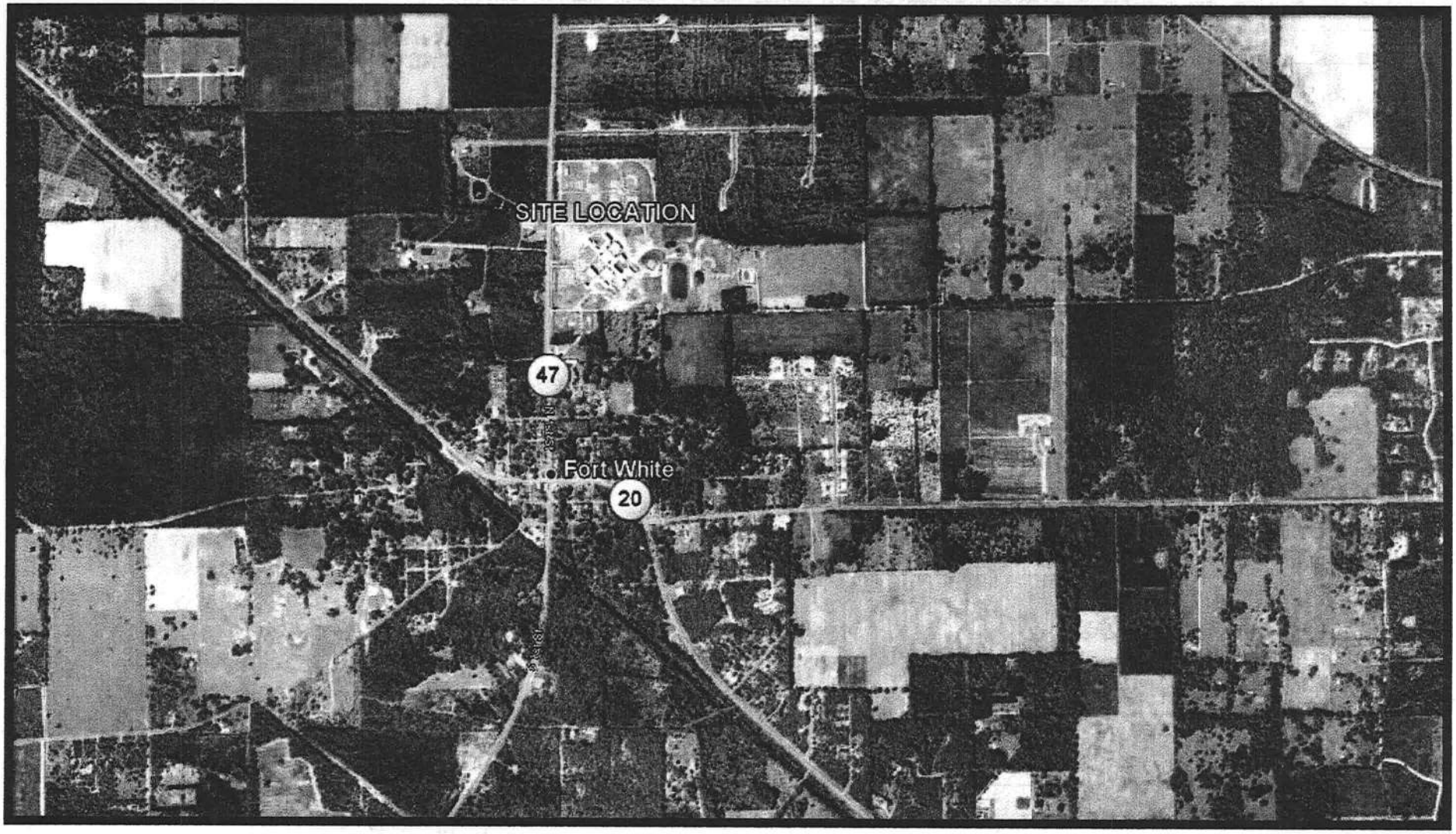
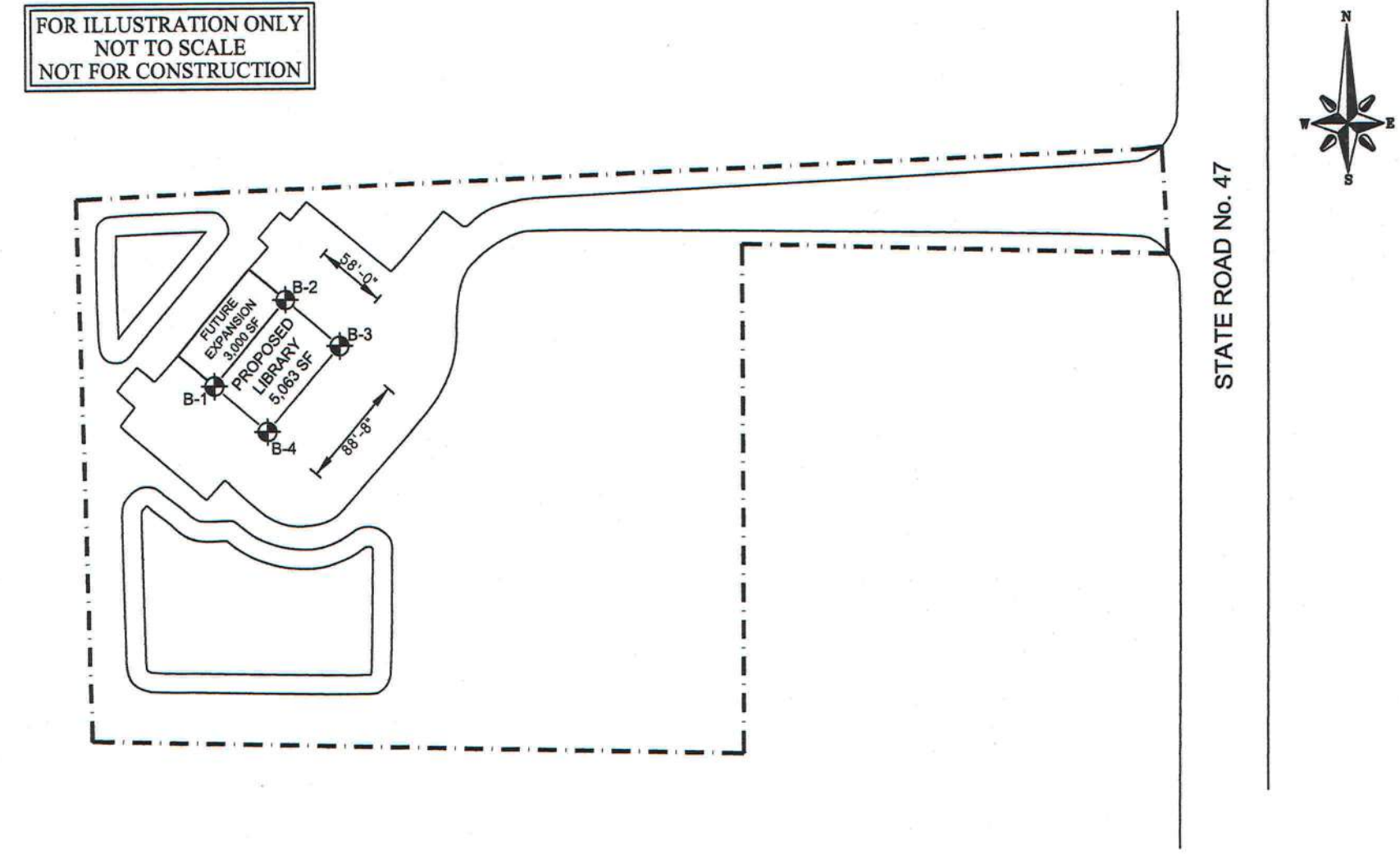


CAL-TECH TESTING, INC. **P.O. Box 1625** **Lake City, Florida 32056-1625** **Phone: (386) 755-3633** **Fax: (386) 752-5456**	**VICINITY MAP** **Ft. White Public Library** **SR 47 & Koonhollow Gln** **Ft. White, Columbia County, Florida** **Cal-Tech Testing Project No. 09-00436-01**

Figure 1

FOR ILLUSTRATION ONLY
NOT TO SCALE
NOT FOR CONSTRUCTION



STANDARD PENETRATION TEST BORINGS PERFORMED BY CTI ON NOVEMBER 05, 2009

GEOTECHNICAL EXPLORATION
FT. WHITE PUBLIC LIBRARY
SR 47 & KOONHOLLOW GLN
FT. WHITE, COLUMBIA COUNTY, FLORIDA

CAL-TECH TESTING, INC.
P.O. Box 1625
Lake City, Florida 32056-1625
Phone: (386) 755-3633
Fax: (386) 752-5456

FIELD EXPLORATION PLAN

Project No. 09-00436-01	DATE: 11-06-2009	FIGURE: 2
APPROVED:		SCALE: N.T.S.

0,0

CAL-TECH TESTING, INC.
3309 SW SR 247
Lake City, Florida 32024
Telephone: (386) 755-3633
Fax: (386) 752-5456

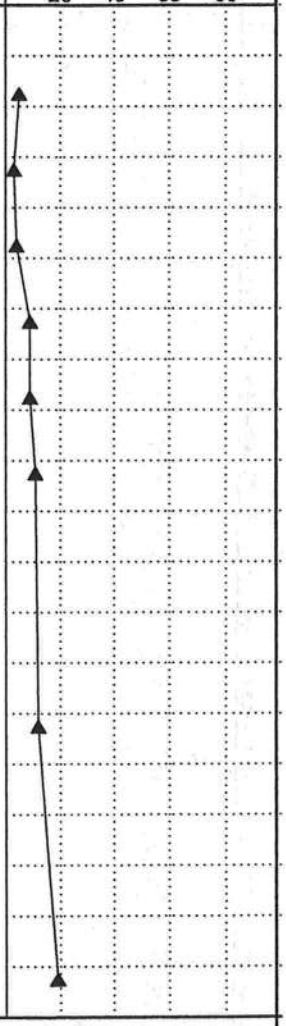
BORING NUMBER B-1

CLIENT Columbia County Board of County Commissioners
PROJECT NAME Ft. White Public Library
PROJECT NUMBER 09-00436-01
PROJECT LOCATION SR 47 & Koon Hollow Road, Columbia County, FL
DATE STARTED 11/05/09 **COMPLETED** 11/05/09
GROUND ELEVATION _____ **HOLE SIZE** 4"
DRILLING CONTRACTOR Cal-Tech Testing, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Continuous Flight Auger/Split Spoon
AT TIME OF DRILLING —
LOGGED BY N.H. **CHECKED BY** _____
AT END OF DRILLING — Not Encountered
NOTES BK-51 (manual hammer)
AFTER DRILLING —

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0		Brown, silty fine sand with organics (TOPSOIL)					
		LOOSE, gray to tan, fine sand with silt (SP-SM)	SPT 1		3-3-2 (5)		
			SPT 2		2-1-2 (3)		
5		LOOSE, yellowish tan, fine sand (SP)	SPT 3		2-2-2 (4)		
		LOOSE to MEDIUM DENSE, reddish brown with light gray mottles, clayey sand (SC)	SPT 4		3-4-5 (9)		
			SPT 5		4-4-5 (9)		
10			SPT 6		5-5-6 (11)		
15			SPT 7		5-6-6 (12)		
		VERY STIFF, light gray and reddish brown, sandy clay (CL)					
20			SPT 8		6-9-10 (19)		

Bottom of borehole at 20.0 feet.

▲ SPT N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
☐ FINES CONTENT (%) ☐ 20 40 60 80



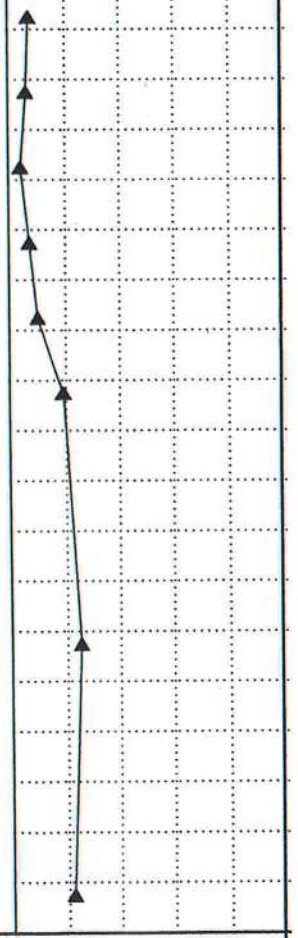
CAL-TECH TESTING, INC.
3309 SW SR 247
Lake City, Florida 32024
Telephone: (386) 755-3633
Fax: (386) 752-5456

BORING NUMBER B-2

CLIENT Columbia County Board of County Commissioners
PROJECT NAME Ft. White Public Library
PROJECT NUMBER 09-00436-01
PROJECT LOCATION SR 47 & Koon Hollow Road, Columbia County, FL
DATE STARTED 11/05/09 **COMPLETED** 11/05/09
GROUND ELEVATION _____ **HOLE SIZE** 4"
DRILLING CONTRACTOR Cal-Tech Testing, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Continuous Flight Auger/Split Spoon
AT TIME OF DRILLING ---
LOGGED BY N.H. **CHECKED BY** _____
AT END OF DRILLING --- Not Encountered
NOTES BK-51 (manual hammer)
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0		Brown, silty fine sand with organics (TOPSOIL)					
		LOOSE, gray to tan, fine sand with silt (SP-SM)	SPT 1		3-3-4 (7)		
			SPT 2		2-3-3 (6)		
5		LOOSE, yellowish tan, fine sand (SP)	SPT 3		1-2-2 (4)		
			SPT 4		2-3-4 (7)		
		MEDIUM DENSE, reddish brown with light gray mottles, clayey sand (SC)	SPT 5		4-4-6 (10)		
			SPT 6		6-8-11 (19)		
10							
			SPT 7		8-11-14 (25)		
15							
		VERY STIFF, light gray and reddish brown, sandy clay (CL)	SPT 8		6-10-12 (22)		
20		Bottom of borehole at 20.0 feet.					

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80



GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/06/09 12:45 - \\CALTECHSERVER\ALL LAKE CITY PROJECTS\2009\09-00436-01\09-00436-01 LOGS.GPJ

CAL-TECH TESTING, INC.
3309 SW SR 247
Lake City, Florida 32024
Telephone: (386) 755-3633
Fax: (386) 752-5456

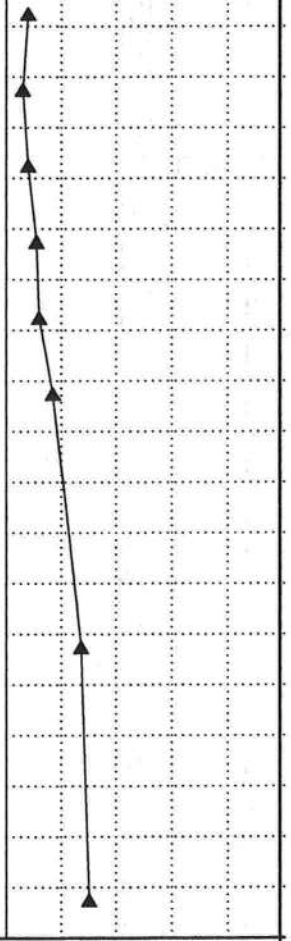
BORING NUMBER B-3

CLIENT Columbia County Board of County Commissioners
PROJECT NAME Ft. White Public Library
PROJECT NUMBER 09-00436-01
PROJECT LOCATION SR 47 & Koon Hollow Road, Columbia County, FL
DATE STARTED 11/05/09 **COMPLETED** 11/05/09
GROUND ELEVATION _____ **HOLE SIZE** 4"
DRILLING CONTRACTOR Cal-Tech Testing, Inc.
GROUND WATER LEVELS:
DRILLING METHOD Continuous Flight Auger/Split Spoon
AT TIME OF DRILLING —
LOGGED BY N.H. **CHECKED BY** _____
AT END OF DRILLING — Not Encountered
NOTES BK-51 (manual hammer)
AFTER DRILLING —

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)
0		Brown, silty fine sand with organics (TOPSOIL)					
		LOOSE, gray to tan, fine sand with silt (SP-SM)	SPT 1		4-4-4 (8)		
		LOOSE, yellowish tan, fine sand (SP)	SPT 2		3-3-3 (6)		
5			SPT 3		4-4-4 (8)		
		MEDIUM DENSE, reddish brown with light gray mottles, clayey sand (SC)	SPT 4		4-5-6 (11)		
			SPT 5		4-5-7 (12)		
10			SPT 6		7-8-9 (17)		
		MEDIUM DENSE, light gray silty clayey sand (SC-SM)	SPT 7		10-12-15 (27)		
15							
		VERY STIFF, light gray and reddish brown, sandy clay (CL)	SPT 8		8-13-17 (30)		
20							

Bottom of borehole at 20.0 feet.

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
☐ FINES CONTENT (%) ☐
20 40 60 80



GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/06/09 12:45 - \\CALTECHSERVER\ALL LAKE CITY PROJECTS\2009\09-00436-01\09-00436-01 LOGS.GPJ

KEY TO TEST DATA

STANDARD PENETRATION TEST:
Soil sampling and penetration testing is performed in accordance with ASTM D-1586. The standard penetration resistance ("*N*") is the number of blows of a 140-pound hammer falling 30 inches to drive a 2-inch O.D., 1.4-inch I.D. split spoon sampler one foot.

ROCK CORE DRILLING:
Rock sampling and core drilling is performed in accordance with ASTM D-2113. The rock quality designation percentage (RQD) is determined by summing only pieces of core that are at least 4 inches long, and dividing by the "run" length.

Relation of RQD and In-situ Rock Quality

RQD (%)	Rock Quality
90 -100	Excellent
75 - 90	Good
50 -75	Fair
25 - 50	Poor
0 - 25	Very Poor

RELATIVE DENSITY (SANDS):

Very loose - less than 4 blows/ft.
Loose - 5 to 10 blows/ft.
Medium - 11 to 30 blows/ft.
Dense - 31 to 50 blows/ft.
Very dense - over 50 blows/ft.

CONSISTENCY (SILTS & CLAYS):

Very soft - less than 2 blows/ft.
Soft - 3 to 4 blows/ft.
Medium stiff - 5 to 8 blows/ft.
Stiff - 9 to 15 blows/ft.
Very stiff - 16 to 30 blows/ft.
Hard - 31 to 50 blows/ft.
Very hard - over 50 blows/ft.

HARDNESS (ROCKS):

Soft - Rock core crumbles when handled.
Medium - Can break core with hands.
Moderately hard - Thin edges of rock core can be broken with fingers.
Hard - Thin edges of core can not be broken with fingers.
Very hard - Can not be scratched with knife.

GROUNDWATER:
Water levels shown on boring logs are taken immediately upon completion of boring, and are intended for general information. The apparent level may have been altered by the drilling process. Groundwater levels, if desired, can be monitored over a long time interval.

CAL-TECH TESTING, INC.
P.O. Box 1625
Lake City, Florida 32056-1625
Phone: 386-755-3633 Fax: 386-752-5456

5% Max. Passing the U.S. No. 200 Sieve ..... SP
5% - 12% Passing the U.S. No. 200 Sieve ..... SP-SM
12% - 50% Passing the U.S. No. 200 Sieve ..... SM/SC

Appendix B

Icynene Spray Foam Insulation

All physical properties were determined through testing by accredited third party agencies. Icynene® Inc. reserves the right to change specifications in its effort to enhance quality features. Please confirm that technical data literature is current.

Council of American Building Officials NER-420 Canadian Construction Materials Center 12070 -R

10. PACKAGING AND STORAGE

Packaging - 55 U.S. gallon, (45 Imperial gallon) open top steel drums

Component 'A'
- 500 lb. per drum
- Polylcynene® MDI

Component `B'
- 500 lb. per drum
- Polylcynene® Resin

Storage

Component A must be protected from freezing. Component B can be frozen but must be protected from overheating (120°F) and prolonged storage above 100°F. Component B separates during storage.

11. OPERATING SPECIFICATIONS

Operating Parameters:
Pressure - use maximum settings
Preheater - 130°F -160°F
Line Heat - same as preheater

Preparation

Component B is viscous and separates when left standing. It should be heated to about 80°F in the drum and mixed thoroughly to achieve a homogenous mix prior to and during use.

Yield

Yield will vary with the temperature of the substrate but an average of 15,000 bd.ft. per drum set can be expected, with higher yields expected in warm weather and lower yields in cold weather.

Refer to Icynene® Installers' Manual for expanded information

SPECIFICATIONS

NEW FT. WHITE BRANCH LIBRARY

For:

COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS
135 NE Hernando Ave. Rm 208
Lake City, FL 32055
C/o Mr. Ben Scott, Purchasing Director

COLUMBIA COUNTY BUILDING DEPARTMENT
Received for FILE COPY
Code Compliance
PLANS EXAMINER

3-10-10

By:

Akin & Associates Architects
2603 West Tharpe Street, Suite A
Tallahassee, FL 32303

CONSTRUCTION DOCUMENTS, Released:
10 March 2010

SPECIFICATIONS
NEW FT. WHITE BRANCH LIBRARY

TABLE OF CONTENTS

DIVISION 4	**MASONRY**
Section 04200	Unit Masonry
DIVISION 5	**METALS**
Section 05120	Structural Steel
Section 05500	Miscellaneous Metal Fabrications
DIVISION 6	**WOOD AND PLASTICS**
Section 06100	Rough Carpentry
Section 06160	Wood Sheathing
Section 06176	Metal-Plate-Connected Wood Trusses
Section 06200	Finish Carpentry
Section 06400	Architectural Woodwork
DIVISION 7	**THERMAL AND MOISTURE PROTECTION**
Section 07220	Building Insulation
Section 07270	Fire stopping
Section 07311	Shingles
Section 07600	Flashing and Sheet Metal
Section 07920	Sealants and Calking
DIVISION 8	**DOORS AND WINDOWS**
Section 08110	Hollow Metal Work
Section 08211	Wood Doors
Section 08500	Aluminum Windows, Entrances and Storefronts
Section 08710	Finish Hardware
Section 08800	Glass and Glazing
DIVISION 9	**FINISHES**
Section 09260	Gypsum Wall Board and Soffit Systems **(Drywall & Accessories only, no metal studs)**
Section 09300	Tile
Section 09510	Acoustical Ceilings
Section 09650	Resilient Flooring
Section 09680	Carpet
Section 09900	Painting
DIVISION 10	**SPECIALTIES**
Section 10155	Solid Plastic Toilet Compartments
Section 10426	Signage and Graphics
Section 10522	Fire Extinguishes and Cabinets
Section 10800	Toilet Accessories
DIVISION 11	**EQUIPMENT (Not Used)**
DIVISION 12	**FURNISHINGS (Not Used)**

DIVISION 13 **SPECIAL CONSTRUCTION (Not Used)**

DIVISION 14 **CONVEYING SYSTEMS (Not Used)**

DIVISION 15 **MECHANICAL (See Drawings)**

DIVISION 16 **ELECTRICAL (See Drawings)**

APPENDICES

"A" - Soil Boring Report (Geotechnical Exploration)

"B" - Icynene Spray Foam Insulation – Specifications/Cut Sheets

SECTION A

ADVERTISEMENT TO BID

COLUMBIA COUNTY, FLORIDA BOARD OF COMMISSIONERS
BID NO. 2009-Y

All State of Florida Licensed General Contractors that meets the requirements of Spec. Section "D" (Statement of Contractor's Qualification) are invited to bid on a General Contract for the Construction of a new Ft. White Branch Library in accordance with the Contract Documents. All bids must be a lump sum basis; segregated bids will not be accepted.

The Columbia County Board of County Commissioners will receive sealed bids until 10:00 a.m. local time on March 31, 2010. Bids received after this time will not be accepted. All interested parties are invited to attend the Bid Opening; Bids will be opened publicly and read aloud at the following location:

Columbia County Board of County Commissioners
Purchasing Department
135 NE Hernando Ave. Rm 208
Lake City, FL 32055

Drawings and Specifications may be obtained at the offices of Akin & Associates Architects, Inc. located at 2603 W. Tharpe Street, Suite A, Tallahassee, Florida 32303 (ph. 850-38502546) OR GTC Design Group, LLC 176 NW Lake Jeffery Road Lake City, FL 32055 (ph. 386-719-9985), in accordance with the Instructions to Bidders upon receipt of $75.00 payment per set. In order to manage the quantities of prints, bidders are asked to call in advance and indicate the number of sets they want. All materials furnished and all work performed shall be in accordance with Drawings and Specifications. Each Bid shall be addressed to:

Columbia County Board of County Commissioners
Purchasing Department
135 NE Hernando Ave. Rm 208
Lake City, FL 32055

and shall be marked:

1. Bids for: new Ft. White Branch Library
2. [Name of Bidder]
3. [Address of Bidder]
4. [City, State, Zipcode]
5. OWNER'S BID NO. 2009-Y

All bids shall be delivered by a representative of the Bidder or by registered mail with return receipt requested. Bid security in the amount of five percent of the Bid must accompany each Bid in accordance with the Instruction to Bidders.

In the event the Contract is awarded to the Bidder, Bidder shall, within ten (10) Owner business days after the award by the Owner of the Contract, furnish the required Performance and Payment Bonds; failing to do such, Bidder shall forfeit their bid guarantee as liquidated damages. The Performance and Payment Bonds shall be secured from any agency of a surety or insurance company, which agency shall have an established place of business in the State of

Florida and be duly licensed to conduct business there.

The Owner reserves the right to waive irregularities and/or informalities in any Bid and to reject any or all Bids in whole or part, with or without cause, and/or accept the Bid that in its judgment will be for the best interest of the Columbia County Board of County Commissioners.

A mandatory Pre-Bid Conference will be held at 10 a.m. on March 24, 2010, at The Ft White Community Center located at 17579 SW SR 47 Ft White, FL. All bidders or their representatives are required to be in attendance.

COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS, FLORIDA

BY: Ronald Williams
Chairman

PUBLISH: March 10 & 17, 2010

END OF SECTION A

SECTION B

INSTRUCTION TO BIDDERS

PROCUREMENT OF BID DOCUMENTS

General Contractors may secure Bidding Documents at the address indicated in the advertisement for bids upon receipt of the required $75.00 payment. General Contractors are limited to two (2) sets each, and Trade Contractors are limited to one (1) set each. At the Bidder's written request, and upon receipt of payment, Bid Documents will be sent collect via UPS.

1. DEFINITIONS:

1.01 All definitions set forth in the General Conditions of the Contract for Construction are applicable to these Instructions to Bidders.

1.02 Bidding Documents include the Advertisement to Bid, Notice to Prospective Bidders, Instructions to Bidders, Statement of Contractor's Qualification, General Conditions, Bid Bond, Performance and Payment Bond, Proposal Form, and the proposed Contract Documents including any Addenda issued prior to receipt of bids.

1.03 Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.

2. BIDDER'S REPRESENTATION:

2.01 Each bidder, by making his bid, represents that he has read and understands the bidding documents.

2.02 Each bidder, by making his bid, represents that he has visited the site and familiarized himself with the local conditions under which the Work is to be performed.

2.03 CRIME INFORMATION - A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public for the construction or repair of a public building or public work, may not submit bids on leases of real property to public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for period of 36 months from the date of being placed on the convicted vendor list.

3. BIDDING PROCEDURES:

3.01 All bids must be prepared using the forms contained in these specifications and submitted in accordance with the Instruction to Bidders.

3.02 A bid is invalid if it has not been deposited at the designated location prior to the time and date for receipt of bids indicated in the advertisement or invitation to bid, or prior to any extension thereof issued to the bidders.

3.03 Unless otherwise provided in any supplement to these Instructions to Bidders, no bidder shall modify, withdraw or cancel his bid or any part thereof for **60 days** after the time designated for the receipt of bids in the advertisement or invitation to bid.

3.04 Prior to the receipt of bids, Addenda will be mailed or delivered to each qualified General Contractor recorded by the Architect as having received the bidding documents and will be available for inspection wherever the bidding documents are kept available for this purpose.

3.05 Preparation and Submission of Bid Proposal Form:

(a) Each bidder shall copy the Proposal Form on Bidder's own letterhead and indicate their bid prices thereon in the proper spaces for the entire work and for the alternates on which they bid. Any erasures or other corrections in the bid must be explained or noted over the signature of the Bidder. Bids containing any conditions, or irregularities of any kind may be rejected by the Owner.

(b) Each Bid shall specify a unit price written in ink in both words and figures, for each of the separate items, as called for, except when the bid is called for on a lump sum basis. Lump sum bids shall be shown in both words and figures; where there is a variation between the written amount and figures, the low one will be taken as the bid price.

(c) Each bid must give the full business address of the bidder, and state whether he is an individual, corporation or partnership. Proposals by a corporation must be signed with the legal name and seal of the corporation followed by the name of the state of its incorporation and by the manual signature and designation of an officer, agent, or other person, authorized to bind the corporation. Proposals by partnerships shall show the names of all partners and must be signed in the partnership name by one of the partners or by an authorized representative. In either case, the partnership signature shall be followed by the manual signature and designation of the person signing.

In every case, the name of the person signing, and his designation, shall be typed or printed below his signature. A bid by a person who affixes to his signature the word "President," "Secretary," "Agent," or other designation without disclosing his principal may be held to be the bid of the individual so signing. Satisfactory evidence of the authority of an officer, agent, attorney, or other person signing for a corporation and for an agent, attorney, etc., signing for a partnership or an individual shall be furnished.

3.06 <u>BASIS OF BID</u>: The Bidder shall include with their Bid all unit cost items, quantity estimates and alternates indicated on the Bid Form. Failure to comply may be cause for rejection. If the Owner wishes to learn the relative or additional construction cost of alternate use of material, or an increase or decrease in scope of the project, these items will be defined as alternates and will be specifically described by the Drawings and/or the Specifications. Alternates will be listed in the Bid Form in such a manner that the Bidder shall be able to clearly indicate what sums will add to (or deduct from) their Base Bid. The Owner reserves the right to accept or reject any or all bids or combinations there-of as deemed in the best interest of the Owner.

No segregated Bids or assignments shall be considered.

3.06.1 Each Bidder shall, if so requested by the Owner, present further evidence of Bidder's experience, qualifications and ability to carry out the terms of the Contract, including a financial statement.

3.07 Modification of Bids: Bid Modifications will be accepted from Bidders if addressed to the Owner at the place where Bids are to be received (marked "Modification of Bid") and if received prior to the opening of the Bids. Modifications may be in written or telegraphic form. Modifications will be acknowledged by the Owner or the Architect before opening of formal Bids. Bid modifications written on the outside of the sealed Proposal envelope are acceptable when such notations are made and signed and dated by the Bidder prior to submittal for the bid. No notations may be made and signed by the Bidder after submittal of the bid. Modifications will be read by the Owner prior to opening of formal bids. It is the full responsibility of the Bidder to bring any Bid Modification to the attention of the person opening the bids at the time of opening of the affected bid.

3.08 Withdrawal of Bids: Bids may be withdrawn on written request received from bidders prior to the time fixed for opening. Such request shall be properly signed in accordance with the requirements pertaining to signatures contained on Page B-3, Paragraph 3.05(c). Negligence on the part of the bidder in preparing the bid confers no right for withdrawal of the bid after it has been opened.

3.09 Bid Guarantee - 5% (Total Bid - Base Bid Plus All Alternates) Bids shall be accompanied by a bid guarantee which shall be a Bid Bond (Signed or countersigned by a Florida Resident Insurance Agent), Cashier's Check, Certified Check (Certified Checks offered as Bid Guarantees must have Florida Documentary Stamps attached), or bank Draft, made payable to the COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS, FLORIDA. Such check or bond shall be submitted with the understanding that it shall guarantee that the Bidder will not withdraw their bid for a period of 60 consecutive calendar days after the scheduled closing time for the receipt of Bids; that, if this Bid is accepted, Bidder will enter into a formal contract with the Owner in accordance with the form of agreement included as part of the Contract Documents and that the required Performance Bond and Payment Bond will be given; and that, in the event of the withdrawal of Bid within said period, or failure to enter into said Contract and give said bond within eight (8) owner business days after Bidder has received notice of acceptance of their Bid; the Bidder shall be liable to the Owner for the full amount of the Bid guarantee as representing the damage to the Owner on account of the default of the Bidder in any particular thereof.

The Bid Guarantees in the form of checks shall be returned by mail to all except the three (3) lowest Bidders within fifteen (15) days after the formal opening of the Bids. The Owner reserves the right to hold the Bid Guarantee of the lowest three Bidders until after they have executed the Contract with the accepted Bidder and the Performance Bond and Payment and Material Bonds have been approved by the Owner.

If required Contract and Bonds have not been executed within 60 consecutive calendar days after the date of the opening of the bids, then the Bid Guarantee of any Bidder will be returned upon his request, provided Bidder has not been notified of the acceptance of their bid prior to the date of such request.

4. EXAMINATION OF DOCUMENTS AND SITE:

4.01 Each Bidder shall examine the Bidding Documents carefully; and, (7) days prior to the date for receipt of bids, Bidders shall make a written request to the Architect for interpretation or correction of any ambiguity, inconsistency or error which may be discovered. Any interpretations or corrections will be issued as addenda. The Architect and/or Owner shall not be responsible for oral clarifications.

4.02 Bidders shall carefully examine the Bidding Documents and the construction site to obtain first-hand knowledge of the existing conditions. Contractors shall not be given extra payment for conditions which can be determined by examining the site and Bidding Documents.

4.03 The submission of a bid by a Bidder shall be an acknowledgment that Bidder has thoroughly examined the Contract, site, specifications, and drawings and completely understands their obligations and those of the Owner under the documents. Failure to mention any work, materials, appurtenances, or safety methods in these specifications or plans which are required for the satisfactory and safe completion of an efficient, safe, complete, and working system as implied by these specifications and drawings shall not relieve the Contractor of any responsibility to provide such for the completion of such a system.

4.04 The Owner assumes no responsibility for any understanding or representations made by any of its officers or agents during or prior to the execution of the Contract, unless (1) such understanding or representation are expressly stated in the contract and (2) the Contract expressly provides that the responsibility therefore is assumed by the Owner.

5. SUBSTITUTIONS:

5.01 Each Bidder represents that his bid is based upon the materials and equipment described in Bidding Documents.

5.02 No substitutions for other material and equipment will be considered unless a written request has been submitted to the Architect for approval at least 7 days prior to the date for receipt of bids. Each such request shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation.

5.03 If the Architect approves any proposed substitution, such approval will be set forth in an addendum.

5.04 If any bidder is unable to procure written approval of any substitution from the Architect prior to the opening of bids, then he shall base his bid on the exact items specified.

5.05 Substitutions which have not been approved in writing by the Architect prior to the opening of bids, may be listed on the Bid Proposal form along with the amount the bidder will add to or deduct from the Base Bid if such substitution is approved. Substitutions so submitted shall include any and all adjustments of that work or any other affected thereby. Substitutions listed on the Bid Proposal Form which are approved will be incorporated into the contract with the successful bidder.

5.06 Requests for any substitutions not submitted in accordance with the above instructions will be denied by the Architect.

5.07 Requests for any substitution(s) of subcontractors will need to be in compliance with FS 255.0515:

FS 255.0515: Bid for state contracts; substitution of subcontractors. With respect to state contracts let pursuant to competitive bidding, whether under chapter 235, relating to educational facilities, or this chapter, relating to public buildings, the contractor shall

not remove or replace subcontractors listed in the bid subsequent to the lists being made public at the bid opening, except upon good cause shown.

History. -s. 1, ch. 78-389.

6. REJECTION OF BIDS:

6.01 The Bidder acknowledges the right of the Owner to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, the bidder recognizes the right of the Owner to reject a bid if the bidder failed to furnish any required bid security, or to submit the data required by the bidding documents, or if the bid is in any way incomplete or irregular; to reject the bid of a bidder who is not in a position to perform the contract; and to re-advertise for other or further bid proposals.

6.02 The Owner reserves the right to reject any or all bids when such rejection is in the interest of the Owner, and to reject the Bid of a Bidder who is not in a position to perform the Contract, or whose List of Subcontractors is improperly prepared, or not included in the Bid proposal.

END OF SECTION B

SECTION C

BID FORM

SUBMIT IN DUPLICATE ON CONTRACTOR'S LETTERHEAD

COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS, FLORIDA

DATE: March 31, 2010

PURCHASING DEPARTMENT

TIME: 10:00 a.m.

135 NE HERNANDO AVE. RM 208
LAKE CITY, FL 32055

OWNER'S BID NO.: 2009-Y

REFERENCE:

I (We), the undersigned, hereby declare that the only persons, firm or corporation interested in this Proposal or the Contract to be entered into, as principals, are named herein, and that this Proposal is made without collusion with any person, firm or corporation, and that it is in all respects fair and in good faith.

The undersigned, hereinafter called "Bidder", having visited the site of the proposed project and become familiar with the local conditions, nature and extent of the work, and having examined carefully the drawings, specifications, the Form of Agreement, and other Contract Documents, with the bond requirements therein, proposes to furnish all labor, materials, equipment and other items, facilities, and services for the proposed execution and completion of the General Construction of new Ft. White Branch Library in full accordance with the drawings and specifications prepared by Akin & Associates Architects, Inc., in full accordance with the Advertisement for Bids, Instruction to Bidders, Agreement and all other Contract Documents; and if awarded the Contract, I (We) will contract with the COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS, FLORIDA to furnish all necessary labor, equipment, materials, and incidental costs, and that I (We) will substantially complete all necessary work in accordance with the Specifications and Drawings, and the requirements under them within **180 consecutive calendar days** after receipt of Notice-to-Proceed for the following Bid price:

BASE BID _____ Dollars ($_____).

The undersigned further agree(s) to bear the full cost of maintaining all work until the final acceptance, as provided in the Contract Documents.

The above amount, if accepted by the Owner shall form a Contract to be entered into. The undersigned agree(s) to furnish a sufficient and satisfactory bond in the sum of not less than 100 percent (100%) of the Contract Price of the work awarded.

It is further agreed that in the case of failure on the part of the undersigned to execute said Contract and Bond under the conditions of this Proposal within ten (10) "Owner Business Days" after the award of the Contract, the accompanying Proposal Guaranty, made payable to the COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS, FLORIDA of not less than

five percent (5%) of the total actual bid (Base Bid plus all Alternates), shall be forfeited as liquidated damages; otherwise, said Guaranty is to be returned to the undersigned upon the delivery of the executed Contract, a satisfactory bond and other specified documents.

Name of Bonding Company: _____

Local Agent's Address: _____ Phone No. _____

Attached hereto, is the said Proposal Guaranty in the form of a Bid Bond, Certified Check, Cashier's Check in the amount of _____Dollars ($_____), according to the provisions contained herein and to the conditions and provisions of the Contract Documents.

Section D: Statement of Contractor's Qualifications.

I (We) hereby acknowledge receipt of the following Addendum, if any, issued during the bidding period:

(List Addendum No. and Date)

It is understood by the Bidder that the Owner shall post its intent to award or reject this Bid. The intent shall remain posted for a period of three (3) working days. Failure to file a protest within the time prescribed in Section 120.53(5), Florida Statutes, shall constitute a waiver of proceedings under Chapter 120, Florida Statutes.

I (We), the undersigned, hereby certify that I (We) have carefully examined the foregoing Proposal after the same was completed and have verified each item placed thereon; and I (We) agree to indemnify, defend and save harmless, the COLUMBIA COUNTY BOARD OF COUNTY COMMISSIONERS, FLORIDA and their agents, against any cost, damage or expense which it may incur or be caused by an error in my (our) preparation of same.

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this ____ day of _____, A.D., 20__.

_____(SEAL)

By:

Title:
The following license is current and the Bidder agrees to maintain it in effect throughout the project duration:

Florida Construction Industries Licensing Board Certification (State Certified of County Registered).

_____
(Name of Holder)

END OF SECTION C

SECTION D

COLUMBIA COUNTY, FLORIDA BOARD OF COMMISSIONERS
STATEMENT OF CONTRACTOR'S QUALIFICATION

1. Legal Name and Address:

Company Name:_____ Phone #:_____
Qualifying Agent:_____ Phone #:_____
Address:_____
Attach copies of Business Occupational License for County of Residence.

2. If a Corporation, state:
Date of Incorporation:_____
Attach a copy of the Corporate Certificate.
Name and Title of Qualifying Agent:_____
_____

Name and Title of Principal Officers	Date of Inception	State Registration

3. If Partnership, state:

Date of Organization:_____
Nature of Partnership (General, Limited, or Association)

Name and Title of Qualifying Agent:_____
_____

Name and Title of Partners	Date of Inception	State Registration

4. If an individual, state:

Name and Title of Partners	Date of Inception	State Registration

5. Attach brief resume of key members of your organization, including: name, title, years of experience, type work experience, and prior job description(s).
Note: For projects over one million dollars ($1,000,000.00), provide resumes of your project specific supervisory personnel.

6. How long has your firm been in business as a General Contractor?

_____

7. How many years has your organization been in business under its present business name?

_____

8. Under what other or former names has your organization operated?

_____

9. A. Has your firm ever failed to complete a bonded obligation? _____ Yes _____ No

B. If yes, give the particulars including circumstances, where and when, name of the bonding company, name and address of the Owner, and disposition of the matter.

_____

_____

_____

10. Within the last five years, has any officer, partner or qualifying agent of another organization failed to complete a construction project? _____Yes _____No
If so, attach a separate sheet of explanation.

11. Has your organization, any officer, partner or qualifying agent thereof ever been party to any criminal or civil procedure as a result of or arising from contracting operations, which has resulted in a conviction or plea bargain admitting guilt or judgment or court order requiring the payment of a penalty, damages(actual or punative)or other compensation for alleged breach of contract or failure to perform as agreed? "
A. If the answer to question #11, above, is "yes", state the case number, court, nature of charge, sentence and fine, if any. Attach documents to the Form Application.

12. Has your organization, any officer, partner or qualifying agent thereof, ever been party to any administrative complaint registered against you by the Department of Professional Regulation, Construction industry Licensing Board for the State of Florida or any of its subdivisions resulting in a finding of guilt, fine, suspension or revocation of your license?

A. If the answer to question #12, above, is "yes", state the case number and final disposition. Attach documents to this Form Application.

13. Has your firm previously constructed County projects in Florida? ____Yes _____No

14. List five (5) projects of similar size or larger than the proposed work which your firm has completed with the last five (5) years.

A. Project and Brief Description: (include square footage, number of floors, basic construction, etc.) _____
_____
_____
_____
_____
Project Owner:_____ Phone:_____
Project Architect:_____ Phone:_____
Stage of Completion:_____
Construction Contract Amount:_____
Date Completed:_____

B. Project and Brief Description:
_____
_____
_____
_____
_____
Project Owner:_____ Phone:_____
Project Architect:_____ Phone:_____
Stage of Completion:_____
Construction Contract Amount:_____
Date Completed:_____

C. Project and Brief Description:
_____
_____
_____
_____
_____
Project Owner:_____ Phone:_____
Project Architect:_____ Phone:_____
Stage of Completion:_____
Construction Contract Amount:_____
Date Completed:_____

D. Project and Brief Description:

_____
_____
_____
_____
_____

Project Owner:_____ Phone:_____
Project Architect:_____ Phone:_____
Stage of Completion:_____
Construction Contract Amount:_____
Date Completed:_____

E. Project and Brief Description:

_____
_____
_____
_____
_____

Project Owner:_____ Phone:_____
Project Architect:_____ Phone:_____
Stage of Completion:_____
Construction Contract Amount:_____
Date Completed:_____

15. List contracts on hand, approximate amounts, and note whether fully bonded or not.

A. Project and Brief Description:_____
_____
_____
_____
_____

Project Owner:_____ Phone:_____
Project Architect:_____ Phone:_____
Stage of Completion:_____
Construction Contract Amount:_____
Bond Amount:_____

B. Project and Brief Description:_____

_____

_____

_____

_____

Project Owner:_____ Phone:_____

Project Architect:_____ Phone:_____

Stage of Completion:_____

Construction Contract Amount:_____

Bond Amount:_____

C. Project and Brief Description:_____

_____

_____

_____

_____

Project Owner:_____ Phone:_____

Project Architect:_____ Phone:_____

Stage of Completion:_____

Construction Contract Amount:_____

Bond Amount:_____

D. Project and Brief Description:_____

_____

_____

_____

_____

Project Owner:_____ Phone:_____

Project Architect:_____ Phone:_____

Stage of Completion:_____

Construction Contract Amount:_____

Bond Amount:_____

E. Project and Brief Description:_____

_____

_____

_____

_____

Project Owner:_____ Phone:_____

Project Architect:_____ Phone:_____

Stage of Completion:_____

Construction Contract Amount:_____

Bond Amount:_____

16. Indicate the highest construction value your firm wishes to be considered for:

VALUE $_____

17. Please list all proposed major subcontractors
Name, Address, Trade, & % of Contract

_____
_____
_____
_____
_____
_____

18. Trade References:_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

19. Bank References:_____
_____
_____

20. Bonding: Submit attached Bond Form labeled "NOTICE FROM SURETY COMPANY".

21. Attach a financial statement, not more than twelve (12) months old, reviewed or audited, including Contractor's latest balance sheet and income statement showing the following items:

A. Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses):

B. Net Fixed Assets:

C. Other Assets:

D. Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries, and accrued payroll taxes):

E. Other Liabilities (e.g., capital, capital stock, authorized and outstanding share par values, earned surplus, and retained earnings):

Name of Certified Public Accountant preparing financial statement and date of same.

