- (G) Finish on all exposed members shall be satin white factory applied.

27:06. Suspension System: (Type "B")

- (A) Suspension system shall be by means of adhesive application for the acoustical material noted on the reflected ceiling plan.
- (B) Apply four (4) spots of adhesive to the back of each 12" x 12" tile so that the adhesive shall be not less than 2" in diameter after tile has been pressed in place.
- (C) This Acoustical Contractor shall make certain the material on which the tile is applied is sufficiently dry and is not in need of sizing prior to installing the tile.
- (D) Provide miter angle where acoustical material abuts a vertical surface. Finish shall be Flat white baked enamel.

27:07. Cleaning:

- (A) All acoustical ceiling tile, upon completion of erection, shall be cleaned of soil marks in a manner and with materials prescribed by the tile manufacturer. Damaged, soiled, and/or misaligned tile shall be replaced by this Sub-Contractor.

27:08. Guarantee:

- (A) All parts of acoustical tile and suspension system shall be fully guaranteed for a period of one year from date of acceptance of this building.

27:09. Acoustical Units:

- (A) Acoustical units where indicated on the drawings shall be Tectum acoustical ceiling panels to size and design indicated on the drawings.
- (B) Installation shall be by means of adhesive applied in accordance with manufacturer's directions. Material applied to external walls shall use an adhesive that is waterproof.
- (C) Finish shall be off white including edges on sides and ends.
- (D) Manufacturer shall be National Gypsum Company. Manufacturers of a similar product may submit literature of a comparative nature to the same specification should they desire to bid their product.
- (E) Finish color shall be off white.



## 28 - FINISH HARDWARE

28:01. Scope of Work:

- (A) The contractor shall receive, check, pay for, and apply all finish hardware selected by the Architect for the entire building in strict accordance with the specifications and drawings, and subject to the terms and conditions of the contract.

28:02. Hardware Allowance:

- (A) The contractor shall include the sum of \$10,000 in the contract for finish hardware to be selected by the Architect. Should the hardware cost more than the above sum, the difference will be paid by the Owner, and should it cost less than this sum, the difference must be credited by the contractor to the Owner, the credit to be deducted from the amount of the contract.

28:03. Application of Hardware:

- (A) The contractor shall receive, store, and be responsible for all finished hardware. Properly tag, index, and file all keys in key cabinet or as directed. Apply hardware in accordance with manufacturer's instructions, fit accurately, apply securely and adjust carefully. Use care not to injure work while applying hardware. When necessary, remove and replace doors so that they may have bottom painted, and remove and replace hardware as required for painting of doors.
- (B) Center door knobs 38" above floor and center door pulls and arm hooks 45" above floor. Cover knobs and pulls with heavy cloth until painting is completed. Prior to completion of building, examine all doors, sash and other movable parts, adjust as required and leave hardware in good working order, free from defects.

## DIVISION NO. 29

Painting and Decorating29:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

29:02. Scope of Work:

- (A) Furnish all labor, materials, equipment and appliances and perform all operations in connection with the provisions of painting and decorating complete in strict accordance with the specifications and drawings.

29:03. General:

- (A) The Contractor shall examine the specifications for the various other trades, and shall thoroughly familiarize himself with all other provisions regarding the painting, and he shall understand that all materials installed throughout the work which necessitates painting which are left unfinished by the requirements of other specifications shall be painted or decorated to completion under this contract.
- (B) Field painting will not be required on items specified to be completely finished at the factory or on aluminum, copper, brass, bronze, or other nonferrous metals unless specifically designated. Do not paint glazing compound on aluminum windows. Do not paint acoustical plaster, arisox or acoustical tile except when otherwise specified.

29:04. Paint Materials:

- (A) Paints, varnishes, and stains shall be of type and brand hereinafter specified. Painting materials such as linseed oil, shellack, turpentine, etc., shall be of highest quality, and have identifying labels on containers.
- (B) All paint shall be delivered to site in manufacturer's sealed containers. Each container shall be labeled by the manufacturer. Labels shall give manufacturer's name, type of paint, color of paint and instructions for reducing. Thinning shall be done only in accordance with the directions of manufacturer. Job mixing or job tinting may be done when approved by the Architect.
- (C) All materials for this work shall be of best quality as manufactured by Pratt and Lambert, DeVoe, Dutch Boy, Sherwin-Williams, Cook, DuPont, Pittsburgh, O'Brien or other approved equal. The painting contractor shall notify the State Architect 60 days in advance of the paint manufacturer's name to be used on the project.



- (D) Minimum thickness of paint for three coat work shall be 4.0 mils for gloss, semi-gloss, etc., and 4.5 mils for flat.

29:05. Preparation of Surfaces:

- (A) Sandpaper wood to smooth and even surface and dust off. After priming or stain coat has been applied, thoroughly fill nail and other holes and cracks with plastic wood or putty. For natural finish work, putty shall be colored to match the wood.
- (B) Remove grease, rust scale and dust from steel and iron, and touch up any chipped or abraded places on items that have been shop coated. Where steel and iron have a heavy coating of scale, it shall be removed by wire brushing or sand blasting as necessary to produce a satisfactory surface for painting.
- (C) All galvanized metal surfaces shall be chemically treated with a compound designed for this purpose (Lithoform, Syblox, Solfo metallic coating, etc.) in accordance with manufacturer's directions for use before applying the first coat of paint.
- (D) Fill all holes and cracks in plaster surfaces. Do not use sandpaper on plaster surfaces to be painted. Before painting any plaster, surfaces shall first be tested with a moisture testing device especially designed for this purpose. No paint or sealer shall be applied on plaster when the moisture content exceeds 8% as determined by the testing device. Test sufficient areas in each space, and as often as necessary to determine the proper moisture content for painting.
- (E) Before painting, remove hardware, accessories, plates, light fixtures, and similar items or provide ample protection of such items. Upon completion of each space, replace the above items. When necessary, disconnect radiators to permit painting of walls behind them. Replace and reconnect radiators upon completion. Remove doors, if necessary, to paint bottom edge. Use only skilled mechanics for removing and connecting above items.

29:06. Protection of Work:

- (A) The painter shall be given the use of one room in a convenient location in the building where he shall keep his materials, and do all mixing, etc. This work shall not be carried on in any other part of the building. The floor of paint room and every other place where painting is to be done shall be protected by drop clothes or suitable materials.
- (B) Oily rags and waste shall be removed from the building at the close of every day, and under no circumstances shall they be allowed to accumulate.
- (C) The painter shall be responsible for any damage done to the work of other Contractors, and shall repair same to the satisfaction of the Architect. Where any work has been damaged to such an extent that it cannot be restored to the original condition, it shall be replaced.

- (D) At the completion of the work, the painter shall clean off all paint spots, oil and stain from all surfaces, and leave the entire building in perfect condition as far as his work is concerned. All containers and debris resulting from this work shall be removed from the premises.

29:07. Exterior Metal Work:

- (A) Exterior metal work not receiving a shop priming coat shall be given a coat of red lead primer.
- (B) In addition to this priming coat, all exterior iron and steel work, unless otherwise specified, shall be painted two coats of first quality ready-mixed paint. Colors to be as selected by the Architect in this division.
- (C) All metal that has been galvanized and is to receive a painted finish shall have the galvanized cut, then primed, as called for in Paragraph (A) above before applying the final coats of paint.

29:08. Painting of Pipes, Pipe Covering, Mechanical Equipment, Etc.:

- (A) All exposed unfinished pipe, pipe covering and mechanical equipment requiring painting shall be painted by the General Contractor after all tests have been made and approved.
- (B) All pipes without pipe covering shall be given one coat of iron primer equal to Sherwin-Williams "Ken-Kromik". All pipe covering shall be primed with a heavy glue size having a fungicidal agent by Mechanical Contractor.
- (C) In addition to the prime coat, all items mentioned in (A) above shall be given two coats of first quality ready-mixed paint matching the color and type of wall paint in the various rooms.
- (D) See Division No. 40 and Division No. 50 regarding the above mentioned painting.

29:09. Interior Wood Finish (Natural):

- (A) All hardwood and standing wood trim scheduled for natural finish shall be finished as follows:
  - I. Walnut: 1 coat white shellack, sanded; 1 coat "30" pale trim varnish gloss, sanded; 1 coat "30" pale trim varnish, dull.
- (B) Fill nail holes and sponge all hardwood surfaces with cold water and when dry, sand perfectly smooth.
- (C) All hardwood cabinet work and trim shall be finished natural.
- (D) All interior of hardwood enclosed cabinets shall receive natural finish.
- (E) Interior of all drawers to receive one coat clear varnish or shellack.
- (F) Use paste filler on open grain wood.
- (G) Prior to finishing any hardwood, the painting contractor shall check with the owner regarding natural finish on equipment to be installed, in order that the natural finish he will apply will match.



29:10. Interior Wall and Ceiling Finishes:

- (A) For purposes of bidding, the following painting shall be used: All wall and ceiling areas are to receive a flat finish, except wall and/or ceiling areas in the following rooms: toilets, mechanical room, storage room, stairwell, corridor, and locker room, where the following finish shall be used,

Lightweight Masonry Block:

1. 1 coat Primafl (untinted).
2. 1 coat Lyt-All double duty primer (tinted).
3. 1 coat Vitralite enamel eggshell.

Plaster:

1. 1 coat Vapex wall primer (untinted).
2. 1 coat Lyt-All double duty primer (tinted).
3. 1 coat Vitralite enamel eggshell.

- (B) Painter shall apply one gallon of block filler to 70 square feet of lightweight concrete block wall, in the presence of the Architect or his representative, as a sample coverage to be furnished on this job. No other block work shall be done until written approval has been received from the Architect or his representative. Should the Painting Contractor proceed without the written approval, such work shall be considered as rejected where applied.
- (C) Colors as selected by the Architect.

29:11. Application:

- (A) Do not apply exterior paint in damp, rainy weather or until the surface has thoroughly dried from the effects of such weather. Do not apply varnish or paint when temperature is below 50 F.
- (B) Surface to stain or paint shall be clean, dry, smooth, and adequately protected from dampness. Each coat of paint shall be sprayed or brushed on, worked out evenly and allowed to dry at least 48 hours before subsequent coats are applied.
- (C) Finished work shall be uniform of approved colors, smooth and free from runs, sags, defective brushings, clogging or excessive flooding. Make edges of paint adjoining other materials or colors sharp and clean without overlapping.
- (D) At completion, touch up and restore finish where damaged and leave in good condition. After fitting, give priming and body coats to all edges of wood scribe moulds. Varnish tops and bottoms of wood doors one coat after fitting.

29:12. Grilles:

- (A) In addition to prime coat, air grilles shall be given two coats of first quality ready-mixed paint which shall match the color and type of wall paint in the various rooms. These grilles shall be removed, spray painted, and replaced and final coat applied on wall.

- (B) Inside of duct directly behind air grilles shall be given one coat of flat black paint.
- (C) Aluminum grilles and registers do not receive paint.

29:13. Exterior Concrete Finish and Cement Plastered Soffit:

- (A) All exposed exterior concrete shall receive acrylic resin emulsion coatings with 100% acrylic binder where indicated in color schedule.
- (B) Two coats Thane-cryl by Thane Company, Inc. Apply by brush or external mix spray gun covering three hundred square feet per gallon per coat.
- (C) Cement plastered soffit finish color shall match the white portland cement.

29:14. Interior Wood Finish: (Paint):

- (A) All interior wood doors, trim, shelving, cabinets, etc., listed for painting shall be given one coat interior trim primer tinted to finish color and two coats enamel. Cases shall be painted inside and out including all sides and edges of shelves.
- (B) All interior wood trim shall be back primed.

29:15. Guarantee:

- (A) Guarantee all paint, varnish, enamel, and wall coverings to stay on and not blister, peel or crack under ordinary usage. This guarantee shall hold good for one year after completion and acceptance of the building. All defective work shall be replaced at the expense of the Contractor.

29:16. Acoustical Units:

- (A) Finish color shall be as called for in Division No. 27.



## DIVISION NO. 30

Miscellaneous Equipment30:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification, and shall be consulted as to detail.

30:02. Scope of Work:

- (A) This Contractor is to furnish and install all articles, materials, operations, or methods of quality or according to qualifications noted, prescribed, and to provide, therefore, all necessary labor, materials, equipment, and incidentals.

30:03. Hat and Coat Rack:

- (A) Provide and install an aluminum shelf consisting of four round anodized aluminum test tubes closed and protected at ends with caps, in Model AA-200E as manufactured by Vogel-Peterson Company. Approved manufacturer is A. R. Nelson Style B2. Other manufacturers desiring approval of their product may submit literature of a comparative nature to that specified to the State Architect's office.
- (B) Brackets shall be held at the wall on anodized aluminum extrusion mountings providing vertical adjustment of one full shelf.
- (C) Finish shall be anodized meeting Alcoa Specification 204 A1.

30:04. Fire Extinguishers and Cabinets:

- (A) Fire extinguishers, cabinets, and hangers located as indicated on the drawings and as detailed shall be as manufactured by J. L. Industries, Elkhart Brass Manufacturing Company, Inc., AAA Fire Extinguisher Company, General Fire Extinguisher Corporation, or approved equal.
- (B) Extinguishers shall be 2½ gallon air pressurized water, 500 pound tested stainless steel underwriters' approved. Where extinguisher is located in an exterior wall water shall have anti-freeze.
- (C) Cabinet for pressurized water extinguishers shall be Duo-Panel and installed according to manufacturer's directions.
- (D) CO<sub>2</sub> extinguishers shall be five pounds capacity as manufactured by J. L. Industries, Seco Engineering and Manufacturing, Inc., or approved equal. Extinguishers shall be complete with mounting brackets.
- (E) Extinguishers shall be loaded and ready for use prior to final inspection and acceptance of the building.
- (F) See Drawings for recessed and surface mounted cabinet use.

30:05. Turnstiles:

- (A) Turnstiles shall be foot control Model "TC" Super Kompak Passimeter for counter installation for exit use and Model "LB" Super Kompak traffic controller for entrance use as manufactured by Perey Manufacturing Company, Inc., 101 Park Avenue, New York 17, New York. Other suppliers wishing to have their product approved may submit comparative literature to that specified to the State Architect for approval.
- (B) Each turnstile shall be equipped with special silencing mechanism to provide extra quiet operation.
- (C) Finish shall be chrome plating.
- (D) See plan to determine direction of rotation required.
- (E) Installation shall be complete in every respect with all necessary accessories for operation.

30:06. Book Depository:

- (A) Depository equipment shall be Model 1112SD as manufactured by the Mosler "Depository" Corporation, Grandview, Missouri. Other suppliers wishing to have their product approved may submit comparative literature to that specified to the State Architect for approval.
- (B) Front facing frame and door and all exposed component parts thereof shall be satin finished anodized aluminum with standard face wording "Book Depository" engraved in front frame and black filled.
- (C) Housing shall be heavy gauge paint grip steel electric arc welded at the seams and ground smooth, thoroughly cleaned and painted a base coat of shop primer.
- (D) This item must be laid up with the wall and not installed at a later date.
- (E) Shop drawings required.

30:07. Metal Lockers:

- (A) Locker body parts to be made from mild cold rolled sheet steel free from surface imperfections and capable of taking a high-grade enamel finish.
- (B) Frame and doors shall be 16 gauge and continuous sloping stops with end caps, and exposed sides shall be 20 gauge.
- (C) Doors to have louvers at top and bottom and locker to size as indicated in details.
- (D) Handle to be lift type with polished, plated finish and shall have padlock eye and padlock strike which is an integral part of the handle.
- (E) Each locker shall be equipped with a built-in combination lock with push-button combination changer as manufactured by Master Lock Company and furnished with number plates. Number plates shall run consecutively from 101 in Room 126, from 1 in Room 128, and from 1 in Room 129.



- (F) One shelf shall be installed with a rolled front edge in all lockers.
- (G) Each locker shall have three wall hooks and one ceiling hook mounted beneath the shelf.
- (H) Finish shall be bonderized and final finish selected by the Architect in color schedule.
- (I) Manufacturers shall be Lyon Metal Products, Inc., the Interior Steel Equipment Company, Pence Products, Inc., DeBourgh Manufacturing Company, and Medart Products, Inc. Other manufacturers may submit literature of a comparative nature to that specified to the State Architect.
- (J) Locker manufacturer shall supply filler strips as detailed in matching color.

30:08. Toilet Room Accessories:

- (A) Towel cabinets and waste receptacles shall be No. B-360 as manufactured by Sobrick. Approved manufacturers of similar type equipment is Brown Company, Crown Zellerbach, and Scott Paper Company.

30:09. Metal Toilet Partitions:

- (A) Furnish and install toilet partitions of academy flush type as manufactured by Sanyometal. Approved manufacturers of a similar partition are Weis, Knickerbocker, Mills, Fiat, Robert Partition Company, Global Steel Products Corporation, or Accurate Partition, Inc.
- (B) Dividing panels shall be constructed of two sheets of 20 gauge galvanized-bonderized steel .000150" in thickness with flanged edges welded to a rigid frame. Panel sheets insulation with rigid core material bonded to panel plate.
- (C) Door shall be constructed of 22 gauge galvanized-bonderized steel with formed edges sealed with continuous locking strip, mitered and welded and finished at corners. Doors shall be electrically welded at approximately 18" intervals.
- (D) Pilasters shall be 1 1/2" thick and constructed of two sheets of 20 gauge galvanized-bonderized steel with formed edges welded together with welds spaced not more than 18" intervals. Pilasters next to walls shall also run from floor to overhead brace above.
- (E) Bottom of pilaster shall have a jack-leveling screw to carry the weight of compartment and to provide a secure mechanical anchorage to floor with adjustable floor fittings.
- (F) Top of pilaster shall be securely braced with a continuous 1" x 1 1/2" lock steel tubular steel overhead bracing attached through the top of the pilasters. Head rail shall be held in place inside the top of the pilaster with #14 x 1/2" metal screws applied through the pilaster into the headrail on the inside of the stall. Headrail shall extend full length of compartments and fasten into wall brackets.
- (G) Doors shall be equipped with concealed, controlled, gravity type hinge and mounted on upper and lower hinge bracket of high tensile alloy, factory mounted on the pilasters in position and designed

so that no bolts are externally visible and no portion of the bracket overlaps the front or back external surface of the pilaster beyond the locking strip and shall be finished to match the pilaster. Top hinge pivot door bracket shall be recessed and inset into edge of door approximately 2" below the top.

- (H) Operation of the door shall be controlled by opposing cams under spring tension, mounted on the fixed vertical pintle. Hinge to be adjustable.
- (I) All moving parts to be self-lubricating and to be completely concealed within the 1" thickness of the door. Top and bottom door hinge casting shall be heavy one-piece cast non-ferrous alloy and top and bottom hinge corner or door sheets.
- (J) Each door shall be equipped with a cast alloy chrome-plated cast hook bumper applied with one-way head screw. Concealed latch with face mortised flush with edge locking strip and all working parts completely concealed within the thickness of the door. Latch bolts shall be stainless steel and exposed escutcheon plate and handle polished chrome-plated cast alloy non-ferrous metal. Provide one-piece heavy cast non-ferrous alloy stop and keeper, polished chrome-plated finish with 3/4" diameter rubber bumper locked in place and made theftproof. Stop and keeper shall be thru-bolted with one-way head shoulder screw and six nuts to pilaster, and one roll tissue holder chrome-plated shall be provided with each toilet partition for each water closet served.
- (K) Finish shall consist of a prime coat and a finish color coat of thermosetting acrylic enamel applied electrostatically and baked on.
- (L) Color shall be as indicated in the color schedule.

#### 30x10. Hop Strips

- (A) Hop strip shall be #231 as manufactured by Architectural Metal Craft Industries, Inc. Manufacturers of similar item approved is #796 by Accessory Specialties, Inc., or approved equal.
- (B) Hop strip shall be 36" long and have a minimum of three (3) holders.
- (C) Material shall be aluminum or stainless steel polished.
- (D) Anchor to wall according the manufacturer's instructions.



## DIVISION NO. 31

Elevator31:01. General Conditions:

- (A) The General Conditions, Special Conditions, and Information to Bidders shall form a part of this specification and shall be consulted as to detail.

31:02. Scope of Work:

- (A) These specifications are intended to cover the complete installation of the elevator plant in a first-class workmanlike manner, and to include all work and materials in accordance with the drawings and as specified. This work shall be done in accordance with the requirements of the latest National Electrical Code, American Standard Safety Code for Elevators, and any local codes which may govern the requirements of the installation.

31:03. Drawings:

- (A) Before beginning work, the Elevator Contractor shall prepare all drawings necessary to show the general arrangement of the elevator equipment. These drawings must be properly approved before the installation of the elevators.

31:04. Painting:

- (A) All exposed metal work furnished in these specifications, except as otherwise specified, shall be properly painted after installation by the Elevator Contractor.

31:05. Permits and Inspection:

- (A) The Elevator Contractor shall obtain and pay for necessary municipal and state elevator permits and inspection as required by authorities having jurisdiction, and also make such tests as called for by the regulations of such authorities. These tests shall be made in the presence of the authorized representatives of such authorities. Others are to secure and pay for such building permits, electrical permits, and inspection fees as may be required.

31:06. Work Not Included:

- (A) The following work shall be performed under another contract:
1. Complete and legal hoistway, pit, and machine room of dimensions and specifications required. On freight elevators, door frames and sills are required when bi-parting doors or hoistway gates are specified.

2. An Underwriters approved light outlet in the center of the side of the hoistway as shown on elevator drawings; also, a light and convenience outlet in the pit and at machine location.
3. Extend the electrical service from the power main through a fused safety switch of ample capacity to the terminals of power unit controller.
4. Any cutting, patching or painting of walls and grouting under thresholds.
5. Adequate supports for guide rail brackets.
6. Ladder to pit floor from lower landing, if required.
7. Electric current during erection and testing of equipment.
8. Necessary recesses to accommodate doors, sills and signal equipment such as indicators, push buttons, hall lanterns, etc.

31:07. Travel:

- (A) Travel of the car shall be from basement floor to second floor, stopping at three landings and serving three openings, a total of 24'-0".

31:08. Capacity and Speed:

- (A) The elevator shall have a net lifting capacity of 3,000 pounds in addition to the weight of the car and appurtenances specified herein. The elevator car shall travel at a minimum UP speed of 100 feet per minute under full contract load.

31:09. Power Supply:

- (A) The power supply for the elevator apparatus will be 480 V. - 3 phase - 60 cycles, alternating current. The lighting supply will be 110 V., 60 cycles, alternating current.

31:10. Car Platform and Sling:

- (A) The outside dimension of the car platform shall be 5'-6" wide by 7'-0" front to back.
- (B) The platform shall have a fabricated frame of formed and structural steel shapes, gusseted and rigidly welded. Flooring shall be wood top floor laid over wood subfloor. Rubber tile of color and design as selected by the Architect shall be installed on top of car floor. The under side of the platform shall be protected with a metal fire shield of not less than 26 gauge.
- (C) The sling shall consist of heavy steel channel stiles properly affixed to a steel crosshead and bolster, with adequate bracing members, to remove all strain from the car enclosure.

31:11. Car Guides and Guide Shoes:

- (A) Guides for the elevator car shall be planed steel elevator guide rails, properly fastened to the building structure with steel brackets. The car stile shall be fitted at top and bottom with



guide shoes of the self-aligning, swivel type, with metal body and removable non-metallic liners to insure smooth and quiet operation of the elevator car.

