DATE 01/22/2008

Columbia County Building Permit

This Permit Must Be Prominently Posted on Premises During Construction

PERMIT
000026648

APPLICANT SCOTT SCHR0ER PHONE 904.208.0799

ADDRESS 1050 N FOURTH STREET COLUMBUS OH 43201

OWNER TOWN OF FT. WHITE PHONE 386.497.2321

ADDRESS 7863 SW US HIGHWAY 27 FT. WHITE FL 32038

CONTRACTOR LOUIS PERRY PHONE 614.299.5522

LOCATION OF PROPERTY 47-S TO US 27,SOUTH OF THE TRAFFI LIGHT, DIRECTLY ACROSS FROM TH S&S STORE.

TYPE DEVELOPMENT RESTORE TRAIN DEPOT ESTIMATED COST OF CONSTRUCTION 0.00

HEATED FLOOR AREA _____ TOTAL AREA _____ HEIGHT ____ STORIES ____

FOUNDATION CONC WALLS _____ ROOF PITCH 7'12 FLOOR CONC

LAND USE & ZONING FT. WHITE MAX. HEIGHT _____

Minimum Set Back Requirments: STREET-FRONT _____ REAR _____ SIDE _____

NO. EX.D.U. 0 FLOOD ZONE _____ DEVELOPMENT PERMIT NO. _____

PARCEL ID 33-6S-16-14456-001 SUBDIVISION TOWN OF FT. WHITE

LOT ____ BLOCK 56 PHASE ____ UNIT ____ TOTAL ACRES 0.38

		CGC1511057	Scott R Schr	
Culvert Permit No.	Culvert Waiver	Contractor's License Number	Applicant/Owner/Contractor	
FDOT-EXISTING	X-07-0432		JTH	N
Driveway Connection	Septic Tank Number	LU & Zoning checked by	Approved for Issuance	New Resident

COMMENTS: 12.19.2007. FEES WAIVED AS PER DALE WMS.VIA PHONE CALL FROM LISA ROBERTS. RESTORE TRAIN DEPOT/FOUNDATION. NO NOC NEEDED PER JDK.

TOWN OF FT. WHITE. Check # or Cash NO CHARGE

FOR BUILDING & ZONING DEPARTMENT ONLY

(footer/Slab)

Temporary Power _____ date/app. by Foundation _____ date/app. by Monolithic _____ date/app. by

Under slab rough-in plumbing _____ date/app. by Slab _____ date/app. by Sheathing/Nailing _____ date/app. by

Framing _____ date/app. by Rough-in plumbing above slab and below wood floor _____ date/app. by

Electrical rough-in _____ date/app. by Heat & Air Duct _____ date/app. by Peri. beam (Lintel) _____ date/app. by

Permanent power _____ date/app. by C.O. Final _____ date/app. by Culvert _____ date/app. by

M/H tie downs, blocking, electricity and plumbing _____ date/app. by Pool _____ date/app. by

Reconnection _____ date/app. by Pump pole _____ date/app. by Utility Pole _____ date/app. by

M/H Pole _____ date/app. by Travel Trailer _____ date/app. by Re-roof _____ date/app. by

BUILDING PERMIT FEE $ 0.00 CERTIFICATION FEE $ 0.00 SURCHARGE FEE $ 0.00

MISC. FEES $ 0.00 ZONING CERT. FEE $ _____ FIRE FEE $ 0.00 WASTE FEE $ _____

FLOOD DEVELOPMENT FEE $ _____ FLOOD ZONE FEE $ _____ CULVERT FEE $ _____ **TOTAL FEE** 0.00

INSPECTORS OFFICE _____ CLERKS OFFICE CH

NOTICE: IN ADDITION TO THE REQUIREMENTS OF THIS PERMIT, THERE MAY BE ADDITIONAL RESTRICTIONS APPLICABLE TO THIS PROPERTY THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY, AND THERE MAY BE ADDITIONAL PERMITS REQUIRED FROM OTHER GOVERNMENTAL ENTITIES SUCH AS WATER MANAGEMENT DISTRICTS, STATE AGENCIES, OR FEDERAL AGENCIES.

"WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT."

EVERY PERMIT ISSUED SHALL BECOME INVALID UNLESS THE WORK AUTHORIZED BY SUCH PERMIT IS COMMENCED WITHIN 180 DAYS AFTER ITS ISSUANCE, OR IF THE WORK AUTHORIZED BY SUCH PERMIT IS SUSPENDED OR ABANDONED FOR A PERIOD OF 180 DAYS AFTER THE TIME THE WORK IS COMMENCED. A VALID PERMIT RECIEVES AN APPROVED INSPECTION EVERY 180 DAYS. WORK SHALL BE CONSIDERED TO BE IN ACTIVE PROGESS WHEN THE PERMIT HAS RECIEVED AN APPROVED INSPECTION WITHIN 180 DAYS.

The Issuance of this Permit Does Not Waive Compliance by Permittee with Deed Restrictions.

– Resubmitted by: Contractor - Agent:

Columbia County Building Permit Application

For Office Use Only Application # 0712-54 Date Received 1/8 By JH Permit # 26648

Zoning Official _____ Date _____ Flood Zone _____ FEMA Map # _____ Zoning _____

Land Use _____ Elevation _____ MFE _____ River _____ Plans Examiner OK JTH Date 1-9-08

Comments – Letter Attached - Town of Ft White

NOT FLOOD ZONE FEE FOR JOB

☐ NOC ☑ EH ☐ Deed or PA ☐ Site Plan ☑ State Road Info ☐ Parent Parcel # _____

☐ Dev Permit # _____ ☐ In Floodway ☑ Letter of Authorization from Contractor

☐ Unincorporated area ☐ Incorporated area ☑ Town of Fort White ☐ Town of Fort White Compliance letter

Septic Permit No. X-07-437 Fax 614. 299. 7100

Name Authorized Person Signing Permit Scott Schroer Phone 614-299-5522

Address 1050 N. Fourth Street, Columbus, Ohio 43201

Owners Name Town of Fort White Phone 386 - 497 - 2321.

911 Address PO Box 129, Ft White, FL 32038.

Contractors Name The Durable ~~State~~ Restoration Company / Louis Perry Phone 614-299-5522.

Address 1050 N. Fourth St, Columbus, Ohio 43201. 32038

Fee Simple Owner Name & Address Town of Fort White, PO Box 129, Ft White, FL

Bonding Co. Name & Address Westchester Fire Ins. Co. 436 Walnut St. Philadelphia, PA 19106

Architect/Engineer Name & Address Bret Hammond 317 E. Park Ave., Tallahassee, FL 32301

Mortgage Lenders Name & Address GRANT - / FUNDED

Circle the correct power company – FL Power & Light – Clay Elec. – Suwannee Valley Elec. – Progress Energy

Property ID Number 00-00-00-14456-001 Estimated Cost of Construction $ 222,849

Subdivision Name N/A. Lot ____ Block ____ Unit ____ Phase ____

Driving Directions ~~HWY~~ to US 27 - N of the traffic light. - Directly across from the V.S Store.

Number of Existing Dwellings on Property Ø

Construction of ~~Restore~~ Train Depot Railroad foundation Total Acreage .381 Lot Size _____

Do you need a - Culvert Permit or Culvert Waiver or Have an Existing Drive Total Building Height 10 ft.

Actual Distance of Structure from Property Lines - Front — Side — Side — Rear —

Number of Stories 1 Heated Floor Area No Total Floor Area 1200 sq ft. Roof Pitch 7/12

Application is hereby made to obtain a permit to do work and installations as indicated. I certify that no work or installation has commenced prior to the issuance of a permit and that all work be performed to meet the standards of all laws regulating construction in this jurisdiction.

JW left message for Scott 12.19.2007 FEES WAIVED AS PER DALE WMS VIA PHONE CALL from USA Bureau (TL)

Columbia County Building Permit Application

WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCMENT MAY RESULT IN YOU PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. A NOTICE OF COMMENCEMENT MUST BE RECORDED AND POSTED ON THE JOB SITE BEFORE THE FIRST INSPECTION. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT.

FLORIDA'S CONSTRUCTION LIEN LAW: Protect Yourself and Your Investment

According to Florida Law, those who work on your property or provide materials, and are not paid-in-full, have a right to enforce their claim for payment against your property. This claim is known as a construction lien. If your contractor fails to pay subcontractors or material suppliers or neglects to make other legally required payments, the people who are owed money may look to your property for payment, even if you have paid your contractor in full. This means if a lien is filed against your property, it could be sold against your will to pay for labor, materials or other services which your contractor may have failed to pay.

NOTICE OF RESPONSIBILITY TO BUILDING PERMITEE:

YOU ARE HEREBY NOTIFIED as the recipient of a building permit from Columbia County, Florida, you will be held responsible to the County for any damage to sidewalks and/or road curbs and gutters, concrete features and structures, together with damage to drainage facilities, removal of sod, major changes to lot grades that result in ponding of water, or other damage to roadway and other public infrastructure facilities caused by you or your contractor, subcontractors, agents or representatives in the construction and/or improvement of the building and lot for which this permit is issued. No certificate of occupancy will be issued until all corrective work to these public infrastructures and facilities has been corrected.

OWNERS CERTIFICATION: I hereby certify that all the foregoing information is accurate and all work will be done in compliance with all applicable laws and regulating construction and zoning. I further understand the above written responsibilities in Columbia County for obtaining this Building Permit.

Owners Signature

CONTRACTORS AFFIDAVIT: By my signature I understand and agree that I have informed and provided this written statement to the owner of all the above written responsibilities in Columbia County for obtaining this Building Permit.

Contractor's Signature (Permitee)

Contractor's License Number CGC 1511057
Columbia County
Competency Card Number_____

Affirmed under penalty of perjury to by the Contractor and subscribed before me this 28th **day of** December **20** 07

Personally known V **or Produced Identification**_____

State of Florida Notary Signature (For the Contractor)

SEAL:

NOTARIAL SEAL * STATE OF OHIO *

GRANT J. MELOUN, Attorney at Law
Notary Public, State of Ohio
My Commission has no expiration date.
Section 147.03 O. R. C.

Revised 11-30-07

T • H • E
DURABLE
RESTORATION
COMPANY

1050 North Fourth Street • Columbus, Ohio 43201 • 800-666-7445
p 614-299-5522 • f 614-299-7100 • www.DurableRestoration.com
Columbus • Cincinnati • Cleveland • Indianapolis • New Orleans • Cocoa, Florida

February 27, 2008

Columbia County Building Department
Attn: Laurie Hodson
PO Box 1529
Lake City, Florida 32056-1529

RE: Change of Qualifier

Dear Ms. Hodson:

The purpose of this letter is to formally change the licensed qualifier for The Durable Restoration Company from Louis J. Perry to Chiu Hoi Chan. Mr. Perry is no longer associated with DRC and therefore Permit #26648 may need to be amended. I have enclosed a copy of Mr. Chan's license for your files.