Is this financial statement for the identical organization named on page one?
_____Yes _____No

If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

Will this organization act as guarantor of the contract for construction?
_____Yes _____No

The undersigned guarantees the authenticity of the foregoing statements, as evidenced by this sworn affidavit, and does hereby authorize and request any person(s), firm or corporation to furnish any information requested buy the Columbia County Board of Commissioners and its authorized representative in verification of the recitals comprising this "Statement of Contractor's Qualification".

Signed:_____

Print Name and Title:_____

For the Firm:_____

_____
CORPORATE SEAL

Subscribed and sworn to before me this_____ day of _____in the year of_____ .

Notary Public:

My Commission Expires:

ATTACHMENTS

_____Copy of Contractor's Florida Department of Business and Professional Regulation License

_____Copy of Business License for county or city of registration

_____Certificates of required insurance for worker's compensation, public liability, and property damage, as required by law.

_____Copy of Corporate Certificate (if applicable)

_____Resume(s) of Key Individuals

_____Copy of Notice From Surety Company Form

_____Financial Statement (Signed and Notarized)

_____Certified Public Accountant's Opinion of Financial Statement

_____Other information, if any, firm would like the Board to consider

C. NOTICE OF SURETY COMPANY

Columbia County Board of Commissioners
P.O. Box 1529
Lake City, FL 32056-1529

Gentlemen:

This is to advise that, until further notice in writing to you, we agree to provide surety ship on behalf of _____

Covering construction in the amount of $ _____ for any single contract and $_____ in the aggregate of outstanding contracts.

Our Best's ratings for performance and financial size are:

PERFORMANCE RATING: (A or higher required)

FINANCIAL SIZE:

It is our understanding that the contents of this letter will not be disclosed to other persons.

_____
Name of Surety

(Affix Seal)

By:_____
Title

SECTION E

CONTRACT AGREEMENT

GENERAL:

The "Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum", American Institute of Architects, Document A-101, Latest Edition shall be used on this project. Upon notification of award the contractor shall submit two original executed contracts along with the payment and performance bond to owner. Upon review of payment and performance bond the owner shall return one executed original to the contractor with the notice to proceed.

FORMS SHALL be obtained by the Contractor from the Florida Association of the American Institute of Architects located at 104 Jefferson Street, Tallahassee, Florida 32301, (850) 222-7590; or location closest to bidder.

==========

The following information is Supplementary Conditions to the Contract to be inserted or amended where indicated:

Article 3

3.1 The Date of Commencement will be defined in a Notice-to-Proceed, unless noted otherwise.

3.2 Substantial Completion for the total project shall be within **180 consecutive calendar** days following Notice-to-Proceed; Final Completion shall be within **30 consecutive** calendar days following Substantial Completion.

Liquidated damages shall be in accordance with Section K, 8.4.1 Supplementary General Conditions of the Contract Documents. Liquidated Damages: **$ 250.00 per day.**

Article 5

5.1 Progress payments, shall be as indicated in Spec. Sec. 01027.

5.1.1 Retainage will be 10% until substantial completion and 5% until final completion and will only be released upon recommendation of the Architect and approval by the County Manager.

END OF SECTION E

SECTION F

GENERAL CONDITIONS

GENERAL:

The "General Conditions of the Contract for Construction", American Institute of Architects, Document A-201, Latest Editions shall be used on this project.

FORMS SHALL be obtained by the Contractor from any branch office of the Florida Association of the American Institute of Architects (i.e. 104 Jefferson Street, Tallahassee, Florida 32301, (850) 222-7590; or location closest to bidder.

END OF SECTION F

SECTION G

List of Subcontractors shall be submitted in two stages:

A. LISTING OF MAJOR SUBCONTRACTORS
(To be submitted in a separate envelope marked, "LISTING OF MAJOR SUBCONTRACTORS," along with Bidder's Bid Form)

NOTE: To be executed as part of the Bidders Proposal. If, due to Alternate bids, more than one subcontractor must be considered, Contractor shall list each and state which is to be considered for Base Bid work and which is to be considered for alternate work if a specific alternate is to be taken.

Bidder agrees that, if they are apparent low bidder or if so requested by the Owner, they will submit to the Owner a full list of subcontractors and suppliers within 48 hours of bid opening.

All subcontractors and suppliers are subject to approval of the Owner. The following are the major subcontractors and suppliers proposed to be used if the undersigned is awarded the contract.

DIVISION OF WORK	CORPORATE NAME AND ADDRESS	PRINCIPAL OR OFFICER'S NAME
HVAC		
Plumbing		
Electrical		
Roofing		

The undersigned declares that they have fully investigated each subcontractor listed and have determined to their own complete satisfaction that such contractor maintains a fully-equipped organization capable technically and financially of performing the pertinent work, and has made similar installations in a satisfactory manner.

Name of Firm: _____

Signed By: _____

Title: _____

Address/Zip: _____

Telephone No._____ Contractor's Certificate No. _____

B. LIST OF SUBCONTRACTORS AND SUPPLIERS

NOTE: To be executed within 48 hours of Bid Opening by apparent low bidder or if requested by Owner. If, due to Alternate Bids, more than one subcontractor or supplier must be considered, Contractor shall list each and state which is to be considered for Base Bid work and which is to be considered if a specific alternate is to be accepted.

All Subcontractors and suppliers are subject to approval by the Owner. The following are the subcontractors and suppliers proposed to be used if the undersigned is awarded the contract for this project.*

*Include only those applicable from the list below, or if using list as-is, write "N/A" for those trades not applicable to this project.

TYPE OF WORK	CORPORATE NAME AND ADDRESS	PRINCIPAL OR OFFICER'S NAME
TERMITE CONTROL		
LANDSCAPE WORK		
CONCRETE WALKS		
CONCRETE WORK		
UNIT MASONRY		
MISCELLANEOUS METALS		
METAL ROOFING		
HANDRAILS AND RAILINGS		
LAMINATE CLAD CASEWORK		
BITUMINOUS DAMPPROOFING		
INSULATION		
JOINT SEALERS		
STEEL DOORS AND FRAMES		
WOOD DOORS		
ALUMINUM WINDOWS		
FINISH HARDWARE		
GLASS AND GLAZING		
GYPSUM DRYWALL		
TILE		

ACOUSTICAL CEILINGS _____ _____

RESILIENT FLOORING _____ _____

CARPETING _____ _____

PAINTING _____ _____

CHALK AND TACK BOARDS _____ _____

TOILET AND BATH ACCESSORIES _____ _____

PRE-ENGINEERED BUILDINGS _____ _____

PIPE AND PIPE FITTING _____ _____

HANGERS AND SUPPORTS _____ _____

EQUIPMENT SUPPORTS, ENCLOSURES AND ACCESS PANELS _____ _____

PIPE INSULATION _____ _____

PLUMBING _____ _____

BUILDING SOIL, WASTE, SANITARY, VENT PIPING AND APPURTENANCES _____ _____

DOMESTIC WATER PIPING AND APPURTENANCES _____ _____

PLUMBING FIXTURES /TRIM _____ _____

AIR CONDITIONING AND HEAT PUMPS _____ _____

DEHUMIDIFYING UNITS _____ _____

AIR DISTRIBUTION _____ _____

RACEWAYS _____ _____

BOXES _____ _____

WIRING DEVICES _____ _____

PANELBOARDS _____ _____

DISCONNECT SWITCHES _____ _____

GROUNDING _____ _____

LIGHTING _____ _____

CONTROLS _____ _____

COMMUNICATION SYSTEMS _____ _____

The undersigned declares that they have fully investigated each subcontractor listed and has determined to their own complete satisfaction that such contractor maintains a fully-equipped organization capable technically and financially of performing the pertinent work, and has made similar installations in a satisfactory manner.

Name of Firm: _____

Signed By: _____

Title: _____

Address/Zip: _____

_____

Contractor's Certificate No: _____

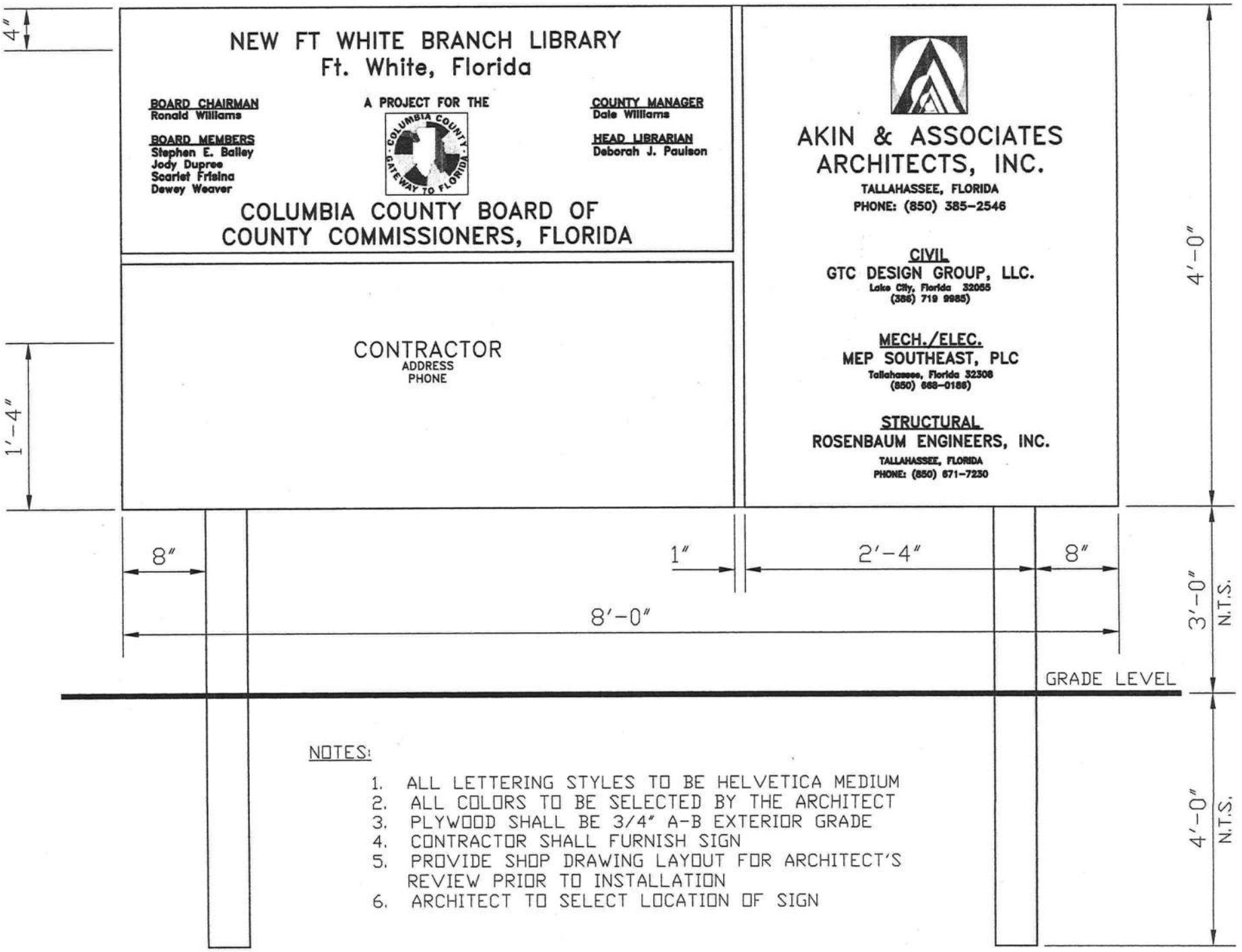
Telephone No: _____

END OF SECTION G

SECTION H

Provide a project identification sign as shown on attached sample.

END OF SECTION H



NOTES:

1. ALL LETTERING STYLES TO BE HELVETICA MEDIUM
2. ALL COLORS TO BE SELECTED BY THE ARCHITECT
3. PLYWOOD SHALL BE 3/4" A-B EXTERIOR GRADE
4. CONTRACTOR SHALL FURNISH SIGN
5. PROVIDE SHOP DRAWING LAYOUT FOR ARCHITECT'S REVIEW PRIOR TO INSTALLATION
6. ARCHITECT TO SELECT LOCATION OF SIGN

SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL:

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The work of this Contract comprises the following:

Project involves the construction of an approximately 5,065sf Community Library.

Trade work includes Sitework (see comment on Table of Content), Concrete, Masonry, Column, Beam & Misc. Steel, Millwork, Wood Framing/Drywalling, Prefab. Wood Roof trusses, Insulation, Shingle Roofing & Accessories, Hollow Metal Work, Wood doors, Storefront, Carpet, VCT & Hard Tile, Toilet Compartments & Accessories, Mechanical, Plumbing, and Electrical.

B. Work is divided into base bid and alternates (where applicable are described in section 01030).

C. Work to be performed shall be in accordance with drawings and specifications prepared by **Akin & Associates Architects, Inc.**

D. The Contractor shall lay out the work with appropriately qualified personnel from the information shown on the drawings.

1.2 RELATED REQUIREMENTS

A. I. Bidding Conditions

B. II. Contractual Conditions

1.3 CONTRACT WORK

2. The General Construction base bid shall generally include, but not be limited to the scope of work described in these specifications and on the drawings except alternates noted in Sec. 01030 and on the drawings cover sheet.

1.4 CONTRACT TIME

1. All work under this contract work shall be substantially complete within **calendar days indicated in the Front-end Specs.**

1.5 WORK BY OTHERS

A. Work on the project which will be executed during or prior to the start of work on this contract, and which is excluded from this contract, noted as "N.I.C." on the drawings.

1.6 CONTRACTOR'S USE OF PREMISES

A. Coordinate use of premises for staging, storage etc. with the owner.

1.7 OWNER OCCUPANCY

A. Contractor shall at all times conduct his operations as to insure the safety of and least inconvenience to the Owner.

1.8 RIGHT OF ACCESS

1. The Contractor agrees that representatives of the Owner and Architect/Engineer will have access to the work wherever it is in preparation or progress and that the Contractor will provide facilities for such access.

1.9 SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

1. The Contractor shall be solely responsible for all applicable obligations prescribed as employer obligations under any and all governmental regulations.

1.10 GROWTH MANAGEMENT REQUIREMENTS - ENVIRONMENTAL

A. The Contractor shall comply with all requirements of the City of Ft. White or Columbia County Environmental Management Ordinance, as specifically set forth in the Owner's Environmental Management Permit. Contact the Owner or the Civil Engineer of Record for further clarifications.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01010

SECTION 01027
APPLICATION FOR PAYMENT

PART 1 - GENERAL:

1. REQUIREMENTS INCLUDED
   Procedures for preparation and submittal of Application for Payment.

2. RELATED REQUIREMENTS
   A. I. Bidding Conditions
   B. II. Contractual Conditions
   C. Section 01340 - Submittal: Submission Requirements
   D. Section 01370 - Schedule of Values
   E. Section 01700 - Contract Closeout: Final Application for Payment

3. FORMAT
   Application for Payment Form - AIA Standard G702.

4. PREPARATION OF APPLICATIONS
   A. Submit applications for payment to Architect in accordance with the schedule established by conditions of the Contract and agreement between Owner and Contractor.
      1. Type required information, or use media-driven printout.
      2. Execute certification by signature of authorized officer.
   B. Submit Schedule of Values for review and acceptance by the Architect/Engineer and Owner per Section 01370. Schedule of Values shall be broken down for each Work item and shall indicated both materials and labor.
   C. Use data on accepted Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed.
   D. Initial progress payment shall not be made until Contractor has established a Contractor's site office, with telephone service, and a temporary field office for the Project Representative.
   E. Prepare Application for Final Payment as specified in Section 01700.
   F. Submit Application for Payment in rough format (percentages complete) for Owner and Architect/Engineer review five (5) days prior to submittal of Application.

5. SUBMITTAL PROCEDURES
   A. Submit four (4) copies of each Application for payment monthly.
   B. Contractor shall submit to Architect/Engineer not later than the first working day of each month an application for payment completed and signed by the Contractor.

6. SUBSTANTIATING DATA
   A. When Architect/Engineer requires substantiating information, submit data justifying line item amounts in question.
   B. Submit suitable information for each copy of application with a cover letter identifying:
      1. Project
      2. Application number and date
      3. Detailed list of enclosures
   C. Submit one copy of data and cover letter for each copy of application.

   D. Submit with each copy of application continuation sheet providing the following:
      1. Fill in total list of all schedule component items of work, with item number and scheduled dollar values for each item.
      2. Fill in dollar value in each column for each schedule line item when work has been performed or materials stored.
      3. list each change order executed prior to date of submission, at the end of the continuation sheets.
   E. Submit data and applicable insurance as required by Owner to establish Owner's title to material and equipment suitably stored at the site.

      The Contractor shall be responsible for all expenses of the Architect/Engineer to verify the quantity of stored materials off of the site.

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01027

SECTION 01029
CHANGE ORDER PROCEDURE

PART 1 - GENERAL:

1. REQUIREMENTS INCLUDED
   - A. Procedures for preparation and submittal of Change Orders.
   - B. This section is a supplement to Article 7 of AIA Document A201, the prescribed "General Conditions of the Contract for Construction" for this project.

2. RELATED REQUIREMENTS
   - A. I. Bidding Conditions
   - B. II. Contractual Conditions
   - C. Section 01027 – Application for Payments
   - D. Section 01340 - Submittal: Submission Requirements
   - E. Section 01370 - Schedule of Values
   - F. Section 01700 - Contract Closeout: Final Application for Payment

3. FORMAT
   Itemized costs, including quantities and unit prices.

4. PREPARATION OF CHANGE ORDERS
   It is recognized that changes to the contract may be desired or necessary from tile to time. When such situation arises, it shall be handled as outlined below.

   - A. The client may at any time, unilaterally or by agreement with the contractor, without notice to the sureties, make changes in the work covered by this agreement. Any mutual agreement must be agreed upon in writing, signed by both parties.
   - B. When the client requests a proposal, contractor shall submit change order proposals within seven (7) calendar days, unless a shorter time is specified elsewhere in the Agreement, in a form acceptable to the client. The quotation shall be supported by a cost breakdown which shall include a quantity survey, unit prices and unit labor hours, markup for overhead and profits and other information as requested by the client.
   - C. Upon written direction of the client to the contractor, specifically stating that an equitable adjustment in contractor price will be made, contractor shall proceed with specified extra work or changes so as not to delay the work. Contractor shall submit an estimate for extra work or changes within seven (7) calendar days, unless a shorter time is specified elsewhere in the Agreement, or receipt of the directive.
   - D. Unless otherwise stated in the Contract Documents, the sum to be paid to Contractor for its combined overhead and profit for additive changes shall be based upon the

following percentages of the cost of the change:

1. Ten Percent (10%) of the cost of the change for that portion of the work performed directly by Contractor.
2. Five Percent (5%) for that portion performed by a lower tier subcontractor or supplier, (there shall be no relationship, other than contractual, between Contractor and lower-tier sub-contractor).
3. If a change in the work consists of both additions and deletions, any overhead and profit shall be computed on the excess of the additive costs over deductive costs.
4. The sum paid for overhead and profit shall cover all Contractor's general and administrative expenses, including but not limited to, all main and branch office labor, plant and equipment, clerical support and supplies, estimating, computers, accounting, time keeping and cost of any additional bond premium and shall pay such cost to its bonding company. Contractor shall keep its surety informed at all times of all changes in the contract.

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01029

SECTION 01040
COORDINATION

PART 1 - GENERAL:

1. WORK INCLUDED
   - A. Contractor shall supervise and direct the work competently and efficiently, devoting such attention thereto and applying such skills as may be necessary to perform the work in accordance with the Contract Documents.
   - B. Contractor shall be solely responsible for all means, methods, techniques, sequences and procedures of construction, and for providing adequate safety precautions and coordinating all portions of the work under the Contract Documents.
   - C. Contractor shall be responsible to see that the finished work complies accurately with the Contract Documents.
   - D. Contractor shall be responsible for all project coordination.

2. RELATED REQUIREMENTS
   - A. Section 01010 - Summary of Work
   - B. I. Bidding Conditions
   - C. II. Contractual Requirements
   - D. Section 01200 - Project Meetings
   - E. Section 01410 - Special Testing/Inspection Requirements
   - F. Section 01700 - Contract Closeout

3. DESCRIPTION
   - A. Coordinate scheduling, submittal, and work of the various sections of specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.
     1. Maintain reports and records at job site:
        - a. Daily log of progress of work and other pertinent data. Maintain log accessible to Owner, Architect/Engineer and his representative.
        - b. Assemble documentation for handling of any claims or disputes which may arise.
     2. Inspections and Testing:
        - a. Inspect the work to assure that it is performed in accordance with the requirements of the Contract Documents.
        - b. Arrange with the Architect/Engineer and/or owner as applicable for special inspections or testing required by Section 01410 or other specification sections.
        - c. Reject work which does not conform to requirements of the Contract Documents.
   - B. Coordinate sequence of work to insure proposed completion dates are met.
     1. Construction Schedule:
        - a. Prepare detailed schedule of Contractor's operations and for all subcontractors on the project.
        - b. Monitor schedules as work progresses.
          1. Identify potential variances between scheduled and probable completion date.

2. Recommend to Architect/Engineer any adjustments in schedule to meet required completion date.

c. Observe work to monitor compliance with schedule.

1. Verify that labor and equipment are adequate to meet and maintain the schedule for the work.
2. Verify that product deliveries are adequate to meet and maintain the schedule for the work.
3. Report any non-compliance to Architect/Engineer, with recommendations for remedy.
4. Verify that adequate services are provided to comply with requirements for work and climatic conditions.
5. Verify proper maintenance and operation of temporary facilities.
6. Administer traffic and parking controls for construction workers. Construction traffic shall not interfere with surrounding traffic movement.

2. Coordination of Subcontractors:

a. Coordinate work of all subcontractors and relationship between them.

b. Establish on-site lines of authority and communication. Schedule and conduct progress meetings among Owner and Architect/Engineer representatives and subcontractors.

c. Ensure that specified cleaning is done daily during progress of the work and at completion of contract.

5. COORDINATION OF SUBMITTAL

A. Schedule and coordinate submittal specified in Section 01340.
Administer processing of shop drawings, product data, and samples.

B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

1. Coordinate Testing Laboratory Services:

a. Notify laboratory of test schedule.

b. Verify that required personnel are present.

c. Verify that specified tests are made as scheduled.

d. Verify compliance of the test results with specified criteria. Determine need for retesting and submit recommendations to Architect/Engineer. Administer and pay for required retesting.

2. Coordinate with Sub-contractors as required:

a. Provide designated location where the Subcontractors may place construction debris for removal by the General Contractor.

b. Owner will provide temporary utilities (electric, water) required by the Subcontractors in the performance of their work.

C. Coordinate requests for changes to assure compatibility of space, of operating elements, and effect on work of other sections.

1. Recommend necessary or desirable changes to Architect/Engineer.
2. Review subcontractor's requests for changes and substitutions. Submit recommendations to Architect/Engineer.
3. Process Change Orders in accord with General Conditions and Change Order Procedures.

6. COORDINATION OF SPACE

A. Coordinate use of Project space and sequence of installation of subcontractor work which is indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

7. INTERPRETATION OF CONTRACT DOCUMENTS
   A. Consult with Architect/Engineer to obtain interpretation or clarifications for any portions of the contract documents which are unclear or ambiguous. Transmit all requests for interpretation in writing.
   B. Assist in the answering of any questions which may arise.
   C. Transmit written interpretations to Sub Contractors, Suppliers and Others who's work may be affected by the clarification.
   D. Interpretations shall be based on the Architect/Engineers review of the Contract Documents. In case of conflicting data, assumption shall be made that the item of greater quality, cost or quantity was bid.
8. START-UP
   A. Direct the check-out of utilities, operational systems, and equipment.
   B. Assist in initial start-up and testing.
   C. Record dates of the start of the operations of systems and equipment.
   D. Submit to Architect/Engineer written notice of the beginning of warranty period for equipment put into service.
9. COORDINATION OF CONTRACT CLOSEOUT
   A. Substantial Completion:
      1. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion.
      2. Upon determination of Substantial Completion of work or portion thereof, prepare for the Architect/Engineer a list of incomplete or unsatisfactory items.
   B. Final Completion:
      1. Upon determination that work is at final completion:
         a. Submit written notice to Architect/Engineer that the work is ready for final inspection.
         b. Secure and transmit to Architect/Engineer required closeout submittal.
      2. Turn over to Architect/Engineer.
         a. Operations and maintenance data.
         b. Spare parts and maintenance materials.
         c. Warranties and other data as required for these specifications.
         d. Owner file copies of all submittal, changes, etc.
   C. After Owner occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
   D. Assemble and coordinate closeout submittal specified.

PART 2 - PRODUCTS:

Not used.

PART 3 - EXECUTION:

Not used.

END OF SECTION 01040

SECTION 01042
COORDINATION DRAWINGS

PART 1 - GENERAL

1.1. GENERAL

A. Furnish all labor, materials, tools, equipment and services for all Coordination Drawings in accord with provisions of Contract Documents.

B. Completely coordinate with work of all other trades.

C. Although all such work may not be specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a complete installation.

D. See Division 1 for General Requirements.

1.2. CONSTRUCTIONTION DRAWINGS

A. Overlay drawings showing all mechanical, electrical, plumbing, etc. work in and above ceilings, exposed and in mechanical, electrical and related equipment rooms with horizontal and vertical dimensions, to avoid interference with structural framing, ceilings, partitions and other services. Provide plans at 1/4" scale; provide sections/elevations at 1" scale' provide enlarged plans at 1" scale.

B. Prior to start of work in any given area, each subcontractor shall approve, in writing, all coordination drawings affecting his work in that area. Drawings shall have such approval and date of same affixed to each sheet in an approval area. Distribute copies of approved coordination to all parties.

C. Any relocations required as a result of failure to resolve interferences, provide correct Coordination Drawings, or call attention to changes required in other work shall be paid for by the responsible Subcontractor.

1.3. COORDINATION MEETINGS

A. Coordination meetings shall be scheduled by the General Contractor. All affected subcontractors are required to attend. Since this is a Contractor meeting, should he so desire the presence of the Agent (any or all) the costs shall be billed at their standard hourly rates plus expenses to the Contractor.

1.4. PRODUCTION OF COORDINATION DRAWINGS

A. General Contractor shall provide background drawings, showing partitions, ceiling heights, and structural framing locations and elevations, and existing obstructions.

B. Resolve major interferences at initial coordination meeting prior to production of any drawings.

C. General Contractor shall arrange for a competent draft person to produce all initial coordination drawings within 30 days after initial meeting. General Contractor shall arrange for production of said drawings during that time.

D. Contractors shall meet as required to resolve interferences and correct coordination drawings during their preparation. Submit written requests for information to Agent to clarify any and all conflicts.

E. Mechanical contractors and electrical contractors shall provide necessary input for the preparation of these coordination drawings.
F. No cost increase to the Agent for any changes due to coordination will be considered.
G. The Architectural and Structural Contract Documents may not be reproduced for such uses. However, the Contractor may, at his expense, purchase a set of reproducible Contract Documents to assist in the production of the Coordination Drawings.

1.5. AFTER APPROVAL
A. After Subcontractors' written approval of coordination drawings, the method used to resolve interferences not previously identified shall be determined by the General Contractor.
B. All changes to approved coordination drawings shall be approved in writing by the General Contractor prior to the start of work in affected areas.
C. No cost increase to the Agent for any changes due to coordination will be considered.

1.6. PRECEDENCE OF SERVICES
A. In the event of conflicts involving location and layout of the work following priority will be used to resolve disputes. Structure has the highest priority:
1. Structure/Architecture.
2. Ceiling grid/tile/light fixtures.
3. Gravity drainage/vent lines.
4. Ductwork.
5. Chilled and hot water piping.
6. Electrical cable tray.
7. Small piping and tubing/electrical conduit.
8. Fire protection system.
9. Access panels.

1.7. SUBMITTALS
A. Project Data:
1. Six (6) sets of prints and one set reproducible of approved drawings, for information only, to Agent prior to start of work. An additional two (2) sets of prints are to be provided to the Owner.
B. Project Closeout:
Provide corrected as-built of Coordination Drawings in same quantities as above as part of project close-out documents. Agent to receive six (6) sets of prints; Owner to receive reproducible and two (2) sets of prints.

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION 01042

SECTION 01045
CUTTING AND PATCHING

PART 1 - GENERAL:

1A DESCRIPTION OF WORK

1. "Cutting-and-Patching" is hereby defined to include, but is not necessarily limited to, the cutting and patching of nominally completed and previously existing work in order to accommodate the coordination of work or the installation of other work or to uncover other work for access or inspection.

   Restoring or removing and replacing non-complying work is specified separately from cutting-and-patching, but may require cutting-and-patching operations as specified herein.
2. Refer to other sections of these Specifications for specific cutting-and-patching requirements and limitations applicable to individual units of work.

   Refer to Division 15 and Division 16 Sections, for additional requirements and limitations on cutting-and-patching of mechanical and electrical work, respectively. The requirements of this section apply to mechanical and electrical work, unless otherwise indicated.

1B QUALITY ASSURANCE

Requirements for Structural Work:
Do not cut-and-patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.

Prior to cutting-and-patching the following categories of work, obtain Architect's/Engineer's written direction to proceed with cutting-and-patching as proposed in submittal by Contractor:

Structural steel.
Bearing walls.
Miscellaneous structural metals, including lintels, equipment supports, stair systems and similar categories of work.

Operational and Safety Limitations:

4. Do not cut-and-patch operational elements and safety related components in a manner resulting in a reduction of capacities to perform in the manner intended, including energy performances, or resulting in decreased operational life, increased maintenance, or decreased safety.
2. Prior to cutting-and-patching the following categories of work and similar categories where directed, obtain Architect's/Engineer's written direction to proceed with cutting-and-patching as proposed in submittal by Contractor:
   Primary operational systems and equipment Control, communication, conveying, and electrical wiring system.

Visual Requirements:

1. Do not cut and patch work which is exposed on exterior (or exposed in occupied spaces of the building) in a manner resulting in a reduction of visual qualities or resulting in substantial evidence of cut-and-patch work both as judged solely by Architect. Remove and replace work judged by Architect/Engineer to be cut-and-patched in a visually unsatisfactory manner.

2. Engage recognized expert entities to perform cutting-and-patching of exposed work including, but not limited to:
   - Roofing
   - Plaster
   - Stucco
   - Gypsum drywall
   - Acoustic ceilings

1C SUBMITTAL

Proposals for Cutting-and-Patching:

Where prior written direction of cutting-and-patching is required, submit proposal well in advance of time work will be performed and request written direction to proceed. Include description of why cutting-and-patching can not (reasonably) be avoided, how it will be performed, products to be used, forms and tradesmen to perform the work, approximate dates of the work, and anticipated results in terms of variations from work as originally completed (structural, operational, visual and other qualities of significance). Where applicable, include cost proposal, suggested alternatives to cutting-and-patching procedure proposed, and a description of circumstances which lead to need for cutting-and-patching.

Written direction by Architect/Engineer to proceed with proposed cutting-and-patching does not waive the right to later required complete removal and replacement of work found to be cut-and-patched in an unsatisfactory manner.

PART 2 - PRODUCTS:

2A MATERIALS

Provide materials for cutting-and-patching which will result in equal-or-better work than work being cut-and-patched, in terms of performance characteristics and including visual effect where applicable. Comply with requirements, and use materials identical with original materials where feasible and where recognized that satisfactory results can be produced thereby.

2B PREPARATION

Temporary Support:

Provide adequate temporary support for work to be cut to prevent failure. Do no endanger other work.

2C PROTECTION

Provide adequate protection of other work during cutting-and-patching to prevent damage and provide protection of the work from adverse weather exposure.

PART 3 - EXECUTION:

3A CUTTING AND PATCHING

1. Employ skilled tradesmen to perform cutting-and-patching. Except as otherwise indicated, proceed with cutting-and-patching at earliest feasible time in each instance and complete work without delay.
2. Cut work by methods least likely to damage work to be retained and work adjoining. Review proposed procedure with original Installer where possible, and comply with recommendations therefrom.

a. In general, where physical cutting action is required, cut work with sawing and grinding tools, **NOT WITH HAMMERING AND CHOPPING TOOLS**. Core drill openings for pipe and conduit through concrete and masonry.

b. Comply with requirements of applicable sections of Division 2 where cutting-and-patching requires excavating and backfilling.

3. Patch with seams which are durable and as invisible as possible. Where feasible, inspect and test patched areas to demonstrate integrity of work.

4. Restore exposed finishes of patched areas and where necessary extend finish restoration onto retained work adjoining in a manner which will eliminate evidence of patching and refinishing.

5. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch after patched are has received prime and base coats.

END OF SECTION 01045

SECTION 01310
CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 The progress schedule required under the General Conditions shall be prepared using bar chart or the critical path method as described herein.

A. The critical path schedules requirement will consist of a two-part network submittal (interim schedule, and detailed schedule), along with monthly progress status reports (Monthly Report), quarterly progress forecast reports (Quarterly Report), and monthly update to the networks and analyses. The planning, scheduling, management, and execution of the Work is the sole responsibility of the Contractor. The progress schedule requirement is established to allow Owner to review Contractor's planning, scheduling, management and execution of the work; to assist owner in evaluating work progress and make progress payments; and to allow other contractors to cooperate and coordinate their activities with those of the Contractor.

B. Review of the schedule of submittal shall not relieve Contractor from responsibility for any deviations from the Contract Documents unless Contractor has, in writing, submission and received written concurrence to the specific deviations, nor shall any concurrence by Owner and Architect/Engineer relieve Contractor from, responsibility for errors and omissions in the submittal.

1.2 INTERIM SCHEDULE SUBMITTAL

A. Submittal set shall include a time-scaled graphic arrow diagram, a detailed schedule of values incorporating shop drawing submittal, and interim status reports. The initial submittal shall be delivered within fourteen (14) calendar days of the effective date of the Agreement and shall use the Notice to Proceed as the data date. The submittal shall be submitted on time, be completed, comply with all contract conditions, and represent realistic approach to the Work. No progress payments for work performed shall be made until this submittal set is submitted and accepted.

B. The graphic arrow diagram shall show one (1) detailed activity for all work to be performed during the first 120 calendar days after Notice to Proceed, and two (2) summary activities for the remainder of the contract.

C. Interim status reports shall be revised and submitted monthly following the initial preliminary schedule submittal, and continue through the first 120 calendar days.

1.3 DETAILED SCHEDULE SUBMITTAL

A. Submittal shall include a time-scaled (day after Notice to Proceed) graphic arrow diagram showing all contract activities, computer printout reports, and a supporting narrative. The detailed schedule submittal shall be delivered within 30 calendar days after the Notice to Proceed, and shall use the Notice to Proceed as the data date. The submittal shall be on time, complete, comply with all Contract conditions, and represent a reasonable approach to the Work. No progress payments shall be made for

work performed after the first 120 days of the Contract until the detailed schedule submittal is submitted and accepted.

B. The graphic arrow diagram shall be formatted in accordance with the paragraph 2A above. The diagram shall include all detailed activities included in the interim schedule submittal grouped by major areas of work and detailed activities, as shown on the Schedule of Values.

1.4 MONTHLY PROGRESS REPORTS

A. Not later than 30 calendar days after the Notice to Proceed, and at Monthly intervals thereafter, Contractor shall submit to the Architect, a draft Monthly Progress Report with data as of the last day of the current pay period. Within fifteen (15) calendar days after receipt of this report, Owner, Architect/Engineer, and Contractor shall meet to discuss the draft report and reach an agreement on job progress. Job progress shall specifically include:

1. Actual completion dates for activities completed during the monthly report period, and actual start dates for activities commenced during the quarterly report period.
2. Estimated start dates for activities scheduled to commence during the following monthly report period.
3. Changes in the duration of any activity and minor logic changes.
4. Activities not included in the currently accepted, detailed graphic arrow diagram.
5. Major changes in scope and other identifiable changes.

1.5 SUBMISSIONS

A. Submit initial schedules within 14 days after award of Contract.

1. Architect will review schedules and return review copy within 10 days after receipt.
2. If required, resubmit within 7 days after return of review copy.

B. Submit revised and/or updated progress schedules with each application for payment. Revised or updated progress schedules does not relieve Contractor of his responsibility of compliance with his original contract/construction deadline.

1.6 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:

1. Architect/Engineer
2. Owner's Representative
3. Job site file
4. Subcontractors
5. Other concerned parties

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

1.7 COMPLIANCE

See paragraph 3.10 of the Supplementary General Conditions for consequences of non-compliance.

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION 01310

SECTION 01340
SUBMITTAL

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED:

A. Submit Shop Drawings, Product Data and Samples required by Contract Documents.

B. Shop drawing submittal:

1. Unless otherwise noted, submit one sepia and three blue-line prints of required shop drawing.
2. Shop drawings shall bear the seal of approval of the General contractor.
3. **All but two (2) sets [three (3) for those to be reviewed by Engineers] of prints shall be returned to the contractor** with specific instructions from the Architect.
4. The contractor shall proceed or re-submit based on the instructions of the Architect.
5. Required shop drawings are identified in the respective sections of this specification.

1.2. RELATED REQUIREMENTS:

A. Definitions and Additional Responsibilities of Parties: General Conditions of the Contract.

B. Designate in the Application for Payments, or in a schedule of submittals, the dates for submission of Shop Drawings, Product Data and Samples.

C. II Contractual Conditions

1.3 SHOP DRAWINGS:

A. Submit a list of all required shop drawings, showing anticipated submittal date, date to be returned to factory to ensure prompt delivery. Also submit a signed letter stating that all Subcontractors and Suppliers have received and shall conform to this submittal schedule.

B. Drawing shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.

C. Shall be original drawings, prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details. Duplication of contract Documents for any submittal shall not be acceptable.

1. Prepared by a qualified detailer.
2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

D. Shop Drawing transmittal letter shall be submitted separate for each required section as provided at the end of this section. Submittal shall note any and all

deviations from Contract Documents.

1.4 PRODUCT DATA:

A. Preparation
   1. Clearly mark each copy to identify pertinent products or models.
   2. Show performance characteristics and capacities.
   3. Show dimensions and clearances required.
   4. Show wiring or piping diagrams and controls.
   5. Note deviations from Contract Documents.

B. Manufacturer's standard schematic drawings and diagrams:
   1. Modify drawings and diagrams to delete information which is not applicable to the work.
   2. Supplement standard information to provide information specifically applicable to the work.
   3. Note deviations from Contract Documents.

1.5 SAMPLES:

A. Office samples shall be of sufficient size and quantity to clearly illustrate materials, equipment or workmanship, and to establish standards by which completed work is to be judged.
   1. Functional characteristics of the product, with integrally related parts and attachment devices.
   2. Full range of color, texture and pattern.
   3. After review, samples shall be used for comparison in construction of project.
   4. Note deviations from Contract Documents.

1.6 CONTRACTOR RESPONSIBILITIES:

A. Review Shop Drawings, Product Data and Samples prior to submission. Check and stamp submittal with his approval.

B. Determine and verify:
   1. Field measurements.
   2. Field construction criteria.
   3. Catalog numbers and similar data.
   4. Conformance with specifications.
   5. Note deviations from Contract Documents.

C. Coordinate each submittal with requirements of the work and of the Contract Documents.

D. Notify the Architect/Engineer in writing, at time of submission, of his review of submittal and of any deviations in the submittal from requirements of the Contract Documents.
   1. Contractor's responsibility for deviations in submittal from requirements of Contract Documents is not relieved by Architects/Engineers review of submittal, unless specific deviations are called to the attention of the

Architect/Engineer in writing and the Architect/Engineer gives written acceptance of specific deviations.

1.7 SUBMISSION REQUIREMENTS:

A. Make submittal promptly in accordance with accepted schedule, and in such sequence as to cause no delay in the work or in the work of any other Contractor.

B. Number of submittal required:

1. Shop Drawings: Submit five (5) prints of shop Drawing. The reproducible sepia will be returned to the Contractor.
2. Product Data: Submit four (4) copies of Product data of which two (2) shall be returned to the Contractor.
3. Samples: Submit the number stated in each specification section. Provide three (3) samples if not indicated.

C. Submittal shall contain:

1. The date of submission and the dates of any previous submissions.
2. The project title and number.
3. Contract identification.
4. The names of Contractor, Supplier and Manufacturer.
5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Identification of revisions on resubmittals.
9. Applicable Standards (such as ASTM or Federal Specification numbers).
10. An 8 inch x 3 inch blank space for contractor and Architect/Engineer or provide review status cover page.
11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.

1.8 RE-SUBMISSION REQUIREMENTS:

A. Make any corrections or changes in the submittal required by the Architect/Engineer and resubmit until accepted.

B. Shop drawings and product data:

1. Revise initial drawings of data, and resubmit as specified for the initial submittal.
2. loud any change which has been made other than those required by the Architect/Engineer.
3. Indicate shop drawing is being resubmitted, use Architect's/Engineer's shop drawing identification number if provided.

C. Samples: Submit new samples if requested by Architect.

1.9 DISTRIBUTION

A. Distribute reproductions of Shop Drawings and copies of Product Data which carry the Architect/Engineer stamp of acceptance to:
   1. Job site file.
   2. Subcontractors.
   3. Supplier or Fabricator.
   4. Project close-out documents (Section 01700).

1.10 ARCHITECT/ENGINEER DUTIES

A. Review and approve submittal; allowing Architect/Engineer a period of 14 calendar days for review and return of Shop drawings.
B. Affix stamp and initials or signature and indicate requirements for resubmittal or approval of submittal.
C. Return submittal to Contractor for distribution or for re-submission.
D. Forward copy of submittal for Owner's use and information. This shall not relieve contractor's requirements in other sections to provide the Owner with a complete record copy at job close-out.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 - GENERAL:

1.1 REQUIREMENTS

A. Closeout is hereby defined to include general requirement near end of Contract Time in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner and similar actions evidencing completion of the Work. Time of closeout is directly related to "Substantial Completion" and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work that have been certified as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this section.

1.2 PREREQUISITES TO SUBSTANTIAL COMPLETION

A. Prior to requesting Architect's/Engineer's inspection for certification of substantial completion for either entire Work or portions thereof, complete the following and list known exceptions in request:

1. In progress payment request, show either 100% completion for portion of work claimed as "substantially complete" or list incomplete items, value of in-completion and reasons for being incomplete.
2. Include supporting documentation for completion as indicated in these Contract Documents.
3. Submit statement showing accounting of changes to the Contract sum.
4. Advise Owner of pending insurance change-over requirements.
5. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.
6. Obtain and submit releases enabling Owner's full and unrestricted use of the Work and access to services and utilities, including (where required) occupancy permits, operating certificates and similar releases.
7. Deliver tools, spare parts, extra stocks of materials and similar physical items to Owner.
8. Complete start-up testing of systems and instructions of Owner's operating/maintenance personnel. Discontinue (or change over) and remove from project site temporary facilities and services, along with construction tools and facilities, mock-ups and similar elements.

B. Upon receipt of Contractor's request, Architect/Engineer will either proceed with inspection or advise contractor of prerequisites not fulfilled. Following initial inspection, Architect/Engineer will either prepare certificate of substantial completion or advise contractor of work which must be performed prior to issuance of certificate; and repeat inspection when requested and assured that work has been substantially completed. Results of completed inspection will form initial "punch-list" for final acceptance.

1.3 PREREQUISITES TO FINAL ACCEPTANCE

A. Prior to requesting Architect's/Engineer's final inspection for certification of final acceptance and final payment as required by General Conditions, complete the following and list known exceptions (if any) in request:

1. Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit updated final statement accounting for additional (final) changes to Contract Sum.
3. Submit certified copy of Architect's/Engineer's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by Architect/Engineer.
4. Submit final meter readings for utilities, measured record of stored fuel and similar data as of time of substantial completion or when Owner took possession of and responsibility for corresponding elements of the work.
5. Submit original Consent of Surety.
6. Submit final liquidated damages settlement statement, acceptable to Owner.
7. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey and similar final record information.
8. Complete final cleaning up requirements, including touch-up of marred surfaces.
9. Touch-up and otherwise repair and restore marred exposed finishes.
10. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.
11. Certificates of elevator inspection.
12. Mechanical:
    a. Air System Test and Balance (prepared by Owner's independent agent)
    b. Piping pressure tests and certificates
    c. Project certification
13. Electrical:
    a. System tests
    b. Project certification

B. Reinspection Procedure:

Upon receipt of Contractor's notice that work has been completed including punch-list items resulting from earlier inspections, and accepting incomplete items delayed because of acceptable circumstances, Architect/Engineer will reinspect work. Upon completion of reinspection, Architect/Engineer will either prepare certificate of final acceptance or advise Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, procedure will be repeated.

If re-inspections of above referenced items are required by the Architect/Engineer due to the failure of any of the Work t comply with the claims made by the Contractor as to the status of their completeness, the Owner will deduct the costs incurred by such re-inspections from the Contract amount.

1.4 RECORD DOCUMENT SUBMITTAL

A. Specific requirements for record documents are indicated in individual sections of these specifications. Other requirements are indicated in General Conditions. General submittal requirements are indicated in Section 01340. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for Architect's/Engineer's reference during normal working hours. At time of final acceptance, submit complete sets of all required record documents to the Architect/Engineer for Owner's records.