31:12. Car Enclosure:

- (A) An elevator cab of ornamental design, with appurtenances and appointments as selected and approved shall be furnished and installed. All allowance of \$1400.00 net for the cab complete with car door, light fixture and accessories, but not including the car operating device, signal fixtures, floor covering, or the erection of the cab in the field shall be included.

31:13. Car Door:

- (A) A horizontal sliding door of the two speed type shall be furnished and installed on one entrance of the elevator cab and equipped with an electric contact to prevent operation of the elevator unless the door is closed.
- (B) The door shall be of design and finish as selected and approved and shall be provided with heavy-duty quiet operating hangers and necessary hardware.

31:14. Hoistway Entrances - (Doors):

- (A) Hoistway entrances of the hollow metal, horizontal sliding two-speed type shall be furnished and installed complete at each of the three hoistway openings, to provide clear door opening of 3'-6" wide by 7'-0" high.
- (B) Entrances shall consist of doors, frames, sills, hangers, hanger supports, and hanger covers, fascia plates, struts, and all necessary hardware. Finish to be of solid color enamel as selected by the Architect.
- (C) The entire front wall of the hoistway is to be left open until entrances are installed. After elevator guide rails are set and lined, the entrance frames shall be installed in perfect alignment with the guide rails. Finished walls will then be completed.

31:15. Door Operation:

- (A) The hoistway doors shall be power operated by a direct current motor driven device mounted on the car. Door movements shall be electrically cushioned or checked at both limits of travel. The door operating mechanism shall be arranged for manual operation in event of power failure. The electric operator shall be of the highest quality, quiet and smooth in operation with all parts designed and constructed to meet the severe requirements of elevator service. The car and hatch door opening speed shall not be less than two feet per second and the closing speed shall not be less than one foot per second. The leading edge of the car door shall be provided











- (H) Self-cleaning strainers shall be provided to prevent foreign materials from lodging in control system.
- (O) Electric controller shall be of the full magnetic type, with silver to silver contacts on all relays and contactors. Thermal overload relays shall be provided to protect the motor against overloading. All components required for proper performance of the elevator as specified under "Operation" section herein, shall be neatly mounted and wired and completely enclosed in a cabinet with a mechanically latched door. Control cabinet shall be designed for mounting on power unit on wall or floor stand. The electric control apparatus shall be completely isolated from the oil reservoir.

#### 31:24. Sound Reduction:

- (A) Sound insulating panels manufactured of reinforced 16 gauge steel panels with a 1" thick  $1\frac{1}{2}$ " core of fiberglass affixed to interior shall be mounted on all four open sides of the power unit frame to isolate air borne noise from motor-pump assembly.
- (B) Sound isolating couplings, a minimum of two, shall be installed in the oil line in the machine room between pump and jack. Each coupling shall consist of two (2) machined flanges separated by a neoprene seal to absorb vibration and to positively prevent metal contact in the oil line. Coupling shall be designed and manufactured in such manner that they will be absolutely blowout proof.
- (C) Oil-hydraulic silencer (muffler device) shall be installed in oil line near power unit. It shall contain vibration absorbing material inserted in a blow-out proof housing arranged for inspecting interior parts without removing unit from oil line. Rubber hose without blow-out proof features will not be acceptable.
- (D) Vibration pads shall be mounted under the power unit assembly to isolate the unit from the building structure.
- (E) Low oil control: A feature shall be incorporated in the electrical control circuit which shall automatically cause the elevator car to descend to the lowest terminal landing, should the system run low of oil during ascending of car. If power operated doors are used, the car and hoistway doors will automatically open when car reaches landing to allow passengers to alight. Doors will then automatically close and all control buttons, except door open button in car station, shall be made inoperative. Oil reservoir should then be refilled and elevator placed back in service thru the main line disconnect switch.

#### 31:25. Buffers:

- (A) Suitable buffers shall be provided and installed in the elevator hoistway.

31:26. Wiring, Piping, and Oil:

- (A) All necessary wiring shall be furnished and installed in the hoistway in accordance with the National Electrical Code, to connect the operating buttons and switches to the control board in the power unit. All wiring shall be done in rigid conduit or electrical metallic tubing except to moving apparatus which shall be connected by short lengths of flexible conduit. All necessary pipe and fittings to connect the power unit to the jack unit, and oil of the proper grade shall be furnished. All underground conduit and piping shall be adequately protected against corrosion.

31:27. Main Line Strainer:

- (A) A main line strainer and shut-off cock assembly of the self-cleaning type, equipped with a 40 mesh element, and a magnetic drain plug, shall be furnished and installed in the oil line. The unit shall be designed for 300 psi. working pressure, shall be compact in design with easy access for cleaning.

31:28. Automatic Guide Lubricators:

- (A) Lubricators shall be provided and mounted on top of upper guide shoes. Wool felt wiper shall apply an even, uniform flow of oil which shall thoroughly lubricate faces of guide rail from a leak-proof oil reservoir.

31:29. Permits and Sales Taxes:

- (A) All permits, inspection fees, licenses, and sales tax necessary for the execution of the work shall be secured and paid for by the Elevator Contractor.

31:30. Painting:

- (A) All exposed metal work furnished under these specifications, except otherwise specified, shall be painted properly after installation, by the Elevator Contractor.

31:31. Warranty:

- (A) The Elevator Contractor shall guarantee that the materials and workmanship of the apparatus installed by him, under these specifications, shall be first class in every respect; and that he will make good any defects, not due to ordinary wear and tear or improper use, which may develop within one year from the date of completion of the installation.
- (B) In addition to the other requirements, inspections, tests, and remedies herein provided, upon completion of the elevator installation and before final approval and final payment, the Elevator Contractor shall make, in the presence of the architect or his



designated representative, a running speed test with full maximum load on the elevator car to determine whether the elevator equipment, as installed, meets the speed, capacity, and all other requirements of the specifications.

- (C) In the event the equipment does not meet all requirements of the specifications, the Elevator Contractor shall promptly remove from the premises all work condemned by the architect as failing to conform to the contract, and shall promptly replace and re-execute his own work in accordance with the contract, without expense to the owner, and shall bear all expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.
- (D) If the Elevator Contractor does not remedy such condemned work within a reasonable time, fixed by written notice from the Architect, the Owner may correct such condemned work at the expense of the Elevator Contractor and withhold such cost from final payment under the contract price. In the event the remainder due under the contract price is insufficient to cover such cost, the Elevator Contractor shall, immediately upon request, shall reimburse the Owner in full.

31:32. Maintenance:

- (A) The Elevator Contractor shall furnish maintenance and call-back service of the equipment provided by him for a period of three months after completion of his work at no expense to the Owner. This service shall include regular examinations of the installation by competent and trained employees of this Contractor; and shall include all necessary adjustments, greasing, oiling, cleaning, supplies, and parts to keep the equipment in good operation; except such parts made necessary by misuse, accidents or negligence not caused by this Contractor.

## DIVISION NO. 40

Electrical40:01. General and Special Conditions:

- (A) The preceding General Conditions (Division No. 1) and Special Conditions (Division No. 2) are a part of this specification, and this Contractor shall consult them in detail for instructions pertaining to his work.

40:02. Extent of Work:

- (A) The work required under this division includes all material, labor, equipment, and services necessary to the proper completion of all electrical work as shown on the plans and specifications and hereinafter specified.
- (B) The installation shall be complete including all services, conduit, wires, switch boxes, panelboards, fuses, pull and outlet boxes, covers, switches, receptacles, plugs, telephone conduit, grounding, special wiring, lighting fixtures, lamps, power center, inter-communications system, fire alarm system, emergency lighting and all other necessary items to give a complete electrical system; connected, adjusted, and ready for operation.

40:03. Warranty:

- (A) This Contractor, by the acceptance of this specification and the signing of the contract, acknowledges his acquaintance with the requirements and guarantees that every part going to make up the system as herein described will be of the best of its respective kind that can be obtained and will be erected in a most thorough and substantial manner by none but experienced labor.
- (B) When all the apparatus herein specified, shown on drawings, or required for a complete system is furnished and installed, the Contractor shall guarantee the installation to operate properly at all times, and to be free from defects for a period of one year. Such defects shall apply to faulty materials, design, or workmanship. In the event of the development of said defects, the Contractor shall remedy the failure at his own expense within a reasonable period of time after notice by the State Architect.

40:04. Standard Products:

- (A) All major items of electrical equipment shall be of the best quality used normally for the purpose in good commercial practice and shall be the products of reputable manufacturers. Each major component of equipment shall have the manufacturer's name, address and catalog number on a name plate securely affixed in a conspicuous place. The name plate of a distributing agent only will not be acceptable.



- (B) All material and equipment shall be new, of best quality and design, and free from defects. All material and equipment to be furnished under this specification shall be essentially the standard products of manufacturers regularly engaged in the production of such equipment and shall be of the manufacturer's latest standard design. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the equipment need not be products of the same manufacturer.
- (C) The manufacturer and model numbers listed in these specifications establish type and quality.
- (D) Defective equipment, or equipment damaged in the course of installation or test, shall be replaced or repaired in a manner meeting the approval of the State Architect.
- (E) Materials shall be delivered on the job in the original labeled containers.
- (F) As soon as practicable, within 30 days after the date of award of contract, and before any materials or equipment are purchased, the Contractor shall submit a complete list of materials and equipment to be incorporated in the work. The list shall include catalogs, cuts, diagrams, and such other descriptive data as may be required by the State Architect. No consideration will be given to partial lists submitted from time to time. Approval by the State Architect of materials and equipment will be based on manufacturer's published ratings. Any material and equipment which are not in strict accordance with the specification requirements will be rejected.
- (G) If the Contractor fails to submit for approval within the specified time a list of materials and equipment in accordance with the preceding paragraph, the State Architect will select a complete line of materials and equipment. The selection thus made by the State Architect will be final and binding and the items shall be furnished by the Contractor without change in the contract price or the time of completion.

40:05. Underwriters' Requirements:

- (A) All work done and material furnished under these specifications shall be in accordance with the rules, recommendations, and requirements of the National Board of Fire Underwriters for the installation of wiring and apparatus in the latest edition of the National Electric Code and the latest supplements thereto and none of the items or provisions of the specifications shall be construed as waiving or canceling any of these rules, recommendations, and requirements.

40:06. Temporary Water, Electricity and Heat:

- (A) Temporary water: Refer to Special Conditions, Division No. 2, Section 2:10.
- (B) Temporary electric energy: Refer to Special Conditions, Division No. 2, Section 2:11.



40:11. Openings and Chases:

- (A) The General Contractor will leave such openings and chases for switches, outlets, panels, and equipment as may be necessary or as directed by the State Architect to facilitate the work of the Electrical Contractor, and he will finish around such openings and chases; provided, however, that the Electrical Contractor is on the job in due time to advise as to location and size of openings and chases.

40:12. Clean-Up:

- (A) The Contractor shall clear away all dirt and rubbish resulting from his operations. This clean-up shall be done at least weekly and more often if so directed by the State Architect. The Contractor shall cover and protect his work and materials from damage by the elements, or other cause during the progress of the project. He shall clean up all fixtures, outlets, switches, panels, equipment, and material at the completion of the project and deliver the entire system in clean and perfect condition.

40:13. Excavation and Backfill:

- (A) Perform all excavation necessary for work under this contract. Make excavation by open cut and keep the banks of trenches as nearly vertical as possible. Provide all shoring and sheeting necessary to protect the excavation and safeguard the employees and wherever required by the State Architect.
- (B) Backfill with materials approved for backfilling, consisting of earth, loam, sandy clay, sand and gravel, or soft shale, free from large clods of earth or stones. All backfilling inside the building shall be sand or gravel placed in 6" layers and mechanically tamped to 90% standard compaction. Backfill under drives, walks, and parking areas outside the building shall be earth backfill placed in 8" maximum layers and mechanically tamped to 90% standard compaction. Backfill in other than the above locations shall be well settled earth and excess material and materials unsuitable for backfill shall be disposed of as directed by the State Architect. Flooding will not be permitted.
- (C) Protect all existing utilities, drives, streets, etc., during all excavation and backfill operations, and repair such utilities, drives, streets, walks, etc., if damaged. Repair all walks, drives, etc., which are removed in order to complete the necessary work.

40:14. Adjusting and Aligning Equipment:

- (A) The Contractor shall adjust all equipment furnished or installed in the contract.



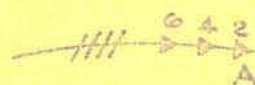





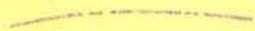

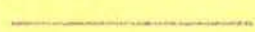

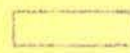







- (B) All detached motors shall be set and properly aligned by the Contractor. Motor bases shall be drilled and doweled permanently in place. All belts, on belt-driven equipment, shall be checked for alignment and tension.
- (C) All switch and control boards shall be adjusted to work as specified, and all wire shall be checked to phase out as intended and shown.
- (D) The Contractor shall furnish sufficient oil to fill all motor bearings and keep them filled for temporary operation and test purposes, until the equipment is accepted.
- (E) The Contractor will be required to provide a first-class volt meter and an ammeter whenever required to take test readings. A voltage and current reading shall be taken for each motor installed on the job and readings shall be recorded in approved form. Where heater coils are found to be overloaded, they shall be changed to proper size by the Contractor.































#### 40:15. Painting:

- (A) All painting of conduits, boxes, panelboards, and other electrical equipment that requires painting shall be done by the General Contractor.
- (B) The Electrical Contractor shall stencil, in one-inch high letters, suitable identification on the cover of all panels and safety switches in the entire project. He shall also identify with stenciled letters all feeder conduits as to the panel or equipment served.

#### 40:16. Drawing Symbols:

- (A) The following are the drawing symbols that were used on the electrical drawings:

	Home Run Indicating Three Circuits (Nos. 2, 4 & 6) With Four Wires to Panel A		Ceiling Mtd. Exit Light
	Conduit Concealed in Clg. or Wall		Wall Mtd. Exit Light
	Conduit Concealed in Floor		120 V. Single Convenience Outlet
	Empty Conduit		120 V. Duplex Convenience Outlet
	Exposed Conduit or Raceway		120 V. Triplex Outlet
	Fluorescent Lighting Fixture		Weatherproof Convenience Outlet
	Incandescent Ceiling Fixture		Range Outlet
	Incandescent Wall Fixture		Polarized Outlet (Size and Type as Noted)
	Square Recessed Incandescent		Floor Outlet

	120/208 V. Combination Receptacle		Disconnect Switch
	Junction Box		Distribution Panel
	Telephone		Recessed Panelboard
	Floor Telephone		Surface Mtd. Panelboard
	Wall Intercomm. Station		Single Pole Switch
	Desk Top Intercomm. Station		Double Pole Switch
	Ceiling Paging Speaker		Three-Way Switch
	Clock		Four-Way Switch
	Bell		Switch with Pilot Light
	Fire Alarm Break Glass Station		Thermal Overload Switch
	Fire Alarm Horn		Weatherproof Switch
	Electric Motor		Push Button
	Magnetic Starter		#12 TW Wire
	Emergency Light		#14 TW Wire
			#16 TW Wire
			Two Shielded Cables in 1/2" Conduit

40:17. Abbreviations:

- (A) The following abbreviation list is a standard list and not all abbreviations shown are necessarily included on the drawings or in the specifications for this project. Refer only to those abbreviations used.

DRAWINGS	SPECS.	DESCRIPTION	DRAWINGS	SPECS.	DESCRIPTION
AC.	a-c	alternating current	C	C	degree Centigrade
ACOUST.	---	acoustical	C.	---	conduit
ALUM.	---	aluminum	CAB.	---	cabinet
A.	A.	amperes	CAP.	---	capacity
AU.	---	air unit	C.C.C.	---	center to center or on centers
AUTO.	---	automatic	CFM	cfm.	cubic feet per minute
BOIL.HP.	boiler h.p.	boiler horsepower	CH	---	hot and chilled water supply
BHP.	bhp.	brake horsepower	CHR	---	hot and chilled water return
BTU.	Btu.	British Thermal Unit	CI.	---	cast iron
BTUH.	Btuh.	British Thermal Unit per hour			



DRAWINGS	SPECS.	DESCRIPTION	DRAWINGS	SPECS.	DESCRIPTION
CIR.		circular	FT. or ' "	ft. or ' "	foot
CL		centerline	GA.	ga.	gauge
CO.		cleanout	GAL.	gal.	gallon
CONN.		connection (or)	GEN.		general
CONTR.		contractor	GPH.	gph.	gallons per hour
C.P.	C.P.	chrome plated	GPM.	gpm.	gallons per minute
CUH.		cabinet unit heater	H.		height
CU.IN.	cu.in.	cubic inch	H-P	h-p	high pressure
CU.FT.	cu.ft.	cubic foot	HP.	hp.	horsepower
CU.YD.	cu.yd.	cubic yard	HR.	hr.	hour
CW		cold water	HTG.		heating
D.		depth	H & V	H & V	heating and ventilating
D.A.		direct acting	HW		hot water
DB.	db.	decibel	HWR		hot water return
D.B.	D.B.	dry bulb	ID	ID	inside diameter
D.C.	d-c	direct current	IN. or " "	in. or " "	inch
DEG or °	°	degree (angle)	IPS.	ips.	iron pipe size
DET.		detail	J.B.		junction box
DF.		drinking fountain	KW	kw.	kilowatt
DIAM.		diameter	KW-HR.	kw-hr.	kilowatt-hour
DIFF.		diffuser	L.		length
DMPR.		dampener	LAV		lavatory
DN		down	LB.	lb. or #	pound
DRWG.		drawing	LBS./HR.	lbs./hr.	pounds per hour
EA.		each	LIN.FT.	lin.ft.	lineal foot
E.D.F.		electric drinking fountain	LOC.		location
EDR.	edr.	equivalent direct radiation	L-P	l-p	low pressure
ELECT.		electrical	MAG.		magnetic
ELEV.		elevation	MAX.	max.	maximum
EMERG.		emergency	MBH.	mbh.	thousand BTU. per hour
EQUIP.		equipment	MECH		mechanical
ER.		exhaust register	MET.		metal
E.W.T.	E.W.T.	entering water temperature	MFGR		manufacturer
EXH.		exhaust	MH.		manhole
EXTR.		extruded	MIN.	min.	minimum
F.	F.	degree Fahrenheit	M-P	m-p	medium pressure
FA.		fresh air	MTO.		mounted
FC.		fan-coil unit	N.C.		normally closed
FD.	FD.	fire department	N.O.		normally open
F.DR.		floor drain	No. or #	no. or #	number
FLEX.		flexible	N-P	n-p	nickel plated
FLR.		floor	OD	OD	outside diameter
FPM.	fpm.	feet per minute	OZ.	oz.	ounce
F & T	f & t	float and thermo-static	PD	PD	pressure drop
			PLMBG.		plumbing
			PRV	prv	pressure reducing valve
			PSI.	psi.	pounds per square inch



DRAWINGS	SPECS.	DESCRIPTION	DRAWINGS	SPECS.	DESCRIPTION
PSIG.	psig.	pounds per square inch - gauge	SQ.FT.	sq.ft.	square foot
RA.		return air	STAT.		thermostat
R.D.		roof drain	SUPP.		supply
RAD.		radiation (or)	SW.		switch
RECPT.		receptacle	TEL.		telephone
REG.		register	TEMP.	temp.	temperature
REL.		relief	TERM.		terminate or terminal
REQD.		required	TV.		television
RET.		return	TYP.		typical
RG.		return air grille	UV		unit ventilator
R.H.	R.H.	relative humidity	UH		unit heater
RM.		room	V.	V.	volts
RPM	rpm	revolutions per minute	VCP		vitrified clay pipe
			VLV.		valve
			VTR.		vent through roof
RR.		return air register	W.	W.	watts
SD.		supply diffuser	W.B.	W.B.	wet bulb
SEC.	sec.	second	WC		water closet
SH.		sheet	W.H.		wall hydrant
SP.	sp.	static pressure	WP.		weatherproof
SPKR.		speaker	W/O		without
SR.		supply register	WST.		waste

#### 40:18. Grounding:

- (A) All conductors, conduit, motor frames, etc., shall be grounded in a thoroughly efficient manner in accordance with the requirements of the National Electrical Code. Provide grounding field (in addition to water pipe ground) outside of building.

#### 40:19. Conduit:

- (A) All rigid conduit shall be standard size galvanized or sherardized conduit manufactured by the Youngstown Sheet and Tube Company, the National Electrical Products Company, General Electric, or approved equal. All conduit shall be coated inside and outside. Where it is impracticable to use rigid conduit, short runs may be made with "Flexsteel," or approved equal flexible conduit; however, permission must be obtained before installation of flexible conduit.
- (B) Thin wall conduit shall be galvanized or sherardized electrical metallic tubing as manufactured by the Youngstown Sheet and Tube Company, the National Electric Products Company, General Electric, or approved equal. Fittings shall be Thomas and Betts, or approved equal compression type.

#### 40:20. Bushings and Locknuts:

- (A) Where conduits enter boxes, they shall be rigidly clamped to the box by a bushing on the inside and a locknut on the outside; conduit shall enter the box squarely. Bushings and locknuts shall be made of malleable iron and shall have sharp clean cut threads.



40:21. Conduit Installation:

- (A) Conduit installed in earth, concrete construction and conduit 2" size and larger shall be rigid conduit. Conduit connecting ceiling outlets above suspended ceiling, conduit connecting outlets in walls, conduit built in laid-up masonry walls and exposed conduit 1-1/2" size and smaller may be thin wall, or heavy wall aluminum.
- (B) The entire system shall be installed complete and thoroughly cleaned and conduit fished before the wires are pulled in. Conduit shall be continuous from outlet to outlet, cabinet or junction box, and shall be so arranged that wire may be pulled in with the minimum practicable number of junction boxes. Changes in direction wherever possible shall be made by bends in the pipe, and these shall be made smooth and even without flattening the pipe or flaking the enamel. Bends shall be of as long radius as possible and in no case smaller than the corresponding trade elbow. Long radius elbows shall be used where necessary. All conduit shall be fastened securely in place, with approved clamps and hangers in sufficient number to prevent movement of any part of the conduit. This applies to exposed conduits as well as concealed conduits.
- (C) Where exposed conduits are suspended from ceiling, hangers similar to Kindorf, Unistrut, or equal, malleable split ring hangers with rod suspension, having a nut fitted into approved type insert. Hangers shall be spaced at not more than 10' centers and closer as required to prevent undue deflection.
- (D) Junctions and pull boxes may be installed to facilitate the pulling of wires, but shall be located as directed or as shown on plans.
- (E) No conduit shall be used where the required number and sizes of wires cannot be easily pulled in and the Contractor shall be responsible for the selection of the conduit boxes, and the number of wires to accomplish the switching and circuit arrangements shown on drawings.
- (F) The conduit system shall be efficiently grounded through heavy galvanized sherardized iron ground clamps.
- (G) The conduits shall be run as required by the structural design of the building and as may be directed.
- (H) The ends of all conduits shall be securely plugged with bushcaps or approved equal caps, and all boxes shall be temporarily filled to prevent plaster or dirt from entering the conduits.
- (I) All conduit shall be run so as to come inside of the finished floors, walls, or ceiling, and shall be run so as to clear all depressions in floors, plumbing and heating pipes or other obstructions. The Contractor shall consult general and mechanical drawings before running conduit to ascertain where conduit might conflict with other piping or equipment.
- (J) Where conduits are stubbed up for connection to panel or distribution boards, they shall be set in wood or steel template, plumbed and lined to make a first-class job in every respect.
- (K) The Contractor shall be entirely responsible for the proper protection of this work from the other trades on the job. Conduit becoming bent or punched with holes, or outlets moved after being roughed-in, shall be repaired by the Contractor as directed without additional cost.