Please do not hesitate to call me if you have any other questions or need any other items. My cell phone number is 614-204-3499. I thank you for your time in this matter.

Sincerely,

Grant J. Meloun
Director of Corporate Affairs

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD (850) 487-1395
1940 NORTH MONROE STREET
TALLAHASSEE FL 32399-0783

CHAN, CHIU HOI
THE DURABLE RESTORATION COMPANY
1050 NORTH FOURTH STREET
COLUMBUS OH 43201

Congratulations! With this license you become one of the nearly one million Floridians licensed by the Department of Business and Professional Regulation. Our professionals and businesses range from architects to yacht brokers, from boxers to barbeque restaurants, and they keep Florida's economy strong.

Every day we work to improve the way we do business in order to serve you better. For information about our services, please log onto **www.myfloridalicense.com**. There you can find more information about our divisions and the regulations that impact you, subscribe to department newsletters and learn more about the Department's initiatives.

Our mission at the Department is: License Efficiently, Regulate Fairly. We constantly strive to serve you better so that you can serve your customers. Thank you for doing business in Florida, and congratulations on your new license!

Sincerely,

Holly Benson

Holly Benson
Secretary, Department of Business and Professional Regulation

STATE OF FLORIDA AC# 3633780
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CGC1514873 02/07/08 070292434

CERTIFIED GENERAL CONTRACTOR
CHAN, CHIU HOI
THE DURABLE RESTORATION COMPANY

IS CERTIFIED under the provisions of Ch.489 FS
Expiration date: AUG 31, 2008 L08020700123

DETACH HERE

AC# 3633780

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

SEQ# L08020700123

DATE	BATCH NUMBER	LICENSE NBR
02/07/2008	070292434	CGC1514873

The GENERAL CONTRACTOR
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2008

CHAN, CHIU HOI
THE DURABLE RESTORATION COMPANY
77 SOUTH PARKVIEW AVENUE
BEXLEY OH 43209

CHARLIE CRIST
GOVERNOR

HOLLY BENSON
SECRETARY

DISPLAY AS REQUIRED BY LAW

26648

HAMMOND DESIGN GROUP

25 February 2008

Scott Schroer
Superintendent
Durable Restoration Company
P.O. Box 65381
Orange Park, FL 32065

RE: Ft. White Railroad Depot

Scott, as discussed with you on 02/14/08 we are in agreement that the sheathing for the roof deck can be 5/8" standard sheathing with ply-clips. This sheathing would be in lieu of the 5/8" tongue and groove specified. This should provide an adequate substrate for the future roofing. The sheathing should be nailed 8" o.c. vertically and 24" o.c. horizontally with 8d ring shank nails Should the Building Official have questions please have him call my office.

HAMMOND DESIGN GROUP

Bret D. Hammond, AIA, ASLA

Architecture / Landscape Architecture
AA #0003346 LA #0001313

317 E. Park Avenue, Tallahassee, Florida 32301 Phone (850) 222-2092 Fax (850) 222-0296

COLUMBIA COUNTY FIRE DEPARTMENT

P. O. BOX 1529 Lake City, Florida 32056
Office (386) 754-7071 Fax (386) 754-7064

David L. Boozer
Division Chief

16 September 2008

TO: Columbia County Building and Zoning
Attention: Wayne Russ

FROM: David L. Boozer
Division Chief / Fire Marshal

RE: Permit # 26648 / Train Depot

A fire safety inspection was performed at the Train Depot, located on SR 27 in Ft. White Florida. At the time of my inspection, this building meets the requirements as set forth in Chapter 38 of the Florida Fire Prevention Code, 2004 Edition. I recommend approval.

Respectfully,

David L. Boozer
Florida State Fire Inspector #146595

26648

Lake City • (386) 755-3633
Fax • (386) 752-5456

Jacksonville • (904) 381-8901
Fax • (904) 381-8902

Quincy • (850) 442-3495
Fax • (850) 442-4008

CAL-TECH TESTING, INC.

ENGINEERING & TESTING LABORATORY

P.O. Box 1625, Lake City, FL 32056-1625
4784 Rosselle St. • Jacksonville, FL 32254
2230 Greensboro Hwy., Quincy, FL 32351

JOB NO.: 08-084
DATE TESTED: 2-4-08

REPORT OF IN-PLACE DENSITY TEST

ASTM METHOD: ✓ (D-2922) Nuclear _____ (D-2937) Drive Cylinder _____ Other

PROJECT: Ft. White Tirain Depot

CLIENT: A+B Construction

GENERAL CONTRACTOR: SAC EARTHWORK CONTRACTOR: SAC

SOIL USE (SEE NOTE): 6 - Footing SPECIFICATION REQUIREMENTS: 95%

TECHNICIAN: C. Day

MODIFIED (ASTM D-1557): X X STANDARD (ASTM D-698): _____

TEST NO.	TEST LOCATION	TEST: ___DEPTH ___ELEV. ___LIFT	PROCTOR NO.	WET DENS. LBS.CU.FT.	DRY DENS. LBS.CU.FT.	MOIST PERCENT	% MAX. DENS.
1	North footing	12"	1	112.0	101.3	10.6	96
2	Middle footing	12"	1	111.8	101.1	10.6	95
3	South footing	12"	1	110.1	101.8	8.1	96

REMARKS: _____

PROCTOR NO.	SOIL DESCRIPTION	PROCTOR VALUE	OPT. MOIST.
1		106.0	12.0

NOTE: 1. Building Fill 2. Trench Backfill 3. Base Course 4. Subbase/Stabilized Subgrade 5. Embankment 6. Subgrade/Natural Soil 7. Other

The test results presented in this report are specific only to the samples tested at the time of testing. The tests were performed in accordance with generally accepted methods and standards. Since material conditions can vary between test location and change with time, sound judgement should be exercised with regard to the use and interpretation of the data.

T • H • E
DURABLE
RESTORATION
COMPANY

1050 North Fourth Street • Columbus, Ohio 43201 • 800-666-7445
p 614-299-5522 • f 614-299-7100 • www.DurableRestoration.com
Columbus • Cincinnati • Cleveland • Indianapolis • New Orleans • Cocoa, Florida

January 16, 2008

Mr. Joe Haltiwanger
Columbia County Building Department
135 NE Hernando Ave.
Lake City, Florida 32056

RE: Scott Schroer

Dear Mr. Haltiwanger:

I hereby authorize Scott Schroer to pull Permit #0712-50 regarding the Fort White Railroad Depot.

Sincerely,

Louis J. Perry
License #CGC1511057

State of Ohio)
) SS
County of Franklin)

Sworn and subscribed to me by Louis J. Perry this 16th day of January, 2008.

GRANT J. MELOUN, Attorney at Law
Notary Public, State of Ohio
My Commission has no expiration date.
Section 147.03 O. R. C.

Notary Public
No Expiration

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD (850) 487-1395
1940 NORTH MONROE STREET
TALLAHASSEE FL 32399-0783

PERRY, LOUIS J
THE DURABLE RESTORATION COMPANY
1050 N FOURTH STREET
COLUMBUS OH 43201

STATE OF FLORIDA AC# 3199272
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CGC1511057 04/13/07 060651174
CERTIFIED GENERAL CONTRACTOR
PERRY, LOUIS J
THE DURABLE RESTORATION COMPANY
IS CERTIFIED under the provisions of ch. 489 FS.
Expiration date: AUG 31, 2008 L0704130862

DETACH HERE

AC# 3199272 STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD SEQ# L0704130862

DATE	BATCH NUMBER	LICENSE NBR
04/13/2007	060651174	CGC1511057

The GENERAL CONTRACTOR
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2008

PERRY, LOUIS J
THE DURABLE RESTORATION COMPANY
1050 N FOURTH STREET
COLUMBUS OH 43201

CHARLIE CRIST
GOVERNOR

HOLLY BENSON
SECRETARY

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD (850) 487-1395
1940 NORTH MONROE STREET
TALLAHASSEE FL 32399-0783

DURABLE SLATE CO
THE DURABLE RESTORATION COMPANY
1050 N FOURTH STREET
COLUMBUS OH 43201

STATE OF FLORIDA AC# 3315669
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CB54392 08/01/07 000000000
QUALIFIED BUSINESS ORGANIZATION
DURABLE SLATE CO
THE DURABLE RESTORATION COMPANY
(NOT A LICENSE TO PERFORM WORK. ALLOWS COMPANY TO DO BUSINESS IF IT HAS A LICENSED QUALIFIER.)
IS QUALIFIED under the provisions of Ch. 489 FS.
Expiration date: AUG 31, 2009 L07080100355

DETACH HERE

AC# 3315669

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD SEQ# L07080100355

DATE	BATCH NUMBER	LICENSE NBR
08/01/2007	000000000	CB54392

The BUSINESS ORGANIZATION
Named below IS QUALIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2009
(THIS IS NOT A LICENSE TO PERFORM WORK. THIS ALLOWS COMPANY TO DO BUSINESS ONLY IF IT HAS A QUALIFIER.)

DURABLE SLATE CO
THE DURABLE RESTORATION COMPANY
1050 N FOURTH STREET
COLUMBUS OH 43201

CHARLIE CRIST
GOVERNOR

HOLLY BENSON
SECRETARY

Town of Fort White

Post Office Box 129 Fort White, Florida 32038-0129
Town Hall - (386) 497-2321 • Public Works - (386) 497-3345 • Fax (386) 497-4946
Email: townofftwhite@alltel.net • Web site: Townoffortwhitefl.com

CERTIFICATE OF COMPLIANCE & REQUEST FOR ISSUANCE OF BUILDING PERMIT

The undersigned hereby certify the following property is in compliance with the Town of Fort White's Comprehensive Plan and Land Development Regulations for the stated development purposes:

FILE No. 055

OWNER'S NAME: Town of Fort White
P.O. Box 129

ADDRESS: 118 SW Wilson Springs Rd. Fort White, FL 32038

PROPERTY DESCRIPTION: 7863 SW US Hwy 27
w/ parcel number
Block #56 parcels 14427, 14428, 14429 and 14456-001