B. Record Drawings:
Maintain a white-print set (blue-line or black-line) of contract drawings and shop drawings in clean, undamaged condition with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawings are most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark-up new information that is recognized to be of importance to Owner but was for some reason not shown on either contract drawings or shop drawings. give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable.

Upon completion of the Work, this data shall be recorded to scale, by a competent draftsman on sepia line mylar prints or transparent paper of the Contract Drawings. Sepias will be furnished to the Contract by the Architect, but cost shall be borne by the Contractor. Where changes are to be recorded, the sepia line prints shall be erased in such a way as to properly represent the work as installed. Where the work was installed exactly as shown on the Contract drawings, the sepia line prints shall not be disturbed. In showing the changes, the same legend shall be used to identify piping, etc., as was used on the Contract Drawings.

The Contractor shall review the completed record drawings and ascertain that all data furnished on the sepia drawings are accurate and truly represent the Work as actually installed. When manholes, boxes, underground conduits, plumbing, hot or chilled water lines, etc., are involved as part of the Work, the Contractor shall furnish true elevations and locations, all properly referenced for the site. Information for reference data can be obtained from the office of the Architect/Engineer. Upon completion, the subcontractor involved shall date and sign the drawings, signifying compliance with the requirements set forth herein prior to submission of the sepias and prints required.

The Contractor shall sign all pages to certify completeness of the Record Set of Drawings. Contractor shall submit the sepia line mylars and two sets of prints to the Architect/Engineer for the Owner.

C. Record Specifications:
Maintain one copy of specifications including addenda, change orders and similar modifications issued in printed form during construction and mark-up variations (of substance) in actual Work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data where applicable.

D. Record Shop Drawings and Product Data:
Maintain one copy of each product data submittal and mark-up significant variations in actual work in comparison with submitted information. Include both variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up or record drawings and specifications.

E. Record Sample Submittal:
Immediately prior to date(s) of substantial completion, Architect/Engineer (and including Owner's personnel where desired) will meet with Contractor at site and will determine which (if any) of submitted samples maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes. Comply with Architect's/Engineer's instructions for packaging, identification marking and delivery to owner's sample storage space.

F. Miscellaneous Record Submittal:
Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittal in connection with actual performance of the Work. Immediately prior to date(s) of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference.

G. Operation and Maintenance Data: See section 01730

H. Warranties and Bonds: See section 01740

I. Spare Parts and Maintenance Materials: As covered herein or in section 01750 where applicable.

J. ***Consult Owner-Contract agreement for more up-to-date format requirements such as Xerox in lieu of blue-line or mylar prints, PDF and other electronic formats.***

1.5 FINAL CLEANING

A. Special cleaning for specific units of work is specified in sections of Divisions 2 through 16. General cleaning during progress or work is specified in General Conditions and as temporary service in "Temporary Facilities" section of this Division. Provide final cleaning of the work at time indicated, consisting of cleaning each surface or unit of Work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. The following are examples of cleaning levels required:

1. Remove labels which are not required as permanent labels.
2. Clean transparent materials including mirrors and window or glass to a polished condition removing substances that are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.
3. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
4. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other substance.
5. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes and similar spaces.

6. Clean concrete floors in non-occupied spaces broom clean.
7. Vacuum clean carpeted surfaces and similar soft surfaces.
8. Clean plumbing fixtures to a sanitary condition free of stains including those resulting from water exposure.
9. Clean light fixtures and lamps so as to function with full efficiency.
10. Clean project site (yard and grounds) of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petro-chemical spills and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth, even-textured surface.
11. Vacuum clean and sanitize all cabinetwork, equipment, etc. for a move-in condition.

B. Removal of Protection:
1. Remove temporary protection devices and facilities that were installed during course of the Work to protect previously completed Work during remainder of construction period.

C. Compliances:
1. Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at site or bury debris or excess materials on Owner's property or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from site and dispose of in a lawful manner.
2. Where extra materials of value remaining after completion of associated Work have become Owner's property, dispose of these to Owner's best advantage as directed.

1.6 CLOSEOUT DOCUMENTS CHECKLIST

A. All items listed below, with the exception of Item No. 1 and Item No. 2 shall be bound in individual heavy duty 3-ring vinyl covered binders. Mark appropriate identification on front and spine of each binder.

B. All items shall be submitted in triplicate within fifteen day of Substantial Completion for the project.

1. Application and Certification for Payment (Final). Four copies with original signatures and seals.
2. Final schedule of contract values. Four copies attached to Application and Certification for Payment.
3. Contractor's Affidavit of Payment of Debts (AIA G706).
4. Contractor's Affidavit of Release of Liens from all Contractors, Subcontractors, and Suppliers (AIA G706A).
5. Power of Attorney from Surety to make Final Payment.
6. Consent of Surety to Final Payment (AIA G707).
7. Contractor's Guarantee and Warranties as specified under Division 01740.
8. Fully executed Roof Warranty in the name of the Owner.
9. Special warranties as required by the specifications, in the name of the Owner.
10. Provide a list summarizing the various guarantees and warranties and stating the following with respect to each:
    a. Character of work affected.
    b. Name, address and telephone number of each Subcontractor.
    c. Name, address and telephone number of each local firm designated to

provide warranty service for an out-of-town firm. Copy of agreement between the firms.

d. Period of guarantee and effective date.

e. Statement of guarantee in the following form:

"If within any guarantee period, repairs or changes are required in conjunction with the guarantee work, which in the opinion of the Architect or Engineer is rendered necessary as the result of the use of materials, equipment or workmanship, which are defective or inferior, or not in accordance with the terms of the Contract, the Contractor shall, upon written notice from the Owner, and without expense to the Owner, proceed within twenty four (24) house to place in satisfactory condition in every particular all of such guaranteed work, correct all defects therein; and make good all damages to the structure or site or equipment or contents thereof disturbed in fulfilling any such guarantee work."

11. Verification that the Owner's personnel have been trained in the use of their new equipment. Submit attendance lists and videotape record of all training sessions.
12. Operation and Maintenance Manuals.
13. Equipment Inventory List - A list of the following equipment furnished for the project, to include drawings code designation, location (FISH number) description, manufacturer, full model number, serial number, warranty period and warranty expiration date.

a. All HVAC equipment.
b. Any plumbing equipment that carries a serial number (water heaters, compressors, electric water coolers, etc.)
c. Emergency generator.
d. Contractor furnished appliances.

14. Notarized Affidavit of all Subcontractor payrolls, bills for materials/equipment and other indebtedness paid and satisfied.
15. As-built drawings. Provide in accordance with other specification sections.
16. Energy management system programming, operation, maintenance, and parts service manuals. Guaranteed parts price list.
17. Date certain schedule for Owner's personnel to be trained at Energy Management Supplier's training facility.
18. Punch lists signed off by Owner's Representatives.

OWNER'S DOCUMENTS RECEIPT

PROJECT: _____ **SUBSTANTIAL COMP. DATE:** _____

1. Receipt or Waiver of all of the following documents must be signed by the A/E and by Owner staff person prior to final payment. Fill in last name in receipt blocks. When Owner receives this form, with required attached documents, having been received by the A/E, then A/E review and acceptance is assumed. An Owner's Rep. must sign off acceptance within 10 days after receipt, or the A/E must be notified in writing that a document is not acceptable. If no correspondence is received from Owners within 10 days, acceptance is automatic.
2. See specifications for specific requirements.

DESCRIPTION	Received				Accepted
	A /E	Date	Owner	Date	Owner
AIA G706 (Payment of Debts)					
AIA G706A (Release of Lien)					
Surety Power of Attorney					
Consent of Surety					
All Required Guaranties & Warranties					
List - Various Guaranties/Warranties					
Verification of Training					
Operation & Maintenance Manuals					
Equipment Inventory List					
As-Built Drawings					
EMCS Manuals					
EMCS Training Dates					
As-Built Certification to DER					
Punch List Corrections Complete					
Approved Submittal Package					
Control Key and Key Code					

END OF SECTION

SECTION 02300
EARTHWORK UNDER BUILDINGS

PART 1 - GENERAL

1.1 BENCHMARKS

A. Maintain two existing bench marks on the site for references. All vertical dimensions shall be checked from these bench marks.

1.2 BORROW PITS

A. Submit representative samples of all fill material requiring compaction to the Designated Testing Laboratory. **Material and borrow pits shall be approved by the Architect prior to filling operations.** If the quantity available from site grading is not sufficient, purchasing, hauling, and blending of fill shall be done by the Contractor.

1.3 CONTROLLED FILL

A. Class I Fill is all Structural Fill to underside of slabs and to support foundations or footings. Class I Fill shall extend to 10 feet outside the building footprint.

1.4 DESIGNATED TESTING LABORATORY

A. Designated Testing Laboratory shall be selected by the Architect and paid by the Contractor.
B. Designated Testing Laboratory shall:

1. Witness proofrolling and make recommendations concerning undercutting loose subgrade areas and surface scarification.
2. Observe and make recommendations concerning surface drainage.
3. Perform Modified Proctor and field density test.
4. Provide advice concerning fill soils on site and the selection of borrow soils.
5. Evaluate the suitability of the subgrade soils at the foundation bearing level.
6. The Designated Testing Laboratory shall report to the Architect in writing, on a daily basis, the results of the tests including a statement that all tests have been performed as required by the specifications.

1.5 COMPACTION TESTING

A. Existing Subgrade under Building Slabs: One field density test for each 1500 sf of building.
B. Class I Fills: One Field Density Test for each 1500 SF of building area per 8 inch lift.
C. Exact locations of tests shall be as directed by the Architect. Submit five copies of test reports.

1.6 DENSITY TESTING IN FOUNDATIONS

A. One test per 50 Linear feet of continuous wall footing subgrade.
B. One test for every column footing.

1.7 INSUFFICIENT FILL MATERIAL

A. If quantity of grading material is insufficient to provide finish grade elevations indicated on the drawings, obtain additional fill material of specified quality from an off-site source at no additional cost to the owner.

1.8 EXCESS CUT MATERIAL

A. If quantity of grading material is in excess of quantities required to provide finished grade elevations indicated on the drawings, any excess material shall be disposed of off-site at no additional cost to the owner.

PART 2 - PRODUCTS

2.1 FILL MATERIAL

A. Sand Fill (capillary water barrier) material shall consist of clean sand with a fineness modulus of 1.6 to 3.1 and containing not more than 10 percent by weight finer than No. 200 U.S. Standard Sieve.
B. Structural Fill material shall consist of clean fine sand to slightly silty or clayey sands containing not more than 20 percent by weight finer than No. 200 U.S. Standard Sieve.

PART 3 - EXECUTION

3.1 SITE GRADING

A. See Section 02200 Earthwork.

3.2 GROUNDWATER CONTROL

A. Temporary sumps or gravity flow drainage ditches shall be excavated to a minimum depth of 3-feet around the area of construction to control the shallow ground water during the wet season.

3.3 RAINWATER, SURFACE WATER, AND BACK-UP

A. Protect all Work, including excavations and trenches, from rainwater, surface water, and back-up of drains and sewers. Furnish all labor, pumps, shoring, enclosures, and equipment necessary to protect and to keep work free of water.

3.4 INSPECTION OF SUBGRADE, PROOFROLLING, SCARIFYING, AND COMPACTION

A. After stripping and excavation of the cut areas, and prior to filling, the exposed subgrade shall be approved by the Architect. The exposed subgrade, enclosed by a line drawn 10 feet outside the building and paved areas, shall be predensified and proofrolled by rolling the surface with compaction equipment.
B. Rolling shall consist of a minimum of eight overlapping coverages in each of two perpendicular directions and shall continue until density test at a depth of 12 inches below the surface indicates the attainment of 95 percent of the Modified Proctor Maximum (ASTM D 1557).
C. The equipment used for rolling shall be a heavy weight vibratory drum roller having a static weight of at least 8 to 10 tons and a drum diameter of at least 4 to 5 feet.
D. Proofrolling shall be performed in the presence of the Designated Testing Laboratory Representative.
E. Soft, loose or unstable surface zones which are detected during proofrolling and compaction shall be scarified and recompacted or undercut and replaced with controlled fill as directed.
F. Stockpile undercut materials by Fill Material classification in on-site locations where it will not interfere with construction operations. Materials stockpiled shall be placed in a manner to afford drainage. Protect against erosion.
G. Undercut materials which qualify as Structural Fill may be used in Class I Fill areas.
H. Provide 6-10 test pits to a minimum depth of 6 feet below existing grade under the direction of the geotechnical representative.

3.5 INSTALLATION OF CLASS I FILL

A. Class I Fill shall be Structural Fill material.
B. Compact within + 2 percent of optimum moisture content in 8-inch (maximum) loose layers to a density equivalent to 95 percent of the Modified Proctor Maximum (ASTM D 1557).

3.6 INSTALLATION OF BACKFILL

A. Shore Foundation Walls which are to be tied into floor slabs prior to installation of Backfill and until slabs have been in place sufficient time to achieve strength and provide structural stability against overturning.
B. Where Backfill is required on both sides of walls, it shall be brought up in even layers so as not to provide an unequal lateral load.
C. Install Backfill against Foundation Walls only when directed by the Architect.

3.7 EXCAVATION AND COMPACTION

A. Excavate to elevations and dimensions, plus space to permit erection of forms.
B. All bottoms shall be clean cut, true, level, and sound.
C. The bottom of all excavations shall be compacted to a density equivalent to 95 percent of the Modified Proctor Maximum (ASTM D 1557) at a depth of 12 inches. Any water softened soils in foundation excavations shall be removed or recompacted prior to steel and concrete placement.

D. At no extra cost to the Owner, carry foundations to bottom of any excavation erroneously carried too deep.

END OF SECTION 02300

SECTION 02361
TERMITE CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Soil treatment with termiticide.
2. Wood treatment with borate.
3. Bait-station system.
4. Metal mesh barrier system.

B. See Division 06 Section "Rough Carpentry" for wood preservative treatment by pressure process.

C. See Division 07 Section "Sheet Metal Flashing and Trim" for custom-fabricated metal termite shields.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include the EPA-Registered Label.

B. Product certificates.

C. Soil Treatment Application Report: Include the following:

1. Date and time of application.
2. Moisture content of soil before application.
3. Brand name and manufacturer of termiticide.
4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes, and rates of application used.
6. Areas of application.
7. Water source for application.

D. Wood Treatment Application Report: Include the following:

1. Date and time of application.
2. Brand name and manufacturer of borate.
3. Quantity of undiluted borate used.
4. Dilutions, methods, volumes, and rates of application used.
5. Areas of application.

E. Bait-Station System Application Report: Include the following:

1. Location of areas and sites conducive to termite feeding and activity.
2. Plan drawing showing number and locations of monitoring stations and bait stations.
3. Dated report for each monitoring and inspection occurrence indicating level of termite activity, procedure, and treatment applied before time of Substantial Completion.
4. Brand name and manufacturer of termiticide.

5. Quantities of termite bait used.
6. Schedule of inspections for one year from date of Substantial Completion.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located.

B. Regulatory Requirements: Formulate and apply termiticides according to the EPA-Registered Label.

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: Five years from date of Substantial Completion.

1.5 MAINTENANCE SERVICE

A. Continuing Service: Beginning at Substantial Completion, provide 12 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity. Provide a standard continuing service agreement. State services, obligations, conditions, and terms for agreement period; and terms for future renewal options.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Termiticides:

a. Aventis Environmental Science USA LP; Termidor.
b. Bayer Corporation; Premise 75.
c. Dow AgroSciences LLC; Dursban TC or Equity.
d. FMC Corporation, Agricultural Products Group; Talstar, Prevail FT or Torpedo.
e. Syngenta; Demon TC, or approved equal.

2. Borates:

   a. Nisus Corp.; Bora-Care, Jecta.
   b. NovaGuard Technologies, Inc.; Armor-Guard, Shell-Guard.
   c. U.S. Borax Inc.; Tim-Bor or approved equal.

3. Bait-Station Systems:

   a. Dow AgroSciences LLC; Sentricon System.
   b. Ensystex, Inc.; Exterra or Quarterra System.
   c. FMC Corporation, Agricultural Products Group; First Line Systems; or approved equal.

4. Metal Mesh Barrier System:

   a. TERMI-MESH, Inc.; TERMI-MESH, or approved equal.

2.2 SOIL TREATMENT

A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.

2.3 WOOD TREATMENT

A. Borate: Provide an EPA-registered borate complying with requirements of authorities having jurisdiction, in an aqueous solution for spray application and a gel solution for pressure injection, formulated to prevent termite infestation in wood. Provide quantity required for application at the label volume and rate for the maximum diffusible borate concentration allowed for each specific use, according to product's EPA-Registered Label.

2.4 BAIT-STATION SYSTEM

A. Provide bait stations and monitoring stations based on the dimensions of building perimeter indicated on Drawings, according to manufacturer's EPA-Registered Label for product, manufacturer's written instructions, and the following:

   1. Not less than 1 station per 20 linear feet of building perimeter.
   2. Not less than 1 cluster of stations per 20 linear feet, consisting of not less than 3 stations per cluster.

2.5 METAL MESH BARRIER SYSTEM

A. Product: Subject to compliance with requirements, provide "TERMI-MESH" by TERMI-MESH, Inc. or approved equal.

B. Stainless-Steel Mesh: 0.025-by-0.018-inch mesh of 0.08-inch-diameter, stainless-steel wire, Type 316.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.

B. Soil Treatment Preparation: Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.

3.2 APPLYING SOIL TREATMENT

A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.

1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
2. Foundations: Adjacent soil including soil along the entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating the slab, and around interior column footers, piers, and chimney bases; also along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
3. Crawlspaces: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
4. Masonry: Treat voids.
5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.

C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.

D. Post warning signs in areas of application.

E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

3.3 APPLYING BORATE TREATMENT

A. Application: Mix wood treatment borate solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of borate, according to manufacturer's EPA-Registered Label, so that wood framing, sheathing, siding, and structural members subject to infestation receive treatment.

1. Framing and Sheathing: Apply borate solution by spray to bare wood for complete coverage.
2. Wood Members thicker than 4 Inches: Inject borate gel solution under pressure into holes of size and spacing required by manufacturer for treatment.
3. Exterior Uncoated Wood Trim and Siding: Apply borate solution to bare wood siding. After 48 hours, apply a seal coat of paint as specified in Division 9.

3.4 INSTALLING BAIT-STATION SYSTEMS

A. Place bait stations and, if applicable, monitoring stations, according to the EPA-Registered Label for the product and manufacturer's written instructions, in areas that are conducive to termite feeding and activity, as follows:

1. Conducive sites and locations indicated on Drawings.
2. In and around infested trees and stumps.
3. In mulch beds.
4. Where wood directly contacts soil.
5. Areas of high soil moisture.
6. Near irrigation sprinkler heads.
7. Each area where roof drainage system, including downspouts and scuppers, drains to soil.
8. Along drip lines of roof overhangs without gutters.
9. Where condensate lines from mechanical equipment drip or drain to soil.
10. At plumbing penetrations through ground-supported slabs.
11. Other sites and locations as determined by licensed Installer.

B. Inspect and service stations from time of their application until completion of time period established by continuing service agreement, according to the EPA-Registered Label for product and manufacturer's written instructions for termite management system and bait products.

1. Service Frequency: Inspect monitoring stations no fewer than once every three months.

3.5 INSTALLING METAL MESH BARRIER SYSTEM

A. Metal Mesh Barrier: Place metal mesh barrier where indicated to provide a continuous barrier to entry of subterranean termites.

1. Fit mesh tightly around pipe or other penetrations, and terminate at slab and foundation perimeters.
2. Install mesh under the perimeter of concrete slab edges and joints after vapor barrier and reinforcing steel are in place, and comply with manufacturer's written installation methods.

END OF SECTION 02361

SECTION 03100
CONCRETE FORMWORK

PART 1 - GENERAL

1.1 DESIGN FORMWORK

A. Assume all responsibility for the design and engineering of the formwork, as well as its construction and removal.
B. Design formwork for the loads, lateral pressure, and allowable stresses outlined in Chapter 2, Guide to Formwork for Concrete", ACI 347, latest edition.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Facing Materials shall be such as to provide the specified surface finish.
B. Form Coating shall be a field applied chemical concrete release agent capable of preventing bond between poured concrete and the form and shall contain no oil, or shall be factory applied non-absorptive liner. Coat form before reinforcement is placed.
C. Form Ties shall be broken back at 1-inch from surface of concrete. Tie Cones, 1-inch diameter by 1-inch long, shall be used on all exposed concrete.
D. Pre-molded Expansion Joint material (E.J.) shall conform to ASTM D1751, "Preformed Expansion Joint Fillers for Concrete Paving and Structural Concrete (non-extruding and resilient bituminous types)".

2.2 FABRICATION

A. Construct formwork so that concrete surfaces will conform to the tolerance limits specified in Table 4.3.1, "Tolerances for Formed Surfaces", ACI 301, latest edition.
B. Provide positive means of adjustment (wedges or jacks) of shores and struts to compensate for anticipated deflections and settlement in the Formwork during concrete placing operations.

PART 3 - EXECUTION

3.1 ERECTION OF FORMS

A. Build forms tight to prevent loss of mortar from the concrete.
B. Provide clean-out openings at base of pier and wall forms to facilitate cleaning and observation immediately before concrete is placed.
C. Unless shown otherwise on drawings, corners of concrete members exposed to view after all other finish materials are in place shall be beveled by the use of chamfer strips (maximum ½-inch across the beveled face) placed in the forms. Submit sample for approval before proceeding.

D. Overlap and hold forms against hardened concrete of a previous placement to prevent offsets or loss of mortar at the construction joint and to maintain a true surface.

3.2 INSTALLATION OF EMBEDDED ITEMS

A. Install inserts and materials to be cast into concrete.
B. Set 1-inch deep 24-gage galvanized iron wall slots in all concrete surfaces adjacent to brick or block masonry. Slots shall be set vertical in concrete surfaces and spaced 16-inches on center horizontally. Provide masonry anchors spaced 16-inches on center vertically in each wall slot.
C. Separate parallel runs of conduit by not less than 1-inch. Do not displace reinforcing bars from positions. No conduit shall be greater than ½ slab thickness. Bury conduit in slabs.
D. Install Adjustable Wedge Inserts at 32-inches on center in concrete for shelf angles.

3.3 REMOVAL OF FORMS

A. Horizontal member forms used to support the weight of concrete of structural members shall remain in place until the concrete has gained not less than 2/3 of the specified 28-day strength, or a minimum of 7 days.
B. Vertical member forms and forms not supporting the weight of concrete shall not be removed in less than 24 hours.

END OF SECTION 03100

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SUBMITTALS

A. Submit six copies of shop drawings for the fabrication and placing of reinforcing steel for approval, after being checked and approved by the contractor and before proceeding. Any changes by contractor or Fabricator of contract document details, materials, member sizes, or reinforcement shall be "flagged" on shop drawings accompanied by a written request for authorization and reason for requested change.
B. Placing plans shall show all dimensions, details, notes, locations, sizes, lengths and each bar mark together with accessories and material belonging to the reinforcing for the concrete.
C. Schedules shall show all information and be of the same form as those on the contract drawings.
D. Concrete wall reinforcing shall be shown in elevation.
E. Detail all reinforcing steel in accordance with the "ACI Detailing Manual", ACI Publication SP-66 (2004), unless otherwise indicated on the drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Reinforcement shall be fabricated from ASTM A615 "Deformed Billet-Steel Bars for Concrete Reinforcement", Grade 60.
B. Welded smooth wire fabric (WWF) shall conform to "Specifications for Welded Steel Wire Fabric for Concrete Reinforcement", ASTM A185, and shall be fabricated from plain wire conforming to "Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement", ASTM A82.
C. Wire bar supports shall conform to the National Bureau of Standards PS7, "Wire Bar Supports for Reinforced Concrete Construction".

2.2 FABRICATION

A. All hooks shall be bent using the pin diameters and dimensions as "ACI Standard Hooks" in the "Manual of Standard Practice for Reinforced Concrete Construction", CRSI latest edition, unless otherwise shown on the plans.
B. Reinforcing bars shall not be bent or straightened in a manner that will injure the materials.
C. Reinforcing bars shall conform to the dimensions shown on the plans and within the fabricating tolerances as shown in the "Manual of Standard Practices for Reinforced Concrete Construction", CRSI latest Edition.

PART 3 - EXECUTION

3.1 PLACEMENT/BAR REINFORCEMENT

A. Bar reinforcement shall be placed in specified positions in the forms and held in place, before and during the placing of concrete by means of bar supports, to carry the reinforcing bars they support within the following tolerances from the positions shown on the drawings or specified herein:

1. For clear concrete protection and for depth "d" in Flexural members, walls, and compression members where "d" is:

   a. 8 inches or less - plus or minus 1/4"
   b. More than 8 inches but less than 24 inches - plus or minus ½ ", but the cover shall not be reduced by more than one-half of the specified cover.

2. For longitudinal location of bends and ends of bars:

   a. +2 inches except at discontinuous ends of members where tolerance shall be +1/2 inch.

3. For spacing:

   a. +2 inches except that total number of bars shall not be reduced.

B. Except as shown otherwise on structural drawings, concrete cover for Reinforcing Bars shall be as follows:

1. Cast against and permanently exposed to earth. - 3 inches
2. Exposed to earth or weather – 2 inches
3. Interior formed surfaces:

   a. Piers and Columns - ½ inches
   b. Beams - ½ inches
   c. Walls - ¾ inch
   d. Slabs & Joists - ¾ inch

C. "Continuous" bars, unless otherwise indicated on drawings, shall be lapped 36 diameters at splices. Provide corner bars to match primary reinforcing at all corner conditions, including continuous wall footings and grade beams.
D. Splices not shown in contract documents shall be subject to approval.
E. Support all reinforcing bars.
F. Space bar supports a maximum of 4-feet on center with the first support not greater than 2-feet from the ends of the bars. Tie to prevent displacement during the concreting operations. Provide #4 support bars at 48-inches spacing where not supported by perpendicular reinforcement.
G. Reinforcement shall not be "field" bent after being embedded in hardened concrete except where specifically shown on the drawings.
H. Set and hold all vertical dowels in footings by template.

3.2 WELDING REINFORCEMENT

A. The welding of reinforcing bars will be permitted only on approval on the shop drawings by the Architect.
B. The welding of reinforcing bars at intersections for support purposes, in lieu of tie wire, is prohibited.
C. The welding of reinforcing bars shall be performed in accordance with "Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections for Reinforced Concrete Construction", AWS D 12.1-latest edition, as published by the American Welding Society.
D. Welders shall be qualified by tests as prescribed in the "Standard Qualification Procedures ", AWS B 3.0-latest edition, as published by the American Welding Society.

END OF SECTION 03200

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RESPONSIBILITY AND QUALIFICATIONS

A. Assume all responsibility for the work, design and engineering of the formwork and the safe support of property adjacent to the work.
B. Work shall be done by one qualified to install the concrete work in accordance with the drawings and specifications. Minimum requirement for qualification shall be five years' experience with satisfactory completion of at least five similar projects.

1.2 SUBMITTALS

A. Submit six shop drawings for the fabrication and placing of reinforcing steel after being checked and approved by the Contractor and before proceeding. Submit no "Approved as Corrected" drawings for approval.
B. Design and submit mix design series along with test data from laboratory or field experience (6 copies) corresponding to the same mix design.
C. Concrete shall have 28 day compressive strength as follows:

Footings and Slabs-on-grade -	3,000 psi.
All Other Concrete -	3,000 psi.

D. Test reports shall show the requirements of ASTM Specifications.
E. Shop drawings shall be submitted in complete sets of a major area of work, with sheets consecutively numbered.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Formwork: See Section 03100.
B. Reinforcement: See Section 03200.
C. Welded Fabric: See Section 03200.
D. Bar Supports: Section 03200.
E. Portland Cement: A domestic brand approved by the Architect for color and conforming to the requirements of ASTM C150, low alkali, Type I or Type III.
F. Fine Aggregate: Conform to ASTM C33 except that the fineness modules shall be not less than 2.1 nor more than 3.1 and the gradation shall be as specified herein below:

Sieve No.	3/8	#4	#8	#16	#30	#50	#100
Total % Passing (By Weight)	100	95-100	80-100	50-85	25-60	10-30	2-10

G. Coarse Aggregate: Crushed stone or gravel and shall conform to ASTM C33. Size of coarse aggregate shall be as specified herein below:

1. Size #67: (3/4 inch to #4) - for Sections 4" thick and greater.
2. Size #7: (½ inch to #4) - for Sections less than 4" thick.

H. Water used in mixing concrete shall be clean and fit to drink.

I. Admixtures:

1. Air Entraining Admixtures: Conform to the requirements of ASTM C260 and shall contain no chloride. Air Entraining shall not be used for interior slabs receiving troweled finishes. Submit certification for approval.
2. Retarding Admixtures: Contain no chloride, shall be free of organic acids or salts of organic acids, shall be compatible with the air entraining admixture to be used and shall conform to the requirements of ASTM C494, Type B. Submit certification for approval.
3. Water-Reducing Admixtures: Contain no chloride, shall be free of organic acids, or salts of organic acids, shall be compatible with the air entraining admixture to be used and shall conform to the requirements of ASTM C494, Type A, water-reducing normal-setting admixture and, ASTM C494, Type D, water-reducing and retarding admixture. Submit certification for approval.
4. Water-Reducing, High Range (WRHR) Admixtures: Shall contain no chloride, shall be free of organic acids or salts of organic acids, shall be compatible with the air entraining admixture to be used, and shall conform to the requirements of ASTM C494, Type F or G. Submit certification for approval.
5. High, early strength accelerating, water-reducing admixture: contains no chloride, shall be free of organic acids, shall be compatible with air-entraining admixtures to be used and shall conform to the requirements of ASTM C494, Type C or F. Submit certification for approval.
6. Provide technical field service during initial pours at no cost to the Owner by one experienced in the adjustment of concrete mixes for the particular admixtures being used.
7. Water proof Curing Paper: Conform to ASTM C171.
8. Curing Compound: Contain no wax or varnish. Conform to ASTM C309, Type I, and Filor by West Chemical Products, Inc., Kure-N-Seal by Sonneborn-Contech, Inc., Clear Bond by Guardian Chemical Corp., Mr. Klear Seal by Castle Chemical Company, or Sealtight CS-309.
9. Expansion Joint Material in the Building: Nonextruding and resilient non-bituminous type conforming to ASTM D1752, Type II.
10. Dovetail Anchor Slots for Brick and Block Against Concrete: 1" x 1" 24 gage galvanized steel with drip type corrugated 16 gage galvanized steel anchors, Hohmann and Barnard, Inc., No. 305 with No. 303 anchor, Richmond Screw Anchor Co., Inc., No. 051F with 020 anchor, or Hackman Building Products No. 100 with No. 108 anchors.

2.2 PROPORTIONING

A. Proportion ingredients for each class of concrete by weight when the slump is the maximum permitted to produce an average compressive strength at 28 days which exceeds the specified compressive strength in accordance with Chapter 5, Section 5.3 of the Building Code Requirements for Reinforced Concrete (ACI-318-02).
B. Air content of freshly mixed, air entrained concrete as determined by the method of ASTM C 173 shall be 5%. A field tolerance of 1%+ is acceptable. All exterior concrete, exposed to the weather, shall be air entrained. Interior concrete shall not be air entrained.
C. Water-reducing admixture shall be used in all concrete to reduce the total water requirement per cubic yard of concrete without loss of workability, and produce an increased strength proportional to the water/cement ratio. During ambient temperatures of 75 F or below use normal setting, water-reducing admixture meeting ASTM C484, Type A. During ambient temperatures of 75 F and above use set-retarding, water-reducing admixture meeting ASTM C494, Type B and Type D. During ambient temperatures of 60 F and below use a high, early strength accelerating water-reducing admixture meeting ASTM C494, Type C and Type E.
D. The mixes shall be designed to secure concrete having the following consistency range in slump:

Type of Construction	Slump Range (Inches)
Reinforced Foundations	2-3
Elevated, Structural Slabs	2-4
Sidewalks, Driveways & Slabs-on-Grade	2-4

2.3 BATCHING AND MIXING

A. Measure cement by weight on a scale separate from those used for other materials. Cement may be measured in bags of standard weight of 94 pounds; however, no fraction of a bag shall be used in any batch.
B. Measure aggregates by weight. Batch weights shall be based on saturated surface dry materials corrected for the actual moisture condition of the aggregate.
C. Measure water by volume or by weight by devices not subject to variation due to variable pressure in the water supply line. Measuring tanks shall be provided with means for checking their calibration.
D. Devices for measuring quantities of cement, aggregates, water and admixtures shall be accurate within 1% under operating condition.
E. Furnish delivery ticket for each batch of concrete before unloading at the site. Weights of fine and coarse aggregate, amount of cement, and total water as batches shall be printed on ticket by an automatic printing device or shall be recorded and initialed by an employee of the Contractor stationed at the batch plant. Delivery ticket shall, in addition, include the following:

1. Name of batch plant.
2. Serial number of ticket.
3. Date and truck number.
4. Name of contractor.
5. Job name and location.
6. Class of concrete and slump.
7. Cubic yards of concrete.

8. Time loaded.
9. Amount water added at job.
10. Initials of job superintendent.

F. Ready-mixed concrete shall be produced and delivered in accordance with the requirements of ASTM C94.

PART 3 - EXECUTION

3.1 RESHORING

A. Concrete elements shall not be permitted to deflect or accept load during form stripping.
B. After forms are removed, slabs, beams and girders over ten feet in span and cantilevers over four feet shall be reshored for the remainder of the 28-day period. Concrete elements shall not be permitted to deflect or accept load during reshoring operations.
C. Reshoring operations shall be performed so that existing concrete members are not subject to overloads, eccentric loading, or reverse bending.
D. Reshoring elements shall have the same capabilities as original shoring, and shall be wedged to provide solid bearing and support. Bracing shall be provided.

3.2 PLACING CONCRETE

A. Give the Architect 48 hours advance notice before placing concrete in any portion of the structure to permit inspection of the forms and reinforcement. Embedded items of whatever nature shall be in place prior to inspection. An authorization of the Architect shall be secured before concrete is placed.
B. Remove water and debris from forms before depositing concrete.
C. Clean reinforcement and forms coated with foreign material or with concrete from previous placing operations before depositing concrete.
D. Place concrete not later than 1-1/2 hours after mixing. Mix temperature shall not exceed 90 F at time of placing.
E. Construction joints shall be keyed and bulkheaded vertically and located at the center of span.
F. Internal type mechanical vibrators and hand spading shall be used to consolidate the concrete.
G. Concrete shall not be placed within twenty-five feet of workmen placing or securing reinforcement.
H. Place no concrete when the atmospheric temperature is below 35 F. After the concrete has been placed, if the temperature drops below 35 F, conform to paragraph 3.06, Curing and Protection.

3.3 FINISHING FORMED SURFACES

A. Rough form finish shall be confined to all concrete surfaces not exposed to public view. After removal of forms, tie holes and defects shall be patched. Fins exceeding 1/4" in height shall be chipped off or rubbed off. Otherwise, surfaces shall be left with the texture imported by the forms.

B. Smooth form finish shall be used for all concrete surfaces exposed to public view. Form facing material shall produce a smooth, hard, uniform texture on the concrete. Form material with raised grain, torn surfaces, worn edges, patches, or dents which will impair the textures of the concrete surface shall not be used. Tie holes and defects shall be patched. All fins shall be removed.

3.4 REPAIR OF DEFECTS

A. Inspection by the Architect shall determine whether or not work is acceptable; and, if repairable, the method of repair to be used. Defects in materials and workmanship shall be subject to the above inspection at all times during the progress of the work regardless of previous inspections.
B. Condemned work shall consist of any concrete work which cannot be repaired. Condemned work shall be removed and replaced, at the Contractor's expense, with work that will conform to the contract documents.
C. Repair surface defects which are ½ inch or less in depth including tie holes by patching the same working day the forms are removed. Cut back defect at 90 degrees to the surface to sound concrete and at least 1" without feather edges. After soaking with water, pack a stiff mortar in the defect. In exposed concrete the mortar mix shall be determined by trial method using a mixture of white and grey portland cement to produce the described color. After mortar has attained its initial set, the patch shall be scraped or rubbed flush with the concrete and match the color and texture of the adjoining surface.

3.5 SLABS

A. Edge forms and intermediate screed strips shall be set to produce the designated elevations and contours of the finished surface. As a minimum, maintain the concrete thicknesses shown on the drawings.
B. Insure that termite treatment shall have been completed before installing vapor barrier. Install vapor barrier with 6" laps sealed with the manufacturer's recommended sealing compound.
C. Place and consolidate concrete to produce a surface within tolerances. Test for grade (or level) and correct by removing excess or adding and compacting additional concrete. These operations must be performed before bleeding water has an opportunity to collect on the surface.
D. Where metal forms are used at joints, the edge of the form shall be flush with the surface of the concrete. Where saw-cut joints are specified herein, cutting shall be started as soon as the concrete has hardened to prevent aggregates being dislodged by the saw, and shall be completed before shrinkage stresses become sufficient to produce cracking.
E. Scratched finish shall be applied to surfaces intended to receive bonded applied cementitious applications. Depress slabs as specified for applied finish. All pitches to drains shall be made in the concrete slab and not the setting bed. Level to a Class C tolerance and roughen surface with stiff brushes or rakes before final set. Before the concrete has fully hardened remove laitance and loose aggregate from the surface.
F. Troweled finish shall be applied to floors intended as walking surfaces or to receive contact floor coverings. Surface shall first be float-finished as specified above. It shall next be power troweled, and finally hand troweled. Final troweling shall be complete when a ringing sound is produced as the trowel is moved over the surface. The finished surface shall be free of trowel marks, uniform in texture and appearance, and shall be planed to a Class A

tolerance, except tolerance for concrete on metal deck shall be Class B. Any defects of sufficient magnitude to show through floor covering shall be removed by grinding or patching.

G. Tolerance for finish surfaces shall be determined by a straight edge placed anywhere on the surface in any direction and shall be true planes within the following limitations:

1. Class A - 1/8 inch in 10 feet;
2. Class B - 1/4 inch in 10 feet;
3. Class C - 1/4 inch in 2 feet.

3.6 CURING AND PROTECTION

A. Immediately after placement, concrete shall be protected from premature drying, temperatures above or below the range recommended in ACI 305R, latest edition and 306R, latest edition and mechanical injury.

B. Cure all surfaces for a period of 7 days and until average compressive strength has reached 70% of specified strength. Curing shall be by ponding, moist curing with sand or absorptive mats kept continuously wet, continuous application of steam (not exceeding 105 F) or mist spray, waterproof curing paper or liquid membrane forming curing compound. Selection of curing method shall be compatible with the finish to be applied to the concrete surface.

C. Use curing compound directly from the container without dilution and apply not later than one hour after final finishing in one coat at a coverage not to exceed 200 S.F. per gallon for surfaces with a "floated" or "broom" finish, or 300 S.F. per gallon for surfaces with a "troweled" finish. Submit engineering testing laboratory certification for approval. Do not use curing compound on surfaces to receive mortar beds for tile work.

D. Cold weather protection shall be in accordance with recommended practices of ACI 306R, latest edition. Whenever the mean daily outdoor temperature is less than 40 F, the temperature of the concrete shall be maintained between 50 F and 70 F for the curing period.

E. Hot weather protection shall be in accordance with ACI 305R, latest edition. When the anticipated ambient air temperature exceeds 80 F during placing or finishing operations, a retarding admixture shall be used in the mix to retard the setting time of the concrete.

3.7 CONTRACTOR DUTIES IN TESTING

A. Contractor shall submit to the Architect the concrete materials and the concrete mix designs proposed for use with a written request for review. Submittal shall include the results of all testing performed to qualify the materials and to establish the mix designs. Place no concrete in the work until mix design has been reviewed.

B. Contractor shall sample, mould, initially cure, and transport to the laboratory the acceptance test specimens for testing. During the first 24 hours after moulding he shall provide means for maintaining the temperature immediately adjacent to the specimens within the range of 60 F to 80 F and prevent loss of moisture from the specimens. After the initial curing period the acceptance test specimens shall be transported in a damp condition to the laboratory in a manner to prevent damage to the specimens. Include information for reporting of test data.

1. Slump and air content shall be determined at the beginning of each day's pour and for each batch of concrete sampled for compressive strength tests. Make corrections to the mix if slump, unit weight, or air content are not within the specified tolerances. Slump and air content shall be determined by ASTM C143 and ASTM C173 respectively.

2. Make sets of four acceptance cylinders for strength testing for each 50 yards of concrete or fraction thereof for each class and strength for each day's concreting which shall be moulded from concrete samples taken at random over the duration of the pour.
3. Samples of concrete for strength testing shall be representative of the concrete in-place in the structure and shall not be taken from the first one-third of the concrete of the ready-mix truck. No water shall be added to the concrete after samples of concrete for strength testing have been secured.
4. Acceptance test cylinders shall be molded and cured in accordance with ASTM C31 from concrete samples in accordance with ASTM C172.
5. Provide designated testing laboratory with all field data specified to be included on concrete test reports in paragraph 3.08.
6. Field sampling and testing shall be performed by ACI Certified Technicians.

3.8 LABORATORY DUTIES IN TESTING

A. Designated testing laboratory shall perform all operations of testing materials, concrete and verifying mix designs.
B. Concrete test reports shall include the following:

1. Class and strength concrete.
2. Slump.
3. Air content.
4. Temperature of concrete mix at time of placement.
5. Date and time of moulding.
6. Date and age of test specimens.
7. Location of concrete in the structure.
8. Delivery ticket serial numbers.

C. Furnish five (5) copies of all test reports to the Architect.
D. Designated testing laboratory shall be selected by the Architect and paid by the Contractor.

3.9 STRENGTH TESTING AND EVALUATION

A. For each set of acceptance test cylinders, one cylinder shall be broken at the age of 7 days for information and two cylinders shall be broken at the age of 28 days for acceptance. The remaining cylinder shall be held by the laboratory for 120 days for use as a verification cylinder if required. Test in accordance with ASTM C39, latest edition.
B. Concrete shall be considered "Questionable Concrete" where any of the following test evaluations occur:

1. Individual test strength is more than 500 psi below specified strength; or
2. Average of any three consecutive strength tests are less than specified strength; or
3. Individual test strength is less than specified strength and the concrete represented by the test is for concrete for a "critical" area of the structure. Critical areas of the structure are those areas which, in the opinion of the Architect, are critical to the structural stability of the structure as a whole.

3.10 QUESTIONABLE CONCRETE

A. Core tests shall be made at no cost to the government, and as directed by the Architect. If core tests fail to demonstrate the test strength required by the contract documents, or if they are impractical to obtain, and structural analysis does not confirm the safety of the structure, the Architect may, at his discretion, condemn the work or require load tests or additional construction. Should structural analysis confirm the safety of the structure, the Architect may, at his discretion, accept the questionable concrete in accordance with the Article of the General Conditions for the Acceptance of Defective Non-Conforming Work.
B. The Contractor shall pay all costs incurred in providing the additional testing or analysis to resolve the acceptability of questionable concrete.
C. The term "Building Official" in ACI Building Code 318 shall be deemed to mean, and does mean, the Architect.

3.11 CORE TESTS

A. Three representative cores shall be taken from each member or area of concrete for each test considered "questionable". Location of cores shall be as directed by the Architect to least impair the strength of the structure. Damaged cores shall be replaced.
B. Cores shall be obtained and tested in accordance with ASTM C42, latest edition except that if concrete in the structure will be dry under service conditions, the cores shall be air dried (temperature 60 F to 80 F, and relative humidity less than 60%) for 7 days before test and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be immersed in water for at least 48 hours and tested wet.
C. Concrete in the questionable area will be considered structurally acceptable if the average of the cores is equal to or greater than 90% of the specified strength and no single core is more than 500 psi below specified strength.

3.12 LOAD TESTS AND ADDITIONAL CONSTRUCTION

A. Load tests shall be applied and their results evaluated in accordance with Chapter 20 of ACI Building Code 318, latest edition.
B. Work judged inadequate by results of a load test shall be reinforced with additional construction if so directed by the Architect or shall be replaced.
C. Additional construction and replaced work shall be at the Contractor's expense.

3.13 CONDUIT WORK

A. Electrical conduits shall be buried in concrete slabs. Low conduit shall be wired to the upper side of bottom reinforcing and top conduit shall be wired to the lower side of top steel.
B. Take care in spacing concrete around gangs or parallel conduit. Where such conduits occur, they shall be separated by at least one inch.

END OF SECTION 03300

SECTION 04200
MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Concrete unit masonry.
   2. Brick Masonry.
   3. Vertically reinforced unit masonry.
   4. Mortar and Grout.
   5. Masonry reinforcement and accessories.

B. Related Sections: The following sections contain requirements that relate to this Section:
   1. Division 7 Section "Through Wall Flashing".
   2. Division 8 Section "Hollow Metal Doors and Frames".

C. Products installed but not furnished under this Section include the following:
   1. Wood nailers and blocking built into unit masonry are specified in Division 6 Section "Rough Carpentry."
   2. Hollow metal frames in unit masonry openings are specified in Division 8 Section "Steel Doors and Frames."