- (L) At various places throughout the building, the electrical conduit shall be run above furred ceiling with outlet boxes in furred ceiling, or it may be necessary to extend from slab to outlet box in furred ceiling. The Contractor shall consult the general drawings and locate all furred ceilings before installing conduit. Where outlets are shown below exposed pipes or ducts, the Contractor shall set box to clear pipes so that lighting fixture may be easily installed. Where conduits pass through waterproof membranes below slabs, the Contractor shall repair seal as directed.

40:22. Location of Outlets:

- (A) Outlets are only approximately located on the drawings, and care must be taken in the actual location of outlets by consulting the various detailed drawings used by other trades, and by securing definite locations from the Architect.
- (B) Switch outlets shall be set so as to clear the door trim and shall be located on the lock side of the door except where otherwise shown. It shall be the responsibility of the Contractor to note door swings on architectural drawings before setting of switch boxes. When receptacles are shown over counter, the Contractor shall mount receptacles so as to clear same regardless of notations on the drawings.
- (C) The height of the center of outlets shown above finished floor, if not otherwise specified or shown on the drawings, shall be as follows:
- Switch Outlets ----- Approximately 4'-0"
- Base Outlets ----- Approximately 1'-8"
- Verify exact height with State Architect to work material and construction.

40:23. Pull, Junction, and Support Boxes:

- (A) All pull, junction, and support boxes shall be substantial and well made of code gauge galvanized steel with bolted or screwed covers. These boxes shall be located according to the directions of the State Architect.

40:24. Outlet Boxes:

- (A) All outlets, including light, switch, receptacle, and similar outlets, shall be provided with approved galvanized code gauge steel knockout boxes, suitable in design to the space which they occupy and the purpose which they serve. Boxes shall be substantial construction and entirely tight. Sectional boxes will not be acceptable, except in locations approved by the State Architect.



40:25. Anchor Bolts and Screws:

- (A) Where conduit straps, cutout switches, etc., are to be fastened to walls, slabs, etc., same shall be securely fastened by means of cadmium plated screws and "Rawplugs" and for the more severe service, lead cinch anchor bolts shall be used. Bolts, etc., for the exposed work shall be cadmium plated.

40:26. Wire and Wiring:

- (A) All wire or cable shall be of size shown on the drawings or as specified herein and shall be U. S. Rubber, General Electric, General Cable, Anaconda, or approved equal. Each roll of wire shall bear the Underwriters' Label. The National Electrical Code identified wiring system shall be used. All wiring shall be run in conduit.
- (B) Branch circuit wiring shall be TW wire. Branch circuits shall be run from the panelboards and shall connect up all outlets, fixtures, switches, etc. Leave sufficient length wire at each outlet box to connect up fixtures, receptacles, switches, or equipment. All branch circuit wiring shall be not smaller than #12. All circuits above 20 A. shall be sized according to the National Electrical Code.
- (C) All travelers in three-way and four-way circuits shall be red in color. All wiring shall be continuous without joints or splices between outlets and boxes. All joints shall be soldered and wrapped with rubber and friction tape. No wires shall be drawn into the conduit until all moisture has left the conduit.
- (D) Feeder wires to panelboards, motors, and equipment shall be sized as indicated on Distribution Panel Schedules. Feeder wires shall be type RHW or THW.

40:27. Splices and Taps:

- (A) All splices and taps in outlet boxes shall be made with approval twisted soldered joints; special connection devices will not be accepted, except that Buchanan, or "Scotchlock" may be used with permission from the Architect.
- (B) Twisted joints shall be used in outlet or junction boxes and in tap circuit wires only, and no splice or joints shall be pulled into a conduit. Joints shall be soldered and covered with an approved high grade rubber tape equal to "Okonite" of a thickness equal to the rubber insulation of the wire, and in addition, an external friction tape equal to "Manson" shall be applied; the whole shall be painted with a first-class insulating paint. Joints and connections in all other wires and cables shall be provided with approved lugs or connections of the proper size for the cables which they connect, and these connections shall be made carefully. Where lugs or connections are used, the ends of cables shall be sweated into them.



- (C) All joints or taps in a stranded cable shall be made up in the manner known as a multiple-wrapped splice or tap. All splices, taps, and joints shall be insulated as hereinbefore specified.

40:28. Switches:

- (A) All wall switches throughout, unless otherwise specified, shall be Sierra "Q-T Quiet", or approved equal, 120-277 V. A.C. twenty (20) ampere flush toggle switches of the following types as required:  
     Single Pole ----- 5021  
     Three-Way ----- 5023  
     Single Pole ----- 5011 (Switching less than 500 watt)
- (B) Switch plates shall be ivory colored plastic plates except as noted below.
- (C) Plates in unfinished spaces shall have Bryant, or approved equal, stamped steel galvanized covers.
- (D) Groups of switches shall be under one (1) gangplate mounted horizontally. Where required by details, vertical mounting shall be used instead of horizontal mounting.
- (E) Plates shall be set plumb and parallel with the wall. Samples of switch plates and switches shall be submitted to the State Architect for approval.
- (F) Equivalent switches and plates by Bryant, P & S, Hubbell or Arrow-Hart & Hegeman may be used.

40:29. Convenience Receptacles:

- (A) All convenience receptacles shall be grounded type receptacles with ivory colored plastic plates (except as otherwise specified) finished to match switch plates. Receptacles shall be the following Sierra model numbers, or approved equal:  
     Single outlets: #1600, 15 A. - 125 V. - parallel slots  
     Duplex: #1800, 15A. - 125 V. - parallel slots  
     Combination: #1850, 15 A. - 125/250 V. - polarized  
     Weatherproof: #1800-WP, 15 A. - 125 V. - parallel slot with stainless steel cover
- (B) Floor outlets shall be National Electric #800-CI Series cast iron gasketed floor boxes with #7903-KGC service fitting with standard NEMA U-slot duplex, 3-wire ground receptacle. Equivalent by Steel City, or approved equal.
- (C) Equivalent receptacles by Bryant, P & S, Hubbell, or Arrow-Hart & Hegeman may be used.

40:30. Installation of Switch Plates, Escutcheons, Etc.:

- (A) It shall be the duty of this Contractor to examine the plaster, painting and other finishes before making his installation to make sure that his accessories, when installed, will fit and cover properly and leave no open or unfinished surfaces showing.



He shall refuse to complete his installation where faulty work on the part of others is found, and he shall promptly report the trouble to the State Architect. Any damage or extra cost to him arising out of such delay shall be paid by the Contractor at fault, provided this Contractor has promptly reported the trouble to the proper parties at the time of its discovery by him.

40:31. Disconnect Switches:

- (A) The Contractor shall furnish and install Cutler-Hammer, General Electric, Westinghouse, Square D, or approved equal, externally-operated, fused, Type "HD" disconnect switches where not furnished with the starting equipment and all other points indicated on the drawings or as required. The Contractor shall install Square D, or equal, thermal switches, Type AG-1, with pilot light, for all fractional horsepower motors.

40:32. Fuses:

- (A) Furnish and install Buss, or approved equal, cartridge or plug-type fuses of proper size as required for switches and panelboards throughout the building. Furnish a complete set of spare fuses in original packages. All fuses serving motors shall be dual element fusetrons.

40:33. Lighting Fixtures:

- (A) Furnish and install all fixtures complete, including all lamps, fixture hickey, and suspension nipples. All lamps shall be as recommended for the fixture, unless specified otherwise. Securely splice fixture wiring to outlet box wiring, solder, splice, and tape according to Code requirements.
- (B) Fixtures shall be wired complete with asbestos-covered heat resisting fixture wire, identified with color code for grounded neutral system.
- (C) Finish on metal parts of fixture shall be as directed by the State Architect, unless specified otherwise. All electrical parts to be ETL and UL approved and all fixtures shall bear Underwriters' Label.
- (D) Wipe all fixtures, glassware, and lamps clean and ready for use.
- (E) Incandescent lamps shall be inside frosted 125 V. lamps, except as otherwise specified. Fluorescent lamps shall be F 40-T12 rapid start bi-pin standard cool white lamps.
- (F) Ballasts for fluorescent fixtures shall be CBM approved high power factor (over 90%) ballasts, sound rated A or B. All ballasts shall be fused with fast acting fuses. All fluorescent fixtures shall be furnished for operation with 277 V. - single phase - 60 cycle current.



- (G) Where only manufacturer is given for each group of fixtures listed, equivalent fixtures by the following manufacturers may be used:  
 Fluorescent: Garco, Daybrite, Sunbeam, Guth, Sechrist, Lithonia, or Columbia.  
 Incandescent: Perfectlite, Prescolite, Kirlin, or Art Metal or Lithonia.
- (H) Consult ceiling schedules on architectural drawings and provide necessary frames for installation of all lighting fixtures. Where incandescent fixtures are installed in acoustical ceiling (T-bar suspension), provide 1" x 1" x 1/8" steel angles and support the fixtures from the inverted T-bars, or the suspension system. All fluorescent light fixtures shall be supported from a fixture support system and not supported by suspended ceiling. Support system shall be anchored to underside of concrete slab. The basic system shall be used and channel may be used as raceway where necessary or between fixture runs. Support to slab shall not exceed 10 feet on centers. Fixture support system shall be Binkley, Kindorf or approved equal.
- (I) Fixture types A, B, C, and D are air-light troffers and shall be furnished with metal filler strips covering the flange air trim openings. The light fixtures shall be suitable for use with Titus Model LT-10, or approved equal, ceiling diffusers. The electrical contractor shall install the lighting fixtures; the mechanical contractor shall install the air diffusers and will remove the metal strips where the flange openings are to be used for return air.
- (J) Fixtures are specified as follows according to types which are shown on the drawings by letters adjacent to fixture outlets. Provide all fixtures with baked white enameled finish on exposed parts unless otherwise noted.

- Type A: Guth #LB5705/FF/IVT/277V 1'x4' fluorescent recessed air troffer with Corning #70 low brightness lens, or Holophane "Controlens", or low brightness prismatic acrylic lens, two 40-watt lamps.
- Type B: Guth #LB 5705/FF/PS/277 V. 1'x4' fluorescent recessed air troffer with Corning #70 low brightness lens, as above, two lamps.
- Type C: Guth #LB 5747/FF/IVT/277 V. 2'x4' fluorescent recessed air troffer with Corning #70 low brightness lens, as above, four 40 Watt lamps.
- Type D: Guth #LB 5747/FF/PS/277 V. 2'x4' fluorescent recessed air troffer with Corning #70 low brightness lens, as above, four 40 watt lamps.
- Type E: Guth #CDP 5182/FF/IVT/277 V. 4'x4' fluorescent recessed troffer with concave plexiglas drop panel lens, eight 40 W. lamps.



- Type F: Guth #LB 5005/FF/IVT/277 V. 1'x4' fluorescent recessed troffer with Corning #70 low brightness lens, or Holophane "Controlens", or low brightness prismatic acrylic lens, two 40 watt lamps.
- Type G: Guth #LB 5147/FF/PS/277 V. 2'x4' fluorescent recessed troffer with Corning #70 low brightness lens, or Holophane "Controlens", or low brightness prismatic acrylic lens, four 40 watt lamps.
- Type H: Kirlin #1808Y square recessed incandescent for inverted tee bar ceiling system, Kirlin wide distributing lens, 200 W. lamp.
- Type J: Guth #B1502/OB aizak shallow dome incandescent reflectors, outlet box mounting, 200 W. lamps.
- Type K: Prescolite #4185 incandescent wall fixture with satin thermopal glass and matte black baked enamel trim plate, 150 W. lamp.
- Type L: Guth #CDP 5182/FF/PS/277 V. 4'x4' fluorescent recessed troffer with concave plexiglas drop panel lens, eight 40 W. lamps.
- Type M: Prescolite #WB-19 incandescent wall fixture with "Thermopal" glass, grounded convenience outlet, two 100 W. lamps.
- Type N: Kirlin #1511-W square recessed incandescent with weather-proof aluminum box for concrete pour, Kirlin wide distributing lens, 200 W. lamp.
- Type P: Holophane #420 wall mounted outdoor luminaire with die-cast aluminum hood and pressed glass refractor, 200 W.
- Type Q: Prescolite #99 incandescent adjustable eyeball unit, matte white finish, with louvers. 150 W., PAR-38 flood lamp.
- Type R: Steber #VC-252 vapor tight cast aluminum incandescent unit, heat-resistant glass globe and cast aluminum guard, 150 W. lamp.
- Exit Lights: Prescolite incandescent fixture with two 25 W. lamps, red letters on white glass background. Provide directional arrows where indicated on the drawings.  
 XA: Prescolite Series W-55 (L, R, or D) end mount units. XB: Prescolite Series C-55 (L, R, or D) ceiling mount units.

40:34. Lighting Panelboards:

- (A) Panelboards shall be Square D Type NTHB 277 V. or Type NTFB 120 V., equivalent General Electric, Federal Pacific, Cutler-Hammer, or approved equal, fusible lighting panelboards with Type SC, 300 V. cartridge fuses. Switches shall be toggle type, quick-make and quick-break with visual indication of blown fuse for each individual pole. Switch mechanism and fuse carriers shall be interlocked to prevent removal of fuses while the switch is in the "On" position. Single pole fusible branches shall be individually removable. Panelboard boxes shall be of code gauge galvanized steel and shall have minimum 5" end gutters and 4" side gutters. Fronts shall be complete with door and flush chrome-plated pin type cylinder lock and catch. All panelboards to be keyed alike. Fronts shall have adjustable indicating trim clamps and directory frames with clear plastic covering. Panelboards shall be Underwriter's Laboratories listed. Main size, branch circuit rating and mountings shall be as indicated in the following schedules.

Circuit No. (Panel Space Number)	Equipment Served	Volts	Amps	Overload Protection Switches	
				No. Req'd.	Poles Ea.
<u>PANEL A</u>					
1 -37	Lighting	277	20	37	1
38-42	Spare	277	20	5	1

NTHB 42-4L, three phase, four wire, 277/480 V., 225 A. main lugs, recessed panelboard.

<u>PANEL B</u>					
1 - 4	Lighting	277	20	4	1
5 -16	Spare	277	20	12	1

NTHB 16-4L, three phase, four wire, 277/480 V., 100 A. main lugs, recessed panelboard.

<u>PANEL C</u>					
1 -24	Lighting	277	20	24	1
25-32	Spare	277	20	8	1

NTHB 32-4L, three phase, four wire, 277/480 V., 225 A. main lugs, recessed panelboard.

<u>PANEL D</u>					
1 -18	Lighting	277	20	18	1
19-24	Spare	277	20	6	1

NTHB 24-4L, three phase, four wire, 277/480 V., 100 A. main lugs, recessed panelboard.



Circuit No. (Panel Space Number)	Equipment Served	Volts	Amps	Overload Protection Switches	
				No. Req'd.	Poles Ea.

PANEL F

1 - 11, 13 15, 17	Convenience Outlets	120	20	14	1
12	Electric D. F.	120	15	1	1
14, 16, 18, 27-42	Spare	120	20	19	1
19-23, 25	Combination Outlets	120/ 208	15	3	2
24, 26	Exhaust Fans	120	20	2	1

NTFB 42-4L, three phase, four wire, 120/208 V., 225 A. main lugs, recessed panelboard.

PANEL G

1 - 6	Lighting	120	20	6	1
7 - 36	Convenience Outlets	120	20	30	1
37-42	Spare	120	20	6	1

NTFB 42-4L, three phase, four wire, 120/208 V., 225 A. main lugs, recessed panelboard.

PANEL H

1 - 5, 7	Plugmold Outlets	120	20	6	1
6, 8-12	Combination Outlets	120/208	15	3	2
13, 15	Kitchenette Unit	120/208	30	1	2
12, 14, 16	Convenience Outlets	120	20	3	1
17	Cabinet Unit Heaters	120	15	1	1
18-32	Spare	120	20	16	1

NTFB 32-4L three phase, four wire, 120/208 V., 225 A. main lugs, recessed panelboard.

PANEL J

1 - 6	Lighting	120	20	6	1
7-11, 13	Combination Outlets	120/208	15	3	2
12	Elevator 120 V Power	120	20	1	1
14	Intercomm. Control	120	20	1	1
15-28	Spare	120	20	14	1

NTFB 28-4L, three phase, four wire, 120/208 V., 225 A. main lugs, surface mounted panelboard.

Circuit No. (Panel Space Number)	Equipment Served	Volts	Amps	Overload Protection	
				No. Req'd.	Switches Poles Ea.
PANEL K					
1 - 6	Lighting	120	20	6	1
7, 9	Combination Outlets	120/208	15	1	2
8, 10	Unit Heaters	120	20	2	1
11	H. W. Circ. Pump	120	15	1	1
12	Master Clock	120	20	1	1
13	Temp. Control Panel	120	20	1	1
14	Temp. Control After- cooler	120	15	1	1
15, 16	Exhaust Fans 3 & 4	120	30	2	1
17-24	Spare	120	20	8	1

NTFB 24-4L, three phase, four wire, 120/208 V., 225 A. main lugs, surface mounted panelboard.

40:35. Primary Service:

- (A) The Electrical Contractor shall provide underground primary service from the existing power pole indicated on the Plot Plan into the building and connected to the power centers. Make all necessary provisions for connecting primary service to existing power line including conduit up the pole and 5000 V. pothead. The primary service shall be 4160 V. delta connected.

40:36. Secondary Electrical Services:

- (A) Secondary electrical services shall be 277/480 V., three phase, four wire, 60 cycle for both power and lighting, and 120/208 V., three phase, four wire, 60 cycle for incandescent lighting and receptacles.

40:37. Power Centers:

- (A) Furnish and install two indoor, self-contained, air cooled power centers. Power centers shall be as manufactured by General Electric, Westinghouse, or approved equal, complete with incoming line section, transformer section and low voltage feeder section as herein specified. Components of these sections shall be manufactured and assembled by the same manufacturer into coordinated units, having a common base and enclosure. Completed units shall be fully enclosed, self-contained, complete power centers, completely factory assembled, tested and manufactured according to standards of NEMA and AIEE.
- (B) Complete data, catalogs, cuts, physical characteristics and other pertinent information must be available to the State Architect upon request if required for study prior to award of contract. After



award of contract, the Contractor shall submit all of these items as a part of the shop drawings. These items shall include:

1. Weights
2. Dimensions
3. Guaranteed losses in watts of no-load (total losses shall be given as measured by a watt meter and corrected to a temperature of 75 C., measured at 100 per cent normal voltage and normal frequency)
4. The per cent of impedance of the transformers
5. The interrupting capacities of all switches and primary fuses.

(C) The incoming line section of the power centers shall be equipped with high voltage disconnect switches, three pole, two position, air insulated type, LCB (load break type) capable of interrupting the transformer full load current. Switch shall be complete with three type BA protective fuses installed between the disconnecting switch and the transformers to protect the high voltage feeders and transformers in the event of a short circuit. These fuses shall be sized in accordance with the full load current of the transformers. Fuses of 60,000 RMS amperes at 4160 volts. Provide one complete set of each main fuses to Owner. Primary switch mechanism shall be mechanically interlocked with enclosure door and with secondary main switch.

(D) The 750 KVA power center shall be three phase, 60 CPS, primary connection, 4160 V. delta. The secondary shall be connected 277/480 V., three phase. The 150 KVA power center secondary shall be connected 120/208 V., three phase, four wire. The transformers shall have four 2 $\frac{1}{2}$ % full capacity taps, two above and two below normal. Transformers shall be dry type, air cooled, insulated with Class H materials, and shall carry the full load continuously without exceeding 150 C. temperature rise above an ambient temperature of 40 C. when cooled by natural circulation of air. The transformer core and coil assembly shall be mounted on suitable vibration isolators so that core vibrations will not be transmitted to the transformer case or to the building structure.

(E) The low voltage feeder sections shall consist of an internally mounted convertible distribution panelboard with a neutral bar and three pole, type QMR fusible interrupter switches with current limiting time delay fuses. Switches shall be interlocked with compartment door and shall have maximum short circuit rating of 100,000 amperes RMS.

(F) The power centers shall have an impedance of not over 5%.

(G) The power centers shall be mounted on vibration control bases. These bases shall be Korfund, or approved equal, Type L. These bases shall be installed as recommended by the isolator manufacturer.

(H) The low voltage distribution sections shall be as indicated in the following schedules.



POWER CENTER #1 277/480 V. DISTRIBUTION SECTION SCHEDULE  
(“MDP” SCHEDULE)

Switch Number	Equipment Served	Switch Data		Fuse Size	Branch Feeder	
		Amps	No. Poles		Wire Size	Conduit
1	Main Switch	1200	3	1200	---	---
2	A.C. Refr. Comp. Unit #1	400	3	350	3 #400	3"
3	A.C. Refr. Comp. Unit #2	400	3	350	3 #400	3"
4	Future 3rd Floor A.C.	400	Space	---	---	---
5	Supply Fan #1	200	3	175	3 #4	1 1/2"
6	Supply Fan #2	200	3	125	3 #6	1"
7	Future Basement A.C.	200	Space	---	---	---
8	Future 3rd Floor Air Unit	200	Space	---	---	---
9	Panel A	200	3	150	4 #3/0	2 1/2"
10	Panel C	100	3	100	4 #1	2"
11	Panel D	100	3	80	4 #3	1 1/2"
12	Elevator Power Contr.	100	3	100	3 #8	3/4"
13	Air Cooled Condenser #1	100	3	70	3 #8	3/4"
14	Air Cooled Condenser #2	100	3	70	3 #8	3/4"
15	Future 3rd Floor Panel	100	Space	---	---	---
16	Panel B	60	3	40	4 #8	1"
17	Return Air Fan #1	60	3	60	3 #10	3/4"
18	Return Air Fan #2	60	3	45	3 #12	3/4"
19	Future Basement Air Unit	60	Space	---	---	---
20	Future Basement Panel	60	Space	---	---	---
21	Equipment Room Ventilating Unit	30	3	15	3 #12	3/4"
22	Bilge Pump #1	30	3	25	3 #12	3/4"
23	Bilge Pump #2	30	3	25	3 #12	3/4"
24	Sump Pump #1	30	3	15	3 #12	3/4"
25	Sump Pump #2	30	3	15	3 #12	3/4"
26	Temp. Control Compressor	30	3	15	3 #12	3/4"
27	Condensate Pump Unit	30	30	15	3 #12	3/4"

POWER CENTER #2 120/208 V. DISTRIBUTION SECTION SCHEDULE  
(“DP” SCHEDULE)

1	Main Switch	400	3	400	---	---
2	Panel G	200	3	150	4 #3/0	2 1/2"
3	Panel F	100	3	70	4 #4	1 1/2"
4	Panel H	100	3	80	4 #3	1 1/2"
5	Panel J	100	3	80	4 #3	1 1/2"
6	Spare	100	Space	---	---	---
7	Panel K	60	3	60	4 #4	1 1/2"
8	Future 3rd Floor	60	Space	---	---	---
9	Exit Light Switch	30	1	15	2 #12	3/4"
10	Fire Alarm Switch	30	2	15	2 #12	3/4"

NOTE: Connect switches #9 and #10 ahead of main switch.