DEVELOPMENT: TRAIN DEPOT RESTORATION

You are hereby authorized to issue the appropriate permits

12-18-07
DATE

Janice E. Revels
LDR ADMINISTRATOR
Town of Fort White

District #1	District #2	District #3	District #4	Mayor
Donald Cook	Henry Maini	Warren Barnes	Demetric Jackson	Truett George
497-1086	497-2992	497-3312	497-2078	497-4741

```
@ CAM112M01     S  CamaUSA Appraisal System                      Columbia County
12/17/2007 13:24  Legal Description Maintenance          43586  Land  002
Year T Property                        Sel                      AG    000
2008 R 00-00-00-14456-001                ...             6747  Bldg  001
                                                                 Xfea  000
       TOWN OF FORT WHITE                                50333  TOTAL      B

  1  COMM NE COR BLK 56 TOWN OF      FORT WHITE, RUN W 210 FT TO NW     2
  3  COR BLK 56, S ALONG W LINE BLK  56, 11.86 FT TO N'LY R/W LINE      4
  5  OLD SCL RR, RUN N 49 DEG W      ALONG RR 62.41 FT FOR POB,         6
  7  CONT N 49 DEG W 7.06 FT TO PT   OF CURVE, RUN NW'LY ALONG ARC      8
  9  OF CURVE 186.95 FT, N 49 DEG W   125.53 FT TO SE'RLY R/W LINE     10
 11  JORDAN ST, RUN N 37 DEG E       30.13 FT TO A PT THAT IS 33 FT    12
 13  RIGHT OF THE BASELINE OF        SURVEY OF SR-20, SAID PT BEING    14
 15  ON A CURVE, RUN SE'RLY ALONG    CURVE 329.12 FT, RUN S 41 DG W    16
 17  74.64 FT TO POB. ORB 962-600.   & BEG AT NE COR OF BLK 56, RUN    18
 19  N 22.14 FT, NW ALONG CURVE      214.56 FT, SW 74.64 FT TO N       20
 21  R/W OF ABANDONED ACL RR, SE     ALONG R/W 62.41 FT, N 11.86 FT    22
 23  E 210 FT TO POB ORB 1132-630                                      24
 25                                                                    26
 27                                                                    28
                                                  Mnt 11/29/2007 LARRY
F1=Task  F3=Exit  F4=Prompt  F10=GoTo  PgUp/PgDn  F24=More
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@ CAM112M01     S  CamaUSA Appraisal System                      Columbia County
12/17/2007 13:23   Legal Description Maintenance          28000  Land  002
Year T Property                          Sel                    AG    000
2008 R 00-00-00-14427-000                 ...                   Bldg  000
         --                                                     Xfea  000
       TOWN OF FORT WHITE                                 28000  TOTAL      B

  1  FORT WHITE:98 FT OFF W SIDE     BLOCK 56,  EX RD R/W.                2
  3  ORB 378-265, 651-669, 684-678,  864-127, 931-140,                    4
  5  WD 1055-1151.                                                        6
  7                                                                       8
  9                                                                      10
 11                                                                      12
 13                                                                      14
 15                                                                      16
 17                                                                      18
 19                                                                      20
 21                                                                      22
 23                                                                      24
 25                                                                      26
 27                                                                      28
                                                  Mnt  9/20/2005 KYLIE
F1=Task  F3=Exit  F4=Prompt  F10=GoTo  PgUp/PgDn  F24=More
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@ CAM112M01     S  CamaUSA Appraisal System                      Columbia County
12/17/2007 13:23   Legal Description Maintenance          65836  Land   001
Year T Property                          Sel                     AG     000
2008 R 00-00-00-14428-000                 ...                    Bldg   000
                                                                  Xfea   000
       TOWN OF FORT WHITE                                 65836  TOTAL      B

  1  THE EAST 1/2 OF BLOCK 56          TOWN OF FORT WHITE.                 2
  3  ORB 959-1594, 963-1741.                                               4
  5                                                                        6
  7                                                                        8
  9                                                                       10
 11                                                                       12
 13                                                                       14
 15                                                                       16
 17                                                                       18
 19                                                                       20
 21                                                                       22
 23                                                                       24
 25                                                                       26
 27                                                                       28
                                                  Mnt 10/22/2002 KYLIE
F1=Task  F3=Exit  F4=Prompt  F10=GoTo  PgUp/PgDn  F24=More
```

COLUMBIA COUNTY 9-1-1 ADDRESSING / GIS DEPARTMENT

P. O. Box 1787, Lake City, FL 32056-1787
Telephone: (386) 758-1125 * Fax: (386) 758-1365 * E-mail: ron_croft@columbiacountyfla.com

ADDRESS ASSIGNMENT DATA

The Columbia County Board of County Commissioners has passed Ordinance 2001-9, which provides for a uniform numbering system. A copy of this ordinance is available in the Clerk of Court records, located in the courthouse. This new numbering system will increase the efficiency of POLICE, FIRE AND EMERGENCY MEDICAL vehicles responding to calls within Columbia County by immediately identifying the location of the caller.

Residential or Other Structure on Parcel Number:
14456-001

Address Assignment:
7863 SW US HIGHWAY 27, FORT WHITE, FL, 32038

Note: **14427-000**- no 9-1-1 address assigned.

14427-028-No record found.

14427-029-No record found.

Any questions concerning this information should be referred to the Columbia County 9-1-1 Addressing / GIS Department at the address or telephone number above.

Florida Department of Transportation

CHARLIE CRIST
GOVERNOR

OVERNIGHT ADDRESS
710 NW LAKE JEFFERY
SUITE 101, LAKE CITY, FL.
32055-2621

STEPHANIE KOPELOUSOS
SECRETARY

FDOT-Lake City Maintenance
Permits Office
P. O. Box 1415
Lake City, Florida
Zip Code: 32056-1415

Date: 12-21-07

Town of Fort White
Mr. Truett George, Mayor
Post Office Box 129
Fort White, Fl. 32038

Subject: Train Depot Restoration
Land Parcel No.'s 14456-001

RE: Requested Minimum Offset Requirement to State Highway EOP

Mr. George:

On 12-20-07 our office met with Mr. Edmund Hudson in regards to the preliminary site and access for the above referenced project. After reviewing the proposed site and access plan it is the Department's opinion that the following changes be made to the proposal as was reviewed.

1. The Department is in agreement that the main entrance to the site should be from Third Street, however, the proposed main entrance is somewhat close to the State Highway EOP and it is our recommendation that this entrance into the Parcel, would be made safer if it was relocated further to the Southwest along Third Street to allow for a minimum 75 foot offset from the existing FDOT EOP.

By relocating the proposed connection further down Third Street, this would add additional safety clearance between the main travel way of State Highway 20 (US 27) and the required actual right in movement into the parcel site parking lot itself. The proposed parking area shown in the plans has room to be moved enough to accommodate the requested realignment of the entrance driveway.

The existing small FDOT concrete headwall would need to be shown as being removed with some of the existing FDOT ditch being piped over for a short distance, with a mitered end section reconstructed at the end to allow for the this realignment. A FDOT Drainage Connection permit may be required.

2. While the proposed main entrance access connection into the site is by way of Third Street, it is recommended that Third Street be paved to the point where the new entrance access is to be finalized and that the right in turn movement radius for the driveway into the site be a minimum of 30 feet for easy vehicular movement into the parking area. While the recommended 30 foot turn radii may be inside the 75 foot offset mentioned above, no part of the actual two 12 foot wide travel lanes should encroach into this minimum offset area, as previously recommended.

Once you have had a chance to review these recommendations, if you, your staff or the design engineer wishes to conduct a revised plan or on-site review of the enclosed recommendations, please feel free to contact my office at 386-961-7193.

Please let me thank you and the Town Staff personnel for the professional manner in which this matter has been addressed. Inter governmental coo operation is the key to the success of most any inter-city planning and we thank you for your willingness to discuss these matters in advance.

Yours Sincerely,

Neil E. Miles

Neil E. Miles
FDOT Permits Coordinator

HAMMOND DESIGN GROUP

Fax Transmittal

DATE: 12/02/07

TO: All Bidders

FAX NO.

Town of Ft. White	386-497-4946
Reed Construction Data	800-303-8629
Ames Construction Co., LLC	386-462-3466
JJS Construction, LLC	386-935-1911 ~~1942~~
The Durable Restoration Co.	614-299-7100
McGraw Hill Co.	850-942-2232
Lawson Construction Group Co.	352-472-3666
O'Neal Construction	386-454-4244

FROM: Bret D. Hammond, AIA, ASLA
Hammond Design Group

RE: Ft. White Railroad Depot – RFI #1 – ADDENDUM 1

PAGES: 6 including cover

FILE COPY

12.24.07

Architecture / Landscape Architecture
AA #0003346 LA #0001313

317 E. Park Avenue, Tallahassee, Florida 32301 Phone (850) 222-2092 Fax (850) 222-0296

HAMMOND DESIGN GROUP

01 December 2007

To All Bidders:

RE: Ft. White Railroad Depot RFI-1

The following are responses directed to this office in response to the construction bid documents:

Comments 1 through 9 submitted by Ames Construction, LLC

COMMENT 1

In discussion with the building movers, would we be allowed to remove the three (3) trees closest to the building now and allow direct route to the new location and avoid the expense of using the highway and the need to have the overhead wiring detached for the mover and reinstalled?

RESPONSE 1

I believe for the purposes of the bid the removal of the trees and a direct route should be assumed to be base bid.

COMMENT 2

The plans indicate a reflected ceiling but there is no grid pattern, type of ceiling panels or drop-in shown.

RESPONSE 2

There is no drop-in ceiling. The existing wood panel ceiling will be repaired to a like new condition or replace with new wood paneling to match existing.

COMMENT 3

The roofing calls for a 5v-crimp. What gauge is specified and is galvalume finish expected? Also provide the fastener type and spacing desired.

Architecture / Landscape Architecture
AA #0003346 LA #0001313

317 E. Park Avenue, Tallahassee, Florida 32301 Phone (850) 222-2092 Fax (850) 222-0296

RESPONSE 3

Galvalume 5 vee crimp is the material type

The gauge of the roofing shall be 24 gauge

The finish is the natural galvalume finish

Fastener type will be the standard neoprene bonnet fastener rated for a galvalume installation. Spacing and layout will conform to the 2004 Florida Building Code for wind loading within a Wind Zone category of 110 miles per hour.

COMMENT 4

Is it your intention that the existing roof boards are to be removed? When indicating 5/8"s tongue and groove decking are you adding plywood decking over existing roof boards? Also, plans show an ice & water shield. What is the material to use and is this to cover the existing substrate? What is the necessity for having an ice shield which would be in Northern Climates extend 24" up the roof rake and be sheet metal?

RESPONSE 4

Remove existing roofing material to lumber roof deck. Repair any wood damage. Sheet the entire roof deck with 5/8" tongue and groove sheathing.

There are several products a contractor can use. W.R. Grace, Inc, Tamco, many companies make this self healing product. Refer to Specification 07131.

The self healing product should be applied to the entire substrate prior to the installation of the 30# felt.

Self Healing product is applied because the roofing contractor is going to be penetrating the roof panels with fasteners.

COMMENT 5

Insulation: All perimeter walls are indicated to have batt insulation. Are we to remove the surface wainscot wood re-install? The ceiling insulation shows batts attached under the roof sheathing but the rafter and purlin centers are too far art to attaché to. Since the attic is not insulated would we be allowed to place insulation on top of ceilings?

RESPONSE 5

We would prefer the insulation be blown into the wall minimizing the removal and disruption of interior wood paneled surfaces.

We believe batt insulation can be attached to the underside of the roof substrate. If the contractor is concerned about the spacing larger batts could be utilized and a plastic sheathing could be stapled below to existing purlins.