1.3 QUALITY ASSURANCE

A. Comply with Industry Standards and Reference Specifications):
   1. Standards of American Society for Testing and Materials (ASTM).
   2. Brick Institute of America (BIA).

B. Obtain masonry units from one manufacturer of uniform texture and color for each continuous area and usually related areas.

1.4 SUBMITTALS

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

B. Product data for each different masonry unit, accessory, and other manufactured product indicated.

C. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.

D. Samples for initial selection purposes of the following:
   1. Unit masonry samples in small-scale form showing full extent of colors

and textures available for each different exposed masonry unit required.

E. Samples for verification purposes of the following:
   1. Full-size units for each different exposed masonry unit required showing full range of exposed color, texture, and dimensions to be expected in completed construction.

F. Material certificates for the following signed by manufacturer and Contractor certifying that each material complies with requirements.
   1. Each different cement product required for mortar and grout including name of manufacturer, brand, type, and weight slips at time of delivery.
   2. Each material and grade indicated for reinforcing bars.
   3. Each type and size of joint reinforcement.
   4. Each type and size of anchors, ties, and metal accessories.

G. Material test reports from a qualified independent testing laboratory employed and paid by Contractor indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:
   1. Mortar complying with property requirements of ASTM C 270.
   2. Grout mixes. Include description of type and proportions of grout ingredients.
   3. Masonry units.

H. Cold-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.

I. Hot-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.

J. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.

K. Results from tests and inspections performed by Owner's representatives will be reported promptly and in writing to Architect and Contractor.

1.5 QUALITY ASSURANCE

A. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures," except as otherwise indicated.
   1. Revise ACI 530.1/ASCE 6 to exclude Sections 1.4 and 1.7; Parts 2.1.2, 3.1.2, and 4.1.2; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9 and to modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry.
   2. Fire resistive ratings, where required, shall be established by either recognized testing laboratory certifications or by Certificate of Equivalent thickness of unit from the manufacturers, established in accordance with ASTM C 140.

B. Owner will employ and pay a qualified professional engineer to inspect foundations for compliance with dimensional tolerances specified in referenced unit masonry standard.

1. Engineer Qualifications: Professional engineer legally authorized to practice surveying in jurisdiction where project is located.

C. Inspecting Laboratory Qualifications: To qualify for employment in performing tests and inspection specified in this Section, an independent testing laboratory must demonstrate to Architect's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM C 1093, that it has the experience and capability to conduct satisfactorily the testing indicated without delaying the progress of the Work.

D. Preconstruction Testing: Owner will employ and pay a qualified independent testing laboratory to perform the following preconstruction testing indicated as well as other inspecting and testing services required by referenced unit masonry standard or indicated herein for source and field quality control:

1. Concrete Masonry Unit Tests: For each different concrete masonry unit indicated, units will be tested for strength, absorption, and moisture content per ASTM C 140.
2. Mortar properties will be tested per property specification of ASTM C 270.
3. Mortar composition and properties will be evaluated per ASTM C 780.
4. Grout compressive strength will be tested per ASTM C 1019.

E. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

F. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

G. Field-Constructed Mock-Ups: Prior to installation of unit masonry, erect sample wall panels to further verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work:

1. Locate mock-ups on site in locations indicated or, if not indicated, as directed by Architect.
2. Build mock-ups for the following types of masonry in sizes of approximately 4 feet long by 4 feet high by full thickness, including face and backup wythes as well as accessories.
   a. Each type of exposed unit masonry construction.
   b. Typical interior unit masonry wall.
3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
4. Protect mock-ups from the elements with weather-resistant membrane.
5. Retain and maintain mock-ups during construction in undisturbed condition as standard for judging completed unit masonry construction.
   a. When directed, demolish and remove mock-ups from Project site.

b. Accepted mock-ups in undisturbed condition at time of Substantial Completion may become part of completed unit of Work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry materials to project in undamaged condition.

B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

C. Store cementitious materials off the ground, under cover, and in dry location.

D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.

D. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:

1. Do not lay masonry units that are wet or frozen.
2. Remove masonry damaged by freezing conditions.

E. Hot-Weather Construction: Comply with referenced unit masonry standard.

F. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout.

G. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 degrees F (6 degrees C.)

1. <u>40 deg. F (4 deg. C) to 32 deg. F (0 deg. C)</u>:

a. <u>Mortar</u>: Heat mixing water to produce mortar temperatures between 40 deg. F (4 deg. C) and 120 deg. F (49 deg. C).

b. Grout: Follow normal masonry procedures.

2. 32 deg. F (0 deg. C) to 25 deg. F (-4 deg. C):
   a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 deg. F (4 deg. C) and 120 deg. F (49 deg. C); maintain temperature of mortar on boards above freezing.
   b. Grout: Heat grout materials to 90 deg.F (32 deg. C) to produce in-place grout temperature of 70 deg. F (21 deg. C) at end of work day.
3. 25 deg. F (-4 deg. C) to 20 deg. F (-7 deg. C):
   a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 deg. F (4 deg. C) and 120 deg. F (49 deg. C); maintain temperature of mortar on boards above freezing.
   b. Grout: Heat grout materials to 90 deg.F (32 deg. C) to produce inplace grout temperature of 70 deg. F (21 deg. C) at end of work day.
   c. Heat both sides of walls under construction using salamanders or other heat sources.
4. 20 deg. F (-7 deg. C) and below:
   a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 deg. F (4 deg. C) and 120 deg. F (49 deg. C).
   b. Grout: Heat grout materials to 90 deg.F (32 deg. C) to produce inplace grout temperature of 70 deg. F (21 deg. C) at end of work day.
   c. Masonry Units: Heat masonry units so that they are above 20 deg. F (-7 deg. C) at time of laying.
   d. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 deg. F (4 deg. C) for 24 hours after laying units.
5. Do not heat water for mortar and grout to above 160 deg. F (71 deg. C).

H. Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperature ranges apply to anticipated minimum night temperatures.
1. 40 deg. F (4 deg. C) to 32 deg. F (0 deg. C):
   a. Protect masonry from rain for at least 24 hours by covering with weather-resistive membrane.
2. 32 deg. F (0 deg. C) to 25 deg. F (-4 deg. C):
   a. Completely cover masonry with weather-resistive membrane for at least 24 hours.
3. 25 deg. F (-4 deg. C) to 20 deg. F (-7 deg. C):
   a. Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours 48 hours for grouted masonry.
4. 20 deg. F (-7 deg. C) and below:

a. Except as otherwise indicated, maintain masonry temperature above 32 deg. F (0 deg. C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 deg. F (4 deg. C) for 48 hours.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

B. Where a "Keynote System" is in effect, the number in parenthesis indicates the corresponding keynote number on drawings.

2.2 CONCRETE MASONRY UNITS (4200a)

A. Hollow Concrete Block:: ASTM C 90-85, Grade N.

1. Weight Classification: Normal Weight.

2 Provide special shapes where required as follows:

a. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.

b. Square-edged units for outside corners, except where indicated as bullnose.

3 Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.

a. Concrete Masonry Units: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings or specified herein.

4. Provide Type I, moisture-controlled units where required, otherwise, provide Type II non-moisture controlled units.

5. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

B. Hollow Load-Bearing Concrete Masonry Units: ASTM C 90, Grade N and as follows:

1. Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:

a. 1900 psi.

b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.

2. Weight Classification: Normal weight.

C. Concrete Building Brick: ASTM C 55 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below:

a. 3500 psi.
b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.

2. Weight Classification: Normal weight.

D. General (i.e. applicable to all CMU)

1. Required sizes: a. 8"W x 16"L x 8"H typical.
b. 8"W x 8"L x 8"H where required for curveture
c. Other sizes as required to match existing.
2. Coursing type: Running bond typical, except as noted in item 3 below.
3. Exposed interior blocks: Where block shall serve as the interior finish:
a. Apply block filler, following proper installation instructions.
b. Install block in stack bond, unless noted otherwise on drawing.
4. Structural Application: See structural drawing for distinctintion of load bearing and non-load-bearing applications.
5. Exterior CMU shall be weather resistant.

2.3 BRICK

A. MAIN BRICK (4200b):
1. Meeting ASTM C216-85a, Grade N
2. 2 1/4" x 3 5/8" x 7 5/8" standard modular brick
3. Brick to match existing, and will be selected from submitted samples.

B. Use special shape bricks as required to form complete closure or provide effect indicated on drawing. Submit samples for selection of all colors and textures as indicated on previous drawings.

C. Accent Brick (4200c): Where applicable shall be type, sizes, color and design pattern as indicated on drawing.

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color as required to produce required mortar color.

B. Masonry Cement: ASTM C 91.

C. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this article, combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.

D. Hydrated Lime: ASTM C 207, Type S.

E. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.

F. Aggregate for Grout: ASTM C 404.

G. Water: Clean and potable.

2.5 REINFORCING STEEL

A. General: Provide reinforcing steel complying with requirements of referenced

unit masonry standard and this article.

B. Steel Reinforcing Bars: Material and grade as follows: Grade 60

C. Deformed Reinforcing Wire: ASTM A 496.

D. Plain Welded Wire Fabric: ASTM A 185.

E. Deformed Welded Wire Fabric: ASTM A 497.

2.6 JOINT REINFORCEMENT

A. General: Provide joint reinforcement complying with requirements of referenced unit masonry standard and this article, formed from the following:

1. Galvanized carbon steel wire, coating class as required by referenced unit masonry standard for application indicated.

B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:

1. Wire Diameter for Side Rods: 0.1483 inch (9 gage).

1. Wire Diameter for Cross Rods: 0.1483 inch (9 gage).

2. For single-wythe masonry provide type as follows with single pair of side rods:

a. Ladder design with perpendicular cross rods spaced not more than 16 inches o.c.

b. Truss design with continuous diagonal cross rods spaced not more than 16 inches o.c.

C. 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering joint reinforcement that may be incorporated in the Work include, but are not limited to, the following:

2. AA Wire Products Co.

3. Dur-O-Wal, Inc.

3. Heckman Building Products, Inc.

4. Hohmann & Barnard, Inc.

5. Masonry Reinforcing Corp. of America.

6. National Wire Products Industries.

7. Southern Construction Products, Inc.

2.7 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standard and of this article.

B. Galvanized Carbon Steel Wire: ASTM A 82, coating class as required by referenced unit masonry standard for application indicated.

C. Galvanized Carbon Steel Wire: ASTM A 82, coating class as required by referenced unit masonry standard, for wire ties and anchors in interior walls, unless otherwise indicated.

D. Galvanized Steel Sheet: As follows:

1. ASTM A 366 (commercial quality) cold-rolled carbon steel sheet hot-dip

galvanized after fabrication to comply with ASTM A 153, Class B2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors exposed to the weather and not completely embedded in mortar and grout.

E. Galvanized Steel Sheet: ASTM A 366 (commercial quality) cold-rolled carbon steel sheet, hot-dip galvanized after fabrication to comply with ASTM A 525, Class B2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors.
   1. Thickness of Steel Sheet Galvanized After Fabrication: Uncoated thickness of steel sheet hot-dip galvanized after fabrication:
      a. 0.0747 inch (14 gage).

F. Galvanized Heavy-Thickness Steel Sheet: ASTM A 635 (commercial quality) hot-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A 525, Class B3, for rigid anchors fabricated from steel sheet or strip with a thickness of 0.180 inch and greater.

G. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
   1. AA Wire Products Co.
   2. Dur-O-Wal, Inc.
   3. Heckman Building Products, Inc.
   4. Hohmann & Barnard, Inc.
   5. Masonry Reinforcing Corp. of America.
   6. National Wire Products Industries.
   7. Southern Construction Products, Inc.

2.8 BENT WIRE TIES

A. Individual units prefabricated from bent wire to comply with requirements indicated below:

B. Tie Shape for Hollow Masonry Units Laid with Cells Vertical: Rectangular with closed ends and not less than 4 inches wide.

C. Tie Shape for Solid Masonry Unit Construction: Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long.

2.9 ADJUSTABLE ANCHORS FOR CONNECTING MASONRY TO STRUCTURAL FRAMEWORK

A. General: Two-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.

B. For anchorage to concrete framework, provide manufacturer's standard with dovetail anchor section formed from sheet metal and triangular-shaped wire tie section sized to extend within 1 inch of masonry face and as follows:

2.10 RIGID ANCHORS

A Provide straps of form and length indicated, fabricated from metal strips of following width and thickness.
1. As indicated.

2.11 MISCELLANEOUS ANCHORS

A. Unit Type Masonry Inserts in Concrete: Cast iron or malleable iron inserts of type and size indicated.

B. Dovetail Slots: Furnish dovetail slots, with filler strips, of slot size indicated, fabricated from 0.0336-inch (22-gage) sheet metal.

C. Anchor Bolts: Steel bolts complying with A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
1 Headed bolts.

2.15 CONCEALED FLASHING MATERIALS:

A. Sheet Metal Flashing: Fabricate from the following metal complying with requirements specified in Division 7 section "Flashing and Sheet Metal" and below:

B. Asphalt-Coated Copper Flashing: Manufacturer's standard product consisting of sheet copper of weight per square foot indicated below coated with flexible fibrated asphalt.
1. Weight: 7 oz.

C. Vinyl Sheet Flashing: Flexible sheet flashings especially formulated from virgin polyvinyl chloride with plasticizers and other modifiers to remain flexible and waterproof in concealed masonry applications, black in color and of thickness indicated below:
1. Thickness: 30 mils.

D. Perm-A-Barrier Wall Flashing: 40mil. Thick, flexible self-sealing ruberized flashing as manuf. By Grace Masonry or approved equal.

E. Laminated Flashing: Manufacturer's standard laminated flashing of type indicated below:
1. Copper-Fabric Laminate: Copper sheet of weight per square feet indicated below, bonded with asphalt between 2 layers of glass fiber cloth.
a Weight: 7 oz.

F. Solder and Sealants for Sheet Metal Flashings: As specified in Division 7 section "Flashing and Sheet Metal".

G. Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated.

H. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
1. Asphalt-Coated Copper Flashing:
a. "Cop-A-Cote"; Afco Products Inc.
b. Coated Copper Flashing; Sandell Manufacturing Co., Inc.
c. "Copperseal"; York Manufacturing, Inc.
2. Vinyl Sheet Flashing:

a. "Vi-Seal Plastic Flashing"; Afco Products Inc.
b. "BFG" Vinyl Water Barrier; B.F. Goodrich Co.
c. "Nuflex"; Sandell Manufacturing Co., Inc.
d. "Wascoseal"; York Manufacturing, Inc.

3. Copper Fabric Laminate Flashing:
a. Copper Fabric; Afco Products Inc.
b. Copper Fabric Flashing; Sandell Manufacturing Co., Inc.
c. Copper Fabric Flashing; York Manufacturing, Inc.

2.13 MISCELLANEOUS MASONRY ACCESSORIES:

A. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 for bars No. 3 to No. 18.

B. Non-Metallic Expansion Joint Strips: Premolded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade RE41E1, capable of compression up to 35%, of width and thickness indicated.

C. Premolded Control Joint Strips: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
1. Styrene-butadiene rubber compound complying with ASTM D 2000, Designation 2AA-805.
2. Polyvinyl chloride complying with ASTM D 2287, General Purpose Grade, Designation PVC-63506.

D. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.14 POSTINSTALLED ANCHORS

A. Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing laboratory.
1. Type: Chemical anchors.

2.15 INSULATION

A. Loose Granular Perlite Insulation: ASTM C 549, Type II (surface-treated for water repellency and limited moisture absorption) or IV (surface-treated for water repellency and to limit dust generation).

2.16 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2-cup dry measure) and laundry detergent (1/2-cup dry measure) dissolved in one gallon of water.

B. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use

by manufacturer of masonry units being cleaned:

1. For masonry not subject to metallic oxidation stains, use formulation consisting of a concentrated blend of surface-acting acids, chelating, and wetting agents.
2. For masonry subject to metallic oxidation stains, use formulation consisting of a liquid blend of organic and inorganic acids and special inhibitors.
3. Available Products: Subject to compliance with requirements, a product that may be used to clean unit masonry surfaces includes, but is not limited to, the following:
4. Products: Subject to compliance with requirements, provide the following:
   a. "Sure Klean No. 600 Detergent," ProSoCo, Inc.

2.17 MORTAR AND GROUT MIXES

A. General: Do not add admixtures including air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
   1. Do not use calcium chloride in mortar or grout.
B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:
C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification for job-mixed mortar and ASTM C 1142 for ready-mixed mortar, of types indicated below:
   1. Limit cementitious materials in mortar to portland cement-lime.
   2. For masonry below grade and in contact with earth, and where indicated, use type indicated below:
      a. Type M.
   3. For reinforced masonry and where indicated, use type indicated below:
      a. Type S.
   4. For exterior, above-grade load bearing and non-load bearing walls and parapet walls; for interior load bearing walls; for interior non-load bearing partitions, and for other applications where another type is not indicated, use type indicated below:
      a. Type N.
D. Grout for Unit Masonry: Comply with ASTM C 476 and referenced unit masonry standard.

2.18 SOURCE QUALITY CONTROL

A. Concrete Masonry Unit Tests: For each type, class, and grade of concrete masonry unit indicated, units will be tested by qualified independent testing laboratory for strength, absorption, and moisture content per ASTM C 140.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.

B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.

B. Thickness: Build walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.

3.3 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arrises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing wall do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

D. Variation in Cross-Sectional Dimensions: For column and thickness of walls,

from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.

C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less that nominal 4-inch horizontal face dimensions at corners or jambs.

1. One-half running bond with vertical joint in each course centered on units in courses above and below.
2. Lay all courses (i.e. full height & width) in stack bond where indicated on drawings.

D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

E. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.

F. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
3. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be

filled with grout.

3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

B. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

C. Nonbearing Interior Partitions: Build full height of story to underside of solid floor or roof structure above and as follows:

1. Install pressure-relieving joint filler in joint between top of partition and underside of structure above.
2. Wedge nonbearing partitions against structure above with small pieces of tile, slate, or metal.

3.6 MASONRY-CELL INSULATION

A. Pour granular insulation into cavities as shown to fill void spaces completely. Maintain inspection ports to show presence of insulation at extremities of each pour area. Close ports after complete coverage has been confirmed. Limit fall of insulation to one story in height, but not to exceed 20'-0".

3.7 HORIZONTAL JOINT REINFORCEMENT

A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.8 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.9 MOVEMENT (CONTROL AND EXPANSION) JOINTS

A. General: Install control and expansion joints in unit masonry where indicated. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint

of wall or partition movement.

B. Form control joints in concrete masonry as follows:
   1. Fit bond breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.
   2. Install preformed control joint gaskets designed to fit standard sash block.
   3. Install special shapes designed for control joints. Install bond breaker strips at joint. Keep head joints free and clear of mortar or rake joint.

C. Build in horizontal pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting nonmetallic 50 percent compressible joint filler of width required to permit installation of sealant and backer rod specified in Division 7 Section "Joint Sealers."

3.10 LINTELS

A. Provide masonry lintels where shown and wherever openings of more than 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
   1. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.

B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.11 FLASHING

A. General: Install embedded flashing on drawings where indicated.

B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive/sealant/tape as recommended by flashing manufacturer before covering with mortar.

3.12 INSTALLATION OF REINFORCED UNIT MASONRY

A. General: Install reinforced unit masonry to comply with requirements of referenced unit masonry standard.

B. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.
   1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

3.13 FIELD QUALITY CONTROL

A. Testing Frequency: Tests and evaluations listed in this article will be performed during construction for each 5000 sq. ft. of wall area or portion thereof.
   1. Mortar properties will be tested per property specification of ASTM C 270.
   2. Mortar composition and properties will be evaluated per ASTM C 780.
   3. Grout compressive strength will be sampled and tested per ASTM C 1019.

B. Prism Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:
   1. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.

C. Evaluation of Quality Control Tests: In absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.

3.14 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

C. Final Cleaning: After mortar is set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
   4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
   5. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.

D. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 05120
STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUBMITTALS

A. Submit six shop drawings for the fabrication and erection of all structural steel after being checked and approved by the Contractor and before proceeding. Submit no "Approved as Corrected" drawings for approval. Shop drawings shall be submitted in complete sets of a major area of work, with sheets consecutively numbered. Any changes by contractor or fabricator of contract document details, materials, member sizes, or reinforcement shall be "flagged" on shop drawings accompanied by a written request for authorization and reason for requested change.

B. Submit current certificate for Certified Welders to perform work on the project.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel: Fabricated from ASTM A36 Structural Steel.

B. Grade 50 Steel (where indicated on the plans): Fabricated from ASTM A572 Structural Steel.

C. Tubular Members: ASTM A500, Grade B.

D. Structural Pipe: ASTM A53, Type E, Grade B.

E. High Strength Bolts: ASTM A325.

F. Furnish all accessories, lintels, anchor bolts, leveling plates, shims, and shelf angles shown on the drawings or specified herein.

G. Shop and Field Paint: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure complying with performance requirements of Structural Steel Painting Council SSPC Paint 11-64T.

H. Grouting Mortar: Embeco, Master Builders Co.; Ferrolith-G, Sonneborn Building Products, Inc.; or Irontox Grout, Toch Bros., Inc.

2.2 FABRICATION

A. No splice or connection shall be made without having been detailed on shop drawings and approved by the Architect.

B. All re-entrant corners of copes, blocks, or cuts shall be shaped, notch free, to a radius of at least 1/4 inch.

C. Members shall be free from twists, kinks, buckles, or open joints and shall be so made that when assembled the parts shall come together without shimming.

D. Open holes shall be provided for bolted connections of work specified in other sections.

2.3 WELDING

A. Details of all joints shall comply with the requirements for joints which are accepted as prequalified under the "Structural Welding Code: D1.1, latest edition, of the American Welding Society. Joint forms not included in the foregoing shall not be employed until qualified in accordance with the "Standard Qualification Procedure" of the above code.
B. Welding of all steel, whether in the shop or field, shall be done by Certified Welders. Prior to welding, all welders shall be certified in accordance with "Qualification of Welding Procedure - Welders and Welding Operators" of the AWS Code, AWS D1.1, latest edition. Submit current certificate for approval. Minimum fillet weld permitted shall be 3/16 inch. The strength values allowed per linear inch of fillet shall be as follows:

ASTM A 36 Base Metal
3/16 inch - 1800 lbs.
1/4 inch - 2400 lbs.
5/16 inch - 3000 lbs.
3/8 inch - 3600 lbs.

C. Provide run-off tabs for full penetration butt welds; clip and grind smooth after welding.
D. Remove all weld slag or flux deposit after welding and before painting.

2.4 CONNECTIONS

A. Beam and girder connections shall be Ninth Edition AISC Steel Construction Manual Framed Beam Connections, "Shop" Welded (Table III) for combination with AISC Framed Beam Connections, "Field" Bolted (Table II) unless shown otherwise on the drawings.
B. Select beam and girder connections to support half the total uniform load capacity shown in the AISC Tables for Allowable Loads on Beams for the given shape, span and steel specified herein, except where specific reactions are shown on the drawings.
C. Connections shall be welded joints in the shop and bolted joints in the field unless shown otherwise on the drawings.
D. Bolted joints shall conform to the "Specification for Structural Joints Using ASTM A325 or A490 Bolts" as approved by the Research Council on Structural Connections of the Engineering Foundation, November 13, 1985. Bolts shall be ASTM A325 and shall be "Bearing-type" with thread included in the shear plane.

2.5 INSPECTION OF WELDS AND BOLTED CONNECTIONS

A. All welds shall be subject to 100% visual inspection.
B. High-strength bolts shall be inspected after tightening in accordance with Section 9 of the "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
C. Contractor and fabricator shall notify the Designated Testing Laboratory of required inspections and shall assist the testing laboratory by providing access to all connections to be inspected.
D. Designated testing laboratory shall be selected by the Architect and paid by the Contractor. The Architect will direct laboratory of conditions under which testing will be performed. Laboratory shall issue professional opinions upon the quality of the work inspected.
E. Retests of defective connections shall be paid for by the Contractor.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Embedded Steel (in concrete)

1. Oil, grease and salts shall be removed by solvent cleaning as outlined in Steel Structures Painting Council Specification SSPC-SP 1.
2. Rust and loose mill scale shall be removed by hand or power tool cleaning in accordance with Steel Structure Painting Council Specification SSPC SP2 or SSPC SP3.

B. Painted Steel (normal exposure)

1. Oil, grease and salts shall be removed by solvent cleaning as outlined in Steel Structures Painting Council Specification SSPC-SP 1.
2. Rust and loose mill scale shall be removed by power tool cleaning in accordance with Steel Structure Painting Council Specification SSPC SP3.

3.2 PAINTING

A. Steel, except steel embedded in concrete, shall be painted as specified herein.
B. Apply paint only when the surface of the steel is dry and the temperature not less than 40 F nor greater than 110 F, and when the relative humidity is not greater than 85%.
C. Shop Painting

1. Primer coat shall be applied after cleaning and before bloom rust occurs. If the surface rusts or becomes dirty before painting, the surface shall again be cleaned as specified herein.
2. All surfaces shall receive one spray or brush coat of shop paint to a 2 mil dry film thickness.
3. Paint shall be used from the original containers without dilution.

D. Field Painting

1. Before erection, all surfaces on which the shop coat of paint is damaged or destroyed or on which the metal is exposed by rust spots shall be cleaned by hand or power tool cleaning in accordance with Steel Structure Painting Council Specification SSPC SP2 or SSPC SP3 and retouched with one coat of Field Paint.
2. After erection all field welds and bolt heads and abrasions shall be retouched with one coat of Field Paint.
3. Paint shall be used from original container without dilution.

E. Do not paint steel to be embedded in concrete.

3.3 ERECTION

A. Anchor bolts shall be located and built into the connecting work in advance. All anchor bolts shall be set by templates.

B. Temporary braces and stays shall be provided to hold all structural steel work in position until made secure.
C. No bolt holes shall be burned or enlarged with a torch. Field reaming or welding to correct minor fabrication or erection errors in alignment of fit will be allowed only upon written approval of the Architect.

3.4 SHELF ANGLES, LINTELS, AND JOIST SEATS

A. Lintels and joists which are to be supported by steel columns shall have stiffened beam seats welded to columns with bearing length of not less than 4".
B. Provide steel framing at openings, supports, angle bracing, shelf angles, roof edges angles, and all members detailed on the drawings.

3.5 COOPERATION WITH OTHER WORKS

A. Supplementary framing members supported by steel beams or joists for roof openings and roof supports shall be provided and installed as work of the appropriate sections of these specifications, but shall be coordinated with this work prior to submission of shop drawings.
B. Fabricator shall punch all holes for the attachment of nailers, hangers, and work to the steel.

END OF SECTION 05120

SECTION 05500
MISCELLANEOUS METAL FABRICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide miscellaneous metal items fabricated from heavy gage ferrous metals.

1.2 APPLICABLE STANDARDS

ALUMINUM ASSOCIATION (AA)

AA DAF-45 (Sep 1980, 7th Ed) Designation System for Aluminum Finishes

AA SAA-46 (Oct 1978, 5th Ed) Standards for Anodized Architectural Aluminum

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A123 (1989a) Hot-Dip Galvanized Coatings on Iron and Steel Products

ASTM A500 (1989) Cold-Formed Welded and Seamless Carbon Steel, Structural Tubing in Rounds and Shapes

ASTM A525 (1987) Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

ASTM B26 (1988) Aluminum-Alloy Sand Castings

ASTM B221 (1988) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

ASTM B429 (1988) Aluminum-Alloy Extruded Structural Pipe and Tube

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1 (1988) Structural Welding Code - Steel

1.3 GENERAL REQUIREMENTS

A. All steel installed in exterior exposures subject to salt spray or corrosive fumes shall be galvanized.

B. The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication.

C. Welding to or on structural steel shall be in accordance with AWS D1.1. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123, ASTM A 446, or ASTM A 525, as applicable. Only concealed Fasteners shall be used unless otherwise approved by the Architect. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather shall be formed to exclude water.

1.4 DISSIMILAR MATERIALS

A. Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces shall be protected with a coat of bituminous paint or asphalt varnish.

1.5 WORKMANSHIP

A. Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines and surfaces. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Exposed connections of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces of work in place shall have a smooth finish, and unless otherwise approved, exposed riveting shall be

flush.

B. Where tight fits are required, joints shall be milled. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

1.6 ANCHORAGE

A. Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts made to engage with the anchors, expansion shields, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; and lag bolts and screws for wood.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials:

1. Steel plates, shapes, and bars: ASTM A 36
2. Steel pipe: ASTM A 53, schedule 40.
3. Bolts: ASTM A 325.
4. Fasteners: Zinc coated fasteners designed for loading and use.
5. Grout: Non-shrink non-metallic grout, Euco NS by Euclid Chemical Co or approved equal, subject to compliance with specified requirements.
6. Other misc. metal as required.

B. Galvanized ferrous metal items at exterior wall and where exposed to weather; 1 coat primer (shop-applied), elsewhere:

1. Galvanizing: ASTM A 525.
2. Primer; Tnemec 10-99, PPG Inhibitive Metal Primer, Rustoleum Rusty Metal Primer, or approved equal, subject to compliance with specified requirements.
3. Galvanizing repair paint, zinc rich primer; Tnemec, PPG, ZRC Chemical Products or approved equal, subject to compliance with specified requirements.

2.2 SHOP PAINTING

A. Surfaces of ferrous metal except galvanized surfaces, shall be cleaned and shop coated with the manufacturer's standard protective coating unless otherwise specified. surfaces of items to be embedded in concrete shall not be painted. Items to be finish painted shall be prepared according to manufacturer's recommendations or as specified.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. All items shall be installed at the locations shown and according to the manufacturer's recommendations. Item listed below require additional procedures as specified.

END OF SECTION 05500

SECTION 06100
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Framing with dimension lumber.
   2. Rooftop equipment bases and support curbs.
   3. Wood grounds, nailers, and blocking.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 6 Section "Finish Carpentry" for nonstructural carpentry items exposed to view and not specified in another Section.
   2. Division 6 Section "Interior Architectural Woodwork" for interior woodwork specially fabricated for this Project.

1.3 DEFINITIONS

A. Rough carpentry includes carpentry work not specified as part of other Sections and generally not exposed, unless otherwise specified.

1.4 SUBMITTALS

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

B. Product data for the following products:
   1. Wood products.
   2. Metal framing anchors.

C. Wood treatment data as follows including chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated material:
   1. For each type of preservative treated wood product include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
   2. For water-borne treated products include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.
   3. Warranty of chemical treatment manufacturer for each type of treatment.

D. Research reports or evaluation reports of the model code organization acceptable to authorities having jurisdiction evidencing compliance of the following wood products with specified requirements and building code in effect for Project.
   1. Engineered wood products.
   2. Metal framing anchors.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
   1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

A. Lumber Standards: Furnish lumber manufactured to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

B. Inspection Agencies: Inspection agencies and the abbreviations used to reference them with lumber grades and species include the following:
   1. RIS - Redwood Inspection Service.
   2. NLGA - National Lumber Grades Authority (Canadian).
   3. SPIB - Southern Pine Inspection Bureau.
   4. WCLIB - West Coast Lumber Inspection Bureau.
   5. WWPA - Western Wood Products Association.

C. Grade Stamps: Provide lumber with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
   1. For exposed lumber furnish pieces with grade stamps applied to ends or back of each piece; or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.

D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
   1. Provide dressed lumber, S4S, unless otherwise indicated.
   2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.
   3. Provide lumber with 15 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

2.2 DIMENSION LUMBER

A. For light framing (2 to 4 inches thick, 2 to 4 inches wide) provide the following grade and species:
   1. "Construction" grade.
   2. Any species of specified grade.

B. For structural light framing (2 to 4 inches thick, 2 to 4 inches wide), provide the following grade and species:
   1. "No. 2" grade.
   2. Any species of specified grade.
   3. Same species as indicated for structural framing grade below.

C. For structural framing (2 to 4 inches thick, 5 inches and wider), provide the following

grade and species:

1. "No. 2" grade.

D. Any species and grade that complies with the following requirements for species group as defined in Table 8.1a of N.F.P.A National Design Specification, for extreme fiber stress in bending "Fb" for single and repetitive members, and for modulus of elasticity "E":

1. Group II species, "Fb" of 1200 psi for single member use and of 1400 psi for repetitive member use, and "E" of 1,600,000 psi.

E. For exposed framing lumber provide material complying with the following requirements:

1. Definition: Exposed framing refers to dimension lumber that is not concealed by other construction and is indicated to receive a stained, painted or natural finish.
2. Grading: Material hand-selected at factory from lumber of species and grade indicated below that complies with "Appearance" grade requirements of ALSC National Grading Rule; issue inspection certificate of inspection agency for selected material.
   a. Same species and grade as indicated for structural framing.
   b. Hem-Fir, "Select Structural" grade per WWPA rules.
   c. Southern Pine, "Select Structural" grade per SPIB rules.
   d. Redwood, "Clear-All Heart" grade per RIS rules.
   e. Spruce-Pine-Fir, "Select Structural" grade per NLGA rules.

2.3 BOARDS

A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:

1. Moisture Content: 15 percent maximum, "MC-15" OR KD-15.
2. Where no finish is indicated, provide the following:
   a. Pressure treated clear pine.
3. Where painted finish is indicated, provide "No. 1 Boards" per SPIB rules, "Select Merchantable Boards" per WCLIB rules, or "No. 2 Common Boards & Better" per WWPA rules.

B. Concealed Boards: Where boards will be concealed by other work, provide lumber of 19 percent maximum moisture content (S-DRY or KD-19).

C. Board Sizes: Provide sizes indicated.

2.4 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

D. Grade: "Standard" grade light-framing-size lumber of any species or board-size lumber as required. "No. 3 Common" or "Standard" grade boards per WCLIB or WWPA rules or "No. 2 Boards" per SPIB rules.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements

specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of AISI Type 304 stainless steel.

B. Nails, Wire, Brads, and Staples: FS FF-N-105.

C. Power Driven Fasteners: National Evaluation Report NER-272.

D. Wood Screws: ANSI B18.6.1.

E. Lag Bolts: ANSI B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and where indicated, flat washers.

2.6 METAL FRAMING ANCHORS

A. General: Provide metal framing anchors of type, size, metal, and finish indicated that comply with requirements specified including the following:

1. Current Evaluation/Research Reports: Provide products for which model code evaluation/research reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with the building code in effect for this Project.
2. Allowable Design Loads: Provide products for which manufacturer publishes allowable design loads that are determined from empirical data or by rational engineering analysis and that are demonstrated by comprehensive testing performed by a qualified independent testing laboratory.

B. Galvanized Steel Sheet: Steel sheet zinc-coated by hot-dip process on continuous lines prior to fabrication to comply with ASTM A 525 for Coating Designation G60 and with ASTM A 446, Grade A (structural quality); ASTM A 526 (commercial quality); or ASTM A 527 (lock-forming quality); as standard with manufacturer for type of anchor indicated.

1. Use galvanized steel framing anchors for rough carpentry exposed to weather, in ground contact, or in area of high relative humidity, and where indicated.

C. Painted Steel Sheet: ASTM A 366 (commercial quality) cold rolled steel sheet or ASTM A 570, Grade 33 (structural quality) hot-rolled steel sheet, as standard with manufacturer for type of anchor indicated, coated after fabrication with manufacturers standard, fast-curing, lead-free "universal primer" resistant to normal atmospheric corrosion.

1. Use painted steel framing anchors for rough carpentry not exposed to weather, in ground contact, or in area of high relative humidity.

2.7 PRESERVATIVE WOOD TREATMENT BY PRESSURE PROCESS

A. General: Where lumber or plywood is indicated as preservative- treated wood or is specified herein to be treated, comply with applicable requirements of AWPA Standards C2 (Lumber) and C9 (Plywood). Mark each treated item with the AWPB or SPIB Quality Mark Requirements.

B. Pressure-treat above-ground items with water-borne preservatives to a minimum retention of 0.25 pcf. For interior uses, after treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and

waterproofing.

2. Wood blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members less than 18 inches above grade.

C. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces to comply with AWPA M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

Discard units of material with defects that impair quality of rough carpentry construction and that are too small to use in fabricating rough carpentry with minimum joints or optimum joint arrangement.

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

Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

A. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.

B. Countersink nail heads on exposed carpentry work and fill holes.

Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.1 WOOD GROUNDS, NAILERS, AND BLOCKING

A. Install wood grounds, nailers, and blocking where shown and where required for screening or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to form work before concrete placement.

3.2 WOOD FURRING

A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finished work.

B. Furring to Receive Gypsum Drywall: Install 1-inch by 2-inch furring at 16 inches o.c., vertically.

3.3 WOOD FRAMING, GENERAL

A. Framing Standard: Comply with N.F.P.A. "Manual for Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install framing composed of engineered

wood products to comply with manufacturer's directions.

C. Install framing members of size and spacing indicated.

D. Anchor and nail as shown, and to comply with the following:
   1. Published requirements of manufacturer of metal framing anchors.
   2. "Recommended Nailing Schedule" of referenced framing standard and with N.F.P.A. "National Design Specifications for Wood Construction."
   3. "Table No. II - Recommended Nailing Schedule" of the Uniform Building Code.
   4. "Appendix C - Recommended Nailing Schedule" of the BOCA National Building Code.
   5. "Table 1705.1 - Fastening Schedule," of the Standard Building Code.

E. Do not splice structural members between supports.

3.4 INSTALLATION OF CONSTRUCTION PANELS

A. General: Comply with applicable recommendations contained in Form No. E30, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:
   1. Sheathing: Nail to framing.
   2. Plywood Backing Panels: Screw to supports.

END OF SECTION

SECTION 06160
WOOD SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Wall sheathing.
2. Roof sheathing.
3. Building wrap.

1.2 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements.

B. Research/Evaluation Reports: For the following:

1. Fire-retardant-treated plywood.
2. Building wrap.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

A. Plywood: DOC PS 1.

2.2 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Comply with performance requirements in AWPA C27.

1. Use Interior Type A, where indicated.

B. Kiln-dry material after treatment to a maximum moisture content of 15 percent.
C. Identify fire-retardant-treated plywood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
D. Application: Treat plywood indicated on Drawings.

2.3 WALL SHEATHING

A. Plywood Wall Sheathing: Exposure 1, rated Structural I, sheathing.

2.4 ROOF SHEATHING

A. Plywood Roof Sheathing: Exposure 1, rated Structural I, sheathing.

2.5 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch (12.7 mm) thick.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated.

1. For wall and roof sheathing panels, provide fasteners with corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

2.7 WEATHER-RESISTANT SHEATHING PAPER

A. Building Wrap: ASTM E 1677, Type I air retarder; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Provide the following:
   a. Dow DuPont (E. I. du Pont de Nemours and Company); Tyvek CommercialWrap.
2. Water-Vapor Permeance: Not less than 200g through 1 sq. m of surface in 24 hours per ASTM E 96, Desiccant Method (Procedure A).

B. Building-Wrap Tape: Tape recommended by building-wrap manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Securely attach to substrate by fastening as indicated, and complying with the following:

1. NES NER-272 for power-driven fasteners.

2. Table 2306.1, "Fastening Schedule," in Florida Building Code, 2004 Edition."

B. Coordinate sheathing installation with flashing installation so these materials are installed in sequence and manner that exclude exterior moisture.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."

1. Comply with "Code Plus" installation provisions in guide referenced in paragraph above.

3.3 WEATHER-RESISTANT SHEATHING-PAPER INSTALLATION

A. General: Cover sheathing with weather-resistant sheathing paper (building wrap) as follows:

1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
2. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap, unless otherwise indicated.

B. Weather-resistant sheathing paper (building wrap): Comply with manufacturer's written instructions.

1. Seal seams, edges, fasteners, and penetrations with tape.
2. Extend into jambs of openings and seal corners with tape.

END OF SECTION 06160

SECTION 06176
METAL-PLATE-CONNECTED WOOD TRUSSES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Wood roof trusses.
   2. Wood truss bracing.
   3. Metal truss accessories.

1.2 SUBMITTALS

A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.
B. Shop Drawings: Show fabrication and installation details for trusses.

   1. Submit layout including spacing, truss mark and dimensions.
   2. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
   3. Indicate sizes, stress grades, and species of lumber (minimum grade; No. 2 Southern Pine).
   4. According to TPI 1, building designer is responsible for design of "permanent lateral bracing as specified by the truss designer, to prevent buckling of the individual truss members due to design loads." See Evaluations.
   5. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
   6. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
   7. Show splice details and bearing details.
   8. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Qualification Data: For metal-plate manufacturer and fabricator.
D. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

   1. Metal-plate connectors.
   2. Metal truss accessories.

1.3 QUALITY ASSURANCE

A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.

1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility. Manufacturer's professional engineer shall be registered in the State of Florida.
2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.
C. Comply with applicable requirements and recommendations of the following publications:
D. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."

1. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
2. TPI HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."

E. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."
F. Forest Certification: Provide metal-plate-connected wood trusses produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria."

PART 2 - PRODUCTS

2.1 DIMENSION LUMBER

A. Lumber: DOC PS 20. Provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

B. Grade and Species: For truss chord and web members, provide dimension lumber of any species, graded visually or mechanically, and capable of supporting required loads without exceeding allowable design values according to AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

1. Minimum grade and species for all truss components shall be No. 2 Southern Pine, or equal.

C. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Division 6 Section "Rough Carpentry."

2.2 METAL PRODUCTS

A. Connector Plates: Fabricate connector plates to comply with TPI 1 from hot-dip galvanized steel sheet complying with ASTM A 653; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Alpine Engineered Products, Inc.
    b. Cherokee Metal Products, Inc.; Masengill Machinery Company.
    c. CompuTrus, Inc.
    d. Eagle Metal Products.
    e. Jager Building Systems, Inc.
    f. MiTek Industries, Inc.; a subsidiary of Berkshire Hathaway Inc.
    g. Robbins Engineering, Inc.
    h. TEE-LOK Corporation; a subsidiary of Berkshire Hathaway Inc.
    i. Truswal Systems Corporation.

B. Fasteners: Where trusses are exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

1. Nails, Brads, and Staples: ASTM F 1667.
2. Power-Driven Fasteners: NES NER-272.
3. Wood Screws: ASME B18.6.1.
4. Lag Bolts: ASME B18.2..
5. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

C. Metal Truss Accessories: Provide truss accessories made from hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

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

    a. Cleveland Steel Specialty Co.
    b. Harlen Metal Products, Inc.
    c. KC Metals Products, Inc.
    d. Simpson Strong-Tie Co., Inc.
    e. Southeastern Metals Manufacturing Co., Inc.
    f. USP Structural Connectors.

2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.3 FABRICATION

A. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.

1. Fabricate wood trusses within manufacturing tolerances in TPI 1.

B. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wood trusses only after supporting construction is in place and is braced and secured.
B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.
C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
D. Install and brace trusses according to TPI recommendations and as indicated.
E. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in truss accessories according to manufacturer's fastening schedules and written instructions.
F. Securely connect each truss ply required for forming built-up girder trusses.
G. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.

1. Install bracing to comply with Division 6 Section "Rough Carpentry ."
2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.

H. Install wood trusses within installation tolerances in TPI 1.
I. Do not cut or remove truss members.
J. Replace wood trusses that are damaged or do not meet requirements.

END OF SECTION 06176

SECTION 06200
FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Exterior standing and running trim and rails.
   2. Interior standing and running trim and rails.
   3. Plywood soffits.
   4. Plywood siding.
   5. Aluminum soffit vents.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 6 Section "Rough Carpentry" for furring, blocking, and other carpentry work that is not exposed to view.
   2. Division 6 Section "Interior Architectural Woodwork" for interior woodwork not specified in this Section.
   3. Division 7 Section "insulation" for insulation under siding.
   4. Division 7 Section "Flashing and Sheet Metal" for flashing and other sheet metal work.
   5. Division 7 Section "Joint Sealants" for sealants.
   6. Division 9 Section "Painting" for back priming and finishing of finish carpentry.

1.3 SUBMITTAL

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

B. Product data for each type of factory-fabricated product and process specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.

C. Wood treatment data as follows including chemical treatment manufacturer's instructions for handling, storing installation, and finishing of treated material:
   1. For each type of preservative treated wood product include certification by treating plant stating type of preservative retained, and compliance with applicable standards.
   2. For water-borne treated products include statement moisture content of treated materials was reduced to levels indicated prior to shipment to Project site.
   3. Warranty of chemical treatment manufacturer for each type of treatment.

D. Samples for initial selection purposes of the following in form of manufacturer's color charts consisting of actual units a\or sections of units showing full range of colors, textures, and patterns available for each type of material indicated.
   1. Each type of paneling specified.
   2. Each type of siding specified.

E. Samples for verification purposes of the following:
   1. Exterior standing and running trim: 2'-0"x long full board or molding width, finished on one side and one edge.
   2. Interior standing and running trim: 2'0" x full board or molding width, unfinished.
   3. Exterior plywood: 2'0" long x panel width, finish applied to upper half of each piece.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels. Provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.

B. Do not deliver interior finish carpentry until environmental conditions meet requirements specified for installation areas. If finish carpentry must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified for installation areas.