40:38. Plugmold Outlets:

- (A) Where plugmold outlets are shown on the drawings, provide Wiremold Company's "Plugmold 2100", equivalent NEPCO, or approved equal, multi-outlet system with all steel raceway and 20 A. - 125 V. - three wire grounding receptacles spaced as shown on the drawings.

40:39. Dimmer and Dimming Ballasts:

- (A) One row of fixtures in Room 132 shall be furnished with dimming ballasts and a dimmer. System shall be Jefferson Electric "Fluor-A-Dim", or approved equal, fluorescent lamp dimming system for a 277 V. system including #251-003 auxiliary and control, #251-208 ballasts, and complete wiring.

40:40. Emergency Lights:

- (A) Emergency lights shall be Electro Powerpacs, Inc. "Dynaray Model 402 T", equivalent Exide or Gould-National automatic 6 V. nickel-cadmium battery unit with transistorized control circuit. Unit shall include two D36-113 25 W. sealed beam lamps, controls for 120 V. power source, on-off switch, operating test switch, meter to indicate battery voltage, removable fuse holder, amber light to indicate AC current on, clear pilot to indicate trickle charge, electrolyte level viewing window, hinged battery access cover, cord and plug and #3389 mounting shelf. Mount units approximately 7'-0" above floor.
- (B) The Contractor shall install single convenience outlets at all locations where emergency lights are shown.

40:41. Pushbutton and Buzzer:

- (A) Provide an Edwards #725 surface mounting 6 V. buzzer, a 120 V. to 6 V. transformer, and a #1786 C weatherproof pushbutton; install to provide door signal for outside door to Room 123. Equivalent equipment by Nutone, Rittenhouse, or approved equal.

40:42. Electrical Connections to Equipment:

- (A) The Electrical Contractor shall furnish and install all conduit and wiring and shall connect up complete and ready for operation all motors, controls, and equipment in the mechanical contract. The Mechanical Contractor shall furnish all motors, motor starters, motor controllers, relays, thermostats, etc., for all equipment specified under the mechanical contract. The Electrical Contractor shall furnish switches required for mechanical contract equipment except where disconnect is furnished with equipment. Mechanical contract equipment to be connected includes, but is not limited to, the following:



1. Kitchenette Unit: Provide 120/208 V. - single phase power to junction box. Make final connection to range unit and lights.
  2. Sump Pumps: Connect motor starter, motor, and float switch.
  3. Bilge Pumps: Provide power to control panel. Panel is factory wired and includes disconnects, starters, and controls. Provide waterproof cable from control panel to motor.
  4. Hot Water Circulating Pump: Provide power to motor and furnish thermal overload switch.
  5. Exhaust Fans #1 and #2: Provide power to fan motors and control lines from temperature control panel to fan motors. Disconnects at fans will be furnished by Mechanical Contractor.
  6. Exhaust Fans #3 and #4: Provide power to starters and motors. Provide control lines from P.E. switches to motor starters.
  7. Supply Fans #1 and #2: Provide power to motor starters and motors. Provide control power from motor starters to E.P. relays and P.E. switches. Connect P.E. switches to solenoid refrigerant valves. Provide control lines from motor starter to temperature control panel.
  8. Return Air Fans #1 and #2: Provide power to motor starters and motors. Provide control power lines from starters to temperature control panel.
  9. Equipment Room Ventilation Unit: Provide power to motor and motor starter. Provide control power from starter to E.P. switch and to temperature control panel.
  10. Unit Heaters and Cabinet Unit Heaters: Provide power to units, and wire up thermostats and aquastats.
  11. Condensate Pump Unit: Provide power to motor starter and motor. Connect up float switch to starter.
  12. Refrigeration Compressor Units #1 and #2: Provide power to units. Interlock compressor starters with air cooled condenser starters. Provide control lines to temperature control panel.
  13. Air Cooled Condensers #1 and #2: Provide power to motor starters and from starters to motors. Furnish weatherproof disconnect switches.
  14. Temperature Control System: Provide power to temperature control compressor motor and motor starter. Provide power to refrigerated aftercooler unit and provide thermal overload switch. Provide all line voltage wiring in connection with the temperature control systems; all low voltage or electronic control wiring for temperature controls will be done by the temperature control sub-contractor. The temperature control panel will be furnished with all electrical items prewired to terminal blocks. Electrical Contractor shall connect equipment control wiring to these terminal blocks. Provide 120 V. power to temperature control panel.
- (B) The Electrical Contractor shall furnish a fused disconnect switch and provide power to the elevator power unit controller. Also, provide 120 V. power to the elevator hoistway as required by the elevator manufacturer.



40:43. Telephone Conduit, Outlet and Terminal Boxes:

- (A) Outlet boxes shall be 4" square and conduit for telephone work to be same as specified for general electrical work.
- (B) Set outlets at height directed and cover with plate finished same as switch plates only with round bushed hole in center.
- (C) Furnish and install terminal cabinet as shown on the plans. Terminal cabinet shall be same construction as panelboards with hinged door and prime coat of paint.
- (D) All conduit shall be left with #14 steel pull wire and shall be as noted on the plan and riser. All details of the system shall be coordinated with the Telephone Company Construction Department representative to facilitate their installation.
- (E) Where floor telephone outlets are shown, provide National Electric #800-CI Series cast iron gasketed floor boxes with #7904-KC service fitting with bushed opening.

40:44. Time, Program and Signal System; Fire Alarm System and Intercommunications System:

- (A) Scope: The Electrical Contractor shall furnish and install complete and functioning combination synchronous wired time, program and signal systems, non-code, single supervised, common signalling fire alarm systems; central control public address and inter-communication systems as hereinafter specified and shown on the plans.
- (B) General: Equipment is based on that manufactured by Simplex Time Recorder Company and the Dukane Corporation and their list numbers are indicated in order to establish the standard of quality and type of operation. All equipment shall be installed in accordance with the requirements of the National Electric Code, local codes, and these specifications, with the stricter requirement governing in case of possible variance. The combination systems shall operate simultaneously without interference and shall share insofar as possible a common conduit system. Systems equipment shall be jointly guaranteed by the Electrical Contractor and the Systems' manufacturers for a period of one year from date of acceptance, except tubes and lamps, which shall be guaranteed ninety days from the effective date.
- (C) Operation: Systems shall be designed and furnished to operate as follows:
  1. Time System: The time, program, and signal system equipment shall be synchronous wired controlled type to operate from the lighting service. Master time controls shall be designed and equipped to automatically correct any secondary time indicating or signalling unit to agree with the master time, including sweep second hands, which shall agree within fractional seconds with twelve-hour correction range for slow units. Program control equipment shall be equipped to operate class schedule signals from a musical chime or tone amplified and distributed



automatically through the sound system wiring and equipment. Six signal circuits schedules shall be provided, each with different schedules and provisions for alternate schedules for different days or portions of days of a week cycle without effectively reducing the flexibility of the circuits. Each circuit shall have a resettable duration or code based upon any multiple of one second. Make provisions to manually signal any individual, group, circuit, or all signalling points either by regular or coded signals without interfering with automatic means or precedence of the functions.

2. Fire Alarm System: The fire alarm system shall be non-code, single supervised, closed circuit, automatic alarm type operating from break glass stations and signalling in common through non-projector horns. Alarms shall sound continuously until reset. Control panel shall be arranged to operate and supervise from separate power sources taken from two phases of the three phase service. System shall give warning to evacuate the building with provisions for future connection to notify the Fire Department.
3. Sound and Intercommunications System: The central system shall consist of the components of a Dukane 1000 Series intercom. system and shall provide at least the following functions:
  - a. Provide dial pushbutton selection for voice communication between all control stations and between all control stations and staff stations.
  - b. Provide light and tone annunciation of all incoming calls to control and staff stations.
  - c. Permit answering a call without operating any controls.
  - d. Provide "busy" indication at all control stations.
  - e. Provide facility to cut off all audio at all control stations and specific staff stations.
  - f. Provide for regulating incoming volume at all control stations.
  - g. Provide for cancelling a call and resetting the system at all control stations.
  - h. Provide a telephone type handset on control stations for completely private conversation.
  - i. Provide for making announcements through paging speakers from all control stations.
  - j. Distribute time zone signals controlled by the master time and program control through the paging speakers.
  - k. Provide for future installation of AM-FM radio, record player, or tape deck to be carried through paging speakers.



## (D) Equipment:

1. Master Time and Program Control: No. 91-9, surface mounted, dual movement, motor wound, hourly supervised, capable of controlling a time and program system within plus or minus 10 seconds per month of true time and having a correction range of 12 hours for slow time. Duration contacts shall be adjustable for each circuit from 1 to 58 seconds, either coded or continuous. Case shall be dustproofed with rubber gasket and secured with key-lock; entire unit suspended on shock mountings and relays silent mounted. Calibrated seconds indicator shall be incorporated and movement operation shall continue for 12 hours reserve period during interruptions of the current supply using a second movement electrically wound and operated in tandem. Master relay control shall be incorporated with necessary relays, power unit, fuses, and all required filters to prevent radio interference from radiation and audio interference from current surges. Program control shall be No. 803-2, six circuits with associated relays. Program machine shall be 24-hour and weekly and shall be capable of sounding a different schedule on every day of the week cycle on any or all circuits. Mount in wall box for surface mounting.
2. Secondary Clocks: Secondary clocks shall be No. 77-35 9", -45 12", -55 15", -75 18", flush mounted, satin chrome finish, sunburst dials, convex protection glass, continuous operating synchronous movement. Mount 9" clocks in No. 5972 wall box, all others in No. 5973 wall box. Provide wall boxes with receptacle and hanger strap.
3. Fire Alarm Control: No. 4245-1 Control Panel, single supervised, non-code, common signalling, two circuits, automatic operation with necessary relays, compensating resistors, fuses, disarrangement bell, push button, etc.
4. Master Test Station: Single pole key operated toggle switch with red cover plate. Station shall be connected in same manner as the break glass stations. Mount adjacent to temperature control panel.
5. Break Glass Station: No. 4251, semi-flush, non-code, mercury switch type with non-removable pull plate to break glass rod. Mounts on 4" square box with single gang plaster ring.
6. Fire Alarm Horns: No. 4040 non-projector, synchronous type, 12 V. series operation. Mount in 5958 wall box.
7. Intercom System: The intercommunications system shall include the following Dukane components:

- a. Control cabinet: Model 14A690 (20 stations)
  - b. Control stations (desk-top intercomm. stations): Model 4A1015 with handset. Where service to station must be from floor, provide National Electric #800-CI Series cast iron gasketed floor boxes with #7904-KC service fitting with bushed opening.
  - c. Staff stations (wall intercomm. stations): Model 4A971 with privacy switch.
  - d. Ceiling paging speakers: Model 6A335 baffle, #145-226 back box, #9935A speaker and #710-3065 line matching transformer.
- (E) Wiring: Provide 120 V. wiring from master clock to all secondary clocks. In addition, one 2-wire cable shall be provided common to all secondary clocks for clock correction and regulation. Fire alarm wiring shall consist of 4 #14 wires connected in series parallel to all stations and two #12 wires connected in series to all horns. Wires shall be color coded, two colors of #14 wire and one color of #12 wire. Speaker and intercomm. cable shall be Dukane or Belden and as required by intercomm. equipment manufacturer. Wiring shall be spliced only in accessible boxes. NO SPLICES shall be made in shielded cable from source to final termination (except as directed by sound engineer). Cable shall be left 2' long at outlets and 15' long at controls minimum.
- (F) Testing: Upon completion, the entire combination intercommunication and time system shall be demonstrated in the presence of the State Architect to be in perfect operating condition and in compliance with these specifications before acceptance of the project.



## DIVISION NO. 50

Plumbing50:01. General and Special Conditions:

- (A) The preceding General Conditions and Special Conditions are a part of this specification, and the Contractor shall consult them in detail for instructions pertaining to his work.

50:02. Scope of Work:

- (A) The scope of work of the mechanical contract shall be the furnishing of all labor, equipment, and materials to complete the plumbing, heating, ventilation and air conditioning systems in accordance with the drawings and these specifications. The specification divisions directly pertaining to the work of this contract are:
- Division No. 50 - Plumbing
  - Division No. 60 - Heating and Air Conditioning
- (B) The requirements included herein (50:01 through 50:24) are applicable to both the plumbing and the heating and air conditioning phases of the mechanical work and shall also be a part of Division No. 60 of these specifications.

50:03. Warranty:

- (A) When all the apparatus herein specified, shown on drawings, or required for a complete system is furnished and installed, the Contractor shall guarantee the installation to operate properly at all times, and to be free from defects for a period of one year. Such defects shall apply to faulty materials, design or workmanship. In the event of the development of said defects, the Contractor shall remedy the failure at his own expense within a reasonable time after notice by the State Architect.

50:04. Standard Products:

- (A) All major items of mechanical equipment shall be of the best quality normally used for the purpose in good commercial practice and shall be the products of reputable manufacturers. Each major component of equipment shall have the manufacturer's name, address, and catalog number on a name plate securely affixed in a conspicuous place. The name plate of a distributing agent only will not be acceptable. The belts, pulleys, chains, gears, couplings, projecting set screws, keys and other rotating parts shall be fully enclosed or properly guarded.
- (B) All material and equipment shall be new, of best quality and design, and free from defects. All material and equipment to be furnished under this specification shall be essentially the standard



products of manufacturers regularly engaged in the production of such equipment and shall be of the manufacturer's latest standard design. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the equipment need not be products of the same manufacturer.

- (C) The manufacturer's model numbers listed in these specifications establish type and quality.
- (D) Defective equipment, or equipment damaged in the course of installation or test, shall be replaced or repaired in a manner meeting the approval of the State Architect.
- (E) Materials such as adhesives, plastic insulation, caulking compound, sealers, insulation materials, etc., shall be delivered on the job in the original labeled containers.
- (F) As soon as practicable and within thirty (30) days after the date of award of contract and before any materials or equipment are purchased, the Contractor shall submit to the State Architect for approval a complete list (in five copies) of materials and equipment to be incorporated in the work. The list shall include catalog cuts, diagrams, drawings, and such other descriptive data as may be required by the State Architect. No consideration will be given to partial lists submitted from time to time. Approval by the State Architect of materials and equipment will be based on manufacturer's published ratings. Any materials and equipment listed which are not in strict accordance with the specifications requirements will be rejected.
- (G) If the Contractor fails to submit for approval within the specified time a list of materials and equipment in accordance with the preceding paragraph, the State Architect will select a complete line of materials and equipment. The selection thus made by the State Architect will be final and binding and the items shall be furnished by the Contractor without change in the contract price or the time of completion.

#### 50:05. Use of Premises:

- (A) The Contractor shall confine his apparatus, storage of materials, and the operations of his workmen to limits indicated by law, ordinances, permits and directions of the State Architect, and shall not encumber the premises with his materials. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety. The Contractor shall enforce the instructions of the State Architect regarding signs, advertisements, fires, and smoking.

#### 50:06. Workmanship:

- (A) Thoroughly examine the drawings and specifications before commencing work. It is the duty of the Contractor to take his own measurements and to be responsible for same. Do not scale mechanical plans for location of partitions, walls, chases, etc. Refer to architectural plans for dimensions.



- (B) This Contractor shall install his work substantially as shown on the drawings, but he shall make such alterations in location of equipment or piping as may be required to conform to building construction or to avoid obstructions. These changes shall be done without extra charge. The Contractors for the mechanical and electrical work shall cooperate in installing their work to the end that there will be no conflict in the space required. In general, duct work shall take precedent over all pipe work, except where it is absolutely necessary to maintain an even grade on the piping.
- (C) Work shall be done by experienced mechanics of the proper trade.

50:07. Setting and Adjusting:

- (A) Set and adjust all materials and equipment included in this work. Set motor-driven equipment level and align motor, drive, and equipment. Anchor all equipment securely in place. Lubricate all equipment requiring lubrication prior to equipment being used and maintain proper lubrication of equipment until final acceptance of the building.
- (B) Adjust all control valves, regulating valves, and relief valves for proper flow and/or pressure.
- (C) Operate the heating and air conditioning system and all exhaust fans, and balance out the air distribution systems. Check all supply outlets, return air registers, and exhaust registers with anemometer or velometer and adjust to the CFM ratings shown on the drawings.

50:08. Operation and Operating Instructions:

- (A) Furnish and pay for all expenses involved for a qualified operating engineer to operate the entire mechanical system, including all plumbing, heating, and air conditioning equipment for a period of four (4) days after the entire system is completed and all adjustments are made. During this period of operation, instruct the State's operator on the entire system of plumbing, heating, air conditioning, ventilation, controls and maintenance of all equipment.
- (B) Provide a sequence of operation on each item of the mechanical system and frame this sequence under glass and mount on Mechanical Equipment Room wall. (Room #12).
- (C) Save all manufacturer's instructions and manuals and one complete set of shop drawings and turn these over to the State at the completion of the project.
- (D) Keep in a safe place all keys and special wrenches furnished with equipment under this contract and give same to the State at the conclusion of the project.

50:09. Permits, Licenses, and Codes:

- (A) Pay for all licenses, permits, fees, etc., associated with the installation and connection of utilities furnished under this contract.
- (B) Comply with the American Standard Plumbing Code and all local rules and ordinances on the entire plumbing installation.



50:10. Painting:

- (A) All painting in rooms scheduled for painting on the architectural drawings will be done by the General Contractor. This painting will include exposed pipes, ducts and insulated surfaces furnished and installed under this section.
- (B) All mechanical equipment and piping furnished and installed under this contract shall be painted by the General Contractor. This will include all insulated and uninsulated surfaces and piping.
- (C) All pipe covering and insulated surfaces furnished and installed under this section, in basement, crawl spaces, horizontal and vertical pipe chases, pipe tunnels, and all other moist locations, shall be given a heavy coat of glue size, with a sufficient amount of fungicidal agent added to render the canvas mildew proof. Glue size and fungicidal agent shall be furnished and applied on insulated surfaces under this section by the Mechanical Contractor.
- (D) The Mechanical Contractor shall label all exposed piping and ducts with stenciled letters at each connection to each piece of equipment and at 20' intervals on exposed horizontal runs. Provide arrows indicating the direction of flow of fluids in pipes in conjunction with labels. Label all items of equipment with stenciled letters.

50:11. Electrical Connections:

- (A) The Mechanical Contractor shall furnish all motors, motor starters, motor controllers, relays, thermostats, control valves, etc., for all equipment specified under the mechanical contract. All disconnect switches (except for disconnect switches furnished with exhaust fans) will be furnished by the Electrical Contractor and all electrical connections to mechanical equipment will be made by the Electrical Contractor.

50:12. Motors and Starters:

- (A) Motors shall be Westinghouse, Wagner, Century, General Electric, or approved equal, alternating current motors for 40° C. continuous duty operation.
- (B) The Mechanical Contractor shall furnish motor starters for motors furnished as part of the mechanical contract. Starters shall be General Electric, Westinghouse, Allen Bradley, Cutler-Hammer, or approved equal, across-the-line (except for refrigeration compressors) three phase A.C. magnetic type motor starters with three coil overload protection, undercurrent protection and hand-off-auto switch in cover of starter. Provide starters for: condensate pump, air cooled condensers, supply fans, return air fans, ventilating unit, sump pumps and bilge pumps.
- (C) The Electrical Contractor shall furnish thermal switches with pilot light for all fractional horsepower motors.
- (D) Starters for refrigeration compressor units shall be as specified in Division No. 60.



- (B) Temporary electric energy: Refer to Special Conditions, Division No. 2, Section 2:11.
- (C) Temporary heat: Refer to Special Conditions, Division No. 2, Section 2:12, in addition to the following: The Mechanical Contractor shall install the steam service into the building and provide temporary heat as soon as the building is enclosed. Install the cabinet unit heaters in the Entry and use these for temporary heat. Make a temporary installation of the two basement unit heaters (install one on the first floor and the other on the second floor) for temporary heat. Install a temporary 4" steam supply and 2 $\frac{1}{2}$ " condensate return up the elevator shaft and connect up unit heaters. After the need for temporary heat has ended, remove the piping and unit heaters. Thoroughly clean the unit heaters and install them in their permanent location in the basement. Thoroughly clean cabinet unit heaters and install new filters after their use for temporary heat. Do not use the high velocity supply fans, return fans, coils, or duct work for temporary heat.

50:16. Clean-Up:

- (A) The Contractor shall clean away all dirt and rubbish resulting from his operations. This clean-up shall be done at least weekly and more often if it is directed by the State Architect. The Contractor shall cover and protect his work and materials from damage by the elements, or other cause during the progress of the project. He shall clean up all fixtures, registers, heating and cooling units, equipment and material at the completion of the project and deliver the entire system in clean and perfect condition.

50:17. Tests:

- (A) Test all piping systems installed under this contract. Tests shall be performed in strict accordance with the best approved practice in the presence of the State Architect, and tests shall be continued or repeated until the lines under test are proven tight. Sections of the system may be tested separately; but when so tested, it shall be distinctly understood that any defects that may develop in a section already tested and accepted shall be corrected and that section shall be re-tested. Equipment required for tests shall be furnished by the Contractor.
- (B) All connections from the building to the sanitary sewer and the storm drainage system below the floors or ground level shall be filled with water to the top of a vertical section of pipe not less than 10' high, temporarily connected to the highest point on the lines to be tested. The water shall be allowed to stand not less than 30 minutes for inspection, after which, if the water level has remained constant, they shall be drained. These tested lines shall be immediately connected with the sewer and the trenches backfilled.



- (C) All soil, waste, vent and downspout piping above the floor or ground level shall have the openings plugged where necessary and shall be filled with water to the top of the vent pipes. The water shall be allowed to stand not less than 30 minutes for inspection, after which, if the water level remains constant, they shall be drained and the fixtures connected. When the vertical stacks above the ground floor, together with their branch waste and vent pipes are tested separately, a plug shall be installed in the cleanout at the base of each vertical stack being tested, in lieu of filling the entire system with water.
- (D) All domestic cold water, domestic hot water, and hot water circulation lines shall be tested hydrostatically at 125 psi. water pressure. This pressure shall be maintained for not less than one hour for inspection, after which, if the lines prove tight, the system shall be reduced to normal pressure or completely drained.
- (E) Test all steam supply, condensate return and condensate pump discharge lines hydrostatically at 60 psi. water pressure. Maintain test pressure for one hour for inspection. If lines prove tight, reduce pressure to normal pressure or drain system.
- (F) Test refrigerant piping with CO<sub>2</sub> at a pressure of 300 psi. Check for leaks with soap solution. Retest with flame torch after system has been charged with refrigerant.

50:18. Piping Installation - General:

- (A) All pipe shall be cut accurately to measurements established at the building and shall be worked into place without springing or forcing. Cutting or other weakening of the building structure to facilitate pipe installation will not be permitted. All pipes shall have burrs removed by reaming and shall be installed so as to permit free expansion and contraction without damage to joints or hangers. Bent pipe showing kinks, wrinkles, or other malformations will not be acceptable. Cap or plug all open ends of pipes during installation to keep out dirt or foreign material.
- (B) Each length of pipe, nipple, coupling, valve, or fitting shall be stamped with manufacturer's name or trademark.
- (C) All changes in direction shall be made by fittings, as bending pipe is prohibited. Reduce fittings shall be used exclusively as reducing bushings are prohibited. Care shall be taken to insure unrestricted circulation and completely eliminate all noise or vibration. Unions shall be installed on the discharge side of each valve, on each long run of unburied water pipe, and to all connections to fixtures or equipment, the trimmings of which do not permit their convenient removal.
- (D) In no instances shall one service line be laid on the backfill over another service line or conduit, except at crossings. Each section of pipe, fitting, valve, etc., shall be carefully inspected and thoroughly cleaned inside before installing. The laying of all pipe shall be according to the sizes specified or shown on the drawings and shall proceed up grade. No pipe to be buried under the building shall be laid except in the presence of the State Architect.