No we would prefer the insulation be attached to the underside of the roof substrate. The attic is currently not insulated, these drawings correct that.

COMMENT 6

Partition walls indicate steel 3 5/8" studs extending 6' or 2' above acoustical ceilings (P1 and P2). Please indicate where the P2 walls are as I cannot locate them on the plans. At what height is the acoustic ceiling above floor level? What gauge of stud is required?

RESPONSE 6

The wall schedule indicates 3 5/8" steel stud sheathed with 5/8" GYP. Board. There are no steel studs. There is no Gyp. Board. There is no acoustical ceiling grid or panel. I find no reference to P-2. I have found reference to P1.1. There are no rated walls.

The wall schedule should reflect that the new walls would be constructed of wood 2 x 4 studs with wood paneling to match the existing wood paneling.

COMMENT 7

Are the new interior walls to be horizontal wainscot? If so, they will have to be screwed to the steel studs. How are the exposed heads to be finished?

RESPONSE 7

Please see comment 6 above. Attachment nails to be counter sunk and spackled.

COMMENT 8

Room finish schedule indicates ceilings are to be painted. Again are the new bathroom and mechanical rooms the only areas to receive suspended ceilings?

Architecture / Landscape Architecture
AA #0003346 LA #0001313

317 E. Park Avenue, Tallahassee, Florida 32301 Phone (850) 222-2092 Fax (850) 222-0296

RESPONSE 8

All ceilings and walls are to be the wood paneling to match the existing wood paneling through out the building.

COMMENT 9

Do we really need to provide 1000' of drain for the 1100 gal. tank? The soil inspection did not indicate clay problems...only variations of sand. Was this indicated by the Health Department?

RESPONSE 9

For the success of the bid all contractors need to provide unit pricing for 1000' of drainfield. This will keep the bidding equal.

Comments 10 through 13 submitted by the Durable Restoration Group.

COMMENT 10

The demo drawings do not indicate to remove all interior finishes, but the wall sections show new 5/8" sheet rock and insulation. We also need access to the framing to run the tie down rods from foundation to trusses. Are all the interior finishes to be replaced?

RESPONSE 10

It is the intent to minimize the removal of existing interior wall finishes. As previously stated there is no sheet rock utilized on the project. The intent is to match the existing interior wood paneling.

COMMENT 11

Is there a brick veneer cheek wall on either side of the entry stair? (detail 4/A1.1)

RESPONSE 11

No the brick cheek wall was removed at the request of the Florida Department of State.

COMMENT 12

Is the ceiling 5/8" drywall or acoustical ceiling? (Partition Schedule Remarks on A1.1.)

RESPONSE 12

No. all interior finishes will match the existing wood paneling.

COMMENT 13

Is the exterior to be painted? Including new screens and handrails?

RESPONSE 13

Yes

General Clarification Comments

1. The project will follow **The Secretary of the Interior's, Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.**
2. Repair existing interior wood flooring and prepare for and install 5/8" Pine flooring.
3. Handicap Access ramp shall be constructed of PT. Wood and receive a painted finish.
4. Site work beyond the installation of H/C Ramp, Entry Stairs and Drainfield is not included in this contract.
5. It is the Contractors responsibility to coordinate the Hazardous Materials Survey. The Owner is responsible for the costs associated with the survey as outlined in 10.3 Hazardous Materials section of the General Conditions. Provide three costs for evaluation by the owner prior to beginning the work.
6. Structural brick piers may be modified to a 16" square pier to provide additional space for the tie downs. All other structural conditions shall be adhered to.

HAMMOND DESIGN GROUP

Bret D. Hammond, AIA, ASLA

Architecture / Landscape Architecture
AA #0003346 LA #0001313

317 E. Park Avenue, Tallahassee, Florida 32301 Phone (850) 222-2092 Fax (850) 222-0296

EnergyGauge FLA/COM 2004 v3.00

INPUT DATA REPORT

Project Information

Project Name: Fort White
Project Title: New Project
Address:

State: FL
Zip: 0

Owner: Enter Owner's name here

Orientation: North
Building Type: Office
Building Classification: New Finished building

No.of Storeys: 1
GrossArea: 921 SF

Zones

No	Acronym	Description	Type	Area [sf]	Multiplier	Total Area [sf]	
1	Pr0Zo1	Zone 1	CONDITIONED	921.3	1	921.3	☐

Spaces

No	Acronym	Description	Type	Depth [ft]	Width [ft]	Height [ft]	Multiplier	Total Area [sf]	Total Volume [cf]

In Zone: Pr0Zo1									
1	Lobby	Zo0Sp1	Lobby (General) - Reception and Waiting	22.10	22.10	9.00	1	488.4	4395.7
2	Bathroom	Zo0Sp2	Toilet and Washroom	7.00	7.80	9.00	1	54.6	491.4
3	Office	Zo0Sp3	Office - Open Plan	19.40	19.50	9.00	1	378.3	3404.7

Lighting

No	Type	Category	No. of Luminaires	Watts per Luminaire	Power [W]	Control Type	No.of Ctrl pts
In Zone: Pr0Zo1							
In Space: Lobby							
1	Compact Fluorescent	General Lighting	14	32	448	Manual On/Off	1
In Space: Bathroom							
1	Compact Fluorescent	General Lighting	1	32	32	Manual On/Off	1
In Space: Office							
1	Compact Fluorescent	General Lighting	16	32	512	Manual On/Off	1

Walls

No	Description	Type	Width [ft]	H (Effec) [ft]	Multiplier	Area [sf]	Direction	Conductance [Btu/hr. sf. F]	Heat Capacity [Btu/sf.F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]
In Zone: Pr0Zo1											
1	Pr0Zo1Wa2	Metal siding/2x4@24"+R11Batt/5/8"Gyp	31.00	10.00	1	310.0	North	0.0920	1.072	19.38	10.9
2	Pr0Zo1Wa3	Metal siding/2x4@24"+R11Batt/5/8"Gyp	34.00	10.00	1	340.0	South	0.0920	1.072	19.38	10.9
3	Pr0Zo1Wa4	Metal siding/2x4@24"+R11Batt/5/8"Gyp	32.00	10.00	1	320.0	East	0.0920	1.072	19.38	10.9

4	Pr0Zo1Wa5	Metal siding/2x4@24"+R11Batt/5/8"Gyp	32.00	10.00	1	320.0	West	0.0920	1.072	19.38	10.9	☐

Windows

	No	Description	Type	Shaded	U [Btu/hr sf F]	SHGC	Vis.Tra	W [ft]	H (Effec) [ft]	Multi plier	Total Area [sf]	
In Zone: Pr0Zo1												
In Wall: South												
	1	Pr0Zo1Wa3Wi1	User Defined	No	1.2500	0.82	0.76	3.00	5.00	3	45.0	☐

Doors

	No	Description	Type	Shaded?	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Cond. [Btu/hr. sf. F]	Dens. [lb/cf]	Heat Cap. [Btu/sf. F]	R-Value [h.sf.F/Btu]	
In Zone: Pr0Zo1													
In Wall: South													
	1	Pr0Zo1Wa3Dr1	Solid core flush (2.25)	No	3.00	7.00	1	21.0	0.3504	0.00	0.00	2.85	☐

Roofs

	No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Tilt [deg]	Cond. [Btu/hr. Sf. F]	Heat Cap [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]	
In Zone: Pr0Zo1													
	1	Pr0Zo1Rf1	Mtl Bldg Roof/R-19 Batt	30.30	30.30	1	918.1	0.00	0.0492	1.34	9.49	20.3	☐

Skylights

	No	Description	Type	U [Btu/hr sf F]	SHGC	Vis.Trans	W [ft]	H (Effec) [ft]	Multiplier	Area [Sf]	Total Area [Sf]

In Zone:
In Roof:

Floors

No	Description	Type	Width [ft]	H (Effec) [ft]	Multiplier	Area [sf]	Cond. [Btu/hr. sf. F]	Heat Cap. [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]
In Zone: Pr0Zo1										
1	Pr0Zo1Fl1	1 ft. soil, concrete floor, carpet and rubber pad	30.30	30.30	1	918.1	0.1745	54.00	108.00	5.73

Systems

Pr0Sy1 **System 1** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. Of Units 1**

Component	Category	Capacity	Efficiency	IPLV
1	Cooling System (Air Cooled < 65000 Btu/h Cooling Capacity)	30000.00	14.00	8.00
2	Heating System (Air Cooled HP < 65000 Btu/h Cooling Capacity)	22000.00	8.20	
3	Air Handling System -Supply (Air Handler (Supply) - Constant Volume)	1000.00	0.32	

Plant

Equipment	Category	Size	Inst.No	Eff.	IPLV

Water Heaters

W-Heater Description	CapacityCap.Unit	I/P Rt.	Efficiency	Loss

1 Electric water heater	1 [Gal]	4 [kW]	0.9500 [Ef]	[Btu/h]	☐

Ext-Lighting

Description	Category	No. of Luminaires	Watts per Luminaire	Area/Len/No. of units [sf/ft/No]	Control Type	Wattage [W]	
							☐

Piping

No	Type	Operating Temperature [F]	Insulation Conductivity [Btu-in/h.sf.F]	Nomonal pipe Diameter [in]	Insulation Thickness [in]	Is Runout?	
1	Domestic and Service Hot Water Systems	120.00	0.28	0.75	0.75	No	☐
2	Cooling Systems (Chilled Water, Brine and Refrigerant)	40.00	0.28	1.00	0.75	No	☐

Fenestration Used

Name	Glass Type	No. of Panes	Glass Conductance [Btu/h.sf.F]	SHGC	VLT	
ASHULSglClrAll Frm	User Defined	1	1.2500	0.8200	0.7600	☐

Materials Used

Mat No	Acronym	Description	Only R-Value Used	RValue [h.sf.F/Btu]	Thickness [ft]	Conductivity [Btu/h.ft.F]	Density [lb/cf]	SpecificHeat [Btu/lb.F]

187	Matl187	GYP OR PLAS BOARD,1/2IN	No	0.4533	0.0417	0.0920	50.00	0.2000
178	Matl178	CARPET W/RUBBER PAD	Yes	1.2300				
265	Matl265	Soil, 1 ft	No	2.0000	1.0000	0.5000	100.00	0.2000
48	Matl48	6 in. Heavyweight concrete	No	0.5000	0.5000	1.0000	140.00	0.2000
23	Matl23	6 in. Insulation	No	20.0000	0.5000	0.0250	5.70	0.2000
4	Matl4	Steel siding	No	0.0002	0.0050	26.0000	480.00	0.1000
271	Matl271	2x4@24" oc + R11 Batt	No	10.4179	0.2917	0.0280	7.11	0.2000
94	Matl94	BUILT-UP ROOFING, 3/8IN	No	0.3366	0.0313	0.0930	70.00	0.3500

Constructs Used

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1055	Metal siding/2x4@24"+R11Batt/5/8"Gyp	No	No	0.09	1.07	19.38	10.9

Layer	Material No.	Material	Thickness [ft]	Framing Factor
1	4	Steel siding	0.0050	0.000
2	271	2x4@24" oc + R11 Batt	0.2917	0.000
3	187	GYP OR PLAS BOARD,1/2IN	0.0417	0.000

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]
1056	Mtl Bldg Roof/R-19 Batt	No	No	0.05	1.34	9.49	20.3

Layer	Material No.	Material	Thickness [ft]	Framing Factor
1	94	BUILT-UP ROOFING, 3/8IN	0.0313	0.000
2	23	6 in. Insulation	0.5000	0.000

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1057	1 ft. soil, concrete floor, carpet and rubber pad	No	No	0.17	54.00	108.00	5.7	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	265	Soil, 1 ft	2.0000	0.000	☐
2	48	6 in. Heavyweight concrete	0.5000	0.000	☐
3	178	CARPET W/RUBBER PAD		0.000	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1058	Solid core flush (2.25)	No	Yes	0.35			2.9	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	279	Solid core flush (2.25")		0.000	☐

Building Summary Loads

Building peaks in August at 3pm.