1.5 PROJECT CONDITIONS

A. Environmental Conditions: Obtain and comply with finish carpentry manufacturer's and installer's coordinated advice for optimum temperature and humidity conditions for finish carpentry during its storage and installation.

B. Weather Conditions: Proceed with finish carpentry only when existing and forecasted weather conditions will permit exterior finish carpentry to be installed in compliance with manufacturer's recommendations and when substrate is completely dry.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber Standards: Comply with PS 20 "American Softwood Lumber Standard" for Lumber and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee Board of Review.

B. Plywood Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood and, for products nor manufactured under PS 1, with APA PRP-108.

C. Inspection Agencies: Inspection agencies and the abbreviations used to reference them with lumber grades and species include the following:
   1. RIS - Redwood Inspection Service.
   2. SPIB - Southern Pine Inspection Bureau.
   3. WCLIB - West Coast Lumber Inspection Bureau.
   4. WWPA - Western Wood Products Association.

D. Grade Stamps: Provide lumber with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
   1. For exposed lumber furnish pieces with grade stamps applied to ends or back

of each piece, or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.

E. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard reference below:
   1. Hardwood Plywood: HPMA FE.

2.2 EXTERIOR STANDING AND RUNNING TRIM AND RAILS

A. Trim and Rails: For trim and rails in form of boards and worked products, Provide lumber complying with the following requirements including those of the grading agency listed with species.
   1. Species:
   2. Pressure treated pine.
      a. Grade: Clear
   3. Species: Western red cedar; WCLIB OR WWPA.
      a. Grade: B and Better, 1 and 2 Clear.
   4. Texture: Surfaced (smooth).
   5. Lumber for Painted Finish: Glued-up lumber or solid lumber stock.

2.3 INTERIOR STANDING AND RUNNING TRIM AND RAILS

A. Trim and Rails: For trim in form boards and worked products, provide lumber complying with the following requirements.
   1. Species: Ponderosa Pine; WWPA.
   2. Select Grade: B and Better.
   3. Finish Grade: Prime.
   4. Select Grade: Choice.
   5. Texture: Surfaced (smooth).
   6. Lumber for Painted Finish: Glued-up lumber of solid lumber stock.

B. Wood Molding Patterns: For stock molding patterns inclined in Wood Molding and Millwork Producers Association WM7 and graded under WM4, provide the following grade cased on finish indicates and fabricated from species specified:
   1. Moldings for Painted Finish: P-Grade.

2.4 SIDING

A. Plywood Siding: Exterior type, APA 303 Series Siding, in size and pattern as shown on drawings.
   1. Thickness: 5/8 inch or as shown on drawing.
   2. Type: Medium-density overlay, V-grooves at 6 inches on center.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering materials that may be incorporated in the Work include, but are not limited to, the following:
   1. Plywood and Plywood Siding:
      1. Abitibi-Price Corp.
      2. Champion International Corp.
      3. Georgia-Pacific Corp.

2.5 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Stainless steel, non-corrosive aluminum or hot dip galvanized nails, in sufficient length to penetrate minimum of 1-1/2 inches

substrate unless recommended otherwise by manufacturer.

1. Countersink nails and fill surface where face nailing is unavoidable.

B. Fasteners for Interior Finish Carpentry: Nails, screws and other anchoring devices of type, size, material , and finish required for application indicated to provide secure attachment, concealed where possible.

1. Countersink nails, fill surface flush, and sand where face nailing is unavoidable.
2. Where finish carpentry materials are exposed in areas of high humidity, provide fasteners and anchorages with hot -dip galvanized coating complying with ASTM A 153.

C. Felt Underlayment: Asphalt saturated organic felts, un-perforated, conforming to requirements of ASTM D 26, Type 1, No. 15.

D. Flashing: Comply with requirements of Division 7, Section "Flashing and Sheet Metal" for flashing materials installed in finish carpentry.

1. Horizontal Joint Flashing for Siding: Preformed galvanized steel or aluminum z-shaped flashing.

E. Sealants: Comply with requirements of Division 7, Section "Joint Sealants" for materials required for sealing siding work.

F. Soffit Vents: Continuous perforated aluminum with mill finish.

2.5 FABRICATION

A. Wood Moisture Content: Comply with requirements of specified inspection agencies and manufacturer's recommendations for moisture content of finish carpentry in relation to relative humidity conditions existing during time of fabrication and in installation areas. Provide finish carpentry and with moisture content that is compatible with project requirements.

B. Fabricate finish carpentry to dimensions, profiles and details indicated. Ease edges to radius indicated for the following:

1. Lumber less than 1 inch in nominal thickness: 1/6 inch.
2. Lumber 1 inch or more in nominal thickness: 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting installation and performance of finish carpentry. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean Substrates of projections and substances detrimental to application.

B. Condition finish carpentry to average prevailing humidity conditions in installation areas before installation for a minimum of 24 hours unless longer conditioning recommended by manufacturer.

C. Backprime lumber for painted finish exposed on the exterior. Comply with requirements for surface preparation and application in Section "Painting."

3.3 INSTALLATION, GENERAL

A. Do not use finish carpentry materials that are unsound, warped, bowed, twisted, improperly treated or finished, not adequately seasoned, or too small to fabricate with proper jointing arrangements.
   1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install finish carpentry plumb, level, true, and aligned with adjacent materials. Use concealed shims where required for alignment.
   1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
   2. Install to tolerance of 1/8 inch in 8 feet for plumb and level. Install adjoining finish maximum offset for reveal installation.
   3. Coordinate finish carpentry with materials and systems that may be in or adjacent to standing and running trim and rails. Provide cutouts for mechanical and electrical items that penetrate exposed surfaces of trim and rails.

C. Finish in accordance with the specified requirements.

D. Refer to Division 9 Sections for final finishing of finish carpentry.

END OF SECTION

SECTION 06400
ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Laminate clad cabinets (plastic-covered casework).
   2. Cabinet tops (countertops).

B. Related Sections: The following sections contain requirements that relate to this section:
   1. Division 6 Section "Rough Carpentry" for furring, blocking, and other carpentry work that is not exposed to view.
   2. Division 9 Section "Painting" for final finishing of installed architectural woodwork.

1.3 SUBMITTALS

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

B. Product data for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.

C. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
   1. Apply WIC Certified Compliance Label to first page of shop drawings.

D. Samples for initial selection purposes of the following in form of manufacturer's color charts consisting of actual units or sections of units showing full range of colors, textures, and patterns available for each type of material indicated.
   1. Plastic laminate.
   2. Factory-applied opaque finishes.

E. Samples for verification purposes of the following:
   1. Lumber and panel products with factory-applied opaque finish, 8- 1/2 inches by 11 inches for panels and 50 square inches for lumber, for each finish system and color, with one half of exposed surface finished.
   2. Laminate clad panel products, 8-1/2 inches, by 11 inches for each type, color, pattern, and surface finish, with separate samples of unfaced panel product used for core.
   3. Corner pieces as follows:
      a. Cabinet front frame joints between stiles and rail as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
      b. Miter joints for standing trim.
   4. Exposed cabinet hardware, one unit of each type and finish.

F. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.

G. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other information specified.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm experienced in successfully producing architectural woodwork similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.

B. Single-Source Manufacturing and Installation Responsibility: Engage a qualified Manufacturer to assume undivided responsibility for woodwork specified in this section, including fabrication, finishing, and installation.

C. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.

D. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI) except as otherwise indicated.

E. Hardware Coordination: Distribute copies of approved scheduled for cabinet hardware specified at end of this Section to manufacturer of architectural woodwork; coordinate cabinet shop drawings and fabrication with hardware requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.

B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.6 PROJECT CONDITIONS

A. Environmental Conditions: Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of Work.

1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with manufacture of woodwork without field measurements. Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCTS

2.1 HIGH PRESSURE DECORATIVE LAMINATE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high pressure decorative laminates which may be incorporated in the work include but are not limited to the following:
   1. Formica Corp.
   2. Laminart.
   3. Micarta Div., Westinghouse Electric Corp.
   4. Nevamar Corp.
   5. Ralph Wilson Plastics Co.
   6. Sterling Engineered Products, Inc.

2.2 MATERIALS

A. General: Provide materials that comply with requirements of the WIC woodworking standard for each type of woodwork and WIC quality grade indicated, unless otherwise indicated.

B. General: Provide materials that comply with requirements of the AWI woodworking standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:
   1. Hardboard: ANSI/AHA A135.4
   2. High Pressure Laminate: NEMA LD 3.
   3. Particleboard: ANSI A208.1
   4. Softwood Plywood: PS 1.
   5. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
      a. Particleboard: NPA 8.
      b. Hardwood Plywood: HPMA FE.

2.3 FABRICATION, GENERAL

A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber in relation to relative humidity conditions existing during time of fabrication and in installation areas.

B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness: 1/16 inch.
   2. Edges of rails and similar members more than 1 inch in nominal thickness: 1/8 inch.

C. Complete fabrication, including assembly, finishing, and hardware application, before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

D. Factory-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar

exposures, seal edges of cutouts with a water-resistant coating.

2.4 LAMINATE CLAD CABINETS (PLASTIC-COVERED CASEWORK)

A. Quality Standard: Comply with AWI Section 400 and its Division 400B "Laminate Clad Cabinets."

B. Grade: Custom.

C. AWI Type of Cabinet Construction: Flush overlay.

D. Laminate Cladding: High pressure decorative laminate complying with the following requirements:

1. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   a. Provide selections made by Architect from laminate manufacturer's full range of standard colors and finishes in the following categories:
      (1) Solid colors.
      (2) Patterns.
   b. Laminate Grade for Exposed Surfaces: Provide laminate cladding complying with the following requirements for type of surface and grade.
      (1) Horizontal Surfaces Other Than Tops: GP-50 (0.050-inch nominal thickness).
      (2) Postformed Surfaces: PF-42 (0.042-inch nominal thickness).
      (3) Vertical Surfaces: GP-50 (0.050-inch nominal thickness).
      (4) Edges: GP-50 (0.050-inch nominal thickness).
   c. Semiexposed Surfaces: Provide surface materials indicated below:
      (1) High pressure laminate, GP-28.

E. Provide dust panels of 1/4-inch plywood or tempered hardboard above compartments and drawers except where located directly under tops.

2.5 CABINET HARDWARE AND ACCESSORY MATERIALS

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Finish Hardware."

B. Hardware Standard: Comply with ANSI/BHMA A156.9 "American National Standard for Cabinet Hardware" for items indicated by reference to BHMA numbers or referenced to this standard.

C. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA code number indicated.
   1. Satin Chromium Plated, Brass or Bronze Base: BHMA 626.

D. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of ANSI/BHMA A156.9.

2.6 ARCHITECTURAL CABINET TOPS (COUNTERTOPS)

A. Quality Standard: Comply with AWI Section 400 and its Division 400C.

B. Type of Top: High pressure decorative laminate complying with the following:
   1. Grade: Custom.
   2. Laminate Cladding for Horizontal Surface: High pressure decorative laminate as follows:

a. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   (1) Match Architect's sample.
   (2) Match color, pattern, and finish indicated by reference to manufacturer's standard designations for these characteristics.
   (3) Provide selections made by Architect from manufacturer's full range of standard colors and finishes in the following categories:
      (a) Solid colors.
      (b) Patterns.

b. Grade: GP-50 (0.050-inch nominal thickness).

3. Edge Treatment: Same as laminate cladding on horizontal surfaces.

2.7 FASTENERS AND ANCHORS

A. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.

B. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.

C. Anchors: Select material, type, size, and finish required by each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

2.8 FACTORY FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

A. Quality Standard: Comply with AWI Section 1500 unless otherwise indicated.

B. General: The entire finish of interior architectural woodwork is specified in this section, regardless of whether factory applied or applied after installation.
   1. Factory Finishing: To the greatest extent possible, finish architectural woodwork at factory. Defer only final touch-up, cleaning, and polishing until after installation.

C. General: The primary and pre-finishing (if any) of interior architectural woodwork required to be performed at factory is specified in this section. Refer to Division 9 Section "Painting" for final finishing of installed architectural woodwork and for material and application requirements of prime coats for woodwork not specified to receive final finish in this section.

D. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.

PART 3 - EXECUTION

3.1 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.

B. Deliver concrete inserts and similar anchoring devices to be built into substrates well in advance of time substrates are to be built.

C. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

A. Quality Standard: Install woodwork to comply with AWI Section 1700 for same grade specified in Part 2 of this section for type of woodwork involved.

B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 8'-0" for plumb and level (including tops) and with no variations in flushness of adjoining surfaces.

C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.

D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.

E. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.

F. Tops: Anchor securely to base units and other support systems as indicated.

G. Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips and by blind nailing on backup strips, splined-connection strips, and similar associated trim and framing. Do not face nail unless otherwise indicated.

H. Complete the finishing work specified in this section to whatever extent not completed at shop or before installation of woodwork.

3.3 ADJUSTMENT AND CLEANING

A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean woodwork on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensures that woodwork is being without damage or deterioration at time of Substantial Completion.

HARDWARE SCHEDULE

Item	Identification No.	Location

Drawer Slides	Knap & Vogt 1300 Self Closing	2 per Drawer
Drawer Pulls - 4"	Stanley 4484	1 per Drawer
Door Pulls - 4"	Stanley 4484	1 per Door
Shelf Standards	Knap & Vogt 255	2 ea. end of Shelf
Magnetic Catches	EPCO #592 w/BHMA code 613 (oil rubbed bronze) finish (US 10B)	All Doors
Adj. Shelf Brackets	K & V 87ANO Standards & 187 Bracket w/ 210, 211, & 212 shelf rests w/129 rubber cushion	1 per 8 in. Length of Standard
Concealed Hinges	Blum 75M3650 dull chrome finish (w/out loose pin)	One pair for doors up to 40" in Height, 1½ pairs for taller doors or as recommended by manufacturer.

Locks: Provide standard pin-type or disc-type (5 pins or discs) tumbler locks, keyed individually except as otherwise indicated. All locks shall be under one master-keyed system. Provide locks at all drawers and door units.

END OF SECTION

SECTION 07220
BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers different types of Foam, Rigid & Batt Insulations. **Specific types, thickness and R-value of Insulation to be provided are as indicated on drawings.**

B. Where none is indicated on drawings, provide a minimum of R-11 for walls and R-19 for roofs.

C. Insulation must form a complete thermal closure. Tape and provide baffle as required.

1.2 RELATED WORK

A. Masonry - Div. 4.
B. Concrete deck - Div. 3
C. Metal deck - Div. 5
D. Rough Carpentry – Div. 6
E. Roofing - Div. 7

1.3 SUBMITTALS

A. Product data: Submit product data and installation instructions for each type installation. Include product data for manufacturer's recommended adhesive sheathing joint tape.

1.4 QUALITY CRITERIA:

A. Applicable standards: Standards of America Society for Testing and Materials (ASTM) as specified herein.

B. Thermal resistance of insulation shall be not less than the R-values shown. R-values shall be determined at 75 degrees F in accordance with ASTM C518. Insulation shall be a standard product of a manufacturer, factory-marked or identified with manufacturer's name or trademark and R-value. Identification shall be on individual pieces or individual packages.

PART 2 - PRODUCTS

2.1 PRODUCTS & ACCEPTABLE MANUFACTURERS

A. **Fiberglass Batt Insulation:**

1. Vinyl Clad having perm rating of 0.50 maximum; width equal to framing spacing, where applicable. Insulation left exposed in

plenums or not covered by subsequent construction shall have a flame spread of 25 or less when tested in accord with ASTM E-84-89a.

2. Acceptable manufacturers:
   A. GAF Materials Corp.
   B. Owens-Corning Fiberglass Corp.
   C. United States Gypsum Co., or approved equal
   3. Thickness as indicated on drawing or as required to meet specified R-value.

B. **Blown-In-place Foam Insulation:**

1. Polyicynene insulation manufactured for celled filled or under-deck roof application, with following characteristics:
   A. Spray formula, 1/2 lb. density open celled material.
   B. Air permeability of core foam - ISSN 0701.5232:
      1.6 l/sec./m^2 @ 3" (76 mm) at 75 Pa. pressure
      1.0 l/sec./m^2 @ 5" (127 mm) at 75 Pa. pressure
   C. Thermal Performance
      Thermal resistance (R-value) ASTM C-518:
      R 3.6 hr.ft^2 F/BTU. In.
      RSI 0.62 m^2 °C/W per 25 mm
2. Acceptable manufacturers:
   Icynene® Inc. (ph. 1-800-758-7325) or approved equal.

C. **Cell-filled Foam Insulation:**

1. A two-component system, consisting of Amino-Plast Resin and a catalyst foaming agent surfactant, with following characteristics:
   A. Density: 0.7-0.9 ib/ft Dry & 2.5-5.5 ib/ft Wet.
   B. Water Absorption not exceeding 15%
   C. STC Rating of 50 in accordance with ASTM E90-90
   D. Fire resistance in accordance with ASTM E-119
2. Acceptable product/manufacturers:
   Core-Fill 500 Foam Insulation by Tailored Foam of Florida, Inc. (ph. 1-800-683-3155) approved equal.

D. **Extruded Polystyrene Rigid Insulation:**

1. Shall be provided where "Rigid Insulation" is called for, U.N.O.
2. Acceptable manufacturers:
   A. Amoco Foam
   B. Dow
   C. U.C. Industries, or approved equal.
3. Thickness as indicated on drawing or as required to meet specified R-value.

E. **Poly-isocyanurate Rigid Insulation:**

1. Shall be provided where Polystyrene cannot meet the specified R-Value for the available space; or where specifically indicated on drawings.
2. Glass fiber reinforced, rigid polyisocyanurate closed cell foam core with three-ply facers laminated to both sides.
3. Meeting ASTM C 1289, Type I, Class 2.
4. Tuff-R "C" (Commercial) Insulation by Celotex Corp. Or approved equal.
5. Thickness as indicated on drawing or as required to meet specified R-value.

2.2 Vapor - Barrier: none-oxidizing, non-corroding, tear resistant, low emissivity metalized film.

2.3 Tape: Insulation manufacturer's standard foil faced tape; width required to cover joints.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. General: Comply with manufacturer's product data for each type installation. Install insulation fitted to adjacent construction and with tight joint to provide unbroken thermal barrier. Cut insulation around obstructions and protrusions; fill voids with insulation. Remove projections interfering with installation. Seal tears and holes in vapor barrier facing with specified foil faced tape.

B. Batt Insulation:
   1. Install batt insulation specified herein, with vapor barrier facing building interior. Attach flanges to framing with self-trapping sheet metal screws.
   2. Install batt insulation with butted joints.
   3. Tape all butted joints using specified foil faced tape.

C. Rigid Insulation:
   1. Install rigid insulation specified herein, in accordance with insulation, substrate and roofing manufacturer standards and with approved fasteners. Bring any conflict amongst manufacturer standards to the architect's attention.

END OF SECTION

SECTION 07270
FIRE STOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Provide fire stopping at all penetration through fire rated enclosures.

B. Related work specified elsewhere:

1. Metal Fabrication
2. Rough Carpentry (Sec. 06100).
3. Sealant and Caulking (Sec. 07920)
4. Mechanical and Electrical (Division 15 & 16)

1.2 APPLICABLE STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E84	(1989a) Surface Burning Characteristics of Building Materials
ASTM E119	(1988) Fire Tests of Building Construction and Materials
ASTM E136	(1982) Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
ASTM E814	(1988) Fire Tests of Through-Penetration Fire Stops

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1990) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL-01	(1990; Supple) Building Materials Directory
UL 263	(Aug 14, 1984; 10th Ed; Rev Feb 19, 1987) Fire Tests of Building Construction and Materials
UL 723	(Nov 21, 1983; 6th Ed; Rev thru Apr 28, 1987) Surface Burning Characteristics of Materials
UL 1479	(Jan 5, 1983; 1st Ed; Rev Jan 20, 1984) Fire Tests of Through-Penetration Firestops

1.3 SUBMITTAL

Certificates attesting that material or equipment complies with requirements of a particular agency, when such a requirement exist. The label or listing of the specified agency will be acceptable evidence. In lieu of the label or listing, a written certificate may be submitted
from an approved, nationally recognized testing organization equipped to perform such

services, stating that the items have been tested and conform to the requirements and testing methods of the specified agency.

1.4 GENERAL REQUIREMENTS

Fire stopping shall consist of furnishing and installing a material or a combination of materials to form an effective barrier against the spread of flame, smoke and gases, or maintain the integrity of fire resistance rated walls, partitions, floors and ceiling-floor assemblies.

1.5 STORAGE AND DELIVERY

Materials shall be delivered in the original unopened packages or containers showing name of the manufacturer and the brand name. Materials shall be stored off the ground and shall be protected from damage and exposure to elements. Damaged or deteriorated materials shall be removed from the site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acceptable products, subject to compliance with specified requirements:

1. Fibrex, Inc., FBX Safing Insulation.
2. Manville Corp., Pyro-fiber Safing Insulation.
3. U.S. Gypsum Co., Thermafiber Safing Insulation.

2.1.1 Fire Hazard Classification

Material shall have a flame spread of 25 or less, a smoke developed rating of 50 or less, and a fuel contribution of 50 or less when tested in accordance with ASTM E 84 or UL 723.

2.1.2 Nontoxicity

Material shall be nontoxic to human beings at all stages of application and during fire conditions.

2.1.3 Fire Resistance Rating

2.1.3.1 Through-Penetrations

Fire stopping materials for through-penetrations of fire resistance rated construction shall provide a "F" and "T" fire resistance rating in accordance to ASTM E 814 or UL 1479.

Fire resistance ratings shall be the following:

a. Penetrations of Fire Resistance Rated Walls and Partitions: F Rating - 1 hour, T Rating - 1 hour.
b. Penetrations of Fire Resistance Rated Floors, Roofs and Ceiling-Roof Assemblies: F Rating - 1 hour, T Rating - 1 hour.

2.1.3.2 Construction Joints and Gaps

Firestopping materials for construction joints in fire resistance rated construction shall provide a fire resistance rating in accordance to ASTM E 119 or UL 263. Construction joints include those joints used to accommodate expansion, contraction, wind or seismic movement of the building. Fire resistance ratings of construction joints and gaps shall be same as required for the assembly for which they are part thereof.

2.1.4 Combustibility:
Material shall be non-combustible when tested in accordance with ASTM E136.

PART 3 - EXECUTION

3.1 INSTALLATION

Firestopping shall be installed at locations shown or specified in accordance with manufacturer's written instruction. Cutting and patching of construction and providing sleeves, where required, are shown in drawings or specified in other sections. Firestopping shall be provided in the following locations:

a. Duct, conduit, tubing, cable and pipe penetrations through roof and through fire-resistance rated walls, partitions, and ceiling-roof assemblies.
b. Other locations as required.

3.1.1 Filling of Voids

Firestopping material shall completely fill void spaces regardless of geometric configuration, subject to tolerances established by the manufacturer. Firestopping for filling voids in floors in which the smallest dimension of the void is 4 inches or more shall support the same load as the floor is designed to support or shall be protected by a permanent barrier to prevent loading or traffic in the firestopped area.

3.1.2 Pipe and Ductwork
3.1.2.1 Piping: Insulated or un-insulated piping penetrating fire resistance rated assemblies shall be fire stopped as listed in UL-01.

SECTION 07311
SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. This section includes specifications for both Fiberglass and Asphalt Shingles. This drawing for specific project application.

1.2 SUMMARY

A. This section includes fiberglass shingles for roofs.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 6 Section "Rough Carpentry" for underlayment and wood framing.
2. Division 7 Section "Flashing and Sheet Metal" for flashing and other sheet metal work.
3. Division 7 Section "Roof Specialties and Accessories" for other roof penetrations.

1.3 SUBMITTALS

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

B. Product data for each type of product specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.

C. Samples for initial selection purposes in form of manufacturer's sample finishes showing full range of colors and profiles available.

D. Samples for verification purposes in form of two full-size units of each type of shingles required.

1.4 QUALITY ASSURANCE

A. Fire Performance Characteristics: Provide products that are identical to those tested for the specified fire performance characteristics by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

1. Fire Resistance Ratings: As indicated by reference to design designations in UL "Fire Resistance Directory."

B. Field-Constructed Mock-Up: Prior to installation, erect mock-up to verify selections made under sample submittals and to demonstrate aesthetic effects as well as quality of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work.

1. Locate mock-ups on site in location and size indicated, or, if not indicated. as directed by Architect.
2. Demonstrate the proposed range of aesthetic effects and workmanship.
3. Obtain Architect's acceptance of mock-ups before start of final unit of Work.
   a. When directed, demolish and remove mock-ups from Project site.
   b. Accepted mock-ups in undisturbed condition at time of Substantial Completion may become part of completed unit of Work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's unopened bundles or containers with labels intact.

B. Handle and store materials at Project site to prevent water damage, staining, or other physical damage. Store roll goods on end. Comply with manufacturer's recommendations for job site storage, handling, and protection.

1.6 PROJECT CONDITIONS

A. Weather Conditions: Proceed with Work only when existing and forecasted weather conditions will permit Work to be installed in compliance with manufacturer's recommendations and when substrate is completely dry.

1.7 EXTRA MATERIALS

A. Deliver extra material to Owner. Furnish extra materials matching products installed as described below, packaged with protective coverings for storage and identified with labels clearly describing contents.
   1. Furnish quantity of full-size fiberglass shingles equal to 2 percent of amount installed.

1.8 WARRANTY

A. Special Project Warranty: Submit a written warranty, executed by manufacturer, agreeing specified warranty period. Failures include, but are not limited to, deformation or deterioration of shingles beyond normal weathering. This warranty shall be in addition to, and not in limitation of, other rights the Owner may have against the Contractor under the Contract Documents.
   1. Warranty Period is 20 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering fiberglass shingles that may be incorporated in the Work include, but are not limited to, the following:
   1. Celotex Corporation.
   2. CertainTeed Corporation.
   3. Elk Corporation.
   4. GAF Building Materials Corporation.
   5. Georgia Pacific.
   6. Manville Roofing Systems Division.
   7. Owens Corning Fiberglass Corporation.

2.2 FIBERGLASS SHINGLES

A. Square-Tab Strip Shingles UL Class "A" 230 Pounds: Fungus-resistant, Mineral-surfaced, self-sealing, three-tab fiberglass strip shingles complying with ASTM D 3018, bearing UI Class "A" external fire exposure label and UI "Wind Resistant" label.

B. Hip and Ridge Shingles: Manufacturer's standard factory precut units to match shingles.

C. Hip and Ridge Shingles: Job-fabricated units cut from actual shingles used.

D. Colors, Blends and Patterns: Where manufacturer's standard products are indicated, provide fiberglass shingles with the following requirements:
   1. Provide selections made by Architect from manufacturer's full range of standard colors, textures, and patterns for fiberglass shingles of type indicated.

2.3 ASPHALT SHINGLES

A. Square-Tab Strip Shingles UL Class " " Pounds:

B. Hip and Ridge Shingles: Manufacturer's standard factory precut units to match shingles.

C. Hip and Ridge Shingles: Job-fabricated units cut from actual shingles used.

D. Colors, Blends and Patterns: Where manufacturer's standard products are indicated, provide asphalt shingles with the following requirements:
   1. Provide selections made by Architect from manufacturer's full range of standard colors, textures, and patterns for fiberglass shingles of type indicated.

2.4 ACCESSORIES

A. Felt Underlayment: No. 15; unperforated organic felt complying with ASTM D 226, Type I; 36 inches wide.

B. Asphalt Plastic Cement: Nonasbestos fibrated asphalt cement complying with ASTM D 4586, designed for trowel application.

C. Nails: Aluminum or hot-dip galvanized steel, 11- or 12-gage, sharp-pointed, conventional roofing nails with barbed shanks, minimum 3/8-inch-diameter head, and of sufficient length to penetrate 3/4 inch into solid decking or to penetrate through plywood sheathing. Material of nails in contact with flashing shall match materials selected for flashing to prevent galvanic action.

D. Metal Drip Edge: Minimum 0.024-inch mill finish aluminum sheet, brake-formed to provide 3-inch roof deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge. Furnish in lengths of 8 or 10 feet.

E. Metal Flashing: 0.024-inch mill finish sheet aluminum, job-cut to sizes and configurations required.

1. Valley flashing shall be performed with inverted v profile at center of valley.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrate for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of Work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with noncorrosive roofing nails.

B. Coordinate installation with flashing and other adjoining work to ensure proper sequencing. Do not install roofing materials until all vent stacks and other penetrations through roof sheathing have been installed and are securely fastened against movement.

3.3 INSTALLATION

A. Comply with manufacturer's installation instructions and recommendations, but not less than recommended by "The NRCA Steep Roofing Manual."

B. Felt Underlayment: Apply one layer of felt underlayment horizontally over entire surface to receive fiberglass shingles, lapping succeeding courses a minimum of 2 inches, end laps a minimum of 4 inches, and hips and valleys a minimum of 6 inches. Fasten felt with sufficient number of roofing nails or noncorrosive staples to hold underlayment in place until fiberglass shingle application.

1. Provide additional layer of felt underlayment for roofs with slope of 3 inches per foot or more.

C. Install fiberglass shingles beginning at lower end with a starter strip of roll roofing or inverted shingles with tabs removed. Fasten shingles in pattern, with weather exposure, and using number of fasteners per shingle as recommended by manufacturer. Use vertical and horizontal chalk lines or premarked underlayment to ensure straight coursing.

1. Cut and fit fiberglass shingles at ridges and edges to provide maximum weather protection. Provide same weather exposure at ridges as specified for roof. Lap shingles at ridges to shed water away from direction of prevailing wind. Fasteners at ridges shall be of sufficient length to penetrate sheathing as specified.
2. Pattern: 1/2 spacing offset at succeeding courses.
3. Valley Construction: Boston Cut or Laced.

D. Flashing: Install metal flashing as indicated and in accordance with details and recommendations of the "Fiberglass Roofing" section of "The NRCA Steep Roofing Manual."

3.4 ADJUSTING

A. Replace any damaged materials installed under this Section with new materials meeting specified requirements.

END OF SECTION 07311

SECTION 07600
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Laminated and composition flashing.

B. Integral masonry flashings are specified as masonry work in sections of Division 4.

C. Roofing accessories installed integral with roofing membrane are specified in roofing system sections as roofing work.

D. Roof accessory units of premanufactured, set-on type are specified in Division 7 Section "Roof Accessories."

1.3 SUBMITTALS

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

B. Product data, Flashing, Sheet Metal, and Accessories: Manufacturer's technical product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

C. Samples of the following flashing, sheet metal, and accessory items:
   1. 8-inch-square samples of specified sheet materials to be exposed as finished surfaces.
   2. 12-inch-long samples of factory-fabricated products exposed as finished work. Provide complete with specified factory finish.

D. Shop drawings showing layout, profiles, methods of joining, and anchorages details, including major counter flashings and trim/fascia units. Provide layouts at 1/4-inch scale and details at 3-inch scale.

1.4 PROJECT CONDITIONS

A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

PART 2 - PRODUCTS

2.5 SHEET METAL FLASHING AND TRIM MATERIALS

A. Zinc-Coated Steel: Commercial quality with 0.20 percent copper, ASTM A 526 except ASTM A 527 for lock-forming, G90 hot-dip galvanized, mill phosphatized where indicated for painting; 0.0359-inch thick (20 gage) except as otherwise indicated.

B. Sheet Aluminum: ASTM B 209, alloy 3003, temper H14, AA-C22A41 clear anodized finish; 0.032-inch thick (20 gage) except as otherwise indicated.

2.6 LAMINATED COMPOSITION SHEET FLASHING

A. Copper/Paper Flashing: 3-oz. copper sheet laminated between 2 sheets of bituminous impregnated creped Kraft paper or saturated fabric.

B. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

1. Afco Products, Inc.; "Cop-A-Bond Duplex."
2. Phoenix Building Products, Inc.; "Duplex Cop-R Flash."
3. York Manufacturing, Inc.; "Cop-R-Tex Duplex."

C. Miscellaneous Materials and Accessories:

D. Solder: For use with steel, provide 50 - 50 tin/lead solder (ASTM B 32), with rosin flux.

E Fasteners: Same metal as flashing/sheet metal or other non- corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

F Bituminous Coating: SSPC - Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

G Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non- drying, non-migrating sealant.

H. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealers."

I. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.

J. Paper Slip Sheet: 5-lb. rosin-sized building paper.

K. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.

L. Elastic Flashing Filler: Closed-cell polyethylene or other soft closed-cell material recommended by elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.

M Roofing Cement: ASTM D 2822, asphaltic.

2.7 FABRICATED UNITS

A. General Metal Fabrication: Shop-fabricate work to greatest extent possible.

Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

B. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Underlayment: Where aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.

C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.

3.2 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Protection: Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion.

3.3 EXPANSION CONTROL:

A. Provide control joints where indicated on drawings and where not indicated on drawing, provide at a maximum spacing per industry standards.

END OF SECTION

SECTION 07920
SEALANTS AND CAULKING

PART 1 - GENERAL

1.1 SUMMARY

A. All flashing, joints, intersection of roofs, roofs and walls, and roof and roof accessories must be properly sealed.

B. Definitions:

1. Sealant: A weatherproof elastomer used in filling and sealing joints, having properties of adhesion, cohesion, extensibility under tension, compressibility and recovery; designed to make joints air and water light. Material is designed generally for application in exterior joints and for joints subject to movement.
2. Caulking compound: A material used in filling joints and seams, having properties of adhesion and cohesion; not required to have extensibility and recovery properties, generally for application in interior joints.
3. Caulk: the process of filling joints, without regard to type of material.
4. Joint failure: A caulked joint exhibiting one or more of the following characteristics:
   a. Air and/or water leakage.
   b. Migration.
   c. Loss of adhesion.
   d. Loss of cohesion.
   e. Failure to cure.
   f. Discoloration.
   g. Staining of adjacent work.
   h. Development of bubbles, air pockets or voids.

1.2 SUBMITTALS

A. Product data: Submit manufacturer's product description indicating conformance with specified requirements and installation instruction for each type sealant. Indicate preparation and priming requirements for each substrate condition.

B. Color samples:

1. Submit samples of manufacturer's standard material colors for standard color sealants.
2. Submit color samples at least 30 days prior to commencement of application.
3. Samples shall be actual materials, or literature depicting actual colors of standard color materials. Architect reserves the right to reject work not in conformance with selected colors, based upon samples submitted.

1.3 JOB CONDITIONS:

A. Protection of adjacent surfaces:

1. Protect by applying masking material or manipulating application equipment or materials in joint. If masking materials are used allow no tape to touch cleaned surfaces to receive sealant. Remove tape immediately after caulking, before surface skin begins to form.

2. Remove misapplied materials from surfaces using solvents and methods recommended by manufacturer.

3. Restore surfaces from which materials have been removed to original condition and appearance.

1.4 WARRANTY:

A. Warranty work to be free from defects in materials and workmanship, including joint failure, for a period of two years, beginning at Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SILICONE SEALANT:

1. Dow Corning Corp.
2. General Electric, Co.

2.2 ACRYLIC SEALANT:

A. Acceptable products:

1. A.C. Horn, Inc., Daraseal A.R.
2. DAP, Inc., DAP Acrylic.
3. Pecora Corp., 60 + Unicrylic.
4. Protective Treatments, Inc., 738.
5. Tremco, Inc., Mono.

B. Characteristics:

1. Type: One part, acrylic polymer sealant.
2. Colors: As selected by Architect From manufacturer's standard selection.

2.3 ACRYLIC LATEX CAULKING COMPOUND:

A. Acceptable products:

1. A.C. Horn, Inc., Acrylic Latex Caulk.
2. DAP, Inc., DAP Acrylic-Latex Caulk.
3. Pecora Corp., AC-20 Acrylic Latex.
4. Sonneborn Building Products, Rexnord Chemical products, Inc., Sonolac.
5. Tremco Mfg. Co., Acrylic-Latex Caulk.

B. Characteristics: Flexible, paintable, non-staining, non-bleeding acrylic emulsion.

2.4 ACCESSORY MATERIALS:

A. Joint cleaner: Type recommended by material manufacturer for substrates indicated.

B. Joint primer/sealer: Type recommended by material manufacturer for substrates, conditions and exposures indicated.

C. Bond breaker tape: Plastic tape applied to contact surfaces where bond to

substrate or joint filler must be avoided for material performance.

D. Tooling agent: Agent recommended by material manufacturer to ensure contact of material with inner joint faces.

E. Divider strips: Synthetic rubber or closed cell synthetic foam not less than 1/16" thick and full depth of sealant or caulking compound; approved by manufacturers of dissimilar materials as being compatible with each other.

PART 3 - EXECUTION

3.1 JOB MOCK-UP:

A. Prepare, caulk and finish one sample of each joint condition.

B. Sample joints shall be accepted by Architect prior to beginning work. Retain approved samples as a standard for work.

3.2 JOINT SURFACE PREPARATION:

A. Clean joint surfaces immediately before caulking joints. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond.

B. Roughen joint surfaces on vitreous coated and similar non-porous materials, unless material manufacturer's product data indicates equal bond strength as porous surfaces. Rub with fine abrasive cloth or wool to produce dull sheen.

3.3 APPLICATION:

A. Comply with caulking material manufacturer's product data, except where more stringent requirements are shown or specified.

B. Prime and seal joint surfaces where recommended by material manufacturer. Do not allow primer/sealer to spill or migrate onto adjacent surfaces.

C. Install backer rod for all caulking materials, except where recommended to be omitted by material manufacturer for application indicated. Place backer rod to maintain manufacturer's recommended sealant thickness and profile. Substitute bond breaker tape for shallow closed joints.

D. Employ installation techniques which will ensure that materials are deposited in uniform, continuous ribbons without gaps or air pockets, with complete wetting of joint bond surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form slight cove, so that joint will not trap moisture and debris.

E. Do not allow materials to overflow or spill onto adjacent surfaces. Use masking tape or other precautionary devices to prevent staining of adjacent surfaces.

F. Remove excess and misplaced materials as work progresses. Clean the adjoining surfaces to eliminate evidence of misplaced materials, without damage to adjacent surfaces or finishes.

G. Tool joints to concave profile and smooth, uniform surface, flush with edges of substrate. Maintain sealant depth to width ratio in accord with manufacturer's product data.

H. Cure sealants and caulking compounds in accord with manufacturer's product data to obtain high early bond strength, internal cohesive strength and surface durability.

Protect uncured surface from contamination and physical damage.

END OF SECTION

SECTION 08110
HOLLOW METAL WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Provide steel doors and frames as indicated on drawings.

1.2 WORK

A. Provide hollow metal doors and frames when indicated on drawings.
B. Factory glazing.
C. Interior light frames.
D. Finish preparation.
E. Louvers.
F. Schedule on Drawings.

1.3 RELATED WORK

A. Builders Hardware
B. Glass and Glazing

1.4 REFERENCES

A. ASTM E152 - Methods of Fire Tests of Door Assemblies.
B. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware, latest Edition. C.NFPA 80 - Fire Doors and Windows.
C. NFPA 252 - Fire Tests for Door Assemblies.
D. SDI-100 - Standard Steel Doors and Frames.
E. SDI-105 - Recommended Erection Instructions for Steel Frames.
F. UL 10B - Fire Tests of Door Assemblies.

1.5 RELATED DOCUMENTS

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

1.6 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
B. Product data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
C. Shop drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
   1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.
   2. Indicate coordinate of glazing frames and stops with glass and glazing requirements.

D. Label Construction Certification: For door assemblies required to be fire-rated and exceeding limitations of labeled assemblies, submit manufacturer's certification that each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

1.7 QUALITY ASSURANCE

A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.

B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined per ASTM E 152 and which are labeled and listed by UL, Factory Mutual, Warnock Hersey, or other testing and inspecting organization acceptable to authorities having jurisdiction.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.

B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering standard steel doors and frames which may be incorporated in the work include; but are not limited to, the following:

1. Standard Steel Doors and Frames:
   a. Amweld Building Products, Inc.
   b. Ceco Corp.
   c. Copco Door Co.
   d. Curries Company.
   e. Deansteel Manufacturing Co.
   f. Fenestra Corp.
   g. Kewanee Corp.
   h. Mesker Door Co.
   i. Pioneer Industries.
   j. Premier Products, Inc. (Formerly Dittco).
   k. Republic Builders Products.

l. Steelcraft Manufacturing Co.

2.1 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.

C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, or drawing quality, ASTM A 642, hot dipped galvanized in accordance with ASTM A 525, with A60 or G60 coating designation, mill phosphatized.

D. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used with galvanized frames.

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.

F. Shop Applied Paint: Apply after fabrication.

1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.3 DOORS

A. Provide metal doors of types and styles or grades and models indicated on drawings or schedules.

B. Provide metal doors of SDI grades and models specified below or as indicated on drawings or schedules:

1. Interior Doors: ANSI/SDI-100, Grade II, heavy-duty, Model 3 or 4, minimum 18-gage cold-rolled sheet steel faces or as indicated on drawings.
2. Exterior Doors: ANSI/SDI-100, Grade III, extra heavy-duty, Model 4, minimum 16-gage galvanized steel faces or as indicated on drawings.

C. Door Louvers: Provide sight proof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 24-gage cold-rolled steel set into minimum 20-gage steel frame.

2.4 FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gage cold-rolled steel. 14 gage where indicated on door schedule.

1. Fabricate frames with mitered or coped corners, welded construction for exterior - exterior applications.
2. Form exterior frames from 16-gage galvanized steel or as indicated on drawings.

B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

C. Plaster Guards: Provide minimum 26-gage steel plaster guards or mortar boxes at

back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

2.5 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI-100 requirements.

1. Internal Construction: Manufacturer's standard honeycomb, polyurethane, polystyrene, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.
2. Clearances: Not more than 1/8 inch at jambs and heads except between non-fire-rated pairs of doors not more than 1/4 inch. Not more than 3/4 inch at bottom.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.

C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.

E. Fabricate exterior doors, panels, and frames from galvanized sheet steel in accordance with SDI-112. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gage inverted steel channels.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236 or ASTM C 976 on fully operable door assemblies.

1. Unless otherwise indicated, provide thermal-rated assemblies with U factor of 0.41 Btu/(hr x sq ft x deg F.) or better.

H. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.

1. For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.

I. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.

J. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.

K. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.

1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

L. Glazing Stops: Minimum 20 gage steel or .040-inch-thick aluminum.
1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
2. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames," unless otherwise indicated.
1. Place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
2. In masonry construction, locate 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry Tee anchors.
3. Install fire-rated frames in accordance with NFPA Standard No. 80.

C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI-100.
1. Install fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.2 ADJUST AND CLEAN

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION

SECTION 08211
WOOD DOORS

PART 1 GENERAL

1.1 WORK INCLUDED
- A. Wood doors fire rated and non-rated.
- B. Factory glazing.
- C. Louvers.
- D. Finish preparation.
- E. Schedule on Drawings.

1.2 RELATED WORK
- A. Wood door frames.
- B. Standard Steel Doors and Frames: Steel frames and doors.
- C. Section 08712 - Hardware.
- D. Section 08800 - Glazing.
- E. Section 09900 - Painting: Site finishing doors.

1.3 REFERENCES
- A. ANSI/NWMA I.S.1 - Industry Standard For Wood Flush Doors (Includes Standards I.S.1.1 through I.I.S.1.7).
- B. ANSI A135.4 - Basic Hardboard.
- C. ASTM E90 - Measurement of Airborne Sound Transmission Loss of Building Partitions.
- D. ASTM E152 - Methods of Fire Tests of Door Assemblies.
- E. AWI - Quality Standards of Architectural Woodwork Institute.
- F. NFPA 80 - Fire Doors and windows.
- G. NFPA 252 - Standard Method of Fire Tests for Door Assemblies.
- H. UL 10B - Fire Tests of Door Assemblies.
- I. NWWDA - National Wood Window and Door Association.

1.4 PERFORMANCE
- A. Acoustic Rating for Door and Frame Assembly: ASTM E90, minimum STC 35.

1.5 QUALITY ASSURANCE
- A. Conform to requirements of AWI Quality Standard Section 1300 and 1400 Custom Grade. ANSI/NWMA I.S.1.
- B. Obtain doors from a single manufacturer to ensure uniformity in quality of appearance and construction.
- C. Allowable fabrication tolerances:
  1. Overall dimension: $\pm$ 1/16"
  2. Maximum warp, bow, cup or twist: 1/4"
  3. Squareness: Maximum 1/8" difference in diagonal measurement.
- D. Allowable erection tolerances:
  1. Variation from specified clearances: $\pm$ 1/32", -0.
  2. Maximum variation in edge alignment, pairs of doors: 1/16"
- E. Allowable color and grain variation: Doors for natural finish shall be selected for uniformity in color and grain. Joints in face veneers shall be inconspicuous. Adjacent doors and doors viewed together shall have similar color and grain.
- F. Labels:
  1. Provide each door with a label on top or bottom edge which identifies

manufacturer, trade association of which he is a member, grade and type of door or industry standard with which it complies.

2. Provide each labeled fire rated door with a label permanently attached to hinge stile showing fire rating.

1.6 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire rated doors.

1.7 SUBMITTALS

A. Submittals shall indicate door elevations, stile and rail reinforcement, internal blocking for hardware attachment, and cutouts for glazing and louvers.