50:19. Pipe Sleeves, Hangers, and Supports:

- (A) Pipe sleeves, hangers, and supports shall be furnished and set by the Mechanical Contractor, and he shall be responsible for their proper and permanent location. Pipe shall not be permitted to pass through footings, beams, or columns.
- (B) Pipe sleeves shall be installed and properly secured in place at all joints where pipes pass through plaster, masonry, or concrete. Pipe sleeves shall be of sufficient diameter to provide approximately  $\frac{1}{4}$ " clearance around the pipe, and in the case of insulated pipe, approximately  $\frac{1}{4}$ " clearance around insulation. Pipe sleeves in walls and partitions shall be of cast, wrought iron or steel pipe. Pipe sleeves in floors shall be 20 gauge galvanized sheet steel. Sleeves in floor shall extend not less than 1" and not more than 2" above the finished floor, and after installation of pipe, the space around the pipe shall be packed with plastic material and made water-tight.
- (C) Flashing sleeves shall be installed where pipes pass through waterproofing membranes. The sleeves shall be provided with a flashing flange or a clamping device to which a flashing shield can be clamped or soldered. Flashing shields shall be of 16 oz. soft sheet copper and shall extend not less than 8" from the sleeve flashing flange, shields shall be thoroughly mopped into the waterproofing membrane. The space between the pipe and the sleeve shall be made watertight by inserting a packed-oakum gasket and filling the remaining space with poured lead and caulked thoroughly. Flashing sleeves shall be Zurn Series Z-195 or approved equal.
- (D) Pipes shall be hung with malleable iron, split ring hangers, Fee and Mason Figure 215, or approved equal. Strap type hangers will not be acceptable. Hangers shall have rods and turnbuckles of required length. Suspension shall be from inserts in concrete, suitable steel supports fastened to ceiling construction, or steel wall brackets.
- (E) Inserts, steel supports, and steel wall brackets shall be pre-fabricated units as manufactured by Kindorf, Unistrut, or Multi-A-Frame. Inserts shall not be expansion-type except where inserts cannot be set in concrete forms before concrete is poured. Supports on masonry walls shall have bolts through wall and fastened to suitable plate on back of wall. Where required to allow for movement of pipe by expansion, pipes shall rest on rollers and covering protection saddles.
- (F) Soil pipe hangers shall be spaced at not more than 5'-0" on centers. Hangers for all other pipes shall be spaced at not more than 8'-0" on centers for pipes up to 1" size and not over 10'-0" on centers for pipes over 1" size. Hangers and supports shall be installed so that pipes are parallel and evenly spaced. All piping shall be supported and secured as required to prevent vibration and transmission of noise.
- (G) All pipe hangers for use with copper water piping shall be copper-plated on surfaces which will be in contact with the pipe.
- (H) All vertical risers shall be supported at the first floor by means of wrought iron riser clamps.



50:20. Cover Plates:

- (A) Exposed pipes passing through floors, walls, or partitions shall have chromium-plated hinged type plates both sides. Plates shall be Beaton-Corbin Company's #3 of 3/16" chromium-plated cast brass, or approved equal. Where pipes will move through sleeves by expansion, plates shall be attached to sleeves independent of pipe.

50:21. Unions and Gaskets:









- (A) Unions shall be Crane, Walworth, Kewance, or approved equal, 2" and smaller standard weight, brass to iron seat, ground joint, malleable iron with screwed ends, and 2½" size and larger - standard steel with flanged ends and gaskets. Right and left couplings and nipples will not be accepted for union connections. Unions shall not be installed in inaccessible spaces. Unions shall be installed wherever necessary for replacement or repair of equipment. Gaskets for all flanged connections shall be Cranite, Durabla, or approved equal, 1/16" thick.
- (B) Unions for copper piping shall be solder-joint type wrought copper unions.
- (C) Install copper from steel insulating unions at all locations where copper piping connects to steel piping.

50:22. Threaded Joints:





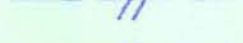
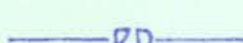
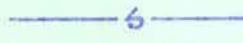





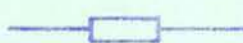
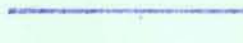





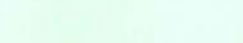
- (A) Threaded joints shall be full and clean cut. Ends of pipe shall be reamed to full inside diameter, all burrs removed and no more than three threads shall be exposed beyond fitting. Make up joints tight with graphite base pipe joint compound. Paint exposed threads of ferrous pipe with acid-resisting paint after piping has been tested and proved tight. No caulking, lampwick, or other material will be allowed for correction of defective joints.


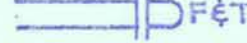



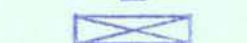

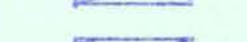
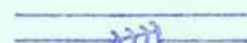
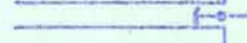




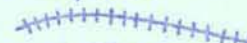

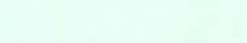
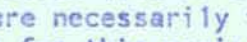
50:23. Drawing Symbols:

- (A) The following are the drawing symbols that were used on the mechanical drawings:

———— Cold Water	 Elbow, Turned Down
----- Hot Water	 Elbow, Turned Up
----- Hot Water Return	 Tee, Outlet Up
===== Soil, Waste, or Leader Above Ground	 Tee, Outlet Down
 Soil, Waste, or Leader Buried in Ground	 Valve in Riser (Or Drop)
———— D ——— Drain	 Gate Valve
	 Globe Valve



	Vent Pipe
	Low Pressure Steam
	High Pressure Steam
	Low Pressure Return
	High Pressure Return
	Cond. Pump Discharge
	Refrigerant Discharge
	Refrigerant Suction
	Refrigerant Liquid
	Balancing Valve
	Check Valve
	Control Valve
	Strainer
	Eccentric Reducer
	Flexible Connector
	Expansion Joint
	Pipe Anchor
	Pipe Alignment Guide
	4" Floor Drain, Type No. and Size
	Flush Floor Cleanout

	Exposed Cleanout
	Float and Thermostatic Trap
	Thermostat - Pneumatic
	Thermostat - Electric
	Pressure Gage
	Thermometer
	Supply Duct - Section
	Return Duct - Section
	Exhaust Duct - Section
	Fresh Air Duct - Section
	Air Volume Extractor
	Splitter Damper
	Rise in Duct
	Drop in Duct
	Inclined Rise or Drop in Duct
	Flexible Duct Connection
	Register, Grille or Diffuser (Size 6"x6", Type A, 100 cfm.)
	Flexible Duct

50:10. Abbreviations:

- (A) The following abbreviation list is a standard list and not all abbreviations shown are necessarily included on the drawings or in the specifications for this project. Refer only to those abbreviations used.

DRAWINGS	SPECS.	DESCRIPTION	DRAWINGS	SPECS.	DESCRIPTION
AC.	a-c	alternating current	EDR.	edr.	equivalent direct radiation
ACOUS.	---	acoustical	ELECT.	---	electrical
ALUM.	---	aluminum	ELEV.	---	elevation
A.	A.	amperes	EMERG.	---	emergency
AU.	---	air unit	EQUIP.	---	equipment
AUTO.	---	automatic	ER.	---	exhaust register
BOIL. HP.	boiler	boiler horsepower	E.W.T.	E.W.T.	entering water temperature
BHP.	bhp.	brake horsepower	EXH.	---	exhaust
BTU.	Btu.	British Thermal Unit	EXTR.	---	extruded
BTUH.	Btuh.	British Thermal Unit per hour	F.	F.	degree Fahrenheit
C	C	degree Centigrade	FA.	---	fresh air
C.	---	conduit	FC.	---	fan-coil unit
CAB.	---	cabinet	FD.	FD.	fire department
CAP.	---	capacity	FL. DR.	---	floor drain
C.C.	---	center to center or on centers	FLEX.	---	flexible
CFM	cfm.	cubic feet per minute	FLR.	---	floor
CH	---	hot and chilled water supply	FPM.	fpm.	feet per minute
CHR	---	hot and chilled water return	F & T	f & t	float and thermostatic
CI.	---	cast iron	FT. or '	ft. or '	foot
CIR.	---	circular	GA.	ga.	gauge
Q	---	centerline	GAL.	gal.	gallon
CO.	---	cleanout	GEN.	---	general
CONN.	---	connection (or)	GPH.	gph.	gallons per hour
CONTR.	---	contractor	GPM.	gpm.	gallons per minute
C.P.	C.P.	chrome plated	H.	---	height
CUH.	---	cabinet unit heater	H-P	h-p	high pressure
CU. IN.	cu. in.	cubic inch	HP.	hp.	horsepower
CU. FT.	cu. ft.	cubic foot	HR.	hr.	hour
CU. YD.	cu. yd.	cubic yard	HTG.	---	heating
CW	---	cold water	H & V	H & V	heating and ventilating
D.	---	depth	HW	---	hot water
D.A.	---	direct acting	HWR	---	hot water return
DB.	db.	decibel	ID	ID	inside diameter
D.B.	D.B.	dry bulb	IN. or "	in. or "	inch
D.C.	d-c	direct current	IPS.	ips.	iron pipe size
DEG or °	°	degree (angle)	J.B.	---	junction box
DET.	---	detail	KW	kw.	kilowatt
DF.	---	drinking fountain	KW-HR.	kw-hr.	kilowatt-hour
DIAM.	---	diameter	L.	---	length
DIFF.	---	diffuser	LAV	---	lavatory
DMPR.	---	damper	LB.	lb. or #	pound
DN	---	down	LBS./HR.	lbs./hr.	pounds per hour
DRWG.	---	drawing	LIN. FT.	lin. ft.	lineal foot
EA.	---	each	LOC.	---	location
E.D.F.	---	electric drinking fountain	L-P	l-p	low pressure
			MAG.	---	magnetic
			MAX.	max.	maximum
			MBH.	mbh.	thousand BTU. per hour



DRAWINGS	SPECS.	DESCRIPTION	DRAWINGS	SPECS.	DESCRIPTION
MECH	---	mechanical	RPM	rpm	revolutions per minute
MET.	---	metal	RR.	---	return air register
MFGR	---	manufacturer	SD.	---	supply diffuser
MH.	---	manhole	SEC.	sec.	second
MIN.	min.	minimum	SH.	---	sheet
M-P	m-p	medium pressure	SP.	sp.	static pressure
MTD.	---	mounted	SPKR.	---	speaker
N.C.	---	normally closed	SR.	---	supply register
N.O.	---	normally open	SQ. FT.	sq. ft.	square foot
No. or #	no. or #	number	STAT.	---	thermostat
N-P	n-p	nickel plated	SUPP.	---	supply
OD	OD	outside diameter	SW.	---	switch
OZ.	oz.	ounce	TEL.	---	telephone
PD	PD	pressure drop	TEMP	temp.	temperature
PLMBG.	---	plumbing	TERM.	---	terminate or terminal
PRV	prv	pressure reducing valve	TV.	---	television
PSI.	psi.	pounds per square inch	TYP.	---	typical
PSIG.	psig.	pounds per square inch - gauge	UV	---	unit ventilator
RA.	---	return air	UH	---	unit heater
R.D.	---	roof drain	V.	V.	volts
RAD.	---	radiation (or)	VCP	---	vitrified clay pipe
RECPT.	---	receptacle	VLV.	---	valve
REG	---	register	VTR.	---	vent through roof
REL.	---	relief	W.	W.	watts
REQD.	---	required	W.B.	W.B.	wet bulb
RET.	---	return	WC	---	water closet
RG.	---	return air grille	W.H.	---	wall hydrant
R.H.	R.H.	relative humidity	WP.	---	weatherproof
RM.	---	room	W/O	---	without
			WST.	---	waste

#### 50:25. Extent of Work (Plumbing):

- (A) Provide all labor, equipment, and materials for a complete plumbing system in accordance with the drawings and these specifications. Major items of work and material are as follows:
1. Piping systems including drains, traps, and valves, fittings for soil, waste and drainage; water supply; hot water.
  2. Plumbing fixtures.
  3. Hot water circulating pump.
  4. Insulation.
  5. Storage water heater.
  6. Sump pumps.
  7. Bilge pumps.

50:26. Pipe and Fittings Specifications:

- (A) Cast iron bell and spigot pipe and fittings shall be service weight cast iron soil pipe and shall conform to the requirements of the A.S.T.M. Standard Specifications for Cast Iron Pipe and Fittings, A.S.T.M. Designation A74-42.
- (B) Clay sewer pipe and fittings shall be standard strength clay sewer pipe and shall conform to the requirements of the A.S.T.M. tentative Specifications for Standard Strength Clay Sewer, A.S.T.M. Designation C13-901.
- (C) Black or galvanized steel pipe shall conform to Standard Specifications for Black and Hot-Dipped Zinc-Coated (Galvanized Welded and Seamless Steel Pipe for Ordinary Uses - A.S.T.M. Designation A120-47.
- (D) Pig lead shall conform to the A.S.T.M. Standard Designation for Pig Lead, A.S.T.M. Designation 329-49.
- (E) Mechanical joints on vitrified clay sewer pipe: A.S.T.M. 425-58-T.
- (F) All changes in direction shall be made with fittings. All fittings screwed and welding shall be standard weight. The welding ells, tees, and reducers shall conform to the A.S.T.M. Specification Designation A-234-52aT. The welding neck flanges shall conform to the A.S.T.M. Specification Designation A-131-Grade I. Fittings for use with screwed pipe, other than soil and waste piping, shall be of best quality, malleable iron and shall conform to the American Standard for Malleable Iron Screwed Fittings, 150-1b. (A.S.A. No.: B16.3-1951) of the American Standards Association. Standard weight ground joint union shall be used instead of right and left couplings and nipples where pipes are joined together. Unions larger than 2½" shall be flanged.
- (G) All flanged joints shall be faced true, packed and made perfectly square and tight. Gaskets for flanged connections shall be Gerlock, or approved equal, No. 555 packing, with centering ring.
- (H) Copper water pipe shall be hard-drawn copper tubing and fittings shall be heavy wrought copper or cast bronze. Pipe and fittings shall conform to A.S.T.M. Designation B88-33.

50:27. Pipe and Fittings - Materials and Installation:

- (A) Downspout piping above ground and waste piping 1½" size and smaller: Standard weight galvanized steel iron pipe with 125# black cast iron screwed drainage fittings. Branch connections and changes in direction shall be made with long turn Y branch fittings or long turn elbows.
- (B) Soil and waste piping (2" size and larger) and below ground downspout piping: Service weight cast iron soil pipe with service weight cast iron fittings. Make branch connections with 45° wye fittings and changes in direction with long sweep ells. Grade piping to a uniform fall of not less than 1/8" per foot. Joints



in cast iron pipe shall be made of soft pig lead and oakum with lead installed in one pour and not less than 1" deep. Joints in underground cast iron pipe may be made with neoprene gaskets; Tyler "Ty-Seal," or approved equal. Soil pipe in 10'-0" lengths may be used.

- (C) Vent piping (smaller than 4" size): Standard weight galvanized steel pipe with 125# black cast iron screwed fittings. 4" size vent stacks shall be service weight cast iron. Vent stacks shall be extended full size through roof and provided with one piece 6-pound lead roof flashings turned down in pipe and with not less than 2 1/2" diameter base and 12" above roof. Vent connections shall be installed on all fixtures and equipment connected to soil and waste system. Vent risers shall be connected to soil stack below lowest fixture connection.
- (D) Soil piping (outside building): Beyond 5'-0" outside the building, piping for sanitary sewer and storm drainage shall be bell and spigot vitrified clay sewer pipe with vitrified clay fittings. Joints in clay pipe shall be Dickey "Plastisol" or P.V.C. compression type joints.
- (E) Domestic water piping (cold, hot, hot water circulating): Type K copper tubing for all piping buried in ground and type L hard-drawn copper tubing above ground with wrought copper or cast bronze fittings. Soft temper copper tubing may be used for small pipe in concealed spaces only to permit bends for roughing-in. Install fittings with sweated joints of 50% pure block tin and 50% lead in accordance with manufacturer's recommendations. Install horizontal piping properly pitched for complete drainage of system. Provide expansion loops where necessary to provide for expansion and contraction. Terminate pipes at valves and fixtures with 18" high air chamber of same size as pipe on which air chamber is installed, except on fixtures connected to a branch which has a shock absorber on the branch.

50:28. Services and Utilities:

- (A) The Contractor shall connect to the existing water main and extend a new water service line into the building. Water service pipe shall be Class 150 cast iron bell and spigot water pipe with lead and oakum or mechanical joints. Install service pipe in ground with a minimum average of 3'-6".
- (B) The Contractor shall construct a new sanitary sewer from the building and connect to the existing sanitary sewer as shown on the plot plan. Make connection to an existing sewer pipe stubbed out from the existing manhole.
- (C) The Contractor shall construct a storm drainage system from the building and extending to a storm sewer outlet at Big Creek. The General Contractor will construct a concrete outlet flume. The Mechanical Contractor shall furnish all piping, manholes, excavations, bilge pumps, backwater valves, etc., as required.



in cast iron pipe shall be made of soft pig lead and oakum with lead installed in one pour and not less than 1" deep. Joints in underground cast iron pipe may be made with neoprene gaskets; Tyler "Ty-Seal," or approved equal. Soil pipe in 10'-0" lengths may be used.

- (C) Vent piping (smaller than 4" size): Standard weight galvanized steel pipe with 125# black cast iron screwed fittings. 4" size vent stacks shall be service weight cast iron. Vent stacks shall be extended full size through roof and provided with one piece 6-pound lead roof flashings turned down in pipe and with not less than 2 1/2" diameter base and 12" above roof. Vent connections shall be installed on all fixtures and equipment connected to soil and waste system. Vent risers shall be connected to soil stack below lowest fixture connection.
- (D) Soil piping (outside building): Beyond 5'-0" outside the building, piping for sanitary sewer and storm drainage shall be bell and spigot vitrified clay sewer pipe with vitrified clay fittings. Joints in clay pipe shall be Dickey "Plastisol" or P.V.C. compression type joints.
- (E) Domestic water piping (cold, hot, hot water circulating): Type K copper tubing for all piping buried in ground and type L hard-drawn copper tubing above ground with wrought copper or cast bronze fittings. Soft temper copper tubing may be used for small pipe in concealed spaces only to permit bends for roughing-in. Install fittings with sweated joints of 50% pure block tin and 50% lead in accordance with manufacturer's recommendations. Install horizontal piping properly pitched for complete drainage of system. Provide expansion loops where necessary to provide for expansion and contraction. Terminate pipes at valves and fixtures with 18" high air chamber of same size as pipe on which air chamber is installed, except on fixtures connected to a branch which has a shock absorber on the branch.

50:28. Services and Utilities:

- (A) The Contractor shall connect to the existing water main and extend a new water service line into the building. Water service pipe shall be Class 150 cast iron bell and spigot water pipe with lead and oakum or mechanical joints. Install service pipe in ground with a minimum average of 3'-6".
- (B) The Contractor shall construct a new sanitary sewer from the building and connect to the existing sanitary sewer as shown on the plot plan. Make connection to an existing sewer pipe stubbed out from the existing manhole.
- (C) The Contractor shall construct a storm drainage system from the building and extending to a storm sewer outlet at Big Creek. The General Contractor will construct a concrete outlet flume. The Mechanical Contractor shall furnish all piping, manholes, excavations, bilge pumps, backwater valves, etc., as required.



50:29. Chlorination and Chlorine Testing:

- (A) The water service and the building domestic hot and cold water systems shall be flushed and disinfected before they are put into use. Prior to chlorination, all dirt and foreign matter shall be removed by a thorough flushing. Each valved section of the piping systems shall be flushed independently after all pressure tests have been performed.
- (B) The point of application for the liquid chlorine shall be at the beginning of the new water service, through a corporation stop inserted in the horizontal axis of the newly laid pipe. The water injector for delivering the gas-water mixture into the pipe shall be supplied from a tap on the pressure side of the gate valve controlling the flow into the pipe line extension. Water from the existing water main shall be controlled to flow very slowly into the newly laid pipe line during the application of chlorine. The rate of chlorine gas-water mixture shall be in such proportion to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly laid pipe shall be at least three hours. Water containing at least 100 parts per million of chlorine shall be allowed to stand in the line for 8 hours after which there shall be at least 25 parts per million residual chlorine remaining. All valves or other appurtenances shall be operated while the pipe line is filled with the chlorinating agent.

50:30. Valves:

- (A) General: Crane, Walworth, Jenkins, Nordstrum, Kennedy, or approved equal, with working pressure and manufacturer's name cast in body of valve.
- (B) Domestic Water System Valves: 200 psi. non shock water, standard working pressure. All bronze with solder joint ends. Cast iron body, brass trimmed, for valves 3" size and larger with flanged ends. Water valves 2½" size and smaller: gate valves - Walworth No. 4 SJ wedge gate valves with non-rising stem. Check Valves - Walworth No. 406 SJ swing check valves with screwed caps and bronze disc. Globe valves: Walworth No. 95 SJ globe valves with rising stems, union bonnets and renewable disc.

50:31. Pipe Covering and Insulation:

- (A) All new domestic cold water, hot water, and interior downspout piping throughout the building, including crawl spaces and tunnels, shall be covered with preformed or sheet formed plastic insulation, Armstrong "Armaflex-22", Johns-Manville "Aerotube", or approved equal. Pipe insulation shall be 3/8" thick, with an average "K"



factor not exceeding 0.25/Btu./sq.ft./inch/hr./degree/f. at 75° mean temperature. Insulation shall be slipped on for all piping up to and including 1". Insulation shall be at least as long as the pipe, so butt joints may be made without stretching. Joists shall be joined by the use of Armstrong #520 Adhesive, or approved equal, and installed in complete accordance with manufacturer's instructions. For pipes larger than 1" insulation will be applied by slitting the insulation or the use of sheets in accordance with the manufacturer's recommendations.

- (B) All fittings, valve bodies, unions and flanges shall be insulated with preformed or sheet foamed plastic insulation as specified above. Fabricate fitting insulation according the manufacturer's directions. Join slit and mitered joints with Armstrong #520 Adhesive, or approved equal.
- (C) End Protectors: Provide Cheney-Royal, Grabler, or Stembridge 20-gauge aluminum clasp type insulation end covering cups for end of insulation at equipment and at all other points where insulation stops.
- (D) Insulate the storage water heater tank with plastic material containing not less than 85% magnesia and not less than 1-3/4" thick applied over 1-1/2" mesh wire netting. The netting shall be held away from the shell by metal spacers fastened to the wire. The final coat shall be mixed half and half with portland cement, troweled smooth. In lieu of plastic material, 85% magnesia block not less than 1-1/2" thick properly wired with brass may be used. The block covering shall be finished with a 1/2" coat of plastic material mixed half and half with portland cement and troweled smooth. Cleanout and access doors shall not be insulated, but insulation shall be neatly beveled off at the edges of such openings. Provide an 8-ounce canvas jacket.