Bldg Load Descriptions	Area Quan	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Roof	1,435	3,615	7.36	0	3,286	3,286	3.68
Wall	1,718	6,926	14.10	0	3,161	3,161	3.54
Glass	196	3,752	7.64	0	6,516	6,516	7.31
Floor Slab	105	3,279	6.68	0	0	0	0.00
Skin Loads		17,572	35.78	0	12,962	12,962	14.54
Lighting	5,033	0	0.00	0	18,031	18,031	20.22
Equipment	2,300	0	0.00	0	8,240	8,240	9.24
People	28	0	0.00	5,916	7,394	13,310	14.93
Partition	1,055	2,389	4.86	0	1,536	1,536	1.72
Cool. Pret.	0	0	0.00	0	0	0	0.00
Heat. Pret.	0	0	0.00	0	0	0	0.00
Cool. Vent.	563	0	0.00	20,819	13,607	34,426	38.60
Heat. Vent.	563	29,148	59.35	0	0	0	0.00
Cool. Infil.	0	0	0.00	0	0	0	0.00
Heat. Infil.	0	0	0.00	0	0	0	0.00
Draw-Thru Fan	0	0	0.00	0	630	630	0.71
Blow-Thru Fan	0	0	0.00	0	0	0	0.00
Reserve Cap.	0	0	0.00	0	43	43	0.05
Reheat Cap.	0	0	0.00	0	0	0	0.00
Supply Duct	0	0	0.00	0	0	0	0.00
Return Duct	0	0	0.00	0	0	0	0.00
Misc. Supply	0	0	0.00	0	0	0	0.00
Misc. Return	0	0	0.00	0	0	0	0.00
Building Totals		49,109	100.00	26,735	62,444	89,179	100.00

Building Summary	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Ventilation	29,148	59.35	20,819	13,607	34,426	38.60
Infiltration	0	0.00	0	0	0	0.00
Pretreated Air	0	0.00	0	0	0	0.00
Zone Loads	19,961	40.65	5,916	48,207	54,123	60.69
Plenum Loads	0	0.00	0	0	0	0.00
Fan & Duct Loads	0	0.00	0	630	630	0.71
Building Totals	49,109	100.00	26,735	62,444	89,179	100.00

Check Figures

Total Building Supply Air (based on a 17° TD):	2,636	CFM
Total Building Vent. Air (21.37% of Supply):	563	CFM
Total Conditioned Air Space:	2,796	Sq.ft
Supply Air Per Unit Area:	0.9428	CFM/Sq.ft
Area Per Cooling Capacity:	376.2271	Sq.ft/Ton
Cooling Capacity Per Area:	0.0027	Tons/Sq.ft
Heating Capacity Per Area:	17.56	Btuh/Sq.ft
Total Heating Required With Outside Air:	49,109	Btuh
Total Cooling Required With Outside Air:	7.43	Tons

Air Handler #1 - Ahu-2 - Summary Loads

Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
1	Office 1	141	1,038	2,570	228	20/P	20/P
	1pm August	1	48	139	0	22	22
		1,269	0.34	0.99	0	36	34
2	Office 2	141	2,045	3,472	228	20/P	20/P
	3pm August	1	95	188	0	22	22
		1,269	0.67	1.34	0	72	46
3	Open Office Area	419	2,008	8,746	840	20/P	20/P
	6pm August	4	93	475	0	80	80
		3,771	0.22	1.13	0	71	117
4	Break Room / Bathroom	660	5,256	12,467	2,520	20/P	20/P
	6pm August	12	244	677	0	240	240
		5,943	0.37	1.02	0	185	166
	Zone Peak Totals:	1,361	10,347	27,254	3,816		
	Total Zones: 4	18	480	1,479	0	363	363
	Unique Zones: 4	12,252	0.35	1.09	0	363	364

Air Handler #1 - Ahu-2 - Total Load Summary

Air Handler Description:	Ahu-2 Constant Volume - Sum of Peaks
Supply Air Fan:	Draw-Thru with program estimated horsepower of 0.14 HP
Fan Input:	0% motor and fan efficiency with 0 in. water across the fan
Sensible Heat Ratio:	0.88 --- This system occurs 1 time(s) in the building. ---
Air System Peak Time:	5pm in August.
Outdoor Conditions:	92° DB, 77° WB, 116.19 grains

Because of the diversity in zone, plenum and ventilation loads, the zone sensible peak time in August at 6pm is different from the total system peak time, hence the air system CFM was computed using a zone sensible load of 27,196.

Summer: Ventilation controls outside air, ----- Winter: Ventilation controls outside air.

Zone Space sensible loss:	10,347 Btuh		
Infiltration sensible loss:	0 Btuh	0 CFM	
Outside Air sensible loss:	18,800 Btuh	363 CFM	
Supply Duct sensible loss:	0 Btuh		
Return Duct sensible loss:	0 Btuh		
Return Plenum sensible loss:	0 Btuh		
Total System sensible loss:			29,148 Btuh
Heating Supply Air: 10,347 / (.998 X 1.08 X 20) =		480 CFM	
Winter Vent Outside Air (75.7% of supply) =		363 CFM	
Zone space sensible gain:	26,949 Btuh		
Infiltration sensible gain:	0 Btuh		
Draw-thru fan sensible gain:	354 Btuh		
Supply duct sensible gain:	0 Btuh		
Reserve sensible gain:	43 Btuh		
Total sensible gain on supply side of coil:			27,345 Btuh
Cooling Supply Air: 27,593 / (.998 X 1.1 X 17) =		1,478 CFM	
Summer Vent Outside Air (24.6% of supply) =		363 CFM	
Return duct sensible gain:	0 Btuh		
Return plenum sensible gain:	0 Btuh		
Outside air sensible gain:	7,979 Btuh	363 CFM	
Blow-thru fan sensible gain:	0 Btuh		
Total sensible gain on return side of coil:			7,979 Btuh
Total sensible gain on air handling system:			35,324 Btuh
Zone space latent gain:	3,816 Btuh		
Infiltration latent gain:	0 Btuh		
Outside air latent gain:	14,234 Btuh		
Total latent gain on air handling system:			18,050 Btuh
Total system sensible and latent gain:			53,374 Btuh

Check Figures

Total Air Handler Supply Air (based on a 17° TD):	1,478	CFM
Total Air Handler Vent. Air (24.58% of Supply):	363	CFM
Total Conditioned Air Space:	1,361	Sq.ft
Supply Air Per Unit Area:	1.0860	CFM/Sq.ft
Area Per Cooling Capacity:	306.0732	Sq.ft/Ton
Cooling Capacity Per Area:	0.0033	Tons/Sq.ft
Heating Capacity Per Area:	21.41	Btuh/Sq.ft
Total Heating Required With Outside Air:	29,148	Btuh
Total Cooling Required With Outside Air:	4.45	Tons

Air Handler #2 - Ahu-2 - Summary Loads

Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
5	Second Floor	1,435	9,613	21,326	2,100	20/P	20/P
	3pm August	10	446	1,158	0	200	200
		12,911	0.31	0.81	0	200	200
	Zone Peak Totals:	1,435	9,613	21,326	2,100		
	Total Zones: 1	10	446	1,158	0	200	200
	Unique Zones: 1	12,911	0.31	0.81	0	200	200

Air Handler #2 - Ahu-2 - Total Load Summary

Air Handler Description:	Ahu-2 Constant Volume - Sum of Peaks
Supply Air Fan:	Draw-Thru with program estimated horsepower of 0.11 HP
Fan Input:	0% motor and fan efficiency with 0 in. water across the fan
Sensible Heat Ratio:	0.91 --- This system occurs 1 time(s) in the building. ---
Air System Peak Time:	3pm in August.
Outdoor Conditions:	94° DB, 77° WB, 112.93 grains

Summer: Ventilation controls outside air, ----- Winter: Ventilation controls outside air.

Zone Space sensible loss:	9,613 Btuh		
Infiltration sensible loss:	0 Btuh	0 CFM	
Outside Air sensible loss:	10,347 Btuh	200 CFM	
Supply Duct sensible loss:	0 Btuh		
Return Duct sensible loss:	0 Btuh		
Return Plenum sensible loss:	0 Btuh		
Total System sensible loss:			19,961 Btuh
Heating Supply Air: 9,613 / (.998 X 1.08 X 20) =		446 CFM	
Winter Vent Outside Air (44.8% of supply) =		200 CFM	
Zone space sensible gain:	21,326 Btuh		
Infiltration sensible gain:	0 Btuh		
Draw-thru fan sensible gain:	277 Btuh		
Supply duct sensible gain:	0 Btuh		
Reserve sensible gain:	0 Btuh		
Total sensible gain on supply side of coil:			21,602 Btuh
Cooling Supply Air: 21,602 / (.998 X 1.1 X 17) =		1,157 CFM	
Summer Vent Outside Air (17.3% of supply) =		200 CFM	
Return duct sensible gain:	0 Btuh		
Return plenum sensible gain:	0 Btuh		
Outside air sensible gain:	4,830 Btuh	200 CFM	
Blow-thru fan sensible gain:	0 Btuh		
Total sensible gain on return side of coil:			4,830 Btuh
Total sensible gain on air handling system:			26,433 Btuh
Zone space latent gain:	2,100 Btuh		
Infiltration latent gain:	0 Btuh		
Outside air latent gain:	7,391 Btuh		
Total latent gain on air handling system:			9,491 Btuh
Total system sensible and latent gain:			35,924 Btuh

Check Figures

Total Air Handler Supply Air (based on a 17° TD):	1,157 CFM
Total Air Handler Vent. Air (17.28% of Supply):	200 CFM
Total Conditioned Air Space:	1,435 Sq.ft
Supply Air Per Unit Area:	0.8068 CFM/Sq.ft
Area Per Cooling Capacity:	479.2175 Sq.ft/Ton
Cooling Capacity Per Area:	0.0021 Tons/Sq.ft
Heating Capacity Per Area:	13.91 Btuh/Sq.ft
Total Heating Required With Outside Air:	19,961 Btuh
Total Cooling Required With Outside Air:	2.99 Tons

Florida Energy Efficiency Code For Building Construction

Florida Department of Community Affairs

EnergyGauge FLA/COM 2004 v3.00 -- Form 400A-2004

Method A: Whole Building Performance Method for Commercial Buildings

Effective December 8, 2006

PROJECT SUMMARY

Short Desc:	Fort White	**Description:**	New Project
Owner:	Enter Owner's name here		
Address1:		**City:**	
Address2:		**State:**	FL
		Zip:	0
Type:	Office	**Class:**	New Finished building
Jurisdiction:	COLUMBIA COUNTY, COLUMBIA COUNTY, FL (221000)		
Cond Area:	921 SF	**Cond & UnCond Area:**	921 SF
No of Storeys:	1	**Area entered from Plans**	0 SF
Permit No:	0	**Max Tonnage**	2.5
		If different, write in:	_____

Compliance Summary

Component	Design	Criteria	Result
Gross Energy Use	655.6	924.5	**PASSES**
LIGHTING CONTROLS			**PASSES**
EXTERNAL LIGHTING			**None Entered**
HVAC SYSTEM			**PASSES**
PLANT			**None Entered**
WATER HEATING SYSTEMS			**PASSES**
PIPING SYSTEMS			**PASSES**
Met all required compliance from Check List?			**Yes/No/NA**

IMPORTANT NOTE: An input report of this design building must be submitted along with this Compliance Report.