B. Submit manufacturer's certificate that doors and louvers meet or exceed specified acoustic, fire rated requirements.

1.8 DELIVERY, STORAGE, AND PROTECTION

A. During transit, storage and handling, prevent damage, soiling and deterioration. Comply with the "on-site care" recommendations of NWMA pamphlet "Care and Finishing of Wood Doors" and with manufacturer's instructions, and as otherwise indicated.

B. Package doors at factory prior to shipping using manufacturer's standard method

C. Do not walk or stack other materials on top of stacked doors. Do not drag across one another.

1.9 WARRANTY

A. Submit written agreement on door manufacturer's standard form signed by manufacturer, installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist), or which show telegraphing of core construction below in face veneers, or do not conform to tolerance limitations of NWMA and AWI.

B. Warranty shall also include refinishing and reinstallation which may be required due to repair or replacement of defective doors.

C. Warranty shall be in effect during following period of time after date of substantial completion: Two (2) years of original installation excluding glazing.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

1. Algoma Hardwoods, Inc.
2. Eggers Hardwood Products Corp.
3. Glen-Mar Door Mfg. Company.
4. C. E. Morgan Company.
5. Florida Made Door Co.
6. Weyerhauser Company.

2.2 DOOR AND PANEL TYPES

A. Flush Interior Doors: 1-3/4 inches (44 mm) thick; solid core construction; wood veneer faces.

B. Stile and Rail Interior Doors: To match existing size and thickness to suite application and match face veneer.

2.3 FLUSH DOOR AND PANEL FACING

A. Facing Quality: AWI premium grade, ANSI/NWMA premium.

B. Flush Interior Door Veneer: Birch species wood, rotary cut with matched grain, for

transparent finish.

2.4 ADHESIVES

A. Interior Doors: AWI, ANSI/NWMA, Type II, under pressure.

2.5 ACCESSORIES

A. Louvers: Material, color, blade, design, style frame and fasteners shall match existing as close as possible.

2.8 FABRICATION

A. Fabricate non-rated doors in accordance with AWI Quality Standards, ANSI/NWMA I.S.1 requirements.

B. Fabricate fire rated doors in accordance with AWI Quality Standards, ANSI/NWMA I.S.1 and to UL requirements. Attach fire rating label to door edge.

PART 3 EXECUTION

3.1 INSTALLATION

A. Inspection: Installer must examine door frames and verify that frames are correct type and have been installed as required for proper hanging of corresponding doors and notify Contractor in writing of conditions detrimental to proper and timely installation of wood doors. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner acceptable to installer.

B. Install doors in accordance with manufacturer's instructions.

C. Machine cut relief for hinges and closures and coring for handsets and cylinders.

D. Trim door width by cutting equally on both jamb edges.

E. Trim door height by cutting equally on top and bottom edges to a maximum of 3/4 inch (19 mm).

F. Pilot drill screw and bolt holes.

G. Prepare doors to receive finish hardware in accordance with AWI and ANSI/AWMA requirements.

H. Conform to AWI and ANSI/AWMA requirements for fit tolerances.

I. Coordinate installation of glass and glazing.

J. Install door louvers.

3.2 ADJUSTING AND CLEANING

A. Adjust for smooth and balanced door movement.

B. Rehang or replace doors which do not swing or operate freely, as directed by Architect.

C. Refinish or replace doors damaged during installation, as directed by Architect.

D. Advise Contractor of proper procedures required for protection of installed wood doors from damage or deterioration until acceptance of work.

3.4 SCHEDULE

A. See Division 8.

END OF SECTION

SECTION 08500
ALUMINUM WINDOWS, ENTRANCES AND STORE FRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes Aluminum doors; window; and framing systems; and covers both exterior and interior application.
B. Unless otherwise noted, exterior applications shall be 1" Insulated glazing and interior 1/4" glazing. Both of which are further described herein.
C. Provide safety or tempered glazing as indicated on drawing or required by code.
D. Coordinate balance of hardware with section 08710.

1.2 APPLICABLE STANDARDS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45	(Sep 1980; 7th Ed) Designation System for Aluminum Finishes

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 101	(1988) Voluntary Specifications for Aluminum Prime indows and Sliding Glass Doors
AAMA 603.8	(1985) Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum
AAMA 1503.1	(1988) Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A39.1	(1987) Safety Requirements for Window Cleaning

1.3 DESIGN

A. Windows shall be of the type and size indicated. The glass and ventilating areas of the windows furnished shall be not less than such areas of the windows indicated. The next larger standard-stock size shall be furnished where windows larger than the openings indicated are required to meet this requirement, and it shall be the responsibility of the Contractor to provide proper sized openings where windows varying in size from those indicated are furnished.

1.4 SUBMITTALS

A. Shop drawings, manufacturer's descriptive data and catalog cuts: Drawings shall indicate elevations of units, full-size sections, thicknesses of metal, fastenings, methods of installation and anchorage, size and spacing of anchors, method of glazing, locations of operating hardware, mullion details, weatherstripping details, screen details, details of installation, connections with other work and window schedules showing location of each window unit.

B. Manufacturer's preprinted installation instructions: Certificates shall state that the windows conform to the specified requirements. Quality certification labels affixed to windows in accordance with AAMA 101 windows will be acceptable in lieu of certificates.

1.5 STORAGE

A. Windows shall be stored out of contact with the ground and under weathertight covering.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Acceptable Aluminum Window Manufacturer:
   1. Amarlite Products, Anaconda Aluminum Co.
   2. Kawneer Company, Inc.
   3. PPG Industries, Inc.
   4. Vistawall (Division of Butler)
   5. YKK AP America, Inc.
   6. U.S. Aluminum

2.2 ALUMINUM WINDOWS

A. Windows shall conform to AAMA 101. Exterior windows shall be double glazed and shall have minimum condensation factor recommended by AAMA 1503.1.

B. Fixed windows shall conform to specification AAMA 101 designation F-C20.

2.3 GLAZING

A. Insulating Glass Units, formed of two pieces of Type I, Class I, Quality Q3, 1-inch thick glass, separated by a 1/2 inch dehydrated air space, hermetically sealed. Insulating glass units shall have polyisobutylene primary seal with two part silicone secondary seals. Aluminum spacer frame shall have bent or soldered corners. Insulating glass units shall conform to ASTM E 773 and ASTM E 774 Class A.

B. Glazing shall be performed in accordance with the approved installation instructions of the glass manufacturer.

2.4 FINISH

A. All exposed members shall be free of scratches and other serious surface blemishes. Anodized finish shall be AA-M12C22A31 clear, AA-M12C22A32 or AA-M12C22A34, in accordance with AA DAF-45. Paint

finish shall conform to AAMA 603.8.

2.5 WINDOW CLEANING ANCHORS

A. Window cleaning anchors shall be of stainless-steel and shall conform to ASME A39.1. Windows shall be reinforced for the reception of window-cleaning anchors if necessary to provide the required strength. Window frames shall be reinforced as may be required to receive the window cleaning anchors, and the window frames shall be anchored securely to the wall construction at point of application of the window cleaning bolts.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation shall be in accordance with the approved installation instructions. Windows shall be securely anchored in place to a straight, plumb, and level condition without distortion. Final adjustment for proper operation of ventilating unit shall be made after glazing. Where aluminum surfaces are in contact with, or fastened to dissimilar materials, except stainless steel or zinc, the aluminum surface shall be protected from dissimilar materials as specified in the Appendix of AAMA 101. Surfaces in contact with sealants after installation shall not be coated with any type of protective material.

3.2 ADJUSTMENTS

A. Adjustments shall be made to operating sash or ventilators to assure smooth operation and units shall be weathertight when locked closed.

3.3 CLEANING

A. Windows shall be cleaned on both exterior and interior in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 08710
FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The extent of door hardware is shown on the drawings and in schedules. Door hardware is hereby defined to include all items known commercially as builder's hardware, as required for the proper operation of all doors.

B. The extent of hardware required on this project varies from complete sets for new door installation to partial replacement of damaged pieces; and are generally of historic (i.e. front doors) or heavy duty, industrial type (i.e. loading dock area). See door schedule and notations for each condition.

C. The required type of door hardware includes (but not necessarily limited to) the following:

1. Butts and hinges
2. Pivots
3. Lock cylinders and keys
4. Panic exit devices
5. Closers
6. Door stops
7. Thresholds
8. Weather-stripping and Gasketting.
9. Miscellaneous items for a complete installation.

1.3 RELATED WORK

A.	Steel Doors and Frames	Section 08110
B.	Wood Doors	Section 08211

1.4 QUALITY ASSURANCE

A. STANDARDS: Manufacturers and model numbers listed are to establish a standard of quality. Similar items by approved manufacturers, unless otherwise noted, that are equal in design, finish and quality will be accepted upon prior approval of the architect and provided required data and physical samples are submitted at least ten (10) days prior to date of bid.

B. QUALIFICATIONS: Hardware supplier must be engaged regularly in contracting work and be staffed to expedite work. The firm shall have been furnishing hardware on similar projects for not foe not less than four years. The supplier must have in his employ a certified Architectural Hardware Consultant (AHC) to periodically inspect and direct detailing, setting, applying of all hardware items.

C. FIELD INSPECTION: Inspection of existing doors, frames and hardware is required to evaluate compliance to the Americans with Disabilities Act, (ADA). A written report detailing any such deficiencies shall be forwarded to the Architect ten (10) business days prior to bid of project.

1.5 REFERENCES

A. ANSI/BHMA designations where used in schedules to describe hardware items or to define quality or function are derived from the following standards and requirements specified elsewhere in this section.

1. Butts and Hinges:	ANSI A156.1 (Formerly BHMA 101)
2. Locks and Lock Trim:	ANSI A156.2 (BHMA 601)
3. Exit Devices:	ANSI A156.3 (BHMA 701)
4. Door Controls: Closers:	ANSI A156.4 (BHMA 301)
5. Auxiliary Locks:	ANSI A156.5 (BHMA 501)
6. Architectural Door Trim:	ANSI A156.6 (BHMA 1001)
7. Template Hinge Dimensions:	ANSI A156.7
8. Door Controls: Overhead Holders:	ANSI 156.8 (BHMA 311)
9. Interconnected Locks & Latches:	ANSI A156.12 (BHMA 311)
10. Mortise Locks & Latches:	ANSI A156.14 (BHMA 401)
11. Sliding & Folding Door Hardware:	ANSI A156.14 (BHMA 401)
12. Closer Holder Release Devices:	ANSI A156.16 (BHMA 1201)
13. Self Closing Hinges & Pivots:	ANSI A156.17 (BHMA 1101)
14. Materials and Finishes:	ANSI A156.18 (BHMA 1301)

1.6 SUBMITTALS

GENERAL REQUIREMENTS: Submit manufacturer's product data for each item of hardware. Include whatever information may be necessary to show compliance with requirements, and instructions for installation and maintenance of operating parts and exposed finishes.

B. SCHEDULES: Submit six (6) copies of the finish hardware schedule for approval. Schedule format shall be similar to the one included at the end of Part 3 of this section.

C. SAMPLES: At the request of the architect, submit samples of products for approval of design, finish, etc.

D. TEMPLATES: Whenever required, furnish templates to the necessary fabricators of other related work, which is to receive finish hardware, such as door and steel door frames.

E. CATALOG CUTS: Submit six (6) copies of catalog cuts of all products listed in the finish hardware schedule.

F. KEYING SCHEDULE: The specific keying requirements should be noted elsewhere in this schedule. If these requirements are not noted then, it is the supplier's responsibility to submit a keying schedule based on the format listed in the DHI annual Keying Procedures, Systems and Nomenclature. Coordinate with owner's on-site representative.

1.7 DELIVERY STORAGE AND HANDLING

A. MARKING & PACKAGING: Hardware should be required to be sent to the job site in the manufacturers original packages marked to correspond with the approved hardware schedule.

B. Some items of hardware may have to be delivered to fabricators for factory installation. (i.e.: Aluminum Storefront)

C. Storage and protection of the materials is the responsibility of the General Contractor. Proper storage methods are advised as protection of the material and finish as necessary.

1.8 WARRANTIES

A. All door closers shall have a ten (10) year warranty against defects in material and workmanship from the date of occupancy of the project.

B. All other products shall have a one (1) year warranty against defects in the material and workmanship from the date of occupancy of the project.

C. Exit hardware shall be warranted for a period of three (3) years against defects material and workmanship.

1.9 ALLOWANCE

A. Furnish and install all hardware for a complete installation.

B. Where no finish schedule is provided or a door's hardware set is not indicated, contractor shall **include an allowance of $180.00 per door leaf for hardware**. Prior to the commencement of construction, Contractor shall submit a complete manual of hardware supplier's set types for each door. Total actual price of hardware shall then be adjusted from original bidding allowance.

C. Contractor shall include installation cost for hardware in Base Bid.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A.

Products:	Specified Manufacturers:	Acceptable Manufacturers:
Hinges	Hager	Stanley
Pivots	Rixon	Lcn
Flush Bolts	Rockwood	Ives, Trimco
Exit Devices	Von Duprin	
Cylinders	Russwin	Russwin No Subst.
Locks	Russwin	Sargent,Yale,Schlage
Push-Pulls	Rockwood	Ives, Trimco
Door Closers	Norton	Corbin-Russwin, Sargent
Floor Closers	Rixon	
Kick Plates	Hager	Ives, Trimco
Door Stops	Rockwood	Ives, Trimco
Thresholds	Pemko	National Guard
Weather Stripping	Pemko	National Guard REESE
Door Bottoms	Pemko	National Guard, Reese
Smoke Seals	Pemko	National Guard, Reese
Electric Strike	Von Duprin	
Magnetic Switch	Von Duprin	
Power Supply	Von Duprin	Locknetics

B. To the greatest extent possible, obtain materials from one manufacturer. Manufacturers listed above are intended to insure quality and design of the project. Other manufacturers submitted will be acceptable, provided they are equal or exceed standard of quality proposed for this project; and submitted in accordance to pre-approval or substation request protocol.

2.2 MATERIALS

A. SCREWS & FASTENERS: All screws and fasteners required for the hardware items are listed in the individual hardware sets. Any omission of these items should be reflected in the schedule submitted for approval.

B. HINGES: Where hinges are specified unless otherwise noted they shall be of types and sizes as required by ANSI A156.1. SIZE HINGES ACCORDING TO MANUFACTURERS RECOMMENDATIONS. Provide stainless steel continuous hinges as listed in the hardware sets.

C. PIVOTS: All pivots and/or pivot sets shall be the product of one (1) manufacturer. Sets as noted in the hardware groups shall be matching in design for aluminum storefront doors. The doors as noted in the hardware sets are to

have intermediate pivots as well as top pivots. All pivot sets are required to meet ANSI Grade One standards as standard listed in ANSI A156.4, 1980.

D. FLUSH BOLTS: Provide annual and automatic flush bolts as noted in the hardware sets. All flush bolts are required to meet ANSI A156.3.

E. COORDINATOR & CARRY BARS: Provide coordinator and carry bars as noted in the hardware sets. Coordinators and carry bars are required to meet ANSI A156.2 TYPE 21.

F. LOCKSETS & CYLINDERS: Provide locksets and cylinders as noted in hardware sets. Locksets shall meet ANSI A156.13, Grade One operational, Grade Two security, UL listed. Lock cases shall be field reversible without disassembly of lock case.

G. LOCK TRIM: Russwin LWM/YWM (LWM for Handicap locations), Sargent LW1H/MRL(LW1H for Handicap locations) Yale CRE/CE(CRE for handicap locations).

H. EXIT DEVICES: Provide the series and type of exit devices as noted in the hardware sets. These exit devices are required to meet ANSI A156.3 Grade One. All exit devices and electrically controlled exit devices shall be of one manufacturer.

I. DOOR CLOSERS: Provide the series and type of door closers as noted in the hardware sets. These door closers required to meet ANSI A156.4 Grade One. All closers and power actuated closers shall be of one manufacturer. Plated finish door closers shall have plated arms and brackets. Painted finish door closers shall be powder coated. Norton 8501BF , Sargent 1230 series, Russwin 2820 series, LCN 4040 series, all with back check.

J. PUSH, PULL & KICK PLATE: Provide the type and size of these plates as noted in the hardware sets. These items are intended for the use and accessibility as protection of the openings indicated in the hardware schedule.

K. DOOR STOPS & HOLDERS: Provide the types as noted in the hardware sets. Any variation in the jobsite conditions could change the type as specified. This should be reflected in the schedule submitted for approval.

L. THRESHOLD & WEATHER-STRIPPING: Provide the types as noted in the hardware sets. All exterior openings and interior fire rated openings shall have the necessary items to meet the local building code standards. Provide stainless steel screws at all locations.

M. SILENCERS: Provide the type required to acc. the hollow metal frames fabricate for this project.

N. ELECTRICAL PRODUCTS: Too assure proper integration, ALL ELECTRICAL PRODUCTS TO BE PRODUCED BY THE SAME MANUFACTURER.

2.3 FINISHES

Provide the finishes as specified in the hardware schedule. Otherwise, provide matching finishes for the hardware items at each door opening to the greatest extent possible. Refer to the ANSI A156.18 for the identification of these finishes.

2.4 KEYING

A. Factory keyed to match existing masters or new standard provided by owner.

B. Coordinate keying of building masters with any user group or building "sector" requirements.

C. Each key shall be marked and identified as directed by the Owner using the mechanical impact method of transferring the numerical impression to the key bow. Characters shall be consistent and uniform in their placement, alignment and depth of impression.

2.5 KEY CONTROL

A. KEY CABINET: Provide a key control system including envelopes, labels tags, with self locking key clips, receipt forms, three-way visible card index, temporary markers and standard metal cabinet. Provide all of this material from one manufacturer and per that manufacturer's system standard. Provide a system with the capacity for 150% of the number of cylinders and locksets required for the project.

PART 3 - EXECUTION

3.1 INSPECTION

A. After installation has been completed, the hardware supplier shall have a qualified Architectural Hardware Consultant (AHC), check the job to determine the proper application of hardware according to the approved hardware schedule and keying schedule. Also, check the operation and adjustment of all hardware items.

3.2 INSTALLATION

A. Refer to the DHI manual publication for Recommended Locations for Builders Hardware, FLA ACCESSIBILITY CODE AND ADA REQUIREMENTS for instruction. Also, coordinate with the door suppliers for these locations. Install all hardware in compliance with manufacturer's instruction and

recommendations. Drill and countersink all items which are not factory prepared for fasteners. Cut and fit all thresholds and weather-stripping to profile of door frames. Set threshold in accordance with the application condition.

3.3 ADJUSTING & CLEANING

A. At final completion all hardware shall be left clean and free from disfigurement. The contractor shall make a final adjustment to all door closers and other items of hardware. Where hardware is found defective, repair or replace or otherwise correct as directed.

3.4 PROTECTION

A. The general contractor is responsible for the proper protection of all items of hardware until the owner accepts the job as complete.

END OF SECTION 08710

SECTION 08800
GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
   1. Window units not indicated to be "preglazed".
   2. Aluminum curtain wall construction.
   3. Store Front construction.
   4. Entrances and other doors.
   5. Interior partitions.
   6. Interior View Windows.

B. Related Sections include the following:
   1. Division 6 Section "Interior Architectural Woodwork" for glass shelves installed in architectural woodwork.
   2. Division 8 Section "Mirrored Glass" for unframed mirrors.
   3. Division 10 Section "Toilet Accessories" for framed mirrors.

1.3 DEFINITIONS

A. "Glass" includes prime glass, processed glass, and fabricated glass products. "Glazing" includes glass installation and materials used to install glass.

B. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.

C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's directions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use due to causes other than glass breakage and improper practices for maintaining, and cleaning insulating glass. Evidence of failure is the obstruction of vision by dust, moisture, or film on the interior surfaces of glass. Improper practices for maintaining and cleaning glass do not comply with the manufacturer's directions.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading specified for the framing system used and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

B. Glass Design: Glass thicknesses indicated on Drawings or scheduled are for detailing only. Confirm glass thickness by analyzing project wind loads specified for the framing system used and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:
   1. Minimum glass thickness, nominally, of lites in exterior walls is 1/4 inch (6.0 mm).
   2. Tinted and heat-absorbing glass thicknesses for each tint indicated shall be the same throughout project.
   3. Minimum glass thickness of lites, whether composed of annealed or heat-treated glass, are selected so the worst-case probability of failure does not exceed the following:
      a. 8 lights per 1000 for lites set vertically or not over 15 degrees off vertical and under wind action. Determine minimum thickness of monolithic annealed glass according to ASTM E 1300. For other than monolithic annealed glass, determine thickness per glass manufacturer's standard method of analysis including applying adjustment factors to ASTM E 1300 based on type of glass.
      b. 1 lite per 1000 for lites set over 15 degrees off vertical and under action of wind or snow.
   4. Normal thermal movement results from the following maximum change (range) in ambient and surface temperatures acting on glass-framing members and glazing components. Base engineering calculation on materials' actual surface temperature due to both solar heat gain and nighttime sky heat loss.
      a. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

   5. Maximum Lateral Deflection: For the following types of glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch (25 mm), whichever is less.

a. For monolithic-glass lites heat treated to resist wind loads.
b. For insulating glass.

6. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
   a. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
   b. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch- wide interspace.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications, including documentation of compliance with requirements, and instructions for handling, storing, installing, cleaning and protecting each type of glass and glazing material.

B. Samples for Verification: For the following products, in the form of 12-inch- square Samples for glass.

1. Each color of tinted float glass.
2. Coated vision glass.
3. Insulating glass for each designation indicated.
4. For each color (except black) of exposed glazing sealant indicated.

C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

D. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

E. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
   2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units.

B. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.

C. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency indicated below:
   1. Insulating Glass Certification Council (IGCC).

D. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.

E. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
   1. Primary glass of each (ASTM C 1036) type and class indicated.
   2. Heat-treated glass of each (ASTM C 1048) condition indicated.
   3. Insulating glass of each construction indicated.
   4. Glazing Accessories.

F. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

G. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1.7 DELIVERY, STORAGE AND HANDLING

A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.9 WARRANTY

A. Manufacturer's Warranty on Coated Glass Products: Submit written warranty signed by coated glass manufacturer agreeing to furnish replacements for those coated glass units that deteriorate as defined in "Definitions" article, f.o.b. point of manufacturer, freight allowed Project site, within 10 years after date of Substantial completion.. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to glass manufacturer's published instructions.

B. Manufacturer's Warranty on Insulating Glass: Submit written warranty signed by manufacturer of insulating glass agreeing to furnish replacements for insulating glass units that deteriorate as defined in "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within 10 years after date of Substantial Completion. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, protecting and maintaining practices contrary to glass manufacturer's published instructions.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS

A. Prime Glass: ASTM C1036, Type I Transparent Glass (Flat), Quality q3 (Glazing Select) clear unless otherwise indicated.
   1. Grey Tinted: Manufacturer's standard color; light transmittance and solar energy transmittance. When in an insulated unit shall meet the thermal performance designated for the system.

2.2 PROCESSED GLASS

A. Tempered Glass: ASTM C 1048, condition A, (uncoated surfaces) Type I (transparent) Class 1 (clear) unless indicated to be tinted (Class 2), Quality Q3, kind FT (fully tempered).
   1. Provide horizontally tempered glass, tong free.
   2. Peak to trough wave distortion shall be held to no more than .005" when measured by a rolling micrometer.

B. Heat-Strengthened Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I, (transparent), Class 1 (Clear) unless indicated to be tinted (Class 2) Quality Q3, kind HS (Heated Strengthened).

C. Coated Monolithic Glass Products
   1. Pyrolytically Coated Glass Products: Float glass with solar-reflective metallic oxide coating applied pyrolytically either during initial manufacture or during heat treatment, complying with requirements specified in pyrolytically Coated Monolithic Glass Product Data Sheet at the end of this Section.

2.3 FABRICATED GLASS UNITS

A. Insulating Glass: Provide manufacturer's standard units of 2 sheets of thick glass as scheduled and meeting the thermal performance as follows:

Visible Light Transmission		.33
Visible reflectance	OUT	.06
	IN	.09
Solar Transmission:		.17

Solar Reflectance:	OUT	.13
U-Value (Winter)		.29
(Summer)		.27
* Shading Coefficient		.33 Max.
* Solar Heat Gain Coefficient		.28 Max.
Relative Heat Gain		69

* Building Envelope Requirements
(See Glass Type G3 in Schedule)

B. Fabricate and label units to match units which have been tested in accordance with ASTM E 774 and certified by the Insulating Glass Certification Council (IGCC) (as sponsored by the Sealed Insulating Glass Manufacturers' Association) and passed tests for the Insulating glass seal classification "CBA."

1. Fabricate units with a permanent, hermetically sealed, dry air or gas filled space of the width indicated, between sheets of glass as indicated. Provide an edge seal consisting of twin primary sealant beads of polyisobutylene; positioned by a tubular aluminum spacer-bar frame with soldered/welded sealed corners, and filled with desiccant with breather ports into sealed space; with secondary edge sealant completely covering perimeter outer face of spacer-bar and sealed to the opposing sheets of glass. Unless indicated otherwise, provide spacer-bar with clear anodized finish. Provide silicone sealant as secondary edge seal.
    a. Extend secondary sealant to provide minimum of 1/16" thick elastomeric coating on edges of glass sheets in each insulating glass unit to form a protective edge cushion.
    b. Width: Fabricate units with air spaces as scheduled.
    c. Fill air spaces by fabricator's standard process, using either gas or dry air with a maximum dew point of -20°F. Exercise extreme care to exclude dirt and other foreign substances.
    d. Label each unit to show compliances with required standards and regulations, and to list generically each component including elements of edge seal. Indicate which face of unit is for exposure to exterior or weather. Provide removable label except where regulations require a permanent label.
2. Insulating glass shall be warranted by manufacturer against seal failure for a period of ten years.

2.4 GLAZING SEALANTS AND COMPONENTS

A. General: Provide color of exposed sealant indicated or if not otherwise indicated, as selected by Architect from manufacturer's standard colors, or black if no color is indicated. Comply with manufacturer's recommendations for selection of hardness, depending upon the location of each application, conditions at time of installation, and performance requirements as indicated. Select materials, and variations or modifications, carefully for compatibility with surfaces contacted in the installation.

B. 1-Part Silicone Rubber Glazing Sealant; Provide for Exterior Glazing except where Glazing Gaskets are provided: Elastomeric silicone Sealant complying with FS TT-S-001543, Class A, non-sag. Provide acid type recommended by manufacturer where only nonporous bond surfaces are contacted; provide nonacid type recommended by manufacturer where one or more porous bond surfaces are contacted.
   1. For butt joints in glass and for joints between glass and glass, provide type silicone glazing Sealant recommended by manufacturer of glass. Color shall be clear.
   2. Provide glazing Sealant recommended by Sealant manufacturer that is compatible with contact surfaces and as required to meet the adhesive and cohesive performance criteria needed to comply with the structural design criteria specified for the framing system used.

C. Reformed Butyl Rubber Glazing Tape; Provide for Interior Glazing: Compound of polymerized butyl rubber and inert fillers, with or without polyisobutylene modification, solvent-based, 95% solids, containing no asbestos, formed and coiled on release paper; tack-free in 24 HS., paintable, nonstaining; plain, preshimmed or reinforced as required for proper installation and setting of glass.
   1. Comply with AAMA 800.

2.5 GLAZING GASKETS

A. Glazing Gaskets:
   1. Gaskets for glazing aluminum doors, frames and storefront and aluminum windows and curtain wall are provided by manufacturer of items to be glazed.

B. Structural Rubber Glazing Gaskets: Neoprene extrusions fabricated into frames with molded corner units and zipper lock strips; comply with ASTM C 542.

2.6 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

B. Setting Blocks: EPDM or Silicone, 85± Shore A durometer hardness, with proven compatibility with sealants used.

C. Edge Blocking and Spacers: EPDM or Silicone, 65± Shore A durometer hardness, with proven compatibility with sealants used.

D. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used, flexible and resilient, with 5-10 psi (.03-.07 MPa) compression strength for 25% deflection.

2.7 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:
   1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
   2. Presence and functioning of weep system.
   3. Minimum required face or edge clearances.
   4. Effective sealing between joints of glass-framing members.

3.2 GLAZING, GENERAL

1. Protect glass from edge damage during handling and installation, Remove damaged glass from project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

B. Comply with combined recommendations and technical reports by manufacturers of glass and glazing products as used in each glazing channel, and with recommendations of GANA's "Glazing Manual" and "Sealant Manual," except where more stringent requirements are indicated.

C. Install insulating glass units to comply with recommendations by Sealed Insulating Glass Manufacturers Association, except as otherwise specifically indicated or recommended by glass and Sealant manufacturers. Install weeps as recommended by insulated glass manufacturer.

D. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

3.3 GLAZING

A. Install setting blocks of proper size in sill rabbet, located 1/4 of glass width from each corner. Set blocks in thin course of heel-bead Sealant compound, if any.

B. Provide spacers inside and out, of proper size and spacing, for glass sizes larger than 50 unit inches (1270 mm), except where gaskets or presumed tapes are used for glazing. Provide 1/8" (3 mm) minimum bite of spacers on glass and use thickness equal to Sealant width, except with Sealant tape use thickness slightly less than final compressed thickness tape.

C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

D. Voids and Filler Rods: Prevent exudation of Sealant by forming voids or installing filler rods in channel at heel of jambs and head (do not leave voids in sill channels), except as otherwise indicated and depending on light size, thickness and type of glass, and complying with manufacturer's recommendations.

E. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of Sealant to glass and channel surfaces.

F. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

G. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discolorations.

H. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in glazing system.

I. Structural Gasket Glazing: Cut zipper strips slightly long, to ensure tight closure. Lubricate zipper strip and use special tool to install zipper. Do not lubricate glazing channel or anchorage rabbet. Comply with details as shown and manufacturer's instructions, including the possible use of liquid sealants and weep holes.

3.4 CURE, PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately ~~upon~~ installation, by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces. Cure sealants for high early strength and durability.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

D. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

E. Wash and polish glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass product manufacturer's recommendations for cleaning.

3.5 GLASS SCHEDULE

A. Thickness: Provide glass of the minimum thicknesses scheduled below increased as required to meet the structural design criteria specified for the framing system used.
B. Schedule: Provide the following glass types in locations indicated herein and on the drawings:

Glass Types:
G1-Clear Tempered Glass, 6 mm (0.23 inch) thick
G2-Tinted Tempered glass, 6 mm (0.23 inch) thick
G3-Insulated Glass: 1" AFG Comfort Green
Exterior Lite: ¼" Green
Spacer: ½" Air filled
Interior lite: ¼" clear
G4-Same as G-3 but interior lite tempered
G5-Same as G-3 but with interior and exterior lites tempered

Locations for Glass Types:
G1-All interior glazing in hollow metal and storefront system.
G2-All exterior storefront doors.
G3-All exterior storefront and curtainwall glazing U.N.O.
G4-At lowest lite of curtainwall above adjacent interior floor per code.
G5-At lowest lite of curtainwall above adjacent interior and exterior floors per code.

END OF SECTION

SECTION 09260
GYPSUM WALL BOARD AND SOFFIT SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide Gypsum wall board and ceiling as shown on drawings.
B. Texture and finish as shown on drawings.

1.2 RELATED WORK

A. Wood Blocking & Misc. Carpentry: Division 6.
B. Lightgage Metal Framing: Division 5.
C. Access Doors: Division 8 and Division 15.
D. Painting: Elsewhere in Division 9.

1.3 APPLICABLE STANDARDS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
B. Comply with most current editions of the following:

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 36	(1985; R 1988) Gypsum Wallboard
ASTM C 442	(1984a; R 1988) Gypsum Backing Board and Coreboard
ASTM C 475	(1989) Joint Compound and Joint Tape for Gypsum Finishing Board
ASTM C 514	(1984) Nails for the Application of Gypsum Wallboard
ASTM C 630	(1985) Water-Resistant Gypsum Backing Board
ASTM C 645	(1988) Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board
ASTM C 754	(1988) Installation of Steel Framing Members to Receive Screw-Attached Gypsum
ASTM C 840	(1988) Application and Finishing of Gypsum Board
ASTM C 931	(1985; R 1988) Exterior Gypsum Soffit Board
ASTM C 954	(1986) Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
ASTM C 955	(1988) Load-Bearing (Transverse and Axial) Steel Studs, Runners (Track), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases
ASTM C 1002(1988)	Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases
FM P8016	FACTORY MUTUAL ENGINEERING AND RESEARCH (FM) (1990) Specification Tested Products Guide
GA 600	GYPSUM ASSOCIATION (GA)

(1988; 12th Ed) Fire Resistance and Sound Control Design Manual

UL UNDERWRITERS LABORATORIES (UL)
(1994) Fire Resistance Directory

1.4 SUBMITTALS

A. Drawings: Installation details.

B. Certificates: Stating that the framing and wallboard meet the specified requirements.

C. Product Data: Submit manufacturer's product data for systems required, including installation instructions and data sufficient to show compliance with requirements.

1.5 DELIVERY AND STORAGE

A. Wallboard delivered prior to use shall be stored off the ground within a completely enclosed structure or completely enclosed within a weathertight covering. Wallboard shall be dry, free of warpage, and have bundling tape intact immediately prior to use. Application shall commence only after the structure is completely weathertight.

B. Store corner bead and other metal and plastic accessories to prevent bending, sagging, distortion, or other mechanical damage.

1.6 PROJECT CONDITIONS

A. Temperature: Maintain temperature in areas of installation between 50 and 70 degrees F for at least 24 hours before installation begins and for not less than 48 hours after joint finishing has been completed.

B. Ventilation: Provide controlled ventilation during joint finishing operations, to eliminate excessive moisture. Avoid drafts during hot, dry weather to prevent excessively fast drying of joint compound.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements: At locations indicated on drawings, provide fire-rated assemblies tested in accordance with ASTM E 119 and acceptable to authorities for ratings required. Provide assemblies as listed in the following:

1. GA-600, "Fire Resistance Design Manual."
2. Underwriters Laboratories Inc.'s (UL) "Fire Resistance Directory"

PART 2 - MATERIALS

2.1 GYPSUM BOARD MATERIALS

A. Materials shall conform to the requirements specified below. Miscellaneous items not otherwise specified shall be as recommended by the wallboard manufacturer and approved prior to use. The long edges of wallboard shall be tapered, except when used as a base layer in a double layer application. Power driven fasteners may be used only when approved in writing. Thickness of wallboard shall comply with the systems, as detailed on the drawings.

1. Exterior Wallboard:
   -ASTM C 93, 5/8" Exterior Gypsum Board, with water repellant paper
   -ASTM C 1177, 1/2" Dens-Glas Gold Sheathing at all EIFS areas
2. Gypsum Wallboard:
   - ASTM C 36, 5/8" thick, standard type, except as otherwise indicated.
   - ASTM C 36, 5/8" thick Type X (Special Fire-Resistant), for rated assemblies.
   - ASTM C 630, 5/8" thick Water-Resistant at Restrooms and other Wet areas.
3. Joint Treatment Materials:
   - ASTM C 475.
4. Taping or Embedding Compound: Vinyl-based ready-mix type for interior general use or compound specifically formulated for water-resistant gypsum.
5. Finishing or Topping Compound: Specifically formulated and manufactured for use as a finishing compound.
6. All-Purpose Compound: Specifically formulated and manufactured to serve as both a taping and a finishing compound and compatible with tape and substrate.
7. Joint Tape: Reinforcing tape recommended by the manufacturer.
8. Nails: ASTM C 514.
9. Screws: ASTM C 1002, Type G for attachment of gypsum board to gypsum board, Type S for attachment to light-gauge steel members, Type W for attachment to wood members; ASTM C 954 for attachment to steel members 0.033- to 0.112-inch thick.
10. Corner bead and Edge Trim: Corrosion protective-coated steel designed for its intended use. Flanges shall be free of dirt, grease, and other materials that may adversely affect the bond of joint treatment.

B. Manufacturers: Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
   1. Georgia Pacific Corporation
   2. USG Corportation
   3. Gold Bond Building Products
   4. Gyproc Products

2.2 FRAMING MATERIALS

A. General: Select size and gage of framing members and establish spacing to comply with requirements of ASTM C 754 unless otherwise specifically indicated.
   1. Maximum deflection: L/240 at 5 lbf per square foot.

B. Studs and Tracks: ASTM C 645, steel with protective coating.
   1. Nominal depths: As indicated on drawings.

C. Ceiling Channels: ASTM C 754, cold-rolled or hot-rolled steel, with rust-inhibitive finish

D. Hanger Wire: ASTM A 641, soft, Class 1 galvanized.
   1. Ceiling hangers: Minimum 8 gage wire.
   2. Furring channel ties: Minimum 18 gage wire.

E. Furring Members: ASTM C 645, steel with protective coating.
   1. 7/8" Hat-shaped except as otherwise indicated.
   2. C-shaped studs, in locations indicated.
   3. 1" Z Furring

F. Manufacturers: Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:
   1. Diedrich Industries, Inc.
   2. Dale/Incor..
   3. Marino Industries Corporation.
   4. Unimast, Inc.
   5. USG Corporation
   6. Gold Bond Building Products

2.3 TRIM AND ACCESSORIES

A. General: Except as otherwise indicated, provide trim and accessories by manufacturer of gypsum board materials, made of galvanized steel or zinc alloy and configured for concealment in joint compound.
   1. Include corner beads, edge trim, and other trim units necessary for project conditions. Provide accessories as required in order to achieve details indicated, whether or not specific accessories are shown on the drawings.

B. Control Joints: At locations indicated, provide manufacture's standard one-piece control joints of extruded vinyl, zinc alloy, or other noncorrosive metal.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide miscellaneous materials as produced or recommended by manufacturer of gypsum products.

B. Screws: ASTM C 1002; self-drilling type; lengths as recommended by gypsum board manufacturer for project conditions.

C. Acoustical Sealants: ASTM C 919; nondrying, nonhardening, nonskinning type for concealed locations; nonoxidizig, skinning type for exposed locations.

D. Sealing: At water-resistant gypsum backing board, provide Type I organic adhesive per ANSI A136.1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspection: Verify that project conditions and substrates are appropriate to begin installation of work of this section.

3.2 PREPARATION

A. Coordination: The installation of anchorage devices for suspended ceilings/soffits, verify that spacing and rated strength are correct for anticipated load conditions.

3.3 SPECIAL FRAMING

A. Framing for beams, columns, soffits, and other special items shall be built to the sizes, shapes, or forms indicated and shall be rigidly secured to each intersection with wallboard screws.

1. Ceiling Openings: Support members shall be provided at ceiling openings such as required for access panels, recessed light fixtures, and for air supply or exhaust. Support members of not less than 1-1/2 inch main runner channels and vertically installed suspension wires or straps shall be located to provide at least the minimum support specified herein for furring and wallboard attachment. Intermediate structural members, although not a part of the structural system, shall be provided for attachment or suspension of support members.

3.4 INSTALLATION OF METAL FRAMING

A. General: Comply with provisions of ASTM C 754 except where exceeded by other requirements.

B. Steel Studs:

1. Door Openings: For wall openings such as required for doors, pass-through openings, and access panels, the framing system shall provide for the installation and anchorage of the required subframes or finish frames. Partitions abutting continuous suspended ceilings shall be strengthened for rigidity at rough openings, such as door openings, of more than 30-inches wide. Studs at openings shall be 20 gauge minimum bare metal thickness and spot grouted at jamb anchor inserts. Double studs shall be fastened together and secured to floor and overhead runners with screws.
   a. At openings in fire-rated partitions, comply with requirements of governing authorities for framing.
2. Partition heights: Extend studs full height, to underside of floor or roof construction above.
3. Bulkhead partitions: Extend studs as indicated above ceiling height to underside of floor or roof construction.
4. Partial height partitions: Extend studs to height indicated, bracing as required to assure stability.
5. Blocking and bracing: Install blocking and bracing as recommended by manufacturer for adequate support of wall-mounted items installed as work of other sections.

B. Suspended Ceilings and Soffits:

1. Secure hangers to structure or to anchorage devices so that full strength of the hanger can be achieved.
   a. Install ceiling channels at spacing indicated or required, but not greater than permitted by ASTM C 754.
2. Secure furring members by means of screws, clips, or wire ties, as appropriate to substrate. Space furring members as follows:
   a. As permitted by ASTM C 754 for span of furring member and thickness

of gypsum board.

3. Level ceiling system and or soffits to a tolerance of 1/8 inch in 12 feet, or to a higher tolerance if required by specific project conditions and Architect approval.
4. Ensure that entire suspension system is laterally braced.

C. Wall furring:
1. General: Install wall furring members in accordance with manufacturer's recommendations. Spacing as permitted by ASTM C 754 for thickness of gypsum board.
2. On solid walls, install furring members vertically.

3.5 INSTALLATION OF GYPSUM BOARD

A. General: Comply with ASTM C 840 and GA-216 except where exceeded by other requirements.
1. Wherever possible, install gypsum board to minimize butt end joints.
2. Apply ceiling boards prior to installation of wallboards. Arrange to minimize butt end joints near center of ceiling area.
3. Install wallboards in a manner which will minimize butt end joints in center of wall area. Stagger vertical joints on opposite sides of walls.
4. Butt all joints loosely, with maximum of 1/16 inch between boards.
5. Place wrapped edges adjacent to one another; do not place cut edges or butt ends adjacent to wrapped edges.
6. Support all edges and ends of each board on framing or by solid substrate, except that long that long edges at right angles to framing members in non-fire-rated construction may be left unsupported.
7. In double-layer ceiling work, apply base layer with long edges perpendicular to framing members, with face layer in opposite direction, and with all joints offset.
8. In double-layer wall applications, apply base layer with long edges parallel to framing members, with face layer in opposite direction, and with all joints offset
9. Surfaces of gypsum wallboard and substrate members may be adhered together with an adhesive, except adhesive shall not be used in lieu of fasteners for fire-rated assemblies.

B. Control Joints: Form control joints by means of 1/4 inch space between adjacent gypsum boards, with each edge supported on separate framing member, ready to receive trim accessory, and located as shown on the drawings and as follows:
1. Not more than 30 feet apart on walls which are not intersected by other walls for 50 feet or more.
2. On ceilings with perimeter relief, not more than 50 feet apart in both directions.
3. On ceilings without perimeter relief, not more than 30 feet apart in both directions.

4. Control joints shall be installed in accordance with ASTM C 840, with the following additional requirements: Ceiling-height door frames may be used as vertical control joints for partitions. Door frames of less than ceiling height may be used as control joints only if standard control joints extend to the ceiling from both corners of the top of door frame. Control joints in the ceiling shall be located to intersect column penetrations.

C. Sound-Rated Construction: Seal perimeter of construction with acoustical sealant, complying with ASTM C919. Carefully seal around penetrations and at control joints and other openings.

D. Installation on Metal Framing and Furring:
1. Single-layer application: Install gypsum board by means of screw attachment.
2. On walls and partitions, plan installation so that leading edge or end of gypsum board is attached to open end of stud flange first.
3. For fire-rated construction, install gypsum board by means of screws as specified for the tested assembly.

E. Installation of Backing Board:
1. At locations indicated for double-layer gypsum board, backing board may be installed as the base layer.
2. At "wet" locations such as shower stalls and tub surrounds, install moisture-resistant gypsum backing board.
3. Install moisture-resistant gypsum backing board in accordance with manufacturer's recommendations for installation, including minimum clearances and sealing of penetrations and edges. Do not install water-resistant backing board on ceilings or over vapor retarders.

3.6 INSTALLATION OF TRIM AND ACCESSORIES

A. General: Comply with manufacturer's recommendations for installation of trim items. Except for times intended by manufacturer to be left exposed or semiexposed, install trim units for concealment in joint finishing compound. Wherever possible, fasten metal trim items to substrate with same fasteners used to install gypsum board products.

B. Corner Bead: Install metal corner bead at all external corners unless details clearly indicate its omission at specific locations.

C. Edge Trim: Install edge trim at locations indicated and wherever edge of gypsum board otherwise would be exposed.

D. Control Joints: Install one-piece control joints at required locations. Do not remove tape until finishing operations are complete.

3.7 FINISHING

A. General: Comply with ASTM C840 and GA-216 except where exceeded by other requirements.
1. Do not mix joint compounds except as specifically recommended by manufacturer.

B. Finish each area of gypsum board as scheduled, complying with the levels of finish:
   1. Mechanical/Electrical Rooms: Embed tape in joint compound at all joints and interior angles. Provide one separate coat of compound at all joints, angles, fastener heads, and accessories. Provide surfaces free of excess joint compound; tool marks and ridges are acceptable.
   2. All other areas: Embed tape in joint compound at all joints and interior angles. Provide three separate coats of compound at all joints, angles, fastener heads, and accessories. Apply a thin skim coat of joint compound or a special-purpose coating to the entire gypsum board surface. Provide smooth surfaces free of tool marks and ridges.

C. Joint Treatment: Tape and finish joints in accordance with manufacturer's instructions for compounds used, using proper hand tools designed for the purpose.
   1. Prefill joints at featured edges of gypsum wallboard, using compound recommended by manufacterer of wallboard.
   2. Avoid raising nap of face paper when sanding; carefully sponge down any areas roughened by sanding process.

D. Penetrations: Fill cutouts and openings around fixtures and penetrations with joint compound.

3.8 FIRE-RESISTANT ASSEMBLIES

A. Wherever fire-rated gypsum wallboard construction is indicated, the fire-rated assembly shall be in accordance with the specifications contained in the UL-05.