#### 50:32. Clean-Out Plugs and Test Tees:

- (A) Provide and install clean-outs where indicated on the drawings and at the foot of all soil, waste, and drain stacks, bends, angles, upper terminals, and not over 50' apart on any lineal run of piping. All shall be accessible; if not, they shall be extended to an accessible location, such as to the floor above. Clean-outs extended to finished floors and walls shall be set flush with the finished surface.
- (B) Clean-outs in finished floors shall be Zurn Z1326-1, Josam, or approved equal, with nickel bronze non-slip scoriated square top set flush with floor.
- (C) Clean-outs in unfinished floors and outside areas shall be Zurn Z1326-10, Josam, or approved equal with non-slip scoriated vandal-proof cover set flush with surface. In non-surfaced areas, they shall be in a concrete block, 14" x 14" square, and 6" deep and set flush with finished grade.



- (D) Clean-outs in finished walls shall be Zurn Z-1315-1, Josam, or approved equal, or Z-1305 in soil lines, or "Code" red brass plugs in IPS lines and shall be covered with Z-1385-1 bronze access box with full 8" x 8" opening and smooth chromium-plated top which shall be set flush with the finished wall and held securely in place by means of integral offset anchoring lugs.
- (E) Clean-outs in unfinished walls and accessible concealed spaces shall be Zurn Z-1315, Josam, or approved equal, or Z-1300 in soil pipe lines or "Code" red brass plugs in IPS pipe lines.

50:33. Installation of Traps:

- (A) Traps shall be installed to connect each fixture or piece of equipment not having a trap or seal as an integral part of same. They shall conform to the following:
  1. Trap shall be placed as close to the fixture as possible.
  2. No clean-out shall be placed in any trap except below the water line.
  3. No trap with any deflector therein shall be used.
  4. No trap with any cast partitions or mechanical sealing devices shall be used.
  5. No trap less than  $1\frac{1}{4}$ " shall be used.
  6. Every trap shall have a water seal of at least  $1\text{-}3/4$ " except shower and floor drains shall have a deep-seal type.
  7. Slip joints shall not be used on the sewer side of traps.
  8. Deep seal traps shall have a water seal of not less than  $4$ ".

50:34. Shock Absorbers:

- (A) Shock absorbers shall be Zurn "Shoktrols", or equivalent Wade "Shokstops", or approved equal. Install shock absorbers at all locations shown on the drawings and as sized on the drawings. Installation shall be in accordance with manufacturer's recommendations.

50:35. Hot Water Circulating Pump:

- (A) Circulating pump shall be a Bell and Gossett #75, or approved equal,  $3/4$ " booster pump with a capacity of 15 gpm. at 5-ft. head. Pump shall have all bronze construction and shall have  $1/12$  HP - 120 V. - single phase motor with overload protection device.

50:36. Storage Tank Water Heater:

- (A) Adco, equivalent Whitlock, Patterson-Kelley, Reco, or Adamson, horizontal storage tank heater constructed of high quality steel plate electric fusion welded; heating element made of  $1\text{-}1/4$ " O.D. 16 gauge copper U-bend tubing in steel tube sheets; tank



and heating element designed for 125 psi. working pressure and constructed in accordance with ASME Code for Unfired Pressure Vessels and bearing Code Stamp; tank with tappings for relief valve, hot water supply, cold water, drain, thermostat, and thermometer; line tank interior with cement lining; tank to have 11' x 15' manhole. Provide pipe leg type cradles and support tank from floor with stand constructed from welded steel pipe. Install  $\frac{1}{2}$ " check valve on steam coil to serve as vacuum breaker.

- (B) Provide a Powers No. 11, equivalent Lawler, self-operating regulator to control steam to coil. Regulator to have capacity indicated with 2 psi. steam. Provide a Powers No. 29, equivalent Weksler, U. S. Gauge, dial thermometer with 3-1/2" dial and brass chromium plated case; range 100 F. to 230 F. Provide a Watts #340, equivalent McDonnell and Miller, or Cash-Acme, temperature and pressure relief valve.
- (C) Tank and heating element capacities: Adsco 30" x 60" storage tank with 185 gallons nominal storage capacity; Adsco #L6-3/4 heating coil, 4.1 sq.ft. heating surface with capacity to heat 158 gal./hr. of water from 40 F. to 140 F. with 2 psi. steam. 190#/hr. steam required.

#### 50:37. Floor Drains:

- (A) Type 1: Zurn Z-415 cast iron drain with adjustable head; Type A standard rounded nickel bronze strainer (6" minimum diameter) with slotted openings; seepage pan. Provide cast iron P trap.
- (B) Type 2: Zurn Z-415 cast iron drain with adjustable head; Type A 5" diameter nickel bronze round strainer; seepage pan, 1 1/2" outlet.
- (C) Type 3: Zurn Z-540 "Continu-Flo" drain, Dura-coated cast iron body with bottom outlet, non-freeze, continuous flow sediment bucket and cast iron grate.
- (D) Equivalent drains by Wade, Josam, or J. R. Smith may be used.

#### 50:38. Roof Drains:

- (A) Josam Series No. 140 cast iron roof drain with large diameter sump and flange, I.P.S. bottom outlet, removable dome and sediment cup, and non-puncturing flashing clamp device integral with gravel stop.
- (B) Equivalent roof drains by Wade, J. R. Smith, or Zurn may be used upon approval by the State Architect.

#### 50:39. Wall Hydrants:

- (A) Josam Series No. 1410-N, equivalent Zurn, Wade, or J. R. Smith, cast bronze non-freeze box type wall hydrant with 3/4" hose connection, polished face, hinged locking cover, galvanized wall sleeve, renewable nylon seat, brass operating parts, ground joint union elbow adapter with 3/4" solder connection and T-handle key. Hydrant sleeve shall be of proper length to fit wall thickness.



50:40. Hose Bibbs:

- (A) Standard #R4411, equivalent Crane, Kohler, or Chicago Faucet, chrome plated single faucet with hose end.

50:41. Plumbing Fixtures:

- (A) Furnish and install all new plumbing fixtures as shown on the plans and as herein specified. All fixtures shall be set firm and true and connected to all required piping. Fixtures are specified from the Standard catalog, but equivalent Crane, Kohler, or Eljer fixtures may be used upon approval of the State Architect.

Type A: Lavatory - Standard #F350-40 - Vitreous china lavatory with front overflow, anti-splash rim and cast in soap dish, size 20" x 18". #N2101-8 combination supply and pop-up drain fitting with aerator. #R2604 3/8" supply pipes stops to wall and flexible tube risers. #R7000-44 1 1/4" P trap. Provide J. R. Smith, or approved equal, Figure 720 concealed arm wall carrier.

Type B: Water Closet - Standard #2495-8 vitreous china siphon jet elongated wall hung bowl, 1 1/2" top spud. Sloan Royal 112YV exposed flush valve with vacuum breaker, 1" stop and flush connection. Church #9500, or equivalent Olsonite, white open front seat. Provide J. R. Smith Series 100, or approved equal, adjustable fixture supports with waste fittings.

Type C: Urinal - Standard #F-6271-1 vitreous china blowout urinal with flushing rims, 1 1/2" top spud, outlet connection threaded 3" inside; #180TYV Sloan Royal exposed hand operated flush valve with vacuum breaker. Provide J. R. Smith Figure 634, or approved equal, floor mounted urinal supports.

Type D: Service Sink - Standard #P7695-2 cast iron acid-resisting enameled inside service sink with drilled back, flat rim, wall hanger. #R5001VB exposed double faucet, short spout with bucket hook and hose end, vacuum breaker. #R5218 "U" type stainless steel flat rim guard bolted to rim. #P7798 - P-trap standard 3" size. Sink size 24" x 20 1/2" x 10 1/4" depth.

Type E: Drinking Fountain - Halsey Taylor Model WM 14A wall-hung electric water cooler with a capacity of 14 gal./hr. of water cooled from 80 F. to 50 F. in a 90 F. room. Unit shall have 18-8 stainless steel top with removable grid, self-closing bubbler, hand operated, with automatic

stream regulator, sealed refrigerant system with 1/5 HP - 120 V. - single phase motor compressor, freeze-up protection and thermostat, steel cabinet with baked enamel finish and all panels removable, concealed plumbing connections, 1 $\frac{1}{4}$ " P trap, stop valve and wall mounting plate.

Type F: Sink - American Standard #SA 803, 18 gauge nickel stainless steel countertop satin finish sink with polished rim, back ledge, self rimming, size 25" x 22". #R 4300-A exposed deck type double pantry faucet with aerator, and #R4510 crumb cup strainer and 1 $\frac{1}{2}$ " tail piece, 1 $\frac{1}{2}$ " P trap.

Type G: Kitchenette Unit: Dwyer #E60-RS, equivalent Crane or approved equal, unit complete with electric range, refrigerator, sink with understorage cabinet and upper cabinet.

Electric range shall be Underwriters' Laboratories and C.S.A. listed and shall be wired for 120/208 V., 3-wire single phase A.C. Range shall have one 2100 W. top burner, two 1250 W. top burners, one grounding type appliance outlet, two separate oven burners (2300 W. each), and total range connected range load of 9860 W. Provide 7-position top burner heat selector switches, removable reflector bowls, oven burners with separate bake or high broil, automatic oven heat control, signal light and utensil drawer.

Refrigerator shall have five cubic feet of storage volume and shall have roll-out shelves on nylon roller bearings, stainless steel freezer with two ice cube trays, interior light, push button door, seamless acid resistant porcelain liner and five-year warranty.

Sink unit shall be one piece, seamless 14 gauge titanium steel range-sink-worktop finished in acid-resistant porcelain with 12-1/4" x 17-3/4" x 6-1/2" sink bowl, aerator faucet, drain, 1 $\frac{1}{2}$ " P trap. Provide undersink storage cabinet.

Upper cabinet shall include insulated heat deflector, porcelain door fronts, concealed hinges, flush double bottom and porcelain backsplash. Kitchen unit shall be a nominal 60" wide and finished with standard ends.

#### 50:42. Sump Pump:

- (A) Sump pump #1 and #2 shall be Weil Pump Company #SEF-902, equivalent Chicago, Yeomans, or Penberthy, submersible sump pump with a capacity of 15 gallons per minute against a 52-ft. head;



1 HP - 1750 rpm. - 480 V. - three phase motor; submersible automatic float switch; bronze impeller; sealed ball bearings; cast iron housing; stainless steel shaft and inlet screen; and line voltage magnetic motor starter.

- (B) Provide 18" diameter cast iron sump basins for sump pumps with 20" O.C. cast iron covers. Sump #1 shall be 4'-0" deep and Sump #2 shall be 6'-0" deep.

#### 50:43. Bilge Pumps:

- (A) Bilge pumps #1 and #2 shall be Weil Pump Company #SE 874-6, equivalent Chicago or Yeomans single submersible screenless sewage pumps with motors, controls and accessories to make a fully automatic installation. Each pump shall have a capacity of 250 gpm. against a head of 34 feet. Motors to be 5 HP. - 480 V. - three phase - 1150 rpm.
- (B) The pump and motor shall be built by the pump manufacturer and the common pump-motor shaft shall be 316 stainless steel. Motor shall be hermetically sealed and bearings shall be double shielded ball bearings sealed with grease to provide lubrication for continuous pumping duty and protection for the bearings when the pump is idle. Maximum temperature rise of motor winding to be 40 C. when operating the pump under full load continuously.
- (C) Provide a Weil Pump Company "Vis-A-Trol", or approved equal, control panel for each pump with panels located in the Mechanical Equipment Room. Panels shall be factory wired control panels for wall mounting and each control system shall include:
1. NEMA 1 control cabinet including magnetic starter, fusible disconnect switch with handle of lock-out type, test push button, running light, high water alarm bell with silencer and 6 volt secondary transformer; pneumatic control instrument, factory wired, with visual scale with cut-in and cut-out setting indicated; instrument shall show water level in pump manhole and relation between pumping rate and inflow.
  2. Pneumatic control bulb in pump manhole with cast bronze housing, wall bracket for mounting and stainless steel chain to remove bulb for inspection; bulb to be properly sized for length of tubing to extend to panel location.
  3. Copper flexible tubing for connecting the bulb in the pump manhole to the control and measuring instrument.
  4. NEMA IV junction box for pump manhole.
  5. Installation and equipment shall be checked by manufacturer's factory representative before system is put into operation.

#### 50:44. Manholes:

- (A) Contractor shall furnish and install material and equipment for manholes located as shown on the drawings.
- (B) Brick for manholes, etc., shall be hard common brick and shall conform to the requirements of the A.S.T.M. Standard Specifications for Sewer Brick, A.S.T.M. Designation C32-50. Wall thickness to be 8" or more for depths up to 12'-0" and diameters under 4'-0" and 12" minimum for greater depths, or diameters larger than 4'-0".



- (C) Casting for manholes shall have the approximate form and dimensions shown and shall be of tough, even grained metal, sound true to pattern and free from defects which unfit them for their intended use. Manhole lids shall not be perforated. After being thoroughly cleaned, castings shall receive two coats of coal tar pitch at foundry. Manhole ring and cover shall be heavy duty and shall weigh not less than 350 pounds.
- (D) Concrete for manhole construction shall be 1:2:4 mix of portland cement, clean sharp sand and clean screened  $3/4$ " lime stone aggregate. Use not less than  $5\frac{1}{2}$  sacks of cement per cubic yard of concrete and not more than 6- $3/4$  gallons of water per sack of cement. Masonry mortar shall be 1:3 portland cement sand mix. At contractor's option hydrated lime shall be substituted for but not to exceed 10 per cent of cement used in masonry mortar.
- (E) Lay brick in manholes, inlets, and other sewer structures with shoved joints, completely filled with mortar. Horizontal joints shall not exceed  $1/2$ ", vertical joints  $1/4$ ", on interior face. Lay brick as headers, breaking joints between courses. Strike interior joints smooth with face of brick.
- (F) Plastering for manholes shall be  $3/4$ " cement plaster on outside of structure.

50:45. Backwater Valves:

- (A) Backwater valves for storm drainage system shall be Zurn #Z-1091, equivalent Josam, Wade, or J. R. Smith, flapper type backwater valves with hub inlet, open outlet, Dura-coated cast iron body, and bronze valve.

50:46. Drain Pit Grates:

- (A) Grate covers for drain pits in mechanical equipment room shall be J. R. Smith Figure 2922, equivalent Josam, Wade, or Zurn light duty cast iron grating and frame.

50:47. Underflow Drainage Piping:

- (A) Underflow drainage piping shall be Carlon "D" perforated plastic pipe as manufactured by Carlon Products Corporation, or approved equal. Pipe shall conform to Commercial Standard CS 228-61 and shall have  $\frac{1}{2}$ " perforations on 5" centers, 120° apart. Provide couplings for joining lengths of pipe and make joints with Carlon cement. Refer to installation details on the drawings.

50:48. Valve and Valve Box:

- (A) Valve for water service shall be a Kennedy Figure 56 or 571, equivalent Mueller, or approved equal, iron body double disc gate valve A.W.W.A. Standard for 200 lbs. working pressure. Provide Kennedy Figure 121 three piece screw type extension valve box with cover marked "Water".



50:49. Hot Water Heater (Option):

- (A) The contractor may have the option to furnish an instantaneous hot water heater in lieu of the hot water storage tank as specified.
- (B) Omit the storage water heater as specified under paragraph 50:36 and the insulation for the storage tank as specified in paragraph 50:31, sub-paragraph (D).
- (C) Furnish and install a Leslie-Constantemp B-300 or approved equal hot water heater consisting of an integrally piped heater and control package capable of supplying 30 gpm of hot water when heated 100 F. rise without the use of thermostatic devices, storage tank or aspirating devices. The unit shall be capable of maintaining the set temperature within 8 F. over a flow range of 1% to 100% rated capacity. Package to include built-in hot water relieving feature, water flow actuated steam control valve and strainer, 1" bucket trap and strainer.

## DIVISION NO. 60

Heating and Air Conditioning60:01. General and Special Conditions:

- (A) The preceding "General Conditions" and "Special Conditions" are a part of this specification and the Contractor shall consult them in detail for instructions pertaining to his work.
- (B) The requirements of Division No. 50 - Plumbing paragraphs 50:01 through 50:24 - are applicable to this division of the specifications and shall be considered a part of this division even though they are not repeated herein.

60:02. Extent of Work:

- (A) The extent of this work shall be the furnishing of all labor, equipment, and material to complete the heating and air conditioning system in accordance with the drawings and these specifications. Major items of work and material are as follows:
  - 1. Piping systems for steam supply and return; condensation drainage and refrigerant.
  - 2. Air units including supply fans, return air fans, heating and cooling coils.
  - 3. Exhaust fans.
  - 4. Refrigerant compressor units and controls.
  - 5. Air cooled condensers.
  - 6. Condensate pump unit.
  - 7. Sheet metal duct work including registers, grilles, diffusers, louvers, supply boxes, silencers, return air valves, etc.
  - 8. Steam pressure reducing station.
  - 9. Insulation.
  - 10. Humidifiers.
  - 11. Equipment room ventilation unit.
  - 12. Temperature control system.
  - 13. Unit heaters and cabinet unit heaters.

60:03. Description of System and Design Conditions:

- (A) The heating system consists of steam from the central heating plant supplying steam to air handling units and unit heaters. The cooling system includes refrigeration compressor units supplying refrigerant to the air handling units. The air handling units contain steam heating coils and refrigerant cooling coils, and these units supply air to the various spaces through systems of sheet metal ducts. During the winter months, heating will be done by the steam heating coils and cooling will be supplied by a mixture of outdoor air and return air. During



the summer months, cooling will be done by the cooling coils and any necessary heating will be done with a mixture of outdoor air and return air. The system shall be installed in such a manner such that both the steam heating and the refrigeration compressor units can be operated during the spring and fall to provide heating in some areas of the building and cooling to other areas at the same time.

- (B) The air handling units supply all air double duct high velocity distribution systems. The air distribution systems include high velocity mixing boxes controlled by room thermostats to proportion the amount of air from the hot ducts or cold ducts to maintain the proper room temperature. The Contractor shall observe the following precautions in installing the heating and air conditioning system:
1. High velocity duct work must be absolutely air tight.
  2. Ducts must be installed with smooth transitions and changes in direction to avoid greater pressure losses than were anticipated in the system design.
  3. Sharp edges, obstructions, etc., must be avoided in high velocity duct work to prevent regeneration of air noise.
- (C) The design conditions used for the system are:

Summer Outdoor:	99 F D.B.	76 F W.B.	36% R.H.
Summer Indoor:	78 F D.B.	65 F W.B.	50% R.H.
Winter:	-10 F Outdoor	70 F Indoor	
Steam Supply Pressure:	2 psig.		
Refrigerant Suction Temperature:	40.0 F.		

60:04. Piping Materials:

- (A) All steam supply piping, condensate return piping, and condensate return pump discharge piping, 2" and larger shall be seamless black steel A.S.T.M. A-120. Pipes 1½" and smaller shall be butt-welded black steel - A.S.T.M. A-120. All pipes shall be Schedule 40 weight, except for screwed short, shoulder, and close nipples, which shall be Schedule 80.
- (B) All refrigerant piping shall be Type L hard-drawn copper tubing with forged or wrought copper fittings - A.S.T.M. B-88. Sweat solder all fittings with silver solder, "Silfos," or approved equal.
- (C) All condensation drain piping from air unit drain pans shall be Type K hard-drawn copper tubing. Fittings shall be wrought copper or cast bronze fittings. Install fittings with sweated joints of 50% pure block tin and 50% lead.
- (D) All fittings for steel pipe 2" size and larger shall be A.S.T.M. A-120 quality, A.S.T.M. A-234 butt-welding fittings. Fittings for steel pipe 1½" size and smaller shall be 125# black cast iron screwed fittings.
- (E) Flanges for steel pipe shall be 150# welding neck, flat face, ASA B16c. When flanged fittings are shown on the drawings, they shall be 125# cast iron flanged fittings.



- (F) All high pressure steam piping and low pressure steam piping systems composed of pipe 2" and larger shall be butt-welded. Low pressure systems composed of pipe 1 $\frac{1}{4}$ " and smaller shall be screwed.
- (G) Butt-welding tees shall be used in all butt-welded lines where the stub-out branch line size multiplied by two (2) is equal to or exceeds the size of the main run welded pipe line. Weldolets shall be used where the stub-out branch line size multiplied by two (2) is less than the size of the main run welded pipe line.

60:05. Piping Installation:

- (A) All steam supply and return mains shall be evenly graded and shall pitch downward at least 1" in 40' in the direction indicated by arrows on the drawings. Branch runouts shall pitch at least 1" in 10'. Eccentric reducers shall be used for all reduction in pipe size. Connections for branches and risers shall be taken off the mains at 45° upward and connected with double elbow swings to take care of expansion and contraction of pipes and avoid strain on pipes and coils. Horizontal runouts to risers and to equipment shall be pitched to drain all condensate in pipes when control valves are closed.
- (B) Condensation drain piping shall be evenly graded and shall pitch downward at least 1" in 10' in direction of flow. Use reducing fittings for reduction of pipe size. Avoid pockets in piping.
- (C) Refrigerant piping: Provide a suitable dehydrator, strainer and sight glass in liquid lines at the cooling coils. Provide flexible connections in suction and discharge lines at the compressor units. All tubing shall be clean and dry. If there is any evidence of dust, moisture, or corrosion, the tubing shall be cleaned out by drawing a swab soaked with methyl alcohol or refrigerant-11 through the tubing as many times as may be necessary to thoroughly clean the tubing. To eliminate the formation of copper oxide on the inside of the tubing, all air shall be flushed from the inside of the refrigerant line before soldering and a slow stream of dry nitrogen shall be passed through the tube during the soldering process. After soldering, the insides of all refrigerant lines shall be clean and bright.

60:06. Welding:

- (A) All joints between sections of pipe and between pipe and fittings on low pressure steam piping, 2" size and larger and on all high pressure steam piping shall be fusion welded using electric or oxy-acetylene process and welding rods of characteristics similar to the piping material. The welding shall be in accordance with the recommendations of the American Welding Society. Changes in direction and intersections of lines shall be made with welding fittings. Mitering of pipe to form elbows, notching of straight runs to form tees, or any similar construction will not be permitted.



- (B) Butt-welding tees shall be used in all butt-welded lines where the stub-out branch line size multiplied by two (2) is equal to or exceeds the size of the main. Weldolets or Thredolets shall be used when the stub-out branch size multiplied by two (2) is less than the size of the main.
- (C) The State Architect or his representative may require the Contractor to cut a coupon from any weld for testing. Any coupon cut and tested must have a tensile strength of at least 50,000 pounds per square inch before breakage or rupture. In case of any coupon failure, the Contractor must cut out the entire weld and reweld. No additional charge will be allowed for any part of this work.

60:07. Valves:

- (A) Make: Crane, Walworth, Jenkins, Kennedy, Fairbanks, or approved equal, with working pressure and manufacturer's name cast in body of valve. Working pressure - 125# steam pressure.
- (B) Gate Valves: 2" size and smaller; all brass with wedge-disc, union bonnet, rising stem and screwed ends. 2½" size and larger; cast iron body, bronze trimmed with wedge-disc, outside screw and yoke pattern, and flanged ends.
- (C) Check Valves: 2" size and smaller; all brass with swing disc and screwed ends. 2½" size and larger; iron body, brass trimmed with swing disc and flanged ends.
- (D) Globe Valves: 2" size and smaller; all brass with renewable type disc and screwed ends. 2½" size and larger; iron body, brass trimmed with renewable plug type disc and flanged ends.
- (E) Balancing Valves: Illinois Engineering Company Series 4000, or approved equal, combination balancing and shut-off valve.
- (F) Refrigerant Valves: Henry, Kerotest, or approved equal, sylphon bellows type. Expansion valves - Sporlan, Detroit Lubricator, or approved equal, thermostatic expansion refrigerant valves with equalizer line.