CERTIFICATIONS

I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code

Prepared By: R. Winton

Date: _____

Building Official: _____

Date: _____

I certify that this building is in compliance with the FLorida Energy Efficiency Code

Owner Agent: _____

Date: _____

If Required by Florida law, I hereby certify (*) that the system design is in compliance with the FLorida Energy Efficiency Code

Architect:	Bret Hammond	Reg No:	FL
Electrical Designer:	James Lamb	Reg No:	_____
Lighting Designer:	James Lamb	Reg No:	_____
Mechanical Designer:	Robin Winton	Reg No:	FL/56206
Plumbing Designer:	Robin Winton	Reg No:	FL/56206

(*) Signature is required where Florida Law requires design to be performed by registered design professionals. Typed names and registration numbers may be used where all relevant information is contained on signed/sealed plans.

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Whole Building Compliance

	Design	Reference
Total	*69.81*	*100.00*
	$656	*$925*
ELECTRICITY(MBtu/kWh/$)	69.81 12754 *$656*	100.00 18307 *$925*
AREA LIGHTS	16.61 3038 *$156*	18.37 3369 *$170*
MISC EQUIPMT	5.43 982 *$50*	5.43 982 *$50*
PUMPS & MISC	0.16 28 *$1*	0.16 25 *$1*
SPACE COOL	24.76 4528 *$233*	24.60 4508 *$228*
SPACE HEAT	7.51 1375 *$71*	8.47 1540 *$78*
VENT FANS	15.34 2803 *$144*	42.97 7883 *$398*

Credits & Penalties (if any): Modified Points: = 69.81 | **PASSES**

External Lighting Compliance

Description	Category	Allowance (W/Unit)	Area or Length or No. of Units (Sqft or ft)	ELPA (W)	CLP (W)

None

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Lighting Controls Compliance

Acronym	Ashrae ID	Description	Area (sq.ft)	No. of Tasks	Design CP	Min CP	Compliance
Lobby	12	Lobby (General) - Reception and Waiting	488	1	1	1	**PASSES**
Bathroom	6	Toilet and Washroom	55	1	1	1	**PASSES**
Office	16	Office - Open Plan	378	1	1	1	**PASSES**

PASSES

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

System Report Compliance

Pr0Sy1 **System 1** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. of Units 1**

Component	Category	Capacity	Design Eff	Eff Criteria	Design IPLV	IPLV Criteria	Compliance
Cooling System	Air Cooled < 65000 Btu/h Cooling Capacity		14.00	13.00	8.00		**PASSES**
Heating System	Air Cooled HP < 65000 Btu/h Cooling Capacity		8.20	7.70			**PASSES**
Air Handling System -Supply	Air Handler (Supply) - Constant Volume		0.32	0.90			**PASSES**

PASSES

Plant Compliance

Description	Installed No	Size	Design Eff	Min Eff	Design IPLV	Min IPLV	Category	Compliance

None

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Water Heater Compliance

Description	Type	Category	Design Eff	Min Eff	Design Loss	Max Loss	Compliance
Water Heater 1	Electric water heater	<= 12 [kW]	0.95	0.93			PASSES

PASSES

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Piping System Compliance

Category	Pipe Dia [inches]	Is Runout?	Operating Temp [F]	Ins Cond [Btu-in/hr .SF.F]	Ins Thick [in]	Req Ins Thick [in]	Compliance
Domestic and Service Hot Water Systems	0.75	False	120.00	0.28	0.75	0.50	PASSES
Cooling Systems (Chilled Water, Brine and Refrigerant)	1.00	False	40.00	0.28	0.75	0.50	PASSES

PASSES

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Other Required Compliance

Category	Section	Requirement (write N/A in box if not applicable)	Check
Infiltration	406.1	Infiltration Criteria have been met	☐
System	407.1	HVAC Load sizing has been performed	☐
Ventilation	409.1	Ventilation criteria have been met	☐
ADS	410.1	Duct sizing and Design have been performed	☐
T & B	410.1	Testing and Balancing will be performed	☐
Motors	414.1	Motor efficiency criteria have been met	☐
Lighting	415.1	Lighting criteria have been met	☐
O & M	102.1	Operation/maintenance manual will be provided to owner	☐
Roof/Ceil	404.1	R-19 for Roof Deck with supply plenums beneath it	☐
Report	101	Input Report Print-Out from EnergyGauge FlaCom attached?	☐

EnergyGauge FLA/COM 2004 v3.00

INPUT DATA REPORT

Project Information

Project Name: Fort White
Project Title: New Project
Address:

State: FL
Zip: 0

Owner: Enter Owner's name here

Orientation: North
Building Type: Office
Building Classification: New Finished building

No.of Storeys: 1
GrossArea: 921 SF

Zones

No	Acronym	Description	Type	Area [sf]	Multiplier	Total Area [sf]	
1	Pr0Zo1	Zone 1	CONDITIONED	921.3	1	921.3	☐

Spaces

No	Acronym	Description	Type	Depth [ft]	Width [ft]	Height [ft]	Multiplier	Total Area [sf]	Total Volume [cf]

In Zone: Pr0Zo1										
1	Lobby	Zo0Sp1	Lobby (General) - Reception and Waiting	22.10	22.10	9.00	1	488.4	4395.7	☐
2	Bathroom	Zo0Sp2	Toilet and Washroom	7.00	7.80	9.00	1	54.6	491.4	☐
3	Office	Zo0Sp3	Office - Open Plan	19.40	19.50	9.00	1	378.3	3404.7	☐

Lighting

	No	Type	Category	No. of Luminaires	Watts per Luminaire	Power [W]	Control Type	No.of Ctrl pts	
In Zone: Pr0Zo1									
In Space: Lobby									
	1	Compact Fluorescent	General Lighting	14	32	448	Manual On/Off	1	☐
In Space: Bathroom									
	1	Compact Fluorescent	General Lighting	1	32	32	Manual On/Off	1	☐
In Space: Office									
	1	Compact Fluorescent	General Lighting	16	32	512	Manual On/Off	1	☐

Walls

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Direction	Conductance [Btu/hr. sf. F]	Heat Capacity [Btu/sf.F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]	
In Zone: Pr0Zo1												
1	Pr0Zo1Wa2	Metal siding/2x4@24"+R11Batt/5/8"Gyp	31.00	10.00	1	310.0	North	0.0920	1.072	19.38	10.9	☐
2	Pr0Zo1Wa3	Metal siding/2x4@24"+R11Batt/5/8"Gyp	34.00	10.00	1	340.0	South	0.0920	1.072	19.38	10.9	☐
3	Pr0Zo1Wa4	Metal siding/2x4@24"+R11Batt/5/8"Gyp	32.00	10.00	1	320.0	East	0.0920	1.072	19.38	10.9	☐

4	Pr0Zo1Wa5	Metal siding/2x4@24"+R11Batt/5/8"Gyp	32.00	10.00	1	320.0	West	0.0920	1.072	19.38	10.9	☐

Windows

No	Description	Type	Shaded	U [Btu/hr sf F]	SHGC	Vis.Tra	W [ft]	H (Effec) [ft]	Multi plier	Total Area [sf]	
In Zone: Pr0Zo1											
In Wall: South											
1	Pr0Zo1Wa3Wi1	User Defined	No	1.2500	0.82	0.76	3.00	5.00	3	45.0	☐

Doors

No	Description	Type	Shaded?	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Cond. [Btu/hr. sf. F]	Dens. [lb/cf]	Heat Cap. [Btu/sf. F]	R-Value [h.sf.F/Btu]	
In Zone: Pr0Zo1												
In Wall: South												
1	Pr0Zo1Wa3Dr1	Solid core flush (2.25)	No	3.00	7.00	1	21.0	0.3504	0.00	0.00	2.85	☐

Roofs

No	Description	Type	Width [ft]	H (Effec) [ft]	Multi plier	Area [sf]	Tilt [deg]	Cond. [Btu/hr. Sf. F]	Heat Cap [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]	
In Zone: Pr0Zo1												
1	Pr0Zo1Rf1	Mtl Bldg Roof/R-19 Batt	30.30	30.30	1	918.1	0.00	0.0492	1.34	9.49	20.3	☐

Skylights

No	Description	Type	U [Btu/hr sf F]	SHGC	Vis.Trans	W [ft]	H (Effec) [ft]	Multiplier	Area [Sf]	Total Area [Sf]

In Zone:
In Roof:

Floors

No	Description	Type	Width [ft]	H (Effec) [ft]	Multiplier	Area [sf]	Cond. [Btu/hr. sf. F]	Heat Cap. [Btu/sf. F]	Dens. [lb/cf]	R-Value [h.sf.F/Btu]
In Zone: Pr0Zo1										
1	Pr0Zo1Fl1	1 ft. soil, concrete floor, carpet and rubber pad	30.30	30.30	1	918.1	0.1745	54.00	108.00	5.73

Systems

Pr0Sy1 **System 1** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. Of Units 1**

Component	Category	Capacity	Efficiency	IPLV
1	Cooling System (Air Cooled < 65000 Btu/h Cooling Capacity)	30000.00	14.00	8.00
2	Heating System (Air Cooled HP < 65000 Btu/h Cooling Capacity)	22000.00	8.20	
3	Air Handling System -Supply (Air Handler (Supply) - Constant Volume)	1000.00	0.32	