3.9 PATCHING

A. Surface defects and damage shall be corrected as required to leave gypsum wallboard smooth, uniform in appearance, and ready to receive finish as specified.

3.10 CLEANING

A. Promptly remove any residual gypsum drywall materials from adjacent or adjoining surfaces, leaving spaces ready for subsequent finishing operations.

3.11 EXPANSION CONTROL:

A. Provide control joints where indicated on drawings and where not indicated on drawing, provide at a maximum spacing per industry standards.

END OF SECTION

SECTION 09300
TILE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quarry; Porcelain; and ceramic, floor and wall tiles, and marble threshold.

B. Setting materials, grouting materials and methods of installation for ceramic tile and dimension stone.

1.2 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete.

B. Section 04200 - Unit Masonry.

C. Section 05400 - Cold-Formed Metal Framing.

D. Section 06100 - Rough Carpentry (for Sheathing).

E. Section 09260 - Gypsum Board Systems.

F. Section 10800 - Toilet and Bath Accessories

G. Division 15 - Floor Drains & Other Mechanical/Plumbing Installations

1.3 REFERENCES

A. ANSI A108 Series - American National Standard Specifications for Installation of Ceramic Tile.

B. ANSI A108.5 Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.

C. ANSI A108.10 Installation of Grout in Tilework.

D. ANSI A118.3 Specifications for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy.

E. ANSI A118.4 Specifications for Latex-Portland Cement Mortar.

F. ANSI A118.6 Specifications for Ceramic Tile Grouts.

G. TCA "Handbook For Ceramic Tile Installation"; Tile Council of America.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data for Mortars, Grouts, and Adhesives:

a. Submit manufacturer's product data demonstrating compliance with specified requirements.

b. Submit manufacturer's instructions for use.

c. Submit manufacturer's certification that materials are suitable for the intended use.

C. Samples: Submit samples of each type and color of grouting material and tile.

D. Tile Certificates:

a. Submit Master Grade Certificates issued and signed by the manufacturer and the Contractor when the tile is shipped. State grade, kind of tile, and identification marks for tile packages.

b. Submit Certification from tile manufacturer of satisfactory performance of frost proof tile.

E. Shop Drawings:

1. Submit shop drawings indication patterns, perimeter conditions, functions with

dissimilar materials, thresholds, and setting materials.

F. Maintenance Data:
   1. Submit maintenance data including recommended cleaning methods, cleaning solutions recommended, and stain removal methods.

1.5 QUALITY ASSURANCE

A. Mock-ups: Provide mock-up panel using materials specified for final work. Construct mock-up as directed, and of full thickness. Obtain Architect's acceptance of visual qualities of the sample panel.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacture of products specified in this Section.
B. Installer: Company specializing in applying the work of this Section approved by manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

A. Provide heated and dry storage facilities on site.
B. Deliver and store all materials on site a minimum of 24 hours before usage.
C. Deliver and store tile and packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage to materials such as chipping, breakage, freezing, or excessive heat. Prevent contamination by water, moisture, foreign matter, or other causes.

1.8 PROJECT CONDITIONS

A. Maintain ambient and surface temperatures at not less than 60 degrees F during installation of cementitious materials and for 72 hours thereafter. Maintain ambient and surface temperatures between 65 degrees F and 95 degrees F during installation of epoxy setting and grouting materials and for 72 hours thereafter.
B. Vent temporary heaters to outside to avoid carbon dioxide damage to new tile work.
C. Provide adequate lighting for good grouting and clean-up.
D. Do not install adhesives in a closed, unventilated environment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, Subject to compliance with this specification, includes but not limited to:
   1. American Olean Tile Co., Inc.
   2. Crossville Porcelain
   3. Dal-Tile Corp.
   4. Florida Tile, Inc.
   5. Laufen International; or approved equal

2.2 Design Basis:

A. Patterns and Colors specified herein or shown on drawing are based on Crossville

Porcelain Products for floors; and Crossville Porcelain & Laufen Ceramic products for walls unless noted otherwise on drawings.

B. It is the responsibility of other manufacturers listed above or approved via the "pre-approval" or "Substitution" process to match these colors.

2.3 TILE

A. Characteristics:
   1. Type: as indicated on drawings.
   2. Size: As selected by owner.
   3. Wearing Surface: With-out abrasive edges.
   4. Base: Provide matching ceramic mosaic tiles for base with coved bottom pieces and bullnosed cap pieces.

B. Color: As indicated on drawing and/or as selected by Owner from standard Manufacturer colors.

C. Pattern: See Floor Plan for Locations.

D. Tile: As scheduled.

2.2 THRESHOLDS

A. Marble type, standard color, finish, and size by full width of wall or frame opening, bevelled one side.

2.3 SETTING MATERIAL MANUFACTURER

A. Provide tile setting and grouting materials manufactured by C-Cure, 13001 Seal Beach Blvd., Seal Beach, CA. Phone: (800)895-2874 or equivalent.

C. Grout color as indicated in Section 09999 Finish-Material & Color Designation or as otherwise selected by Owner from standard Manufacturer colors.

2.4 LEVELING MATERIALS

A. Self leveling Underlayment (Cementitious):
   1. LevelCure LCB 951 as manufactured by C-Cure, for leveling from 3/8 inch to 1 inch depth.
   2. LevelCure SLU 961 as manufactured by C-Cure, for leveling from 0 inch to 3/8 inch depth.

2.5 SETTING MATERIALS

A. Latex-Portland Cement Mortar ANSI A118.4.

   1. MultiFlex 914 as manufactured by C-Cure, for normal installations.
   2. UniFlex 916 as manufactured by C-Cure, for substrates requiring a dry-set mortar which functions as a crack isolation membrane and anti-fracture membrane to prevent cracks from transferring through the tile and when excessive deflection or vibration is anticipated.

2.6 GROUTING MATERIALS

A. Latex Portland Cement Grout; ANSI A118.6-H2.4.
   1. C-Cure MP Grout(Sanded)as manufactured by C-Cure. Forms a colorfast,

dense matrix grout absorptive, vitreous, and semi-vitreous tiles with joint widths 1/8 inch to 1/2 inch.

2. C-Cure MP Grout (Non-Sanded) in color as manufactured by C-Cure. Forms a colorfast, dense matrix grout for absorptive, vitreous, and semi-vitreous tiles with joint widths up to 1/8 inch.

B. Water Cleanable Tile Setting and Grouting Epoxy; ANSI A118.3:

1. ColorSet Epoxy System 931 as manufactured by C-Cure; color as shown on drawing or selected by Owner. For use in areas subjected to harsh chemicals or acids such as food preparation areas.

2.7 BACKING MATERIALS

A. As specified in Section 09260 or elsewhere in this section.

B. Where none is indicated, the tile manufacturer's recommendation for each application shall be provided.

PART 3- EXECUTION

3.1 EXAMINATION

A. Before work commences, examine the areas to be covered and report any flaw or adverse condition in writing. Do not proceed with the tile work until surfaces and conditions comply with the requirements indicated in the manufacturer's instructions and in ANSI A108.5

B. Verify that slope, when required, is in subfloor.

C. Protect adjoining work surfaces before tile work begins.

D. Vacuum clean existing surfaces and damp clean.

3.2 PREPARATION:

A. Floor Flatness: Install leveling material if necessary to bring floors to required flatness. Maximum variation from plane:

1. l/8 inch in 10 feet for thin-set mortar.

2. Leveling, when necessary, is to be accomplished using leveling materials specified in Part 2.

3.3 INSTALLATION - GENERAL

A. Comply with applicable ANSI A108 series of the "American National Standard Specifications for the Installation of Ceramic Tile".

B. Comply with TCA installation methods indicated or, if not otherwise indicated, as applicable to installation conditions shown.

C. Coverage and Terminations: Extend tile work into recesses an under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown.

D. Intersections and Returns: Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces . Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints.

E. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when

adjoining tile on base, walls, and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.

F. Expansion Joints: Locate expansion joints and other sealant filled joints, including control, contraction and isolation joints, where indicated, or if not indicated, at spacings and locations recommended by EJ 171 in the TCA "Handbook for Ceramic Tile Installation", and approved by Architect.
   1. Prepare joints and apply sealants to comply with referenced installation standards and sealant manufacturer's instructions.

G. Manufacturer's Instructions: Mix and install proprietary components to comply with manufacturer's instructions.

H. Install tile to comply with referenced installation standards, using setting materials indicated.
   1. ANSI A108.5 Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
      (1) TCA Method: F113-99.

I. Curing set tile:
   1. 72 hours before grouting when the temperature is low or the humidity is high.
   2. 48 hours before grouting when hot, dry conditions exist.
   3. Check the bond strength carefully before grouting.

J. Grout the tile to comply with referenced installation standards using grouting materials indicated
   1. Latex Portland Cement Grout ANSI A108.10

3.4 CLEANING AND PROTECTION

A. Upon completion of setting and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

B. Acid Cleaning: Tile may be cleaned with sulfamic acid solutions complying with the following:
   1. Only if permitted by tile and grout manufacturer's printed instructions.
   2. No sooner than 14 days after installation.
   3. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning.
   4. Flush surface with clean water before and after cleaning.
   5. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent staining damage and wear.
   6. Protective Coatings: Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

C. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.

D. Protect tile installation from traffic as specified in ANSI specifications.

E. Protect tile installation from traffic according to manufacturer's instructions.

SECTION 09510
ACOUSTICAL CEILING TILE (ACT)

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and install acoustical tiles and grid systems, types as indicated on drawing or as specified herein.

B. Section includes Exposed suspension system; Trims and accessories; and Acoustical lay-in panels.

C. Related work specified elsewhere:

1. Gypsum wallboard systems: elsewhere in Division 9.
2. Heating and Ventilating: Division 15.
3. Fire Suppression Systems: Division 16.
4. Lighting: Division 16.

1.2 SUBMITTALS

A. Shop Drawings: Include the following:

1. Lay-out including locations of lighting fixtures and grilles.
2. Insert and hanger spacing and fastening details.
3. Slicing method for main and cross runners.
4. Change in level details.
5. Access panel dimensions and locations.
6. Support at lighting fixtures and grilles, including methods for lighting fixture support.

B. Project Data: Include product descriptions and installation instructions for each material. Indicate load carrying capacity of suspension system and manufacturer's recommended method for fixture support.

C. Samples: Submit the following:

1. 1'0" by 1'0" samples of each type acoustical material specified.
2. 1'0" length of each suspension member.

D. Certificates: Indicate compliance with specified requirements, including Underwriters' Laboratories, Inc. (UL) fire-resistive ratings.

1.3 JOB CONDITIONS

A. Sequencing and scheduling: Schedule acoustical material installation to minimize need for removal and replacement of acoustical units to accommodate work of other trades.

1.4 QUALITY CRITERIA

A. Applicable Standards: Standards of the American Society for Testing and Materials (ASTM) as referenced herein.

B. Allowable Tolerances:

1. Deflection: Suspension system components, hangers and fastening devices supporting lighting fixtures, ceiling grilles and acoustical units shall have maximum deflection 1/360 of the span, tested in accord with ASTM C635-83.
2. Bow, camber and twist: Not exceeding tolerances established by ASTM

C635-83.

3. Variation from level in finished ceiling: +/- 1/8" in 12'0".

2.0 - PRODUCTS

2.1 CEILING SUSPENSION SYSTEMS

A. Acceptable manufacturers; subject to compliance with specified requirements:
   1. Chicago Metallic Corporation
   2. Eastern Products, Inc.
   3. National Rolling Mills Company
   4. USG Interiors, Inc.
   Or approved equal.

B. Grid system:
   1. Structural classification: Meeting ASTM C635-83, Intermediate Duty for all components.
   2. Module: Manufacturer Standard or as indicated on drawing.
   3. Main and cross tees:
      Tee Material: Galvanized, cold-rolled steel
      Cap Material: Galvanized, cold-rolled steel.
      Design: Double Web
      Tee Size: 15/16" face width; 1 ½" nominal height main tees and 4'0" long cross tees; material thickness as required to meet specified structural classifications.
   4. Edge molding: Minimum 0.020" thickness steel, channel or angle shaped with minimum 3/4" flange width, hemmed edge.
   5. Finish on exposed components: Chemically treated for paint adhesion with factory applied, low-gloss white paint.

C. Accessories:
   1. Hanger Wire: Minimum 12 ga., galvanized, soft-annealed, mild steel wire.
   2. Hanger Rod: 1/4" diameter, threaded galvanized steel wire.
   3. Wire Ties: 18 ga., galvanized, annealed steel wire.
   4. Hanger Clips: Prefabricated metal clamps for fastening to building structure.
   5. Carry Channels: 16 ga., cold rolled steel, 1 ½ " deep. Connected to existing beam above. Verify type & spacing of beam.
   6. Special Shapes: As manufactured by Fry Reglet Corporation, aluminum acoustical moldings; shapes as indicated; color, white.

2.2 ACOUSTICAL CEILING PANELS

A. ACT1: Armstrong Georgian Minaboard, 24"x24", or approved equal. Typical, unless noted otherwise.

B. ACT2: Armstrong Beveled Tegular Tundra #303, 24"x24" with Tegular Grid, where shown on drawing.

C. ACT3: Armstrong Classic Step, 24"x24" where shown on drawing.

D. ACT-4: 24x24 moisture resistance acoustical ceiling tiles with aluminum grid, where shown on drawing or required to given condition.

2.3 ACCESSORIES

A. Acoustical Sealant: Non-hardening, water base type.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which products of this section are to be installed and verify that the wok properly may commence.

B. Verify that products furnished as work of the section, but not installed under this section, have been properly installed by the entity performing the installation.

3.2 PREPARATION

A. Layout: Position ceiling components to maximize use of full-sized acoustical units and to provide border units which are equal in size and shape at opposing ceiling edges. Use of acoustical units which are smaller than ½ full width is prohibited at ceiling perimeters. Conform to reflected ceiling plans to greatest extent possible

3.3 JOB MOCK-UP:

A. Install complete ceiling of each type specified, in space designated by Architect. Notify Architect when spaces are ready for observation.

B. Following Architect's acceptance, retain mock-up as a standard of quality for ceiling installation. Accepted mock-up may remain as part of finished work.

3.4 SUSPENSION SYSTEM INSTALLATION

A. Install suspension system in accord with applicable portions of ASTM C636-76 (1981)

B. Hangers:

1. Space hangers for main tees at 4' 0" o.c. Secureto building structure by bulk tying.
2. Install additional hangers at ends of each suspension members.
3. Install additional hangers for lighting fixtures in accord with approved shop drawings and product data.
4. Splay wires no mor than 5" in 4' 0" vertical drop.
5. Where spacing of hangers for main tees exceeds maximum specified spacing due to interference by adjacent construction, indirect hang tees using carrying channels to maintain maximum hanger spacing.
6. Wrap wire, minimum of three times horizontally, turning ends upward.

C. Direct hung, exposed grid system, 2' 0" by 2' 0" module:

1. Space main tees at 4' 0" o.c., maximum perpendicular to structure.
2. Space cross tees at 2' 0" perpendicular to main tees to form 2' 0" by 4' 0" grid module. Connect to main tees through slots in main tees.

D. Level and square suspension system components within specified tolerances prior to beginning ceiling material installation.

E. Install cross tees adjacent to lighting fixtures and grilles on each side not supported by main tees. Support no fixtures on main or cross tees when fixture weight results in dead load exceeding deflection capacity of suspension system.

F. Wall Molding:
   1. Install wall moldings at intersection of suspended ceiling and vertical surfaces.
   2. Miter corners where wall moldings intersect or install corner caps.
   3. Attach to vertical surfaces with mechanical fasteners.
   4. Apply continuous ribbon of acoustical sealant on vertical web.

G. Where grid system exists in an unrestrained condition, brace back to building structure using hanger wire, main tee or carrying channel braces spaced at 4' 0" o.c., maximum.

3.5 ACOUSTICAL UNIT INSTALLATION

A. Locate and mark access tiles prior to beginning installation.

B. Install acoustical units in level plane in straight line courses, within specified tolerances.

C. Place acoustical materials to bear all around on suspension members.

D. Pattern shall be symmetrical about centerline of area, unless otherwise indicated. Lay out units having directional pattern in same direction.

E. Where cutting of acoustical units is required, cut so that no cut or damaged edges are visible in finished work.

3.6 MAINTENANCE MATERIALS:

A. Furnish extra materials equal to one percent of each type of acoustical material supplied.

B. Furnish suspension system components in amount sufficient to install extra ceiling units.

3.7 CLEANING:

A. Clean soiled or discolored unit surfaces after installation.

B. Touch up scratches, abrasions, voids, and other defects in painted metal surfaces.

C. Remove and replace damaged and stained acoustical units with new units.

3.8 EXPANSION CONTROL:

A. Provide control joints where indicated on drawings and where not indicated on drawing, provide at a maximum spacing per industry standards.

END OF SECTION

SECTION 09650
RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Resilient tile flooring.
- B. Resilient base.
- C. Resilient stair accessories

1.2 RELATED SECTIONS
- A. Finish of concrete substrate for resilient flooring installation: Division 3
- B. Finish of wood substrate for wood flooring: Division 6

1.3 REFERENCES
- A. ASTM E84 - Surface Burning Characteristics of Building Materials.
- B. FS L-F-475 - Floor Covering, Vinyl Surface (Tile and Roll), with Backing.
- C. FS RR-T-650 - Treads, Metallic and Non-metallic, Non-skid.
- D. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl Composition.
- E. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.4 REGULATORY REQUIREMENTS
- A. Conform to applicable code for flame/ fuel/smoke rating requirements of in accordance with ASTM E84.

1.5 SUBMITTALS
- A. Product data: Submit technical data describing physical and performance characteristics, sizes, patterns and colors available.
- B. VCT Samples: Submit two samples 12 x 12 inches (full size) in size, illustrating color and pattern for each floor material specified.
- C. Base Samples: Submit two 2-1/2 inch long samples of base and accessory material for each color specified.
- D. Stair Accessory Samples: Submit full 6" strips of each material
- E. Submit manufacturer's installation instructions.
- F. Maintenance procedures: Submit manufacturer's published recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- G. Shop Drawings: Provide shop drawings noting all colors for any patterns shown.

1.6 PROJECT CONDITIONS
- A. Environmental Requirements: Store materials for three days prior to installation in area of installation to achieve temperature stability.
- B. Installation: Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.
- C. Sequencing: Do not begin installation of resilient flooring products until painting has been completed for each area.
- D. Existing Conditions: Do not install resilient flooring on concrete substrates until testing has been conducted to assure that moisture levels area acceptable.

1.7 QUALITY ASSURANCE

A. Manufacturer: For each type of product required, including adhesives, cleaning compounds, and other accessories, provide the same product by one manufacturer throughout the project.

1.8 MAINTENANCE

A. Extra Materials: At time of completing installation, deliver stock maintenance materials to the Owner. Furnish products matching those actually installed, packaged for storage and clearly labeled.
   1. Resilient Tile: 2 percent of each variety installed.
   2. Resilient Base: 2 percent of each variety installed.

PART 2 PRODUCTS

2.1 FLOORING MATERIALS

A. Vinyl Composition Tile: FS SS-T-312, Type IV; 12 inches by 12 inches.
   1. Manufacturers: Products of the following manufacturers, provided they comply with those requirements of the contract documents, will be among those considered acceptable:
      a. Azrock
      b. Armstrong
      c. Mannington
      d. Dodge-Regupol - Eco Surfaces
      e. Tarkett
   2. Composition: Free of asbestos
   3. Gage: 1/8 inch

2.2 BASE MATERIALS

A. Base: FS SS-W-40, Type II, and as follows:
   1. Manufacturers: Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable.
      a. Armstrong
      b. Mercer
      c. Roppe Rubber Corporation
      d. Johnsonite
      e. Azrock

B. Base Material: Rubber; 4 inch (100 mm) high; 1/8 inch thick; coved; premolded external corners x 48 inches long.

C. Accessories: Pre-molded end stops and external corners, of same material, size, and color as base.

D. Color: As selected by Owner.

E. Finish: Matte, unless otherwise noted on drawing.

2.3 RESILIENT STAIR ACCESSORIES

A. Manufacturers: Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:

   1. AFCO-USA Corporation

2. Burke Mercer Flooring Products
3. Johnsonite, Inc.
4. The R.C.A. Rubber Company
5. Roppe Corporation

B. Rubber Stair Treads: FS RR-T-650, Composition A, single units for full width of stair or equal lengths if stair width exceeds maximum length available from manufacturer.
   1. Type: Manufacturer's standard
   2. Thickness: 1/4" inch at nosing, tapering to back edge.
   3. Nose design: Square nose.

C. Resilient Risers: Coved base, nominal .080 or 1/8 inch thickness, matching stair treads; single units for full width of stair or equal lengths if stair width exceeds maximum length available from manufacturer.

D. Resilient Stringers: Nominal .080 or 1/8 inch thick resilient stringer material, matching resilient base and coped profile of riser and tread combination.

2.4 MISCELLANEOUS ACCESSORIES

A. Sub-floor Filler: Type recommended by flooring material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Edge Strips: As recommended by flooring manufacturer and as approved by Owner.
1. Provide 1 inch width minimum at any tile, wood, concrete, carpet, or other floor surface where the VCT is terminated.

D. Sealer and Wax: Non-slip types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. General: Verify that surfaces are smooth and flat and are ready to receive Work.

B. Acceptance: Beginning of installation means acceptance of existing substrate and site conditions.

C. Concrete Substrates: Perform manufacturer's recommended moisture tests before beginning installation, to verify that concrete surfaces have cured sufficiently to allow adhesive bond to resilient flooring.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.

B. Apply, trowel, and float filler to leave a smooth, flat, hard surface.

C. Prohibit traffic from area until filler is cured.

D. Thoroughly clean substrate as required to assure a proper installation.

E. Apply primer to surfaces as per manufacturer recommendation.

3.3 INSTALLATION - TILE MATERIAL

A. Install in accordance with manufacturers' instructions.

B. Mix tile from container to ensure shade variations are consistent.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

E. Lay flooring with joints and seams parallel to building lines to produce minimum number of seams and symmetrical tile patterns.

F. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

G. Install edge strips at unprotected or exposed edges, and where flooring terminates.

H. Cut and fit tightly to fixtures, pipes, and other obstructions, as well as to walls and partitions.

3.4 INSTALLATION - RESILIENT BASE

A. Apply base securely in locations indicated, using maximum lengths available to minimize joints. Adhere to substrate with full spread of adhesive, assuring continuous contact with vertical and horizontal surfaces. Site-fabricate corners, coping or mitering inside corners and heat-forming outside corners using manufacturer-approved device, or provide preformed corner units.

1. Apply resilient base to columns and other fixed, freestanding elements in spaces where resilient base is scheduled.
2. At irregular vertical surfaces where top edge of resilient base does not make continuous contact, fill voids with manufacturer's recommended adhesive compound.

3.5 INSTALLATION - STAIR ACCESSORIES

A. General: Install accessories as shown on the drawings, following manufacturer's recommended procedures for a secure, fully adhered application.

1. Adhere stair accessories over entire surface, fitted accurately to achieve hairline joints.
2. Install stair skirting configured tightly to stair and stringer profile.

3.6 INSTALLATION - MISCELLANEOUS ACCESSORIES

A. Resilient Edge Strips: At locations shown on drawings, or where otherwise required to protect edge of resilient flooring, install resilient edge strips securely with recommended adhesive, to achieve tightly butted joint.

3.7 CLEANING

A. Initial Cleaning: Remove excess and waste materials promptly, and sweep or vacuum clean resilient flooring as soon as installation has been completed in each area. After adhesive has had adequate time to set, mop each area with damp mop and mild detergent.

B. Final Cleaning: Remove scuff marks, excess adhesive, and other foreign substances, using only cleaning products and techniques recommended by manufacturer of resilient products.

3.8 WAXING

A. Substantial Completion: A few days before calling for substantial inspection, thoroughly clean dry & wax the floor per manufacturer's instructions.

B. Final Completion: When the floor is thoroughly rinsed and dried, apply three coats of gloss wax with an electric floor machine recommended by the manufacturer.

C. Provide Manufacturer's information on future waxing procedure for Owner's use.

3.9 PROTECTION

A. Construction Period: Cover traffic routes across completed resilient flooring with plywood, hardboard, or other durable material to protect against damage from loaded dollies and other construction traffic.

1. Polish: Apply protective polish to clean resilient flooring surfaces, unless manufacturer of resilient product recommends otherwise.

B. Final Protection: Cover resilient flooring surface with nonstaining building paper until substantial completion in each area. Refer to Section 3.8 for waxing after substantial completion.

END OF SECTION 09650

SECTION 09680
CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Work includes preparation of surfaces to receive carpeting; application of carpeting on floor surfaces, complete with underlay and required accessories; Installation of rubber base where scheduled.

B. Carpet to be mid-grade commercial carpet as specified herein.

1.2 SCOPE OF WORK

A. Prepare surfaces to receive carpeting.

B. Apply carpeting on floor surfaces. Complete with underlay & required accessories.

C. Install rubber base as scheduled.

D. Install thresholds where carpeting terminates, type (i.e. rubber, metal etc.) as specified herein, as indicated on drawing, or as required for each location.

1.3 REFERENCES

Comply with most current editions of the following:

A. 16 CFR, Chapter 11, Part 1630 - Standard for the Surface Flammability of Carpets and Rugs (FF 1-70); Code of Federal Regulations; 1988.

B. AATCC Test Method 30-1993 - Antifungal Activity, Assessment on Textile Materials: Mildew and Rot Resistance of Textile Materials; American Association of Textile Chemists & Colorists; 1993.

C. AATCC Test Method 134-1991 - Electrostatic Propensity of Carpets; American Association of Textile Chemists & Colorists; 1991.

D. AATCC Test Method 147-1988 - Antibacterial Activity Assessment of Textile Materials: Parallel Streak Method; American Association of Textile Chemists & Colorists; 1988.

E. ASTM D 1335-67 (72) - Standard Test Method for Tuft Bind of Pile Floor Coverings; 1967 (Re-approved 1972).

F. ASTM E 84-91a - Standard Test Method for Surface Burning Characteristics of Building Materials; 1991.

G. ASTM E 648-93a - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 1993.

H. ASTM E 662-93a - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 1993.

I. NFPA 253-1990 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 1990.

J. NFPA 255-1990 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 1990.

K. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials: Underwriters Laboratories Inc., 1983 (with 1987 Revision)

1.4 GENERAL REQUIREMENTS

A. Experience: Provide carpet from a manufacturer with not less than five years of production experience with carpets similar to types indicated in this section.

B. Installation: Should be accomplished by a Carpeting Contractor with not less than five years of carpeting experience, similar to work of this section.

C. Guarantee: A 2-year written guarantee covering installation is required. A minimum 5-year free wear replacement warranty is required.

D. Maintenance Instructions: Furnish two manuals of carpet care and maintenance instructions bound in a substantial manner.

1.5 QUALITY CRITERIA

A. Applicable Standards: Standards of the following as referenced herein:
   1. American Association of Textile Chemists and Colorists (AATCC).
   2. American Society for Testing and Materials (ASTM).
   3. National Fire Protection Association (NFPA).
   4. In addition, carpet for Educational Facilities shall meet Department of Education (DOE)'s MC-I Specification.

B. Design Criteria: Carpet shall meet the following:
   1. Flaming mode: 450 maximum flaming mode when tested in accord with ASTM E662-83.
   2. Critical radiant flux: Class I, 0.45 watts/cm2 when tested in accord with ASTM E648-84.
   3. Electrostatic propensity: Less than 3000 volts when tested in accord wth AATCC 134.
   4. Flammability of carpet: Pass methanamine pill test when tested in accord with ASTM D2859-76.
   5. Tuft bind: 20 lbs. average pull force, with no pull less than 15 lbs., when tested in accord with ASTM D1335-67 (1972).

1.6 SUBMITTALS

A. Shop drawings: Submit layout and seaming drawings. Where accents have been drawn on the contract documents, submit color identification numbers for final approval on the shop drawings.

B. Product Data: Submit for carpet and installation accessories. Include test reports verifying that carpet meets specified design criteria. Include manufacturer's specification data and installation procedures. Indicate primers, adhesives and seaming methods proposed for use. Should carpet manufacturer not publish detailed installation data, installer shall submit detailed proposed procedures for Architect's approval.

C. Maintenance data: Submit as part of contract close-out documents. Include recommendations for various traffic conditions, cleaning procedures and intervals.

D. Samples:
   1. Carpet: Submit minimum of two 1'-0" by 1'-0" samples of each type, color and pattern selected.
   2. Accessories: Submit 1'-0" length of carpet edge strip.

E. Certificates: Carpet shall be certified for compliance with specification requirements. Submit certificates from carpet manufacturer at time of carpet delivery to project site. Each certificate shall be signed by authorized officer of carpet manufacturing company and shall contain the name and address of the Contractor, the project location and the quantities and date or dates of shipment or delivery to which certificates apply.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original mill wrappings; carpet having register tab number attached. Deliver only after building is inclosed and spaces are temperature and humidity controlled.

B. Storage: Store materials undercover, off floor in ventilated space. Protect from damage, staining and moisture. Stand no roll material on end.

C. Verification: Upon receipt of custom carpet submit samples to Architect for verification of selected type, pattern and color. Identify samples with carpet name, number and manufacturing and shipping registry numbers. Inspect carpet for quantity and defects.

1.8 SEQUENCING AND SCHEDULING

A. Coordinate work of this section with other work to ensure that installed carpeting materials are not damaged or soiled.

1.9 WARRANTY

A. Submit a written warranty signed by the manufacturer, installer, and the contractor, guaranteeing to correct failures in carpeting which occur within 2 years after substantial completion, without reducing or otherwise limiting any other rights to correction which the Owner may have under the contact documents. A minimum 5 year free wear replacement warranty is also required. Correction may include repair or replacement.

1.10 MAINTENANCE MATERIALS

A. Extra Materials: After carpet installation has been completed, deliver to the Owner replacement carpeting in quantities not less than 5 percent; for each distinct carpet color, pattern, and type installed. Extra materials furnished must precisely match materials installed, must be wrapped in suitable packaging, and must be clearly labeled.

B. Scraps: Salvage scraps from installation over three sq.ft in area and over 1'-0" in width for the Owner's miscellaneous "Attic Stock". This requirement is in addition to the 5 percent of unused carpet listed above.

PART 2 - PRODUCTS

2.1 CARPET

A. Acceptable Manufacturers:

1. Bigelow - Basic Instinct
2. J & J - Reliance 2602

3. Mohawk - Collegiate 28oz, bond-lock
4. Shaw - Potential 26, or approved equal.

2.2 MATERIALS

A. Pile Fiber: The pile fiber shall consist of 100% branded (i.e. federally registered trademark) soil hiding and static resistant advanced generation continuous filament nylon and shall not have been reclaimed from any textile fabric. Apart from meeting any denier, ply and/or weight requirements, the nylon yarn must have sufficient twist and/or entanglement properties to assure acceptable wearability performance when tested as specified in Table I.

B. Backing: When tested as specified in Table 1., the backing shall consist of:
   1. A primary backing made from 100% synthetic materials with a vinyl sealant or vinyl based latex fusion coat.
   2. A secondary backing consisting of a closed cell vinyl cushion with the following.
      a. Thickness: 0.156 (-0.016) in., minimum.
      b. Volume Density: 18.5 (-2.0) lbs per cu. Ft., minimum to 27.5 (+2.5) lbs per cu. Ft., maximum.
      c. Weight Per Unit Area (Area Density): 35.5 (-1.8) oz. Per sq. yd., minimum to 50 (+2.5) oz. per sq. yd., maximum.
      d. Compression Resistance: 7 (-0.5) lbs per sq. in., maximum, at 25% deflection.
      e. Compression Set: 9.6 (+.4)%, maximum (under 25% constant compression).
   3. Labeling: A label meeting the Federal Labeling Requirements, as stated in the Textile Products Identification Act under the Federal Trade Commission, shall be attached to the Department of Education Certification sample and the product delivered to the purchaser.

      The manufacturer is required to put all information as to the country of origin, fiber content, manufacturer's name or RN number on a label or tag attached to a conspicuous place on the outside of the carpet. This information should be set forth consecutively and separately, in type or lettering plainly legible and of equal size.

2.3 CONSTRUCTION REQUIREMENTS

A. Requirements:

1.	Surface Texture:	All loop
2.	Yarn Ply:	Multi-ply or commingled.
3.	Pile Weight:	26 (-1.00) oz. per sq. yd., minimum, when tested as specified in Table I.
4.	Finished Pile Height:	0.156 (+0.008) in., maximum, when tested as specified in Table I.
5.	Dye Method:	Solution dyed.

6. Gauge: 1/10 or 5/64 when tested as specified in Table I.

2.4 PERFORMANCE REQUIREMENTS

A. Tuft Bind:
10 (-1.5) lbs., minimum, when tested as specified in Table I, with a non-prorated fifteen (15) year (minimum) manufacturers warranty covering edge ravel and zippering.

B. Static Control:
A peak electrostatic charge generated of 3.5 KV, maximum, when tested according to AATCC Method 134-1979.

C. Color-fastness:
1. To crocking: Color transfer class 4, minimum, wet and dry, when tested as specified in Table I.
2. To light: A color contrast between the exposed and unexposed carpet areas equivalent to a minimum of Step 4 on the Gray Scale for Color Change after an exposure of 60 AFU (AATCC fading units) for all colors when tested as specified in Table T.

D. Shrinkage:
A maximum shrinkage of 5.0 % in both the length and width, when tested as specified in Table T.

E. Delamination Resistance of the Secondary Backing:
2.5 (-0.1) lbs. per in. of carpet width, minimum, in the warp direction when tested as specified in Table I.

F. Smoke Density:
A specific optical density of 450 (maximum) or less (flaming), when tested according to ASTM E 662-=83.

G. Flammability:
The carpet must comply with the specific flammability criteria of the Florida State Board of Education Rules, Section 6A-2, which are appropriate for the products's intended use (as defined by the type and location or surface to which is will be applied and by the the recommended method(s) of installation, when applicable).
1. In all areas:
Compliance with Federal Flammability Standards DOC FF 1-70, when tested according to ASTM D 2859-76 (Methenamine Table Test - Pill Test), 7 out of 8 minimum front end back surfaces.
2. In Means of Egress, Direct Glue Down Installation:
A minimum critical radiant flux of 0.22 watts per cm. Sq., when tested over fiber cement board according to ASTM E 648-88.

2.5 TEST PROCEDURES FOR LABORATORY ANALYSIS

A. Testing: Failure of the carpet to pass any test in this section shall constitute a failure of the product to conform to the specification.

B. Physical and Chemical Properties:
The following tests are conducted in accordance with the standard test methods specified in Table I.

TABLE 1 - TESTS AND METHODS

Test	Method
Pile Fiber Identity	AATCC 20-1985
Backing Material Identity	AATCC 20-1985
Pile Weight	ASTM D 418-82
Finished Pile Height	ASTM D 418-82
Guage	ASTM D f418-82
Tuft Bind	ASTM D 1335-72
Methenamine Tablet Test	ASTM D 2859-76
Color fastness to Crocking	AATCC 165-1988
Color fastness to Light, Xenon-Arc	AATCC 16E1982
Shrinkage	DDD-c-0095A (para. 4.5.14)
Attached Backing:	ASTM D 1667-76
Thickness	ASTM D 1667-76
Volume Density	ASTM D 1667-76
Weight per Unit Area (Area Density)	ASTM D 1667-76
Delamination Resistance	ASTM D 1667-76
Compression Resistance	ASTM D 1667-76
Compression Set	ASTM D 1667-76

2.6 METHODS OF SAMPLING, INSPECTION AND OTHER TESTS

A. Sampling:

At the option of the purchaser, representative samples (which shall consist of a full width strip, a minimum of 18 in. long from a production roll) shall be taken from deliveries made under this invitation and submitted for quality control testing. If the purchaser's sample fails, the manufacturer shall pay for the actual cost of testing. Failure of any sample so taken to comply with the specification requirements shall invalidate any purchase contract made under this invitation unless the second sample shall be from the same production run. The test should the sample fail, and this invalidates any purchase contract made under this invitation. If the second sample passes, the manufacturer is not responsible for paying the actual const of the test, and the results obtained from the second quality control test shall prevail.

B. Inspection:

Physical inspection of package, condition, quantity, and labeling, meeting the federal labeling requirements of the textile Products Identification Act under the Federal Trade Commission, shall be made at point of delivery by the purchaser.

C. Other Tests:

For purposes of certification only, the manufacturer will be required to submit copies of independent laboratory reports showing the results of the tests 1. And 2. below. Documentation if the results of test 3. will also be required when the

manufacturer desires certification for compliance with flammability criteria II.C.7.a.(2).

1. Static Control: This test should be performed in accordance with AATCC Method 134-1986.
2. Smoke Density: This test should be performed in accordance with ASTM E 662-83.
3. Flooring Radiant Panel Test: This test should be performed in accordance with ASTM E 618-88.

2.7 INSTALLATION ACCESSORIES

A. Carpet edge strip: Mercer Plastics Company, Inc. Royal Custom/Edge; color as selected by Architect from manufacturer's standard selection. Minimum width of anchorage flange is 2 inches.

B. Adhesive: Type recommended by carpet manufacturer for installation conditions. Adhesive shall be release type, allowing removal of carpet without damage to carpet or substrate.

C. Leveling compound:

1. Acceptable products:
   a. Euclid EUCO Polypatch.
   b. Flintkote Latex Underlayment.
   c. GAF Leveling and Patching Compound.
   d. Tamms Floorstone with Latex Liquid.

D. Miscellaneous materials: Furnish fiberglass seaming tape, thread and similar accessories required for carpet installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General: Verify that substrates are completely dry, free of harmful substances, and in satisfactory condition to receive carpeting materials.

B. Conditions: Notify the architect in writing of unsatisfactory conditions. Do not begin installation until these conditions have been satisfactorily corrected.

C. Acceptance: Start of installation work constitutes acceptance of substrate conditions and full responsibility for the completed work.

D. Tests: Perform moisture and acidity tests on concrete surfaces where recommended by carpet manufacturer.

3.2 WORKMANSHIP

A. Vacuum substrate immediately prior to beginning carpet installation. Remove debris, oil, grease, and other foreign materials. Surfaces to receive installation shall be dry.

B. Grind high areas and fill depressions with leveling compound where required to produce smooth installation and for proper alignment of carpet with adjacent flooring materials.

C. Except where more stringent requirements are specified herein, comply with manufacturer's product data.

D. Lay out carpeting materials in accord with approved shop drawings.

E. Lay carpet with pattern and texture running in same direction. Do not seam weft to warp. Lay out for minimum number of seams. Locate seams perpendicular to doorways so as not to occur in doorways. Locate seams at doorways parallel to openings directly under door.

F. Extend carpet under movable furniture and equipment and into closets of rooms indicated to be carpeted unless other floor finish is indicated in finish schedule.

G. Install carpet edge strip at locations where edge of carpet is exposed to traffic except where another device, such as a threshold is indicated.

H. Maintain edges and seams straight and square with adjacent surfaces.

3.3 DIRECT GLUE INSTALLATION

A. Unroll cut and fit carpet lengths for space prior to applying adhesive. In cutting allow 1/2" overlap in adjacent widths.

B. Apply adhesive in accord with manufacturer's printed directions. Apply to half of width at a time, beginning at seam with carpet width already laid.

C. Install pre-fitted carpet; butt edges snugly at seams and against vertical obstructions.

1. Stretch carpet tightly over substrate, so that it lies flat, is uniformly smooth, and free of bulges.
2. Apply seaming cement to butted edges.

D. Install edge guards at exposed carpet edges unless indicated otherwise; provide secure attachment to substrate.

E. After installation, lightly roll carpet as recommended by carpet manufacturer.

F. Immediately remove adhesive from surface of carpet by method which will not damage carpet.

3.4 CLEANING

A. Remove carpet remnants which are not usable; comply with Owner's instructions for final disposition of usable remnants.

B. Use commercial-quality vacuum cleaner to thoroughly clean installed carpeting; trim loose yarns where required.

C. Eliminate stains; contractor shall pay for and replace carpet from which stains cannot be eliminated using carpet manufacturer's recommended products and methods.

3.5 PROTECTION

A. Protection installation with a non-staining building paper. Do not use a moisture barrier such as plastic film.

B. Do not permit foot traffic or place furniture on glued-down carpet for a minimum of 48 hours after installation.

1. Do not wet-clean any glued-down carpet within 60 days of installation.

C. Ensure that carpet will be clean and without deterioration or damage at date of substantial completion.

SECTION 09900
PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Section Includes:
1. Painting and finishing of exposed exterior items and surfaces.
2. Painting and finishing of exposed interior items and surfaces.
3. Field painting of exposed electrical items.
4. Field painting of exposed mechanical items.

B. Section does not include:
1. Factory finishing of manufactured porducts.
2. Painting of concealed surfaces, unless specifically indicated.
3. Prefinished metal surfaces.
4. Moving parts of equipment.

C. Related Sections:
1. Shop priming of ferrous metal: Division 5
2. Painting of mechanical work: Division 15
3. Painting of electrical work: Division 16.

D. Work shall include surface preparation, application of a one-coat primer and a minimum of two-coat paint finish. Type of paint for each type of surface shall be as specified herein.

1.2 REFERENCES

A. Steel Structures Painting Manual Volume 2, "Systems and Specifications", Steel Structures Painting Council (SSPC); Current Edition.

1.3 DEFINITIONS

A. DFM (dry film mils) : Thickness, measured in mils, of a coat of paint in the cured state.

1.4 SUBMITTALS

A. Product data:
1. Submit complete list of products proposed for use at least 30 days prior to commencement of painting work.
2. Indicate manufacturer, brand name, quality and type paint for each surface to be finished.
3. Intent of Contractor to use products specified does not relieve him from responsibility of submitting product list.

B. Color Samples:
Submit two sets of color samples from paint manufacturers proposed for use, for color selection by Owner.

C. Brush-outs:

1. Following issue of final color schedule, prepare actual brush-outs for each paint, stain or finish specified.
2. Submit brush-outs in duplicates; minimum size, 120 sq. in..
3. Apply products in number of coats specified for actual work.
4. Provide the following substrates for brush-outs:
   a. To simulate concrete and masonry: Concrete block painted one face. (8-by 16 inch samples with mortar joint.)
   b. To simulate drywall, lumber, board products and metals for paint finish: Hardboard. (8-inch sample).
   c. To simulate wood for transparent finish: Actual species and grade specified. (8-inch sample.)

1.5 QUALITY ASSURANCE

A. Materials:

1. All coating materials required by this section shall be provided by a single manufacturer, unless otherwise required or approved.

B. Applicator: Firm with successful experience in painting work similar in scope of work for this project.

1. Maintain throughout duration of the work a crew of painters who are fully qualified to satisfy the requirements of the specifications.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Delivery: Deliver materials to project site ready-mixed in original containers with labels intact; labels bearing manufacturer's name, paint type, color and recommended installation and reducing procedures.

B. Storage and handling:

1. Store materials in location acceptable to Architect.
2. Maintain neat, clean conditions in storage of each day's work.
3. Close containers at end of day's work. Leave no materials open.
4. Maintain above 40 degrees F. Do not allow materials to freeze.

1.7 JOB CONDITIONS:

A. Environmental requirements:

1. Comply with manufacturer's product data as to environmental conditions under which materials may be applied.
2. Apply no materials in spaces where dust is being generated.

B. Protection:

Cover finished work of other trades and surfaces not being painted concurrently and pre-finished items.

C. Safety precautions:
   1. Provide temporary fire protection equipment in materials storage area.
   2. Prohibit smoking in storage area.

D. Requirements: Do not apply coatings during inclement weather except within enclosed, conditioned spaces.
   1. Provide temporary lighting to achieve a well- lit surface with a level of at least 80 footcandles measured mid-height.
   2. Provide continuous ventilation and heating to prevent accumulation of hazardous fumes and to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, or longer if required to obtain full cure as indicated by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The brand-name products listed in the schedule at the end of this section and made by the following manufacturer are the basis of the contract documents:
   1. Sherwin Williams

B. Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered in accordance with standard substitution procedures.
   1. Benjamin Moore
   2. Duron Paint Co.
   3. Glidden Co.
   4. Pittsburg Paint
   5. Pratt & Lambert

C. Paint Colors:
   1. **Shall be selected by the Architect & Owner from manufacturer's full range of standard colors** through the shop drawing submittal process, unless specified herein or on the drawings.
   2. Where painting is scheduled or required to "match existing", contractor shall field verify during bidding; and provide color matching mock-up(s) as part of the shop drawing submittal process.
   3. We finish schedule and elevations for multiple colors or other unique painting requirements, where application.

D. Miscellaneous Materials:
   1. Paint thinners and tints by paint manufacturer.
   2. Shellac, turpentine and patching compound shall be pure, best quality products.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that surfaces and conditions are ready for work in accordance with the coating manufacturer's recommendations.

B. Prior to commencement of work, examine surfaces scheduled to be finished.

1. Report any unsatisfactory conditions in writing.
2. Do not apply coatings to unsatisfactory substrates.
3. By beginning painting work on unsatisfactory areas will be deemed as unacceptable.