60:08. Insulations:

- (A) Steam supply and condensate return lines: All steam supply, condensate return, and condensate pump discharge lines through the building, including chases, pipe corridors, pipe tunnels, and crawl spaces under the building, shall be covered with preformed, molded sectional, bonded-glass-fiber pipe insulation. Pipe insulation shall have an average "K" factor not exceeding 0.25/Btu./sq.ft./inch/hour/degree/F. at 75 F. mean temperature. Insulation shall have a standard weight, factory-applied, white canvas jacket. In applying the canvas, flap shall be loosened and the cylinder opened, then carefully fit the insulation to the pipe so that the end to end and the longitudinal joints are tightly butted together to give heat-tight joints. Secure the flap with wheat paste and smooth out to give a neat and finished appearance. Stapling will not be permitted. Insulation shall fit tight to pipe. Provide expansion joints at 30-foot intervals in all continuous runs of pipe which have no side take-offs.



1. Piping sized  $1\frac{1}{4}$ " and smaller shall be covered with 1" thick insulation. Piping sized  $1\frac{1}{2}$ " and larger shall be covered with  $1\frac{1}{2}$ " thick insulation. All sizes of condensate return lines shall be covered with 1" thick insulation.
  2. All fittings, valve bodies, unions, flanges, and pipe hangers on steam supply lines shall be insulated with a layer of Eagle-Picher, or approved equal, "One-Cote Cement", followed by a  $\frac{1}{2}$ " layer of Eagle-Picher No. 99, or approved equal, asbestos finishing cement. Both layers of insulation and finishing cement shall be troweled to a smooth even finish and shaped to give a neat appearance. Finish with standard weight canvas pasted in place. Insulation shall have the same thermal characteristics as specified above for piping. Hanger rods and turnbuckle adjusters shall not be insulated. The thickness of the "One-Cote Cement" layer for fittings, on  $1\frac{1}{4}$ " and smaller lines shall be 1", on  $1\frac{1}{2}$ " and larger lines thickness shall be  $1\frac{1}{2}$ ". The thickness of the "One-Cote Cement" layer for fittings on all condensate return lines shall be  $\frac{3}{4}$ ".
- (B) All refrigerant suction lines shall be covered with preformed molded sectional bonded glass fiber pipe insulation. Pipe insulation shall be low pressure Type 7 $\frac{1}{4}$ # density,  $1\frac{1}{2}$ " thick with an average "K" factor not exceeding 0.25 Btu. per square foot, per inch, per hour, per degree Fahrenheit, at 75 F. mean temperature. Insulation shall have a factory applied integral vapor barrier jacket. Coat entire longitudinal lap with vapor barrier adhesive Morningstar Paisley's Tac Spread or approved equal. Adhere tightly and smoothly in place. No staples will be permitted. Each longitudinal joint - wrap  $\frac{1}{4}$ " wide band of vapor barrier jacket material coated on one side with the above type of adhesive tightly around each joint.

All fittings, unions, flanges, and pipe hangers shall be insulated with flexible glass fiber blanket insulation wrapped firmly under compression, minimum 2 to 1 and held in place with spiral windings of jute twine. Spiral vapor barrier tape over the blanket insulation and to the adjacent pipe insulation a minimum of one inch making sure a complete vapor barrier has been accomplished. Finish with Ryder Industries One Kote Cement troweled to a smooth even finish and shaped to give a neat appearance. Apply 6 ounces canvas jacket over the insulating cement and apply an additional finish cover of white 6 ounces canvas over piping insulation.

- (C) Line the following sheet metal ducts with insulation in thicknesses listed:

All rectangular low velocity supply ducts (downstream from high velocity boxes):  $1\frac{1}{2}$ "

All low velocity return ducts (upstream from return air valves):  $1\frac{1}{2}$ "

All exhaust ducts:  $1\frac{1}{2}$ "

Line ducts with Gustin-Bacon "Ultra-Liner", or approved equal, variable density, acoustical insulation with heavy density surface on air stream side. Liner and coating shall comply with N.B.F.U. Bulletins No. 90-A and B. Cut insulation  $\frac{1}{4}$ " past drive connections so that insulation will be compressed at each joint. Adhere the liner to all interior sides of the duct with 100% coverage of the



clean sheet metal using Minnesota-Mining adhesive EC-1128. Apply insulation to the flat metal sheet and form with the metal through the brake. Butt all joints in the insulation firmly and tight. Cut liner accurately and thoroughly coat ends so that when the duct section is installed, the liner will make a firmly butted and tightly sealed joint. On ducts 18" or over in width or breadth, further secure the liner with sheet metal screws and caps plated on not more than 18" centers both vertically and horizontally and point up caps with adhesive. Seal all joints in the sheet metal work on the outside of duct with Sealfas 30-36 vapor barrier coating, painted on, to provide a tight vapor barrier. Miter insulation at branch duct take-offs in such a manner that no unfaced insulation will be exposed to the air stream. The ducts shown on the drawings have been sized to allow for the duct lining and the sizes shown are to be the actual sheet metal sizes.

- (D) Insulate externally the following duct work with insulation in thicknesses listed:  
 All round low velocity supply ducts (downstream from supply boxes): 1"  
 All cold high velocity supply ducts (rectangular and round): 2"  
 Insulation shall be Gustin-Bacon #75 "Ultralite", or approved equal, 3/4 lb./cu.ft. density, glass fiber insulation with laminated, reinforced aluminum foil-kraft paper facing. Secure insulation to ducts by use of pins and caps placed so the insulation will be held tight to the duct. Edges shall be tightly butted together. Longitudinal joints shall have overlaps taped with J. M. Dutch Branch pressure sensitive tape, 3" wide. Further cover ducts in basement with 6 ounce canvas.
- (E) The masonry air plenums for return air fans, heating and cooling coils, etc., in the mechanical equipment room will be insulated by the General Contractor. The sheet metal plenums and duct work for fan discharge transitions, silencers, and connections to masonry plenums shall be insulated by the Mechanical Contractor with 2" thickness Gustin-Bacon #600 "Ultra-Lite" 6-lb. per cubic foot density glass fiber insulation with facing of linenized pattern white vinyl scrim foil laminated to aluminum foil. Secure insulation to sheet metal by means of pins and caps placed at 12" on centers horizontally and vertically. All end and longitudinal seams, sheet metal caps and screws shall be covered with 4" wide asbestos paper applied with wheat paste and vapor sealed with vapor barrier mastic.
- (F) The high velocity return air ducts (between return air valves and return air fan plenums) and the hot high velocity supply ducts (between heating coil plenums and high velocity supply boxes) are not to be insulated.
- (G) Certain manufacturer's products are specified in the insulation specifications. Equivalent products by Pittsburgh-Corning, Gustin-Bacon, Pittsburgh Plate Glass, or Armstrong may be used upon approval by the State Architect.
- (H) End Protectors: Provide Cheney-Royal, Grabler, or Stembridge 20 gauge aluminum clasp type insulation end covering cups for end of insulation at equipment and at all other points where insulation stops.



60:09. Specialties:

- (A) Furnish and install the following specialty items. See diagrams and details on the drawings for details of installation.
- (B) Thermometers shall be Weksler Instruments Type No. AA5a, or approved equal, adjust angle industrial thermometers with 7" scale,  $3\frac{1}{2}$ " stem length and separable socket. Scale range 30 F. to 180 F.
- (C) Pressure gauges shall be Marshalltown, Crosby, Ashcroft, or approved equal,  $4\frac{1}{2}$ " dial pressure gauges with cutoff cocks. Gauges shall have black enameled cases with nickel plated rings.

60:10. Steam Traps:

- (A) Float and thermostatic traps shall be installed in the return connection of low pressure mains and elsewhere as indicated on the drawings. The size and capacity of these traps shall be ample for the equipment served, but in no case smaller than shown on the drawings. These traps shall be designed for steam working pressures up to 15 lbs. per square inch guage. Each float and thermostatic trap shall be provided with a hand bronze valve seat and mechanism and a brass float, all of which can be easily removed for inspection or replacement without disturbing the piping connections. The inlet to each trap shall have a brass strainer as an integral or separate part of the trap. Traps shall be as manufactured by Sarco, Trane, Dunham, or approved equal.
- (B) Radiator traps: Trane, Dunham, or Sarco designed for pressures up to 15 psi.; cast bronze bodies, forged brass covers, brass tail pipes and collars. Brass bellows type thermostatic member; seats and plungers of stainless steel and shall be removable.
- (C) Furnish and install bucket traps in high pressure steam main drips and elsewhere as indicated on the drawings. Bucket traps shall be designed for 150 psig. working pressure and shall be factory tested at 200 psig. Traps shall have heavy body and cap of fine grained gray cast iron; stainless steel bucket, valve seat, lever, valve retainer; and chrome seat. Traps shall have ample capacity for the equipment served, but in no case less than 200 pounds of condensate per hour when operating with a 5 psig. pressure differential and a continuous discharge. Traps shall be as manufactured by Armstrong, or approved equal.

60:11. Strainers:

- (A) Basket or "Y" type strainers shall be the same size as the pipe line in which they are installed. The bodies shall have arrows clearly cast on the sides to indicate direction of flow. Each strainer shall be equipped with an easily removable cover and sediment basket. The strainer bodies shall be heavy, durable, and of the best grade gray cast iron with bottoms drilled and plugged. The basket shall be of not less than 0.025" thick (22 gauge) sheet brass having perforations to provide a net free area through the basket of at least four times that of the entering pipe. The flow shall be into the basket and out through the perforations.



60:12. Low Velocity Sheet Metal Duct Work:

- (A) Low velocity duct work includes all exhaust ducts; mechanical equipment room ventilation duct work, supply ducts downstream from supply boxes, and return ducts upstream from return air valves.
- (B) Sheet metal shall be best grade prime open hearth galvanized sheet steel as manufactured by American Rolling Mills, Republic Steel, or approved equal. All gauges, joints, and reinforcing shall be in accordance with the following schedule for greatest dimension of duct or housing. Letters (A), (B), etc. refer to joint details shown on the drawings.

<u>Duct Dimension</u>	<u>Metal Gauge</u>	<u>Transverse Joints</u>		<u>Stiffeners</u>		<u>Longitudinal Joints</u>
		<u>Wide Side</u>	<u>Narrow Side</u>	<u>Size</u>	<u>Max. Spacing</u>	
0"- 24"	24	(B)	(A)	NONE		(L) or (W)
25"- 36"	22	(C)	(A)	1" x 1" x 1/8"	5'-0"	(L) or (W)
37"- 59"	20	(D)	(A)	1 1/4" x 1 1/4" x 1/8"	5'-0"	(L) or (W) and (N)
60"- 72"	18	(D)	(A)	1 1/2" x 1 1/2" x 1/8"	5'-0"	(L) and (N)
73"- 96"	18	(F)	(A)	1 1/2" x 1 1/2" x 3/16"	5'-0"	(L) and (N)
97"-120"	18	(F) or (K) at 4'-0"	(A)	2" x 2" x 3/16"	4'-0"	(O) or (L) and (N)
121"-144"	18	(F) or (K) at 3'-0"	(A)	2" x 2" x 3/16"	3'-0"	(O) or (L) and (N)
		centers without stiffeners				

- (C) Support ducts with 3/16" rods or strap iron hangers attached to bottom of ducts and to ceiling structure and bracing with toggle bolts or other approved means. Space hangers at not over 5'-0" on centers. Cross break all duct panels.
- (D) Install air turning vanes on all changes in direction greater than 15°. Turning vanes shall be as detailed on the drawing or manufactured turning vanes, Barber-Colman "Airturms" or approved equal.

60:13. Flexible Connectors:

- (A) Provide flexible connectors at all duct connections to supply fans, return air fans, exhaust fans, and ventilating unit.
- (B) Construct connections with "Ventglas" fire retardant, waterproof, mildew-resistant fabric, 6" wide as manufactured by Ventfabrics, Inc., or approved equal.



60:14. High Velocity Duct Work:

- (A) High velocity duct work includes all supply ducts between supply fans and supply boxes, all return ducts between return air valves and return air fans, and all air unit housings.
- (B) Sheet metal for high velocity duct work shall be best grade prime open hearth galvanized sheet steel as manufactured by American Rolling Mills, Republic Steel, or approved equal. All gauges, joints and reinforcing shall be in accordance with the following schedule for greatest dimension of duct or housing. Letters (A), (B), etc., refer to joint details shown on the drawings.

Duct Dimension	Metal Gauge	Transverse Joints		Stiffeners		Longitudinal Joints
		Wide Side	Narrow Side	Size	Max. Spacing	
0"-12"	22	(B)	(A)	NONE		(L) or (W)
13"-18"	20	(B)	(A)	NONE		(L) or (W)
19"-30"	20	(C)	(A)	1" x 1" x 1/8"	4'-0"	(L) or (W)
31"-42"	18	(D) or (E)	(A)	1" x 1" x 1/8"	4'-0"	(L) or (W) and (N)
43"-54"	18	(D) or (E)	(A)	1 1/2" x 1 1/2" x 1/8"	4'-0"	(L) and (N)
55"-60"	16	(F)	(A)	1 1/2" x 1 1/2" x 1/8"	4'-0"	(L) and (N)
61"-84"	16	(F)	(A)	1 1/2" x 1 1/2" x 3/16"	2'-0"	(L) and (N)
85"-96"	14	(H) or (K)	(A) or (K)	1 1/2" x 1 1/2" x 3/16"	2'-0"	(O) or (L) and (N)
Over 96" housings	14	(J) or (K)	(A) or (K)	2" x 2" x 1/4"	2'-0"	(O) or (L) and (N)

- (C) Support ducts with 3/16" rods or angle iron hangers attached to the bottom of ducts and to concrete structure. Space hangers at not more than 5'-0" on centers. Construct joints similar to those detailed on drawings. In addition, seal each joint completely air tight with caulking compound, 3M EC-800, or approved equal. All high velocity duct work shall be absolutely air tight.
- (D) Round high velocity ducts: United Sheet Metal Co. "Spiral", equivalent Carrier or approved equal, lock seam prefabricated spiral conduit constructed of galvanized sheet steel - 25 gauge up to 8" diameter and 24 gauge in diameter larger than 8". All fittings, elbows, take-offs, etc., shall be prefabricated units constructed of 20 gauge galvanized sheet metal with welded joints. Seal joints between sections of spiral duct and between spiral duct and fittings with 3M EC-800 caulking compound.
- (E) Test all high velocity supply ducts and housings with air at a pressure of 8" of water. Provide temporary pressure blowers and test duct work in sections. While pressure is being maintained, carefully inspect for leaks and check all joints with soap suds. Make sure that all duct work is absolutely air tight before any insulation is applied, or before any ceilings are installed. If any leaks develop within one year after acceptance of the building by the State, it will be the responsibility of the Mechanical Contractor to stand all expenses involved in repairing the system.



60:15. Flexible Ducts:

- (A) Flexible air duct shall be used at connection to every supply box and elsewhere as shown on the drawings. Flexible ducts shall be Wiremold Type 54, Thermaflex, or approved equal, constructed of a coated fabric with a mineral core and a non-corrosive steel supporting spiral. Flexible duct shall be listed by Underwriter's Laboratories and shall have a flame spread rating not exceeding 25 and a smoke developed rating not exceeding 50. All flexible ducts shall be factory pre-insulated with 1" of 3/4 lb. density fiber glass blanket sheathed with an exterior vapor barrier. Insulation shall be rated by UL the same as the flexible duct. Flexible duct shall be joined to rigid duct and supply box inlet by coating male outlets with 3M-#EC-800 compound and then placing flexible duct. Joints shall be further secured with hose clamps securely tightened in place.

60:16. High Velocity Supply Boxes:

- (A) Supply boxes shall be Buensod-Stacey Type H or HL, equivalent Carnes, Barber-Colman, Tuttle and Bailey, or Anemostat, double duct mechanical constant volume type mixing boxes complete with valve linkage for automatic temperature control, construction of not lighter than 20 gauge galvanized sheet metal, 1" coated Fiberglas lining, constant volume regulator, sound attenuation chamber, hot and cold inlet valves. The temperature control motor shall be factory-mounted, linked and calibrated. Constant volume regulator shall be factory-adjusted and calibrated to deliver the CFM of air indicated on the drawings. Provide access panel in bottom of box for access to constant volume regulator.
- (B) Supply boxes and air valves have been sized on the drawings for operation with a minimum of static pressure available at box inlet as shown on box schedule. Boxes and valves shall have a Sound Pressure Level Index not exceeding the HC-40 curve as shown on the 1963 ASHRAE Guide at the CFM rating shown on the drawings with air at 2" static pressure entering the box and using 5db. for duct lining and 15 db. for room attenuation.

60:17. Return Air Valves:

- (A) Return air valves shall be Anemostat Type LPL, equivalent Titus, Barber-Colman, Tuttle and Bailey, or Carnes, manually operated valves constructed of neoprene gasketed blades in a galvanized steel frame. Pivots, slides, and bearings shall be nylon. Provide manual operating crank.

60:18. Registers, Grilles, and Diffusers:

- (A) Type A: Titus Model TMS-T square ceiling supply diffusers. Furnish diffusers with baked white enamel finish to match ceiling T-bar finish. Provide diffusers for mounting in T-bar ceiling suspension system. Provide Model AG-75 radial deflector dampers for diffusers where more than one diffuser are connected to a supply box.



- (B) Type B: Titus Model TMS surface type square ceiling supply diffusers with baked enamel white finish. Provide Model AG-75 radial deflector dampers where more than one diffuser is connected to a supply box.
- (C) Type C: Titus Model S-277 adjustable deflection wall supply registers with prime coat finish and opposed blade damper.
- (D) Type D: Titus Model RL-251 return air or exhaust registers with prime coat finish and opposed blade dampers.
- (E) Type E: Titus Model RH-50 extruded aluminum return air registers with  $\frac{1}{2}$ " fixed aluminum louvers adapted to fit a T-bar ceiling suspension system. Provide opposed blade dampers.
- (F) Type F: Titus Model RH-50 extruded aluminum return or exhaust air registers with  $\frac{1}{2}$ " fixed louvers and key operated opposed blade damper. Border shall be suitable for use in acoustical tile or plaster ceiling.
- (G) Type G: Titus Model ML-3500 extruded aluminum linear diffuser with one slot and adjustable vanes.
- (H) Type H: The Electrical Contractor will furnish air-light type troffers with metal filler strips covering the flange air trim openings. Where supply air units are indicated, the Mechanical Contractor shall remove the filler strips and install Titus Model LT-10 ceiling diffusers. Each diffuser shall be equipped with a built-in air volume controller and an air flow pattern controller. In addition to the supply units, the Mechanical Contractor shall remove all metal filler strips from the air troffers to allow the flange air trim openings to serve as return air openings. All troffers not used as supplies will be used for return air to allow return air to enter the return air plenum space above the ceiling.
- (I) Type J: Titus Model TMD-SI square ceiling diffusers arranged for four-way diffusion. Provide AG-125 Ductrol.
- (J) Set all registers, grilles, and diffusers on sponge rubber or felt gaskets. Furnish steel units with prime coat of paint. Furnish aluminum units with brushed satin finish.
- (K) Equivalent registers, grilles, and diffusers by Anemostat-Waterloo, Barber-Colman, or Tuttle and Bailey may be used upon approval of the State Architect.

60:19. Dampers and Damper Regulators:

- (A) Provide Titus AG-45, or approved equal, 14 gauge steel air volume extractors on low velocity supply branch take-offs where indicated. Provide a No. 2 adaptor for regulator control.
- (B) Provide splitter dampers, constructed of 16 gauge steel metal and 5/16" damper rod at locations shown on the drawings.
- (C) Provide Young No. 403B, equivalent Ventlok, or approved equal, damper regulator on all air volume extractors and splitter dampers.



60:20. Fresh Air and Exhaust Louvers:

- (A) Fresh air louver and exhaust louvers shall be Titus OXL-02, or approved equal, all aluminum constructed unit, size as shown on plans. Provide #2 mesh aluminum bird screen on back face of louvers. Thoroughly caulk around frame to provide a complete weatherproof installation.

60:21. Exhaust Fans:

- (A) Exhaust fans #1 and #2 shall be Carnes, equivalent Jenn-Air, Cook, or approved equal, low contour roof exhausters with balanced non-overloading centrifugal blowers, heavy gauge weatherproof housings, aluminum mounting bases, bird screens, and back-draft dampers. Provide disconnect switches at fans. Motors shall be 120 V., single phase with automatic reset overload protection. Fan sizes and capacities shall be:  
 Exhaust Fan #1: Carnes, Model BE3-24A 2070 cfm. at  $\frac{1}{4}$ " sp.,  $\frac{1}{4}$  HP motor.  
 Exhaust Fan #2: Carnes Model D12-10B, 640 cfm. at  $\frac{1}{4}$ " sp., 1.8 HP motor.
- (B) Exhaust fans #3 and #4 shall be ILG Size PD303, #1270, or approved equal, square panel type direct drive propeller fans with a capacity of 7800 cfm. each at 0" sp. and 685 rpm. Furnish fans with size 30" motor operated shutters,  $\frac{3}{8}$ " HP - 120 V. - single phase motors and line voltage A.C. magnetic motor starters with overload protection.

60:22. Supply Fans and Return Air Fans:

- (A) Fans shall be Trane Type DW AF, equivalent American Blower, Chicago Blower, or approved equal, backward curved air foil, double inlet, double width. Arrangement #3, centrifugal type blower with a capacity as shown in the following schedule. Furnish units complete with multi-sheave V-belt pulleys, V-belts, vibration isolation rails for fan and motor, 480 V. - three phase, single speed motors and magnetic across-the-line starters as hereinbefore specified. Vibration eliminators shall be Korfund or Vibration Mountings with rubber as the isolation media.