Plant

Equipment	Category	Size	Inst.No	Eff.	IPLV

Water Heaters

W-Heater Description	Capacity	Cap.Unit	I/P Rt.	Efficiency	Loss

1 Electric water heater	1 [Gal]	4 [kW]	0.9500 [Ef]	[Btu/h]	☐

Ext-Lighting

Description	Category	No. of Luminaires	Watts per Luminaire	Area/Len/No. of units [sf/ft/No]	Control Type	Wattage [W]	
							☐

Piping

No	Type	Operating Temperature [F]	Insulation Conductivity [Btu-in/h.sf.F]	Nomonal pipe Diameter [in]	Insulation Thickness [in]	Is Runout?	
1	Domestic and Service Hot Water Systems	120.00	0.28	0.75	0.75	No	☐
2	Cooling Systems (Chilled Water, Brine and Refrigerant)	40.00	0.28	1.00	0.75	No	☐

Fenestration Used

Name	Glass Type	No. of Panes	Glass Conductance [Btu/h.sf.F]	SHGC	VLT	
ASHULSglClrAll Frm	User Defined	1	1.2500	0.8200	0.7600	☐

Materials Used

Mat No	Acronym	Description	Only R-Value Used	RValue [h.sf.F/Btu]	Thickness [ft]	Conductivity [Btu/h.ft.F]	Density [lb/cf]	SpecificHeat [Btu/lb.F]

187	Matl187	GYP OR PLAS BOARD,1/2IN	No	0.4533	0.0417	0.0920	50.00	0.2000	☐
178	Matl178	CARPET W/RUBBER PAD	Yes	1.2300					☐
265	Matl265	Soil, 1 ft	No	2.0000	1.0000	0.5000	100.00	0.2000	☐
48	Matl48	6 in. Heavyweight concrete	No	0.5000	0.5000	1.0000	140.00	0.2000	☐
23	Matl23	6 in. Insulation	No	20.0000	0.5000	0.0250	5.70	0.2000	☐
4	Matl4	Steel siding	No	0.0002	0.0050	26.0000	480.00	0.1000	☐
271	Matl271	2x4@24" oc + R11 Batt	No	10.4179	0.2917	0.0280	7.11	0.2000	☐
94	Matl94	BUILT-UP ROOFING, 3/8IN	No	0.3366	0.0313	0.0930	70.00	0.3500	☐

Constructs Used

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1055	Metal siding/2x4@24"+R11Batt/5/8"Gyp	No	No	0.09	1.07	19.38	10.9	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	4	Steel siding	0.0050	0.000	☐
2	271	2x4@24" oc + R11 Batt	0.2917	0.000	☐
3	187	GYP OR PLAS BOARD,1/2IN	0.0417	0.000	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1056	Mtl Bldg Roof/R-19 Batt	No	No	0.05	1.34	9.49	20.3	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	94	BUILT-UP ROOFING, 3/8IN	0.0313	0.000	☐
2	23	6 in. Insulation	0.5000	0.000	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1057	1 ft. soil, concrete floor, carpet and rubber pad	No	No	0.17	54.00	108.00	5.7	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	265	Soil, 1 ft	2.0000	0.000	☐
2	48	6 in. Heavyweight concrete	0.5000	0.000	☐
3	178	CARPET W/RUBBER PAD		0.000	☐

No	Name	Simple Construct	Massless Construct	Conductance [Btu/h.sf.F]	Heat Capacity [Btu/sf.F]	Density [lb/cf]	RValue [h.sf.F/Btu]	
1058	Solid core flush (2.25)	No	Yes	0.35			2.9	☐

Layer	Material No.	Material	Thickness [ft]	Framing Factor	
1	279	Solid core flush (2.25")		0.000	☐

Building Summary Loads

Building peaks in August at 3pm.

Bldg Load Descriptions	Area Quan	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Roof	1,435	3,615	7.36	0	3,286	3,286	3.68
Wall	1,718	6,926	14.10	0	3,161	3,161	3.54
Glass	196	3,752	7.64	0	6,516	6,516	7.31
Floor Slab	105	3,279	6.68	0	0	0	0.00
Skin Loads		17,572	35.78	0	12,962	12,962	14.54
Lighting	5,033	0	0.00	0	18,031	18,031	20.22
Equipment	2,300	0	0.00	0	8,240	8,240	9.24
People	28	0	0.00	5,916	7,394	13,310	14.93
Partition	1,055	2,389	4.86	0	1,536	1,536	1.72
Cool. Pret.	0	0	0.00	0	0	0	0.00
Heat. Pret.	0	0	0.00	0	0	0	0.00
Cool. Vent.	563	0	0.00	20,819	13,607	34,426	38.60
Heat. Vent.	563	29,148	59.35	0	0	0	0.00
Cool. Infil.	0	0	0.00	0	0	0	0.00
Heat. Infil.	0	0	0.00	0	0	0	0.00
Draw-Thru Fan	0	0	0.00	0	630	630	0.71
Blow-Thru Fan	0	0	0.00	0	0	0	0.00
Reserve Cap.	0	0	0.00	0	43	43	0.05
Reheat Cap.	0	0	0.00	0	0	0	0.00
Supply Duct	0	0	0.00	0	0	0	0.00
Return Duct	0	0	0.00	0	0	0	0.00
Misc. Supply	0	0	0.00	0	0	0	0.00
Misc. Return	0	0	0.00	0	0	0	0.00
Building Totals		49,109	100.00	26,735	62,444	89,179	100.00

Building Summary	Sen Loss	%Tot Loss	Lat Gain	Sen Gain	Net Gain	%Net Gain
Ventilation	29,148	59.35	20,819	13,607	34,426	38.60
Infiltration	0	0.00	0	0	0	0.00
Pretreated Air	0	0.00	0	0	0	0.00
Zone Loads	19,961	40.65	5,916	48,207	54,123	60.69
Plenum Loads	0	0.00	0	0	0	0.00
Fan & Duct Loads	0	0.00	0	630	630	0.71
Building Totals	49,109	100.00	26,735	62,444	89,179	100.00

Check Figures

Total Building Supply Air (based on a 17° TD):	2,636	CFM
Total Building Vent. Air (21.37% of Supply):	563	CFM
Total Conditioned Air Space:	2,796	Sq.ft
Supply Air Per Unit Area:	0.9428	CFM/Sq.ft
Area Per Cooling Capacity:	376.2271	Sq.ft/Ton
Cooling Capacity Per Area:	0.0027	Tons/Sq.ft
Heating Capacity Per Area:	17.56	Btuh/Sq.ft
Total Heating Required With Outside Air:	49,109	Btuh
Total Cooling Required With Outside Air:	7.43	Tons

Air Handler #1 - Ahu-2 - Summary Loads

Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
1	Office 1	141	1,038	2,570	228	20/P	20/P
	1pm August	1	48	139	0	22	22
		1,269	0.34	0.99	0	36	34
2	Office 2	141	2,045	3,472	228	20/P	20/P
	3pm August	1	95	188	0	22	22
		1,269	0.67	1.34	0	72	46
3	Open Office Area	419	2,008	8,746	840	20/P	20/P
	6pm August	4	93	475	0	80	80
		3,771	0.22	1.13	0	71	117
4	Break Room / Bathroom	660	5,256	12,467	2,520	20/P	20/P
	6pm August	12	244	677	0	240	240
		5,943	0.37	1.02	0	185	166
	Zone Peak Totals:	1,361	10,347	27,254	3,816		
	Total Zones: 4	18	480	1,479	0	363	363
	Unique Zones: 4	12,252	0.35	1.09	0	363	364

Air Handler #1 - Ahu-2 - Total Load Summary

Air Handler Description:	Ahu-2 Constant Volume - Sum of Peaks
Supply Air Fan:	Draw-Thru with program estimated horsepower of 0.14 HP
Fan Input:	0% motor and fan efficiency with 0 in. water across the fan
Sensible Heat Ratio:	0.88

--- This system occurs 1 time(s) in the building. ---

Air System Peak Time:	5pm in August.
Outdoor Conditions:	92° DB, 77° WB, 116.19 grains

Because of the diversity in zone, plenum and ventilation loads, the zone sensible peak time in August at 6pm is different from the total system peak time, hence the air system CFM was computed using a zone sensible load of 27,196.

Summer: Ventilation controls outside air, ----- Winter: Ventilation controls outside air.

Zone Space sensible loss:	10,347 Btuh		
Infiltration sensible loss:	0 Btuh	0 CFM	
Outside Air sensible loss:	18,800 Btuh	363 CFM	
Supply Duct sensible loss:	0 Btuh		
Return Duct sensible loss:	0 Btuh		
Return Plenum sensible loss:	0 Btuh		
Total System sensible loss:			29,148 Btuh
Heating Supply Air: 10,347 / (.998 X 1.08 X 20) =		480 CFM	
Winter Vent Outside Air (75.7% of supply) =		363 CFM	
Zone space sensible gain:	26,949 Btuh		
Infiltration sensible gain:	0 Btuh		
Draw-thru fan sensible gain:	354 Btuh		
Supply duct sensible gain:	0 Btuh		
Reserve sensible gain:	43 Btuh		
Total sensible gain on supply side of coil:			27,345 Btuh
Cooling Supply Air: 27,593 / (.998 X 1.1 X 17) =		1,478 CFM	
Summer Vent Outside Air (24.6% of supply) =		363 CFM	
Return duct sensible gain:	0 Btuh		
Return plenum sensible gain:	0 Btuh		
Outside air sensible gain:	7,979 Btuh	363 CFM	
Blow-thru fan sensible gain:	0 Btuh		
Total sensible gain on return side of coil:			7,979 Btuh
Total sensible gain on air handling system:			35,324 Btuh
Zone space latent gain:	3,816 Btuh		
Infiltration latent gain:	0 Btuh		
Outside air latent gain:	14,234 Btuh		
Total latent gain on air handling system:			18,050 Btuh
Total system sensible and latent gain:			53,374 Btuh

Check Figures

Total Air Handler Supply Air (based on a 17° TD):	1,478 CFM
Total Air Handler Vent. Air (24.58% of Supply):	363 CFM
Total Conditioned Air Space:	1,361 Sq.ft
Supply Air Per Unit Area:	1.0860 CFM/Sq.ft
Area Per Cooling Capacity:	306.0732 Sq.ft/Ton
Cooling Capacity Per Area:	0.0033 Tons/Sq.ft
Heating Capacity Per Area:	21.41 Btuh/Sq.ft
Total Heating Required With Outside Air:	29,148 Btuh
Total Cooling Required With Outside Air:	4.45 Tons

Air Handler #2 - Ahu-2 - Summary Loads

Zn No	Description Zone Peak Time	Area People Volume	Htg.Loss Htg.CFM CFM/Sqft	Sen.Gain Clg.CFM CFM/Sqft	Lat.Gain S.Exh W.Exh	Htg.O.A. Req.CFM Act.CFM	Clg.O.A. Req.CFM Act.CFM
5	Second Floor	1,435	9,613	21,326	2,100	20/P	20/P
	3pm August	10	446	1,158	0	200	200
		12,911	0.31	0.81	0	200	200
	Zone Peak Totals:	1,435	9,613	21,326	2,100		
	Total Zones: 1	10	446	1,158	0	200	200
	Unique Zones: 1	12,911	0.31	0.81	0	200	200

Air Handler #2 - Ahu-2 - Total Load Summary

Air Handler Description:	Ahu-2 Constant Volume - Sum of Peaks
Supply Air Fan:	Draw-Thru with program estimated horsepower of 0.11 HP
Fan Input:	0% motor and fan efficiency with 0 in. water across the fan
Sensible Heat Ratio:	0.91

--- This system occurs 1 time(s) in the building. ---

Air System Peak Time:	3pm in August.
Outdoor Conditions:	94° DB, 77° WB, 112.93 grains

Summer: Ventilation controls outside air, ----- Winter: Ventilation controls outside air.