3.2 PREPARATION:

A. Surfaces: To receive finishes shall be dry and free of debris, oils, dust or other deleterious materials.

1. For previously painted surfaces, remove dirt, debris and chalk by washing with detergent and water. Sand glossy surfaces. Remove loose paint and blisters by scraping and sanding.
2. Treat mildewed surfaces with a solution of one quart hypochlorite bleach to a half cup of detergent to one gallon water. Rinse and allow to dry prior to painting.
3. Do not apply coatings to labels that identify equipment, fire resistant ratings, etc.
4. Remove hardware, cover plates, and similar items before applying the coatings.
5. Provide protection for non-removable items not scheduled for coating. After application of coatings, install removed items. Use only skilled workmen for removal and replacement of such items.
6. Protect surfaces not scheduled for coating. Clean, repair, or replace to the satisfaction of the architect any surfaces inadvertently spattered or coated.

B. Lumber, plywood and veneered wood surfaces:

1. Apply shellac, maximum two pounds cut to knots, pitch and resinous sapwood prior to application of first paint or stain coat.
2. For surfaces to receive opaque finish, fill nail holes, cracks, joints and defects with spackling compound. Apply after first coat of paint.
3. For surfaces to receive transparent finish, fill nail holes, cracks and defects with wood filler matching smooth. Dust to remove debris.
4. Sand surfaces lightly between successive coats. Dust to remove debris.

C. Gypsum drywall:

1. Fill narrow, shallow cracks and small holes with patching compound. Allow to dry and sand smooth without raising nap of wallboard paper.

D. Concrete:

1. Fill cracks, holes and irregularities with cement grout.
2. Remove laitance, oil, grease, dirt and debris from surfaces. Allow

concrete to cure prior to paint application.

3. Apply coatings to fully cured surfaces that are at least 28 days old.

E. Concrete unit masonry:
   1. Rub to remove loose mortar and debris.
   2. Fill irregularities with cement grout. Verify that joints/wall is pointed.

F. Previously painted masonry:
   1. Where existing paint is loose or blistered, remove by scraping or brushing.
   2. Remove debris and chalking from surfaces after scraping, by washing with detergent and water. Flush with clean water. Touch up with material specified for finish.

G. Galvanized metals:
   1. Wash with xylol to remove grease, oil and contaminants. Wipe dry with clean cloth.

H. Aluminum:
   1. Sand or scrape to remove oxides.
   2. Wash with xylol to remove grease, oil and contaminants. Wipe dry with clean cloth.

I. Ferrous metals:
   1. Wire brush or sandpaper to remove rust and mill scale.
   2. Solvent clean with xylol to remove grease, oil and contaminants. Wipe dry with clean cloth.

3.3 APPLICATION:

A. Apply paint only when moisture content of surfaces is within limits recommended in product data. Apply paint materials using clean brushes, rollers or spraying equipment.

B. Apply materials at rate not exceeding that recommended in product data for surface being painted, less ten percent for losses.

C. Comply with product data for drying time between coats.

D. Sand and dust between coats to remove defects visible from distance of 2'-0".

E. Finish coats shall be smooth, free of brush marks, streaks, laps or pile-up of paint, skipped or missed areas.

F. Do not apply additional coats until completed coat has been observed by Architect. Only these coats of paint will be considered in determining number of coats applied.

G. Make edges of paint adjoining other materials or colors clean and sharp without overlapping.

H. Primer coats may be omitted for surfaces specified to receive factory applied primer, if primer is compatible with finish coats. If primer coats are not compatible, substitute a bond coat as recommended by paint manufacturer for specified primer coat.

I. Where two coat finish is specified, prime coat shall be tinted to approximate finish color.

J. Where portion of finish on drywall partition is damaged or unacceptable, refinish

entire surface of partition.

K. Back prime exterior and interior finish carpentry and millwork with material specified for prime coat, without runs on face. Finish cut edges prior to installation.

L. Paint inside of ductwork flat black for entire area visible through ceiling openings. Paint underside of ductwork and other above ceilings items flat black for entire area visible through ceiling openings.

M. Seal tops and bottoms of interior doors with prime coat only; side edges same as faces.

N. Finish all edges of exterior doors same as faces.

O. Paint exposed piping and ductwork in occupied areas same as adjacent wall surfaces.

P. Unless otherwise indicated, all construction on roof top, including mechanical and electrical equipment, shall be painted.

Q. Paint exposed grilles and registers in public spaces.

R. Paint walls, exposed structure, handrails and exposed ductwork and piping in stairwells.

S. Remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work and similar items, or provide ample in-place protection. upon completion of each space, carefully replace all removed items.

3.4 PAINTING MECHANICAL & ELECTRICAL ITEMS

(See additional requirements in Div. 15 & 16)

A. Paint electrical items exposed to view in finished spaces and in equipment rooms.

B. Paint mechanical items exposed to view in finished spaces and in equipment rooms.

C. Color-code items in accordance with requirements indicated in respective sections.

1. Color-band and identify each component with the following:
   a. Flow arrow.
   b. Name.
   c. Number.

D. Paint the following mechanical items:

1. Piping and supports.
2. Motors and supports.
3. Others as indicated on the drawings.

E. Paint the following electrical items:

1. Panel enclosures.
2. Others as indicated on the drawings.

3.5 PRIME COATS

A. General:

1. Field apply bottom coats scheduled except where the contract documents require shop coating of ferrous metals.

2. Where first coat shows signs of suction spots or poorly sealed areas, reapply first coat material to adequately seal surface before proceding with successive coats.
3. Apply block fillers using manufacturer's recommended application techniques and achieving a pinhole-free surface.
4. Ferrous metals that have been shop primed shall be field primed promptly after arrival at the site or shall be stored away from the effects of weather.
5. Reprepare and retouch damaged prime coats using approved, compatible primer.

3.6 FINISH COATS

A. Number of coats and minimum coating thickness:
1. Apply not less than the number of coats indicated.
2. Apply each coat to achieve not less than the dry film thickness indicated per coat.
3. Apply additional coats at no additional cost to the owner when necessary to achieve complete hiding, uniform texture, or uniform sheen and appearance.

3.7 PAINTING SCHEDULE FOR INTERIOR NONTRAFFIC SURFACES

A. Interior surfaces:
1. Ferrous metals, alkyd semigloss.
   a. First coat: Kem Kromik Universal Metal Primer (VOC Complying) B50 WZ1/White; 3.0 DFM.
   b. Second coat: Same as first coat.
   c. Third Coat: Classic 99 Alkyd Semi-Gloss Enamel A40 Series; 1.8 DFM.
2. Galvanized metals and aluminum, alkyd semi-gloss.
   a. First coat: Galvite Paint B50 W3; 2.0 DFM.
   b. Second coat: Same as first coat..
   d. Third coat: Classic 99 Alkyd Semi-Gloss Enamel A40 Series; 1.8 DFM.
3. Concrete, alkyd semi-gloss.
   a. First coat: ProMar 200 Interior Latex Wall Primer B28 W200; 1.1 DFM.
   b. Second Coat: Same as top coat.
   c. Third Coat: Classic 99 Alkyd Semi-Gloss Enamel A40 Series, 1.8 DFM.
4.. Wood for transparent finish, including:
   a. First coat: No. 1600 Series Woodmaster Oil Wood Satin.
   b. Second coat: Woodmaster No. 82 Satin Sheen Polyurethane.
   c. Third coat: Woodmaster Satin Sheen Polyurethane.
5. Concrete unit masonry, filled finish.
   a. First coat: Heavy Duty Block Filler B42 W46..

b. Second Coat: Same as first coat.
c. Third Coat: Classic 99 Alkyd Semi-Gloss Enamel A40 Series, 1.8 DFM.

6. Gypsum wallboards, latex- eggshell.
   a. First coat: ProMar 200 Interior Latex Wall Primer B28 W200; 1.1 DFM.
   b. Second coat: Same as first coat.
   c. Third coat: ProMar 200 Latex Eg-Shel B20 W200 series; 1.3 DFM.
7. Gypsum wallboard ceilings, semigloss.
   a. First coat: ProMar 200 Latex Wall Primer B28 W200; 1.1 DFM..
   b. Second coat: Same as first coat.
   c. Third coat: Classic 99 Alkyd Semi-Gloss Enamel A40 Series, 1.8 DFM.

3.8 PAINTING SCHEDULE FOR EXTERIOR NONTRAFFIC SURFACES

A. Exterior surfaces:
1. Ferrous metals, alkyd semigloss.
   a. First coat: Kem Kromik Universal Metal Primer (VOC Complying) B50 WZ1/White; 3.0 DFM.
   b. Second coat: Same as first coat.
   c. Third Coat: Industrial Enamel B54 Series; 2.0 DFM..
2. Galvanized metals and aluminum, alkyd semi-gloss:
   a. First coat: Galvite Paint B50 W3; 2.0 DFM.
   b. Second coat: Same as first coat..
   d. Third coat: Industrial Enamel B54 Series, 2.0 DFM.
3. Concrete unit masonry, filled finish.
   a. First coat: Heavy Duty Block Filler B42 W46..
   b. Second Coat: Same as first coat.
   c. Third Coat: A-100 Latex House & Trim Paint; Flat Series A6; 1.2 DFM.
4. Concrete: stain.
5. Wood, gloss
   a. First Coat: A-100 Alkyd Exterior Wood Primer Y24 W20.
   b. Second Coat: Same as first coat.
   c. Third Coat: SWP Exterior Gloss Paint A2 Series; 2.0 DFM.

3.9 CLEANING AND PROTECTION

A. Cleaning:
1. Clean work area on a daily basis; dispose of spent materials and empty containers. If requested, turn over to the architect all empty coating containers used during the course of each day.
2. Remove all trace of coatings from adjacent surfaces not scheduled to be coated. Remove by appropriate methods that do not damage surfaces.

B. Protection:

1. Protect work against damage until fully cured. Provide signs identifying wet surfaces until surfaces are adequately cured.
2. Shortly before final completion of the project, examine surfaces for damage to coatings and restore coatings to new, undamaged condition.
3. Touch-up of minor damage will be acceptable where the result is not visibly different from surrounding surfaces. Where the result is different either in color, sheen, or texture, recoat the entire surface.

END OF SECTION

SECTION 10155
SOLID PLASTIC TOILET COMPARTMENTS AND VANITY TOPS

PART 1 GENERAL

1.1 SUMMARY

A. This section includes:
   1. Compartments
      a. Water Closet Compartments
   2. Screens
      a. Urinal Screens
   3. Vanity Counter Tops

1.2 RELATED SECTIONS

A. Section 05500 - Metal Fabrications: Concealed steel support members.
B. Section 06100 - Rough Carpentry: Concealed wood framing and blocking for compartment support.
C. Section 10800 - Toilet Accessories.

1.3 SUBMITTALS

A. See Division 1 - Adminsitrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
C. Product Data: Provide data on panel construction, hardware, and accessories.
D. Samples: Submit two samples of partition panels, 12 x 12 inch in size illustrating panel finish, color, and sheen.

1.4 COORDINATION

A. Coordinate the work with placement of support framing and anchors in wall.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Capitol Partitions, Inc.
B. Santana Products Company
C. The Sanymetal Products Company, Inc.
D. or approved equal

2.2 PANEL SYSTEMS

A. Provide compartment and screen panels made of solid plastic and anchored as shown on drawing or specified herein.
B. Floor mounted overhead braced

2.3 SOLID PLASTIC COUNTER TOPS, BACK SPLASH AND TRIM.

A. 1" Thick solid polymer resin.

2.4 ACCESSORIES

A. Pilaster Shoes: Formed chromed steel with polished finish 3 inch high, concealing floor fastenings.
   1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Hollow chrome-plated steel tube, 1 x 1-5/8 inch size, with anti-grip strips and cast socket wall brackets.

C. Brackets: Polished chrome plated non-ferrous cast metal.

D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

E. Steel Plate Reinforcement: Carbon steel, prepared for fasteners, 1/8 inch thick.

F. Hardware: Polished chrome plated non-ferrous cast metal:
   1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
   2. Thumb turn door latch with exterior emergency access feature.
   3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
   4. Coat hook with rubber bumper; one per compartment, center mounted on door.
   5. Provide door pull for out-swinging doors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.2 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to ½ inch space between wall and panels and between wall and end pilaster.

C. Attached panel brackets securely to walls using anchor devices. Align anchors with horizontal joints.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.3 ERECTION TOLERANCES

A. Maximum Variation From True Position: 1/4 inch

B. Maximum Variation From Plumb: 1/8 inch

3.4 ADJUSTING

A. Adjusting and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10426
SIGNAGE AND GRAPHICS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide door number/name, ADA, and other signage as indicated on drawing.

B. Where indicated to match existing, verify type and dimensions in the field.

C. Include an allowance of $5,000 in base bid for signage requirements that may not be included on bid documents. Upon verification of signage information with the Owner via the submit shop drawing submittal/approval process (schedule, layout drawing, samples etc.) provide a full account of cost for reconciliation.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45 (Sep 1980; 7th Ed) Designation System for Aluminum Finishes

AA SAA-46 (Oct 1978; 5th Ed) Standards for Anodized Architectural Aluminum

AA PK-1 (Sep 1987) Registration Record of Aluminum Association Alloy Designations and Chemical Composition Limits for Aluminum Alloys in the Form of Castings and Ingot

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 605.2 (1990) Voluntary Specification for High Performance Organic Coatings on Ahitectural Extrusions and Panels

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A117.1 (1986) Providing Accessibility to and Usability by Physically Handicapped People

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 209 (1990) Aluminum and Aluminum-Alloy Sheet and Plate

ASTM B 221 (1990) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

ASTM D 702 (1981) Cast Methacrylate Plastic Sheets, Rods, Tubes and Shapes

1.3 GENERAL

A. Signage shall be of the sizes and types shown on the drawings, shall conform to the requirements specified herein, and shall be provided at the locations indicated. Signs shall be complete with lettering, framing as detailed, and related components for a complete installation. Signs shall be the standard product of a

manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate signs that have been in satisfactory use at least 2 years prior to bid opening.

1.4 SUBMITTALS

A. Manufacturer's descriptive data, catalogs cuts and installation instructions.

B. Drawings shall include elevations of each type of sign and shall show dimensions, details and methods of mounting or anchoring, shape and thickness of materials, and details of construction. A schedule showing the location of each sign type shall be included.

C. Samples of the following signs showing typical quality and workmanship. The samples may be installed in the work, provided each sample is identified and location recorded.

1. Direction sign.
2. Door sign.
3. Changeable letter for building directory.

D. Two samples of manufacturer's standard color chips for each material requiring color selection.

1.5 DELIVERY AND STORAGE

A. Materials shall be delivered to the jobsite in manufacturer's original packaging and stored in a clean, dry area.

PART 2 PRODUCTS

2.1 ALUMINUM ALLOY PRODUCTS

A. Aluminum extrusions shall be at least 1/8-inch thick, and aluminum plate or sheet shall be at least 16 gauge, 0.0508-inch thick. Extrusions shall conform to ASTM B 221; plate and sheet shall conform to ASTM B 209. Where anodic coatings are specified, alloy shall conform to -AA PK-1- alloy designation 514.0. Exposed anodized aluminum finishes shall be as shown and shall conform to -AA SAA-46-.

B. Anodic Coating
Anodized finish shall conform to -AA DAF-46.

C. Organic Coating
Organic coating shall conform to AAMA 605.2, with total dry film thickness not less than 1.2 mils.

2.2 VINYL SHEETING FOR GRAPHICS

A. Vinyl sheeting for graphics shall conform to MS MIL-M-43719, minimum 0.003-inch film thickness. Film shall include a pre-coated pressure sensitive adhesive backing (Class 3).

2.3 ACRYLIC SHEET

A. ASTM D 702, Type III.

2.4 ANCHORS AND FASTENERS

A. Exposed anchor and fastener materials shall be compatible with metal to which applied and shall have matching color and finish.

2.5 FABRICATION AND MANUFACTURE

A. Workmanship

Holes for bolts and screws shall be drilled or punched. Drilling and punching shall produce clean, true lines on surfaces. Exposed surfaces of work shall have a smooth finish and exposed riveting shall be flush. Fastenings shall be concealed where practicable.

B. Dissimilar Materials

Where dissimilar metals are in contact, the surfaces will be protected to prevent galvanic or corrosive action.

2.6 PLAQUE SIGNS

A. Plaque signs shall be a modular type signage system. Signs shall be fabricated of Type ES melamine plastic conforming to FS L-P-387, Type NDP self-extinguishing or acrylic conforming to ASTM D 702 as shown.

1. Standard Modular Plaque Signs

Plaque signs shall consist of gloss or matte finish; acrylic plastic, ES plastic or laminated to acrylic or plexiglass back, thickness and size as shown. Corners of signs shall be squared 3/8, 1/2, or 3/4-inch radius.

2. Modular Changeable Message Strip Plaque Signs

Where required, changeable message strip plaque signs shall consist of acrylic or plexiglass back laminated to gloss or matte finish, acrylic plastic or ES plastic face with message slots as detailed for insertion of changeable message strips. Thickness and size of signs shall be as shown. Individual 1/16-inch thick message strips to permit removal, change, and reinsertion shall be provided as detailed.

3. Mounting of Plaque Signs

Mounting may require, extruded aluminum brackets, in finish as shown, shall be furnished for hanging, projecting, and double-sided signs; Mounting for framed, hanging, and projecting signs shall be by holes and screws; Surface mounted signs shall be provided with 1/16-inch thick vinyl foam tape or countersunk mounting holes in plaques and mounting screws. When required, sign inserts shall be provided with 1/16-inch thick foam tape.]

4. Extra Stock

The Contractor shall provide extra stock of blank plaques of each color and size for sign, pressure-sensitive letters in each color and size for sign type and changeable message strips for sign(s), where required.

2.7 GRAPHICS

A. Tactile Graphics

Signage that provides emergency information, general circulation directions, or identification of rooms and spaces shall be tactile (perceptible to touch) and shall comply with ANSI A117.1, paragraph 4.28. Characters, symbols, or pictographs on tactile signs shall be recessed or raised 1/32 inch minimum. Tactile letters and numbers shall be sans serif upper case. Tactile characters or symbols shall be at least 5/8-inch high, but no higher than a nominal 2 inches. Characters and symbols shall contrast with their background.

B. Graphics Application

Signage graphics shall conform to the following: Message shall be acrylic letters and chemically welded.

C. Messages

See drawings and/or schedule for message content, typeface, type size and color or coordinate with Owner.

2.8 CHANGEABLE LETTER BUILDING DIRECTORIES

Changeable letter building directories shall be provided with a changeable directory listing consisting of the areas, offices and personnel located within the facility. The size and color of the sign shall be as shown on the drawings. Message content shall be coordinated with the Owner.

A. Changeable Directory Letters

Changeable letters shall be upper case helvetica, 3/4-inch high capital letter, flush left.

B. Header Panel

Background metal to match frame with raised letters. Acrylic with raised acrylic letters.

C. Doors

1. Door Glazing

Clear acrylic sheet 3/16-inch thick conforming to ASTM D 702. Clear polycarbonate sheet 3/16-inch thick.

2. Door Construction

Extruded aluminum door frame shall be of same finish as surrounding frame.Corners shall be mitered and assembled with concealed fasteners. Hinges shall be full length piano in finish to match frames and trim. Glazing shall be set in frame with resilient glazing channels.

c. Door Locks

Door locks shall be manufacturer's standard, and shall be keyed alike.

D. Fabrication

Extruded aluminum frames and trim shall be assembled with hairline fit corners and joints. Removable changeable directory panel shall consist of fiberboard back with vinyl covering backgrooved 1/4 inch on centers to receive flanged letters.

E. Changeable Letters

Tabbed vinyl or butyrate letters and numbers shall be furnished in accordance with the drawings.

F. Illuminated Units

Directory units shall have concealed internal top lighting with rapid start fluorescent tube lamp, internal wiring, and lead at wire for connection. Electrical work shall comply with NFPA 70.

PART 3 EXECUTION

3.1 INSTALLATION

A. Signs shall be installed at locations shown on the drawings. Signs shall be installed plumb and true at mounting heights indicated, and by method shown or specified. Signs on doors or other surfaces shall not be installed until finishes on such surfaces have been installed.

1. Anchorage

Anchorage not otherwise specified or indicated shall include slotted inserts, expansion shields, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine carriage bolts for steel; lag bolts and screws for wood.

2. Protection and Cleaning

The work shall be protected against damage during construction. Hardware shall be adjusted for proper operation. Glass, frames, and other sign surfaces shall be cleaned.

END OF SECTION

SECTION 10522
FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Extent of fire extinguisher, cabinets and accessories is indicated on drawings.

B. Definition: Fire extinguisher as used in this section refers to units which can be hand carried as opposed to those which are equipped with wheels or to fixed extinguishing systems.

C. Types of products required include:

1. Fire extinguisher.
2. Fire extinguisher cabinets.
3. Mounting brackets.

1.2 RELATED WORK

A. Roughed-in wall openings.

B. Section 09900 - Painting: Field paint finish.

C. Wall module cabinet enclosures.

1.3 REFERENCES

A. NFPA 10 - Portable Fire Extinguishers.

1.4 QUALITY ASSURANCE

A. Single source responsibility: Obtain products in this section from one manufacturer.

C. UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

1.5 SUBMITTALS

A. Submittal shall include physical dimensions, operational features, color and finish, wall mounting brackets with mounted measurements, anchorage details, rough-in measurements, location, and details.

B. Submit manufacturer's installation instructions.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit manufacturer's operation and maintenance data which shall include test, refill or recharge schedules, procedures, and re-certification requirements.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not install extinguishers when ambient temperatures may cause freezing.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Product/Manufacturer: Subject to compliance with requirements, provide products of one of the following:
   1. J. L. Industries
   2. Larsen's Mfg. Co.
   3. Potter-Roemer, Inc.

B. Type and location as indicated on drawings. "FE" indicates bracket mounted, "FEC" indicates extinguisher in cabinet.

2.2 FIRE EXTINGUISHERS

A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated.

B. Multi-Purpose Dry Chemical Type FE-1: UL-rated 4-A:60-B:C, 10 lb. nominal capacity, in enameled steel container, for Class A, Class B and Class C fires.

2.3 FIRE EXTINGUISHER CABINETS (FEC)

A. General: Provide fire extinguisher cabinets here indicated, of suitable size for housing fire extinguishers of types and capacities indicated. **The design basis is Larsen's model no. 2409-R3, "Rolled edge Semi-recessed 2 ½" with "Vertical Duo" door style.** Provide "FS" (Flame Shield) for FEC located in rated walls.

B. Construction: Manufacturer's standard enameled steel box, with trim, frame, door and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter door frames.

C. Cabinet Type: Suitable for mounting conditions indicated.

D. Door and Material Construction
   1. Manufacturer's door construction, of material indicated, coordinated with cabinet types and trim styles selected.

E. Door Style
   1. Manufacturer's standard design.
   2. Provide silk screen lettering: "FIRE EXTINGUISHER".

F. Door Hardware: Provide manufacturer's standard door operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous type hinge permitting door to open 180 degrees.

2.4 MOUNTING BRACKETS (FE)

A. Provide manufacturer's standard bracket designed to prevent accidental dislodgement

of extinguisher, of proper size for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.

2.5 ACCESSORIES

A. General: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations except as otherwise indicated. Apply finishes in factory after products are assembled. Protect cabinets with plastic or paper covering, prior to shipment.

B. Painted Finishes

1. Preparation: Clean surfaces of dirt, grease and loose rust or mill scale. Apply finish to all surfaces of fabricated and assembled units, whether exposed or concealed then installed, except those surfaces specified to receive another finish.
2. Extinguisher: Red Enamel.
3. Cabinet Trim and Door: Primed. Suitable for field finish with enamel paint to match walls. Color as selected by Owner/Owner's Representative.
4. Cabinet Interior: White enamel.

PART 3 EXECUTION

3.1 INSPECTION

A. Verify rough openings for cabinet are correctly sized and located.

B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.

B. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.

C. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.

D. Paint fire extinguisher cabinet doors in accordance with specified requirements.

1. Apply "Fire Extinguisher" lettering after final painting, or protect from damage if factory applied.

END OF SECTION

SECTION 10800
TOILET AND BATH ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Toilet, bath, and washroom accessories.
B. Attachment hardware.

1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Installation of concealed anchor devices.
B. Installation of backing plate reinforcement.

1.3 RELATED SECTIONS

A. In wall framing and plates and above ceiling framing for support of accessories.
B. Section 08800 - Glazing: Wall mirrors.

1.4 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible To and Usable by Physically Handicapped People.
B. ANSI/ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.
C. ANSI/ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
D. ANSI/ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.
E. ANSI/ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
F. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
G. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
H. NEMA LD-3 - High Pressure Decorative Laminates.

1.5 SUBMITTALS

A. Submittals shall provide product data on accessories describing size, finish, details of function, attachment methods.
B. Submit manufacturer's installation instructions.

1.6 KEYING

A. All accessories shall be keyed alike.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for installing work in conformance with ANSI A117.1.

1.8 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with the placement of internal wall reinforcement to receive anchor attachments.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide toilet accessories by one of the following:
   1. Bobrick Washroom Equipment, Inc.
   2. Bradley Corporation.

B. Model numbers of toilet accessories listed herein are those of Bobrick Washroom Equipment, Inc., and are indicated to establish a standard of quality for each item specified.

2.2 MATERIALS

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gauge minimum, unless otherwise indicated.

B. Sheet Steel: Cold-rolled, commercial quality ASTM A366, 20-gauge minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.

C. Mirror Glass: See Glazing Section.

D. Fasteners: Screws, bolts and other devices of same materials as accessory unit or of galvanized steel where concealed.

2.3 FABRICATION

A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted. Unobtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project.

B. Surface-Mounted Toilet Accessories, General: Fabricate units with tight seams and joints, exposed edges rolled. Provide concealed anchorage wherever possible.

C. Recessed Toilet Accessories, General: Fabricate units of all welded construction with mitered corners. Hinge doors or access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that site conditions are ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

A. Deliver inserts and rough-in frames to site at appropriate time for building-in.

B. Provide templates and rough-in measurements as required.

C. Verify exact location of accessories for installation.

3.3 INSTALLATION

A. Install fixtures, accessories and items in accordance with manufacturers' instructions, and as per ANSI 117.1.

B. Install plumb and level, securely and rigidly anchored to substrate.

3.4 ADJUSTING AND CLEANING

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

B. Clean and polish all exposed surfaces after removing labels and protective coating.

3.5 SCHEDULE: The following items specified are indicated on drawings with the abbreviations in parenthesis. Bring any conflict to the attention of the architect or CM prior to bid:

A. Combination Towel Dispenser/Waste Receptacle Units (TDR)
   1. Recessed Unit: Stainless steel combination unit fabricated for nominal 4" wall depth and with continuous seamless wall flange.
   2. Towel compartment in upper portion of unit designed to dispense not less than 400 C-fold or 700 multi-fold paper towels.
   3. Waste receptacle in lower portion of unit provided with reusable heavy-duty vinyl liner, min. 4 gallon capacity.
   4. Provide flush doors with piano hinges and tumbler locks on upper and lower compartments.
   5. Equal to Bobrick B-3944.

B. Paper Towel Dispenser (TD)
   1. Surface Mounted Towel Dispensers: Fabricate of stainless steel nominal 4" depth, sized to dispense not less than 400 C-fold or 525 multifold paper towels without use of special adapters, door equipped with tumbler lockset.
   2. Equal to Bobrick B-262.

C. Paper Towel Waste Receptacle (TR)
   1. Recessed Unit: Stainless Steel Unit fabricated for nominal 4" wall depth and with continuous seamless wall flange. Waste receptacle to provide reusable heavy-duty vinyl liner, min. 4 gal. capacity and tumbler locks.
   2. Equal to Bobrick B-3644.

D. Toilet Tissue Dispenser (TTD)
   1. Double-Roll Dispenser: Size to accommodate two separate rolls of core type tissue to 5" diameter.
   2. Equal to Bobrick Model No. B-274.

E. Grab Bars (GB, GB1=42"length, GB2=36"length, GB3=24"length)
   1. Stainless Steel Type: Provide grab bars with wall thickness no less than 10 gauge equal to Bobrick Model No. B-6106 x 48, B-6137 and as follows:
   2. Mounting: Concealed, manufacturers standard flanges, and anchorages equal to Bobrick's 256 Series Anchor plate.
   3. Clearance: 1-1/2" clearance between wall surface and inside face of bar.
   4. Gripping Surfaces.

5. Heavy-duty size: Preened outside diameter of 1-1/2".

F. Sanitary Napkin Disposal Units (FND)
   1. Partition-Mounted Single-Access Type (FND): Fabricate of stainless steel equipped with adjustable flanges to permit partition mounting to service one toilet compartment.
   2. Provide self-closing door and all-welded stainless steel receptacle removable from one side.
   3. Equal to Bobrick Model No. B-353.

G. Liquid Soap Dispenser (SD)
   1. Surface Mounted: Wall mounted, piston type unit with minimum 40 fluid ounce capacity.
   2. Stainless steel with vandal proof filler cap.
   3. Equal to Bobrick Model No. B-11.

END OF SECTION

Appendix A

Soil Boring Report

REPORT OF GEOTECHNICAL EXPLORATION

Ft. White Public Library
SR 47 & Koonhollow Gln
Ft. White, Columbia County, Florida
CTI Project No. 09-00436-01

- Prepared For -
Columbia County Board of County Commissioners
P.O. Drawer 1529
Lake City, Florida 32056

- Prepared by -
Cal-Tech Testing, Inc.
P.O. Box 1625
Lake City, Florida 32056-1625

November 6, 2009

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November 6, 2009

Columbia County Board of County Commissioners
P.O. Drawer 1529
Lake City, Florida 32026

Attention: Mr. Ben Scott, Purchasing Director

Reference: Report of Geotechnical Exploration
Ft. White Public Library - SR 47 & Koonhollow Gln
Ft. White, Columbia County, Florida
Cal-Tech Project No. 09-00436-01

Dear Mr. Scott:

Cal-Tech Testing, Inc. (CTI) has completed the geotechnical exploration and engineering evaluation for the proposed Ft. White Public Library. Our work was planned and performed in general accordance with our proposal dated October 22, 2009. Authorization for this work was provided by you on October 27, 2009. This report briefly outlines our understanding of the planned construction, describes the field exploration, presents the collected data, and provides our geotechnical engineering evaluation of the subsurface conditions with respect to the planned construction. Also included in this report are our recommendations for the design and construction of the proposed library.

INTRODUCTION

The purpose of this exploration was to develop information to evaluate the site and subsurface conditions and to present site preparation recommendations and foundation support for the proposed library building. This report describes our field activities and presents our findings and recommendations. The services rendered by CTI during the course of this exploration can be summarized as follows:

1. Performed a brief site reconnaissance;
2. Planned and performed a total of 4 Standard Penetration Test (SPT) borings each extending 20 feet below the existing ground surface;
3. Reviewed available data such as results of similar exploration and published data including the U.S.G.S. Quadrangle map, and the Geologic Map of Florida for this area.
4. Reviewed and analyzed gathered data in order to evaluate the subsurface conditions with respect to the proposed construction.

5. Prepared this report, which includes the results of our field exploration as well as our recommendations with respect to foundation design, foundation related site work, general site development, and quality control.

SITE & PROJECT INFORMATION

The subject site is located on the north side of Koonhollow Gln approximately 650 feet west of State Road No. 47 in Ft. White, Columbia County, Florida. At the time of our site visit, the ground surface appears to have been recently cleared of trees and vegetations. The ground surface appears relatively level with no ponded water.

We have been furnished with an undated Site Plan prepared by GTC Design Group, LLC of Lake City, Florida. Based on available data, we understand the proposed development will consist of constructing a ±5,100 (88' by 58') one-story building for use as a public library with associated landscaped, parking and driveway areas. We have been instructed by Mr. Chad Williams, P.E. of GTC to limit our exploration to the proposed building area (i.e. pavement and driveway areas to be excluded). Structural loading information for the building is not available at this time; however, we anticipate that column loads will be no greater than 25 kips and wall loads no greater than 4 kips per lineal foot. We assume the building will be structural steel or CMU framed construction with concrete slab-on-grade. Existing grade elevations within the subject property range from about 70 to 75 feet at the northwestern and southeastern property corners, respectively. Existing ground surface elevation within the proposed building area is at ±71 feet. We understand the finished floor elevation will be near the existing elevations with cut/fill not to exceed 3 feet.

FIELD PROGRAM

The field program consisted of performing a total of four (4) SPT borings each extending 20 feet below the existing ground surface. The SPT borings were performed at the approximate building corners as shown on the attached Field Exploration Plan. These locations were determined in the field and measured by tape and approximating right angles from existing features (property corners). Therefore, the borings location should be considered only as accurate as the means and methods by which they were obtained.

Sampling and penetration procedures of the SPT borings were accomplished in general accordance with ASTM D-1586, "*Penetration Test and Split-Barrel Sampling of Soils*", using a power rotary drill rig. The standard penetration tests were performed by driving a standard 1-3/8" I.D. and 2" O.D. split spoon sampler with a 140 pound hammer falling 30 inches. The number of hammer blows required to drive the sampler a total of 18 inches, in 6 inch increments, were recorded. The penetration resistance or "*N*" value is the summation of the last two 6 inch increments and is illustrated on the attached boring logs adjacent to their corresponding sample depths. The penetration resistance is used as an index to derive soil parameters from various empirical correlations. The borings were performed using a BK-51 drill rig equipped with a manual hammer.

The attached record of boring logs presents the descriptions of the subsurface conditions encountered at the time of our field program, and also provide the penetration resistances recorded during the drilling and sampling process. The stratification lines and depth designations on the boring record represent the approximate boundaries between the various soils encountered. In some cases, the transition between the various soils may be gradual.

SITE & SUBSURFACE CONDITIONS

General Area Geology/Sinkhole Potential

Published information regarding the geology in this area of Columbia County indicates the site is situated within the Undifferentiated Quaternary Sediments (Qu) of the Pleistocene and Holocene epochs. Typically, these sediments consist of siliciclastics, organics and freshwater carbonates. The siliciclastics are light gray, tan, brown to dark, unconsolidated to poorly consolidated, clean to clayey, silty, fossiliferous, variably organic-bearing sands to blue green to olive green, poorly to moderately consolidated, sandy, silty, clays. Freshwater carbonates "*marls*" are buff colored to tan, unconsolidated to poorly consolidated, fossiliferous (mollusks) carbonate muds containing organics.

The limestone in this area consists of carbonate rock and its weathered residuum. Surface soil mantle is typically characterized by sands, sandy clays, or clays. In this area of Columbia County, Florida, the limestone is marked by solution features (sinkholes) associated with *karst* terrains. Areas underlain by karst terrains are prone to sinkhole activities, these sinkholes are primarily caused by an advanced state of internal soil erosion or raveling action, which under certain circumstances can lead to ground subsidences. This internal soil erosion is a very slow process by which soil particle usually migrate under the influence of a hydraulic gradient to underlying karsted and/or fractured limestone formation. There are several indicators generally associated with an advanced state of long term internal soil erosion such as noticeable surface depressions and/or very loose to soft soil zones just above the rock formation.

The USGS Map Series No. 110, Sinkhole Type, Development, and Distribution in Florida dated 1985 identifies the site within Area I. In this document, Area I consists of ground with bare or thinly covered limestone. Gradually developed solution sinkholes are few, broad and shallow. A brief review of the Sinkhole Database issued by the Florida Geological Survey indicates a number of "*reported*" sinkhole occurrences within 1 mile radius of the subject site.

General Statements About Carbonate Terrains

Our site observation at the time of drilling and results of the test borings did not reveal presence of active sinkholes within the explored areas. However, it must be understood that this exploration was not intended to predict or preclude future sinkholes from occurring or developing at this site or within the vicinity of the subject site. We note that major topographic changes in surface or groundwater patterns in carbonate terrains can sometimes induce sinkholes. Therefore, it is recommended the site grades should follow the existing topography as much as

possible. In addition, no water wells should be installed within the site influence area, as pumping from these wells will cause groundwater fluctuations and may induce sinkholes.

Subsurface Soil Conditions

In general, the soil profile as disclosed by SPT borings B-1 through B-4 initially consisted of about 6 to 9 inches of brown silty fine sand with organics (TOPSOIL) underlain by about 2½ to 3½ feet of gray to tan fine sand with silt (SP-SM), about 1 to 7 feet of yellowish tan fine sand (SP), about 7 to 10½ feet of reddish brown with light gray mottles clayey sand (SC), about 4½ feet of light gray silty clayey sand (SC-SM), and about 1 to 4 feet of light gray and reddish brown sandy clay (CL). Typically, the sandy soils vary from very loose to medium dense in relative density with standard penetration resistance or "*N*" values ranging from 3 to 27 Blow Per Foot (BPF). The clay soils have "*N*" values ranging from 19 to 30 BPF indicating these soils to have a very stiff consistency. Refer to the attached record of boring logs for a more detailed description of the subsurface conditions encountered.

Groundwater

At the time of completion of drilling, the groundwater was not encountered in any of the test borings. It must be noted that due to the relatively short time frame of the field exploration, the groundwater may not have had sufficient time to stabilize. For a true groundwater level reading, piezometers may be required. In any event, fluctuation in groundwater levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff, and other site-specific factors.

RECOMMENDATIONS FOR FOUNDATION DESIGN & SITE PREPARATION

Foundation Support

The test borings indicated the presence of very loose soils within the upper 4 feet of the existing ground surface (may be due to recent site clearing of trees and vegetations). The majority of these soils are considered suitable for reuse as structural fill, however, they are not considered acceptable for the support of the proposed building in their current conditions. To improve the density of the supporting soils, the upper 3 feet of the site soils within the building and pavement areas (including 5 feet outside the perimeter of the building) should be overexcavated and recompacted as indicated herein.

Provided the foundation and site soils are prepared in accordance with the guidelines presented in this report, it is our opinion the proposed structure may be supported on a conventional shallow foundation system. The shallow foundation may be designed for an allowable bearing pressure of 2,500 pounds per square foot (psf) or less on recompacted soils or newly placed structural fill.

In using net pressures, the weight of the footing and backfill over the footing need not be considered. Only loads applied at or above final grade need to be used for dimensioning footings. However, wall bearing footings should be designed with a minimum width of 18 inches, while the individual column footings should have minimum dimensions of 2 feet by 2 feet.

Settlement Analyses

Actual magnitude of settlement that will occur beneath foundations will depend upon variations within the subsurface soil profile, actual structural loading conditions, embedment depth of the footings, actual thickness of compacted fill or cut, and the quality of the earthwork operations. Assuming the foundation related site work and foundation design is completed in accordance with the enclosed recommendations, we estimate the total settlement of the structure will be on the order of 1 inch or less. Differential settlements (between adjacent columns or along the length of a continuous wall footing) should be approximately one-half of the total settlement. This settlement is primarily the result of elastic compression of the upper looser sands, and should occur almost immediately following the application of the structural dead load during construction.

Uplift Resistance

Under wind loading conditions, the foundations will likely be subjected to uplift forces. To resist these forces, it may be necessary to increase the footing size (thus increasing the dead weight) or lower the footing to mobilize additional soil weight above the footing. Uplift resistance from the soil may be evaluated as the weight of the soil directly above the footing, plus the shearing resistance along the vertical face of the soil prism. Alternately, the available soil uplift resistance may be calculated as the weight of the soil prism defined by the diagonal line drawn from the top of the footing to the ground surface at an angle of 30 degrees with the vertical. We recommend that a total unit weight of 100 pcf (compacted to 95% of the modified Proctor maximum dry density) be used for well-compacted, suitable fill. Should the bottom of any structure be below the stabilized seasonal-high groundwater level, these structures must be properly designed to resist the resulting uplift forces due to hydrostatic pressures.

Lateral Resistance

Lateral loads created by wind may be resisted by the passive pressure of the soil acting against the side of the individual footings and/or the friction developed between the base of the foundation system and the underlying soils. For compacted backfill and/or in-situ material, the passive pressure may be taken as an equivalent to the pressure exerted by a fluid weighing 300 pcf for above the groundwater table and 113 pcf below water level. A coefficient of friction equal to 0.4 may be used for calculating the frictional resistance at the base of the shallow footings. The resistance values discussed herein are based on the assumption that the foundations can withstand horizontal movements on the order of ¼ inch. Lateral resistance determined in accordance with the recommendations provided herein should be considered the total available resistance. Consequently, the design should include a minimum factor of safety of 1.5.

Lateral Earth Pressures

Generally, retaining walls (if any planned for the subject site) will be subjected to "at-rest" or "active" pressures. Retaining walls that are restrained at the top will be subject to "at-rest" pressures due to their restricted movement. The "at-rest" pressures may be calculated as the equivalent pressure exerted by a fluid density of 50 pcf. Where walls are not restrained at the top and thus allowed sufficient movement to mobilize "active" pressures, an equivalent fluid density of 33 pcf should be used in the design. These values may be used only for walls above the groundwater table. The presence of any groundwater due to surface water intrusion should be handled with the use of a drainage layer behind the walls with a collection pipe discharging accumulated water away from the walls. If this is not practical, then the hydrostatic pressure due to water should be included in the design of the walls.

Drainage Considerations

Adequate drainage should be provided at the site to minimize increase in moisture content of the foundation soils. Excessive moisture can significantly reduce the soils bearing capacity and contribute to foundation settlement. For the protection of the foundation soils, we recommend the ground water surface be sloped away from all proposed structures.

Floor Slab

All unsuitable material (such as topsoil, organics, etc.) located within the building area (including 5 feet outside the perimeter of the building) should be overexcavated and removed. As previously indicated, the upper 3 feet of the existing site soils will require overexcavation and recompaction as indicated herein. After proper preparation of the near surface soils, the exposed subgrade should then be recompacted and proofrolled with a fully-loaded, tandem-axle dump-truck or similar pneumatic-tired equipment. Provided the recompaction and proofrolling operations do not indicate significant deflecting or pumping of the existing subgrade, the floor slab may be designed as a slab-on-grade. Any soft or loose soils found during the proofrolling operation should be undercut and/or replaced with suitable, well-compacted, engineered fill.

Floor slabs should be supported on at least 4 inches of relatively clean granular material, such as sand, sand and gravel, or crushed stone. This is to help distribute concentrated loads and equalize moisture beneath the slab. This granular material should have 100 percent passing the 1½ -inch sieve and a maximum of 10 percent passing the No. 200 sieve.

Based upon the soil conditions encountered at the subject site, the anticipated fill placement, and the recommended site preparation operations presented in this report, a modulus of vertical subgrade reaction (k) for the slab bearing soils of 150 pounds per square inch per inch of vertical deflection (pci) may be used.

Exposed Subgrade

Following excavations, all exposed soils in the building and pavement areas should be compacted with overlapping passes of a relatively heavy weight vibratory drum roller having a total operating static weight (weight of fuel and water included) of at least 10 tons and a drum diameter of 5 feet. All exposed surfaces should be compacted to a minimum of 95 percent of the modified Proctor maximum dry density (ASTM D-1557) to a depth of at least 12 inches below the compacted surface.

Structural Fill/Backfill

Structural fill should be placed in thin loose lifts not exceeding 12 inches in thickness and compacted with a heavy roller as described above. For walk-behind equipment, a maximum loose lift thickness of 6 inches is recommended. Each lift should be thoroughly compacted with the vibratory roller to provide densities equivalent to at least 95 percent of the modified Proctor maximum dry density (ASTM D-1557). Structural fill should consist of an inorganic, non-plastic, granular soil containing less than 10 percent material passing the No. 200 mesh sieve (relatively clean sand with a Unified Soil Classification of SP or SP-SM).

Due to the varying density of the upper soils, it is recommended the exposed subgrade be proofrolled and proof-compacted to a depth of 4 feet below the existing grade prior to concrete placement (including bottom of footings and slab areas). This may require the overexcavation and recompaction of the upper 3 feet of the existing soils. All soils should be proof-compacted to a minimum of 95% of the modified Proctor maximum dry density (ASTM D- 1557).

Report Limitations

This report has been prepared for the exclusive use of **Columbia County Board of County Commissioners, Florida** for the specific application to the project discussed herein. Our conclusions and recommendations have been rendered using generally accepted standards of geotechnical engineering practice in the State of Florida, no other warranty is expressed or implied. CTI is not responsible for the interpretations, conclusions, opinions, or recommendations of others based on the data contained herein. We note that assessment of environmental conditions at the site was beyond the scope of this exploration. Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of the geotechnical design. We recommend that the owner retain these services and that CTI be allowed to continue our involvement in the project through these phases of construction. During construction, we accept no responsibility for job site safety.

Closing

We appreciate the opportunity to work with you on this project, and look forward to serving as your geotechnical and construction materials testing consultant for the remainder of this and future projects. Should you have any questions and/or comments concerning this report, please contact our office at 386-755-3633.

Respectfully submitted,
Cal-Tech Testing, Inc.

Abby Stalnes for
David B. Brown
Executive Vice President

11/6/09
Nabil O. Hmeidi, P.E.
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Distribution: *File (1 copy)*
Addressee (3 bound copies)

Attachments: *Vicinity Map (1 page)*
Field Exploration Plan (1 pages)
Record of Boring Logs (4 pages)
Unified Soil Classification System (1 page)
Key To Test Data (1 page)

ATTACHMENTS