Fan capacity data:

	Supply Fan #1	Supply Fan #2	Return Fan #1	Return Fan #2
Model No. (Trane)	DW36AF	DW33AF	DW40AF	DW40AF
Fan Capacity - cfm.	34,475	29,302	30,186	26,832
Total Static Pressure - inches	5.70	5.30	1.75	1.75
Brake Horsepower	36.95	30.14	10.90	9.22
Fan rpm.	1122	1238	628	596
Motor Horsepower	40	30	15	10
Capacitors Required	Yes	Yes	Yes	No

60:23. Heating and Cooling Coils:

- (A) Heating coils and cooling coils shall be extended surface coils with aluminum fins, continuous plate-type, spaced 8 fins per inch and bonded to copper tubes. Tubes shall be 5/8" O.D. seamless copper and headers shall be heavy gauge seamless drawn copper tubing. Coils shall have flanged 16 gauge galvanized steel casings and end tube sheets. Coils shall be factory tested with 300 psig. pneumatic pressure under water. Provide intermediate center supports on all coils exceeding 53' in length.
- (B) Cooling coils shall be direct expansion coils designed and serpentine for refrigerant 22 according to the following conditions. Provide necessary multi-circuit distribution, expansion valves, capillary tubing, solenoid valves, etc., as indicated on the drawings and as required. Connect coils for counter-flow of air and refrigerant.
- (C) Heating coils shall be standard steam coils. Connect coils for counter-flow of steam and air.
- (D) Coil capacity data:

	<u>Air Unit #1</u>	<u>Air Unit #2</u>
Total Air - cfm.	34,275	29,302
Outside Air - cfm.	6400	5860
<u>Cooling Coil Data:</u>		
Estimated Max. Air Flow	32,000	29,302
Size	2 @ 120"L.x36"H.	2 @ 120"L.x36"H.
Face Area - sq.ft.	60 (Total)	60 (Total)
Face Velocity - fpm.	533	488
Number of Rows	6	6
Air Entering Coil F.	81.2 D.B. & 66.9 W.B.	81.2 D.B. & 66.9 W.B.
Air Leaving Coil F.	53.0 D.B. & 52.3 W.B.	53.0 D.B. & 52.3 W.B.
Space Sensible Load Btuh.	860,530	792,840
Space Total Load Btuh.	941,370	880,450
Total Cooling Load Btuh.	1,430,000	1,328,000
Refrigerant	22	22
Suction Temperature	40 F.	40 F.
<u>Heating Coil Data:</u>		
Estimated Max. Air Flow -cfm.	19,975	20,800
Size	2 @ 48"L.x36"H.	2 @ 48"L.x36"H.
Face Area - sq.ft.	24 (Total)	24 (Total)
Face Velocity - fpm.	832	867
Number of Rows	2	2
Air Entering Coil F.	54.0	54.0
Air Leaving Coil F.	100.0	107.5
Space Heat Load - Btuh.	647,190	842,400
Total Heat Load - Btuh.	992,360	1,201,800
Steam Pressure - psig.	2	2
Steam Required #/hr.	1027	1244



60:24. Humidifiers:

- (A) Humidifiers shall be Armstrong, or approved equal, of a type which discharge clean, dry steam without drip or objectionable noise. Humidifier design shall utilize a steam jacketed valve and separating chamber, and asbestos wick muffler, and a stainless steel steam jacketed distribution manifold for this purpose. Each humidifier shall be furnished with a normally closed full modulating direct acting pneumatic valve, a .045" perforated strainer, an inverted bucket trap and a suitably sized stainless steel discharge manifold equipped with internal silencing screen. Installation shall be in accordance with manufacturer's recommendations.
- (B) Humidifier sizes and capacities shall be:
  - Air Unit #1: Armstrong #AMH-34D-M with 13/16" orifice. 160 #/hr. capacity with 2 psig. steam.
  - Air Unit #2: Armstrong #AMH-34D-M with 11/16" orifice. 130 #/hr. capacity with 2 psig. steam.

60:25. Air Filters:

- (A) Air filters for Air Units #1 and #2 shall be Cambridge Filter Corporation #SC-D-60-100, equivalent American Air Filter or approved equal, side servicing "Side-Cap" filters with a capacity (each) of 37,500 cfm. at .25" sp. initial pressure drop. Filter bank dimensions shall be approximately 6'-1-3/8" H. x 10'-0" W. x 20" D. with 15" deep cartridges.
- (B) Units shall consist of a completely factory assembled housing with upstream and downstream flanges for securing to duct work system. Housing shall be manufactured of suitable reinforced 16 gauge galvanized steel. Access doors with internal perimeter gasketing and positive locking devices shall be provided at both sides of the housing. When an access door is opened, "Hi-Cap" filter units shall be slid into the housing where they shall be retained on slide channels. The channels shall incorporate a woven pile gasket material to seal the top and bottom of the filter cartridge frames and prevent any by-pass. In addition, the filter cartridge frames shall be gasketed on the vertical sides. These cartridge frames may be loaded or unloaded through either access door.
- (C) Filter cartridges shall be Cambridge "Hi-Cap" filters with a minimum average efficiency by the N.B.S. atmospheric discoloration method of 30%. Each filter shall include a permanent frame, media retainer and a media cartridge. Media cartridge shall be preformed and shall consist of two layers modified acrylic fiber treated to make it fire resistant. Downstream layer shall be treated with adhesive.
- (D) Provide a Cambridge #6A25 manometer for each filter bank to indicate air pressure drop across the filters.



60:26. Air Units Construction:

- (A) Air Units #1 and #2 shall be built up air units constructed essentially as detailed on the drawings and including return air fan sections, fan silencers, humidifiers, diffuser plates, heating coil section, and cooling coil sections. The plenums for return air fans, mixed air, supply fans, and coils indicated to be constructed of brick will be constructed by the General Contractor. All sheet metal construction in conjunction with the air units shall be furnished by the Mechanical Contractor. The Mechanical Contractor shall furnish all necessary structural angles, anchors, and sealer to insure an air tight connection at all locations where sheet metal joins brick work or concrete floor or ceiling. Seal all joints with 3M EC-800 and obtain absolutely air tight joints. Provide structural steel angles both horizontally and vertically to support heating coils, cooling coils, and diffuser plates.
- (B) Where pipes pass through brick plenum walls, provide sleeves for pipes. After pipes are installed and tested, fill space between sleeve and pipe with oakum and caulk both sides with 3M EC-800 duct sealer.
- (C) Diffuser plates shall be Style E (diamond) grille as manufactured by Harrington and King Perforating Company, Inc., Chicago, Illinois. Material for plates shall be 3/16" thickness steel with painted finish. Grilles shall have 52% free opening.

60:27. Silencers:

- (A) Fan silencers for supply fans #1 and #2 shall be Elof Hansson #HL-650, equivalent Koppers or Industrial Acoustics, 60" W. x 60" H. x 6'-0" L. (25 sq.ft.) prefabricated duct silencers with a capacity of 36,250 cfm. at a pressure loss not to exceed .15". Outside casing shall be approximately 1/2" thickness and shall have sound and air sealing gaskets on all sides in the front and back of the sound absorber. All interior surfaces shall have erosion resistant screening. The silencers shall be not less than 72" long and shall have a minimum insertion loss when measured in octave bands as follows.

Octave Band	1	2	3	4	5	6	7	8
Insertion Loss (db.)	7	10	16	23	36	30	27	27

- (B) Ventilation silencers shall be Elof Hansson Model 350, equivalent Koppers or Industrial Acoustics, 3'-0" length silencers constructed with 22 gauge galvanized steel casing and inside facings, mineral wool sound absorption material. See plans for sizes required.



60:28. Ventilation Unit:

- (A) Ventilation unit for equipment room ventilating air shall be the blower section and mixing box section of a Trane #T-24 "TorriVent", equivalent American-Blower, American Air Filter, or approved equal, with a capacity of 14,000 cfm. at 1/2" sp., 1389 fpm. outlet velocity and 476 rpm. Casing shall be constructed of steel properly reinforced and braced for maximum rigidity. Panels and access doors shall be not less than 16 gauge. Unit to be without heating coil.
- (B) Fan section shall contain DWDI blower wheels with forward curved blades, self-aligning cast iron pillow block bearings, heavy gauge steel scrolls and adjustable V-belt drive.
- (C) Motor shall be standard NEMA open frame type, 3 HP, 480 V., three phase, continuous-duty motor. Furnish motor starter as hereinbefore specified.
- (D) Support unit by suspending it with hanger rods from under side of First Floor slab. Furnish and install Korfund Type V vibro-hanger, or approved equal, on each support rod.
- (E) Mixing box shall be a combination filter and mixing box section furnished with parallel blade dampers for mixing outdoor air and return air. Mixing box shall contain V-bank of permanent type, 1" thickness cleanable air filters.

60:29. Steam Pressure Reducing Station:

- (A) Provide a steam pressure reducing station complete as detailed on the drawings and including a three valve by-pass, main reducing valve, pilot valve, pressure gauges, safety relief valve and strainer.
- (B) Pressure reducing valve shall be a Spence Engineering Company Type ED, or approved equal, with a capacity to reduce 4800 lbs. of steam per hour from 125 psig. to 2 psig. Unit shall contain Type E main valve and Type D spring loaded pilot valve.
- (C) Relief valve shall be a Consolidated Type 1511, or approved equal, pop safety valve with a capacity of 4800 lbs/hr. and shall conform to A.S.M.E. Boiler Construction Code. Valve shall be set to relieve at 15 psig.

60:30. Cabinet Unit Heaters:

- (A) American Air Filter #3020, Model RW-111, arrangement #4, semi-recessed (9 1/2" recess) with capacity of 28.5 m.b.h. (each) with 2 psi. steam, 350 cfm. Equivalent Modine, Trane, Dunham-Bush, American Standard or Hesbitt. Cabinet constructed of furniture steel with baked enamel finish in color as selected by the State Architect. Heating elements constructed of copper tubes and aluminum fins. Forward curved centrifugal fans, shaft mounted on pillow block bearings, direct drive between motor and shaft, two speed, 115 volt, single phase motor with speed controller and overload protection. Provide 1" thick permanent type filters.



60:31. Basement Unit Heaters:

- (A) Unit heaters shall be Trane Model 240-S, equivalent AAF, Modine, Dunham-Bush, American Standard or Nesbitt horizontal propeller unit heaters with a capacity at high speed of 229,700 Btuh. (each) at 1100 rpm., 3300 cfm., with 2 psig. steam. Provide unit heaters with heating coil constructed of aluminum fins and red brass tubes; two piece 18 gauge steel casing finished with baked-on enamel; louver fin diffuser; aluminum blade propeller fan; and three speed - 120 V. - single phase motor with overload protection. Furnish with three speed switch.

60:32. Condensate Pump Unit:

- (A) Condensate pump unit shall be a Weil Pump Company VCS 1643, Gould or Chicago, automatic single unit underground condensate pump with 20,000 sq.ft. EDR capacity and 30.0 gpm. pump capacity at 20 psi. discharge pressure with 24" diameter x 36" deep cast iron basin. Heavy cast iron cover plate with all necessary openings, including handhole. Pump to be of the vertical centrifugal type having a stainless steel shaft, bronze closed type impeller, cast iron casing. Lower bearings of the self lubricating sleeve type; upper bearings of the ball thrust type. Pump to be connected through a flexible coupling to a 1 HP, 480 V. - three phase open type vertical electric motor. Provide across-the-line magnetic starter. Pump shall be automatically controlled by means of pedestal mounted float switch with heavy seamless copper float and brass float rod with guide pipe. Float rod to have packing to prevent escape of steam.

60:33. Air Conditioning Refrigeration Compressor Units #1 and #2:

- (A) Compressor units shall be Trane Model 2 HE-260, equivalent Carrier, York, or approved equal, with a capacity each of 111.0 tons of refrigeration (each unit) when operated with 100 F. outdoor ambient temperature and 40 F. suction temperature with an air cooled condenser as hereinafter specified. Units shall be complete factory assembled units with two compressors mounted on a common frame with control panel factory wired and mounted and containing motor starters for both compressors, capacitor, and all safety controls.
- (B) Compressors shall be of the accessible hermetic or open reciprocating type with 1750 rpm., 480 V., 60 cycle, 3 phase motors. Compressors shall start unloaded, have at least three stages of capacity modulation and forced feed lubrication utilizing a positive feed reversible oil pump. Provide hot gas mufflers on compressor discharge lines.



- (C) Units shall be complete with compressors, starters and controls including dual pressure switch, differential oil pressure switches, safety thermostats, suction pressure controller, gauges, pressure relief valve, and charging valves. Units shall include factory installed and wired Sprague or Westinghouse capacitors to provide 93% power factor.
- (D) Each unit shall include an automatic temperature control system operated by oil pressure to provide step unloading of the compressor and reduced motor input at partial loads. The safety controls shall be factory assembled in the control panel. The controls shall include safety thermostat, non-cycling relay for pump down, terminal strip, differential oil pressure controller, dual pressure switches, and an on-off switch.
- (E) The units shall use refrigerant 22. Contractor shall provide necessary charge of refrigerant and oil to satisfactorily operate the compressors for one (1) year.
- (F) Contractor shall set units on Vibration Mountings and Controls, Inc. Series C "Spring-Flex", equivalent Korfund or approved equal, spring type vibration isolators. Size and loading of isolators shall be as designed by vibration isolator manufacturer.
- (G) Compressor units shall be furnished with sound insulating cabinets enclosing each compressor. Cabinets shall be constructed of 18 gauge steel, lined with not less than 1" thickness glass fiber insulation and finished with baked enamel finish.
- (H) Compressor motor starters shall be provided with auxiliary contacts to provide for interlocking of compressor motor starter with air cooled condenser motor. Units shall be wired so that when one compressor is started, one condenser fan motor starts; then, if the other compressor of the unit starts, the second condenser fan motor will start.

60:34. Air Cooled Condenser #1 and #2:

- (A) Air cooled condensers shall be a Trane #CA 12508, equivalent Marley, or approved equal, with a capacity of 111.0 tons with 100 F. entering air, and 40 F. suction temperature when used with Model 2 HE-260 compressor unit.
- (B) Unit casings shall have 10 gauge steel support casings with all other panels 14 gauge. Units shall have structural steel mounting base and shall be bolted to concrete pad. Finish on all surfaces shall be baked on epoxy, corrosion resistant finish.
- (C) Provide units with induced draft fan, steel shaft, V-belt drive, pillow block bearings, 7½ HP - 480 V. - three phase drip proof motor (two per unit) magnetic motor starter (for each motor), condensing coil constructed of 5/8" O.D. seamless copper tubing and aluminum fins.
- (D) Furnish units with automatic shatters controlled by direct acting pressure actuation. Head pressure control shall be arranged to allow operation of refrigeration at outdoor temperatures down to 40 F.
- (E) Furnish refrigerant receivers as recommended and required by manufacturer of condensers and compressor units.



60:35. Flexible Pipe Connectors:

- (A) Compressor connections: Where flexible connectors are indicated for connection to suction and discharge of refrigeration compressors, use flexible braided seamless bronze tubing with male or female copper tube ends for solder joint connections; American Brass Company, or approved equal. Length shall be as recommended by manufacturer for the various pipe sizes.

60:36. Steam Pipe Expansion Joints:

- (A) Expansion joints in steam lines shall be Adco Type "P", equivalent Yarway, or approved equal, piston-ring internally guided double end expansion joints with traverse as indicated on the drawings. Joints shall be designed for 150 psi. and shall be capable of being unpacked and repacked under full operating pressure.
- (B) Provide Adco, Model H pipe alignment guides both upstream and downstream from expansion joints.

60:37. Vibration Type Pipe Hangers:

- (A) On all pipe hangers for refrigerant discharge and suction lines in Room 12, provide Vibration Mountings and Controls, Inc., Type RH, or approved equal, neoprene in shear vibration pipe hangers. Provide sizes, loadings and arrangement as recommended by vibration hanger manufacturer.

60:38. Capacitors:

- (A) Provide low voltage indoor dustproof capacitors, Westinghouse, Sprag, or equal with all motors 15 HP and larger. Capacitors shall be furnished as part of the mechanical equipment and shall be sized by the motor manufacturer to provide a power factor of 93% minimum. Equipment requiring capacitors includes:  
 Air Conditioning Refrigeration Compressor Units  
     #1 and #2  
 Supply Fans #1 and #2  
 Return Air Fan #1

60:39. Temperature Control System:

- (A) Provide a complete system of pneumatic temperature control as manufactured by the Johnson Service Company, equivalent Powers Regulator or Minneapolis-Honeywell. Control system shall include all equipment and labor necessary to accomplish the specified operations and shall be installed by factory trained mechanics in the regular employ of the control manufacturer.
- (B) Air Piping: Run all air piping required from the compressor to various valves, thermostats, damper motors, E.P. switches, regulators, relays, and other miscellaneous devices requiring compressed air. Air piping shall stand 30# air test for 24 hours. The pressure drop for this period shall not exceed 10#. The air piping shall be copper tubing with soldered cast bronze fittings. Piping shall be concealed from view except where specifically approved otherwise



by the State Architect and shall be protected from possible injury throughout the period of construction. Air piping shall be substantially supported with pipe hangers or clamps.

- (C) **Thermostats:** Furnish and install at each location as indicated on plans an adjustable gradual acting room thermostat of ornamental design with thermometer. Room thermostats to be finished brushed aluminum or to match hardware as directed and located where directed. They shall control their respective valves, dampers, or operators with a graduated action and respond to a temperature range of as little as one degree when occurring at the thermostat. In finished rooms, thermostats shall be centered on finish regardless of location shown on drawings. All thermostats shall be furnished with approved type insulating base. Where thermostats are found to be located so as to give a false room temperature, same shall be moved to the proper location. Contractor shall get approval of thermostat locations from the State Architect prior to installation. Where duct type thermostats are required, provide gradual acting thermostat with liquid filled element and compensated capillary so as to properly sense the average temperature of the air in the duct. Each duct type thermostat shall be furnished with an air gauge and cut-off cocks.
- (D) **Diaphragm Valves for Coils and Other Uses:** Where diaphragm valves are required or shown on the drawings, furnish and install valves with bronze or steel bodies as required for particular type of service with disc seats of proper type for steam or water as required. Valve operators are to be moulded rubber diaphragm type. Valve bodies and tops to be painted a neutral color.
- (E) **Dampers:** Furnish and install where indicated on drawings, mixing dampers and fresh air dampers, exhaust dampers, shut-off dampers, and any other dampers required that are automatically controlled. All dampers shall be of size shown on the drawings or required and controlled as noted hereinafter. Where dampers are specified or shown as part of mixing boxes furnished with the air units, they shall not be part of this sub-contract, but shall comply with these specifications as to quality and power required to operate. Dampers shall be constructed of not less than #16 gauge sheet steel mounted in substantial angle, channel, or flat iron frame, fitted with approved type brass bearings, must close absolutely tight and fitted with angle wind stops on all four sides. Blades shall have felted interlocking edges. All dampers over 12" width shall be multi-louver.
- (F) **Damper Operators:** Furnish and install air damper motors for the control of all automatic louver dampers shown on the drawings and indicated in the schedules. Motors shall be of proper size to control the size dampers as shown, and mounted on substantial angle brackets in connection with damper frame. Damper operators shall be of the piston type and of ample size to operate the dampers in any intermediate position. These damper motors shall be controlled by pressure switches, electric pneumatic switches, thermostats or other devices as specified hereinafter.



- (G) Setting of Dampers and Valves: All automatic control valves shall be furnished by the temperature control manufacturer and installed under his supervision by the Mechanical Contractor. All automatic control dampers shall be furnished by the temperature control manufacturer and installed under his supervision by the Mechanical Contractor. Air connections and adjusting of all such equipment shall be the responsibility of the temperature control personnel.
- (H) Manual Switches: Furnish and install manual switches where specified to operate all controls as required and specified. Connect all controls so that the fresh air and exhaust dampers will close when the fan stops.
- (I) Thermometers: Furnish and install at each duct thermostat location a duct type 6" mercurial thermometer angle type. Locate thermometer where same can be easily read.
- (J) Air Compressor: Provide air compressor to supply air for all pneumatic controls and operating devices in the building. Compressor shall be air cooled with a capacity to handle the pneumatic control system when operating 1/3 of the time at 80 psig. operating pressure and 400 rpm. maximum. Compressor shall be belt-driven with automatic stop-start devices including a combination disconnect switch and starter. Receiver shall be suitable for 150 psig. working pressure and shall conform to the A.S.M.E. Code for Unfired Pressure Vessels. Unit to be complete with all accessories, including above mentioned starter and controls, pressure reducing valves, tank and low pressure gauges, relief valves, intake and discharge filters, discharge moisture removal devices, other required accessories. The moisture removal device shall be the refrigerated type similar to Johnson Service Company A-421.
- (K) Electrical Wiring: All line voltage wiring in connection with the temperature control system or other control systems will be furnished by the Electrical Contractor. All low voltage or electronic control wiring shall be completely furnished and installed by the temperature control sub-contractor.
- (L) Control Panels: A local sub-panel for each dual duct supply unit (two required) shall be provided adjacent to the unit. All control components, except damper motors and valves, shall be flush mounted, back piped and wired on these panels. This includes capillary thermostats, capillary thermometers, pneumatic relays, E.P. switches, P.E. switches and velocity controllers. A main air gauge and a branch air gauge for each controller shall be flush mounted on panel. All set point adjustments shall be made from the front of the panel. The panel material shall be a minimum 5/8" thick with formica facing laminated to the front similar and equal to graphmite. The edges shall be finished with matching plastic. Each instrument shall be permanently identified by means of a removable engraved name plate. Layout and fabrication drawings for the panels shall be a part of the over-all temperature control submittal and shall be approved before construction begins.



## (M) Central Control Center:

1. Furnish and install a MAGIC line free standing control center enclosure as manufactured by Johnson Service Company, or equal. Enclosure frame to be fabricated from aluminum alloy extrusions, and be capable of assembly and dismantling in the field, to permit relocation or alterations.
2. Frame is to be rigid and is to be formed without welds. The frame is to be provided with leveling bolts in each of the four corners of the base of the frame to permit final hand leveling of the enclosure.
3. Enclosure panels shall be plastic laminate on flakeboard, 5/8" thick. The panels shall be flat, showing no curvature, or warpage, and shall be impervious to water. The plastic laminate facing on the panels must be impervious to acids and alkalines and be hard and scratch resistant. Panels shall be in satin finish to reduce light reflectivity. Panels are to be supported firmly and securely in the aluminum frame and no screws or bolts shall penetrate the panels. Panel colors to be selected by the State Architect.
4. The interior of the enclosure panels and/or doors shall be non-reflective white. Access to inside shall be through door in end panel.
5. A 110 volt double outlet receptacle shall be provided on the interior of the enclosure. A 110 volt rapid starting fluorescent fixture, minimum 20" in length, together with self-actuating door switch and interlocked to all access doors shall also be provided on interior of enclosure.
6. Furnish and install an aluminum canopy light, securely attached to the enclosure frame at the top. Canopy to be extruded aluminum, with provision made for inserting plastic laminate strips on the fascia and ends, of a color to match or complement the enclosure, as selected by the Architect. Canopy shall be designed to reflect the light completely and evenly over the face panel, to eliminate shadows and dark spots. Canopy shall be equipped with rapid start fluorescent fixtures, extending the full width of the enclosure. Toggle switch to control canopy light shall be mounted on a corner post of the enclosure.
7. Furnish and install a work shelf on the enclosure. Shelf shall be 1-5/16" thick, 14" wide, be mounted on face of enclosure with top surface of shelf 30" from the floor and shall be covered on top, bottom, and edges with plastic laminate.
8. All electrical items furnished on panel shall be prewired to terminal blocks and identified for continuation of wiring by Electrical Contractor.
9. The face panel shall include the following functions:

Start-Stop Buttons and Pilot Indication for:

- Exhaust Fans #1 and #2
- Supply Fans #1 and #2
- Return Fans #1 and #2
- Equipment Room Vent Fan
- Air Conditioning Compressor #1 and #2

Pilot Indication For:

- Outdoor Air
- Mixed Air Units #1 and #2
- Hot Deck Units #1 and #2
- Cold Deck Units #1 and #2
- Return Air Units #1 and #2

Humidity Indication:

- 1st and 2nd Floors

Fresh Air Damper Position:

- Units #1 and #2

Graphic Indication:

- Units #1 and #2

10. Layout and fabrication drawings for the central control center shall be a part of the overall temperature control submittal and shall be approved before construction begins.