Zone Space sensible loss:	9,613 Btuh		
Infiltration sensible loss:	0 Btuh	0 CFM	
Outside Air sensible loss:	10,347 Btuh	200 CFM	
Supply Duct sensible loss:	0 Btuh		
Return Duct sensible loss:	0 Btuh		
Return Plenum sensible loss:	0 Btuh		
Total System sensible loss:			19,961 Btuh
Heating Supply Air: 9,613 / (.998 X 1.08 X 20) =		446 CFM	
Winter Vent Outside Air (44.8% of supply) =		200 CFM	
Zone space sensible gain:	21,326 Btuh		
Infiltration sensible gain:	0 Btuh		
Draw-thru fan sensible gain:	277 Btuh		
Supply duct sensible gain:	0 Btuh		
Reserve sensible gain:	0 Btuh		
Total sensible gain on supply side of coil:			21,602 Btuh
Cooling Supply Air: 21,602 / (.998 X 1.1 X 17) =		1,157 CFM	
Summer Vent Outside Air (17.3% of supply) =		200 CFM	
Return duct sensible gain:	0 Btuh		
Return plenum sensible gain:	0 Btuh		
Outside air sensible gain:	4,830 Btuh	200 CFM	
Blow-thru fan sensible gain:	0 Btuh		
Total sensible gain on return side of coil:			4,830 Btuh
Total sensible gain on air handling system:			26,433 Btuh
Zone space latent gain:	2,100 Btuh		
Infiltration latent gain:	0 Btuh		
Outside air latent gain:	7,391 Btuh		
Total latent gain on air handling system:			9,491 Btuh
Total system sensible and latent gain:			35,924 Btuh

Check Figures

Total Air Handler Supply Air (based on a 17° TD):	1,157 CFM
Total Air Handler Vent. Air (17.28% of Supply):	200 CFM
Total Conditioned Air Space:	1,435 Sq.ft
Supply Air Per Unit Area:	0.8068 CFM/Sq.ft
Area Per Cooling Capacity:	479.2175 Sq.ft/Ton
Cooling Capacity Per Area:	0.0021 Tons/Sq.ft
Heating Capacity Per Area:	13.91 Btuh/Sq.ft
Total Heating Required With Outside Air:	19,961 Btuh
Total Cooling Required With Outside Air:	2.99 Tons

Florida Energy Efficiency Code For Building Construction

Florida Department of Community Affairs

EnergyGauge FLA/COM 2004 v3.00 -- Form 400A-2004

Method A: Whole Building Performance Method for Commercial Buildings

Effective December 8, 2006

PROJECT SUMMARY

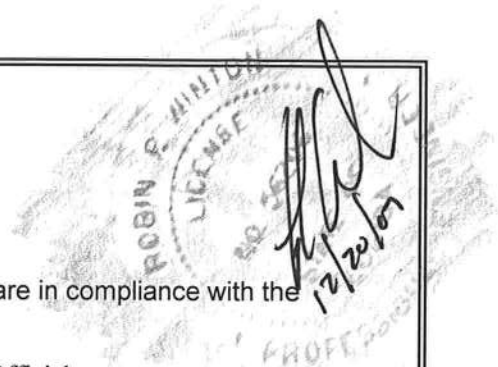
Short Desc:	Fort White	**Description:**	New Project
Owner:	Enter Owner's name here		
Address1:		**City:**	
Address2:		**State:**	FL
		Zip:	0
Type:	Office	**Class:**	New Finished building
Jurisdiction:	COLUMBIA COUNTY, COLUMBIA COUNTY, FL (221000)		
Cond Area:	921 SF	**Cond & UnCond Area:**	921 SF
No of Storeys:	1	**Area entered from Plans**	0 SF
Permit No:	0	**Max Tonnage**	2.5
		If different, write in:	_____

Compliance Summary

Component	Design	Criteria	Result
Gross Energy Use	655.6	924.5	**PASSES**
LIGHTING CONTROLS			**PASSES**
EXTERNAL LIGHTING			**None Entered**
HVAC SYSTEM			**PASSES**
PLANT			**None Entered**
WATER HEATING SYSTEMS			**PASSES**
PIPING SYSTEMS			**PASSES**
Met all required compliance from Check List?			**Yes/No/NA**

IMPORTANT NOTE: An input report of this design building must be submitted along with this Compliance Report.

CERTIFICATIONS



I hereby certify that the plans and specifications covered by this calculation are in compliance with the Florida Energy Code

Prepared By: R WINTON

Building Official: _____

Date: _____

Date: _____

I certify that this building is in compliance with the FLorida Energy Efficiency Code

Owner Agent: _____

Date: _____

If Required by Florida law, I hereby certify (*) that the system design is in compliance with the FLorida Energy Efficiency Code

Architect:	Bret Hammond	Reg No:	FL
Electrical Designer:	James Lamb	Reg No:	_____
Lighting Designer:	James Lamb	Reg No:	_____
Mechanical Designer:	Robin Winton	Reg No:	FL/56206
Plumbing Designer:	Robin Winton	Reg No:	FL/56206

(*) Signature is required where Florida Law requires design to be performed by registered design professionals. Typed names and registration numbers may be used where all relevant information is contained on signed/sealed plans.

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Whole Building Compliance

	Design	Reference
Total	*69.81*	*100.00*
	$656	*$925*
ELECTRICITY(MBtu/kWh/$)	69.81 12754 *$656*	100.00 18307 *$925*
AREA LIGHTS	16.61 3038 *$156*	18.37 3369 *$170*
MISC EQUIPMT	5.43 982 *$50*	5.43 982 *$50*
PUMPS & MISC	0.16 28 *$1*	0.16 25 *$1*
SPACE COOL	24.76 4528 *$233*	24.60 4508 *$228*
SPACE HEAT	7.51 1375 *$71*	8.47 1540 *$78*
VENT FANS	15.34 2803 *$144*	42.97 7883 *$398*

Credits & Penalties (if any): Modified Points: = 69.81 | **PASSES**

External Lighting Compliance

Description	Category	Allowance (W/Unit)	Area or Length or No. of Units (Sqft or ft)	ELPA (W)	CLP (W)

None

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Lighting Controls Compliance

Acronym	Ashrae ID	Description	Area (sq.ft)	No. of Tasks	Design CP	Min CP	Compliance
Lobby	12	Lobby (General) - Reception and Waiting	488	1	1	1	PASSES
Bathroom	6	Toilet and Washroom	55	1	1	1	PASSES
Office	16	Office - Open Plan	378	1	1	1	PASSES

PASSES

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

System Report Compliance

Pr0Sy1 **System 1** **Constant Volume Air Cooled Split System < 65000 Btu/hr** **No. of Units 1**

Component	Category	Capacity	Design Eff	Eff Criteria	Design IPLV	IPLV Criteria	Compliance
Cooling System	Air Cooled < 65000 Btu/h Cooling Capacity		14.00	13.00	8.00		PASSES
Heating System	Air Cooled HP < 65000 Btu/h Cooling Capacity		8.20	7.70			PASSES
Air Handling System -Supply	Air Handler (Supply) - Constant Volume		0.32	0.90			PASSES

PASSES

Plant Compliance

Description	Installed No	Size	Design Eff	Min Eff	Design IPLV	Min IPLV	Category	Compliance

None

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Water Heater Compliance

Description	Type	Category	Design Eff	Min Eff	Design Loss	Max Loss	Compliance
Water Heater 1	Electric water heater	<= 12 [kW]	0.95	0.93			PASSES

PASSES

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Piping System Compliance

Category	Pipe Dia [inches]	Is Runout?	Operating Temp [F]	Ins Cond [Btu-in/hr .SF.F]	Ins Thick [in]	Req Ins Thick [in]	Compliance
Domestic and Service Hot Water Systems	0.75	False	120.00	0.28	0.75	0.50	PASSES
Cooling Systems (Chilled Water, Brine and Refrigerant)	1.00	False	40.00	0.28	0.75	0.50	PASSES

PASSES

Project: Fort White
Title: New Project
Type: Office
(WEA File: JACKSONVILLE.TMY)

Other Required Compliance

Category	Section	Requirement (write N/A in box if not applicable)	Check
Infiltration	406.1	Infiltration Criteria have been met	☐
System	407.1	HVAC Load sizing has been performed	☐
Ventilation	409.1	Ventilation criteria have been met	☐
ADS	410.1	Duct sizing and Design have been performed	☐
T & B	410.1	Testing and Balancing will be performed	☐
Motors	414.1	Motor efficiency criteria have been met	☐
Lighting	415.1	Lighting criteria have been met	☐
O & M	102.1	Operation/maintenance manual will be provided to owner	☐
Roof/Ceil	404.1	R-19 for Roof Deck with supply plenums beneath it	☐
Report	101	Input Report Print-Out from EnergyGauge FlaCom attached?	☐

HAMMOND DESIGN GROUP

Architecture AA 0003346
Landscape Architecture LA 0001313

317 E. Park Avenue
Tallahassee, FL 32301

Office: 850-222-2092
Fax: 850-222-0296

LETTER OF TRANSMITTAL

DATE 1/2/08	JOB NO. 2702
ATTENTION JOE HALTIWANGER	
RE: FT. WHITE RAILROAD DEPOT	

TO COLUMBIA COUNTY BUILDING DEPT

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of Letter ☐ Change Order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
2	12/20/07		TWO SETS ENERGY CALCS. (SIGNED & SEALED)

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO FILE

SIGNED: _____

If enclosures are not as noted, kindly notify us at once.

Instructions to Bidders & Technical Specifications For:

Ft. White Railroad Depot Restoration

Ft. White, Florida

12.20.07

BID SET # 3

Date: August 2007

HAMMOND DESIGN GROUP

Architecture AA0003346
Landscape Architecture LA0001313

317 East Park Avenue
Tallahassee, Florida 32301
(850) 222-2092 Phone (850) 222-0296 Fax

FILE COPY

General Instructions to Bidders:

1. Deliver Sealed Bid to Ft. White Town Council, Ft. White, Fl., no later than Monday, December 10, 2007 @ 12:00 Noon Deliver directly to the office of Mr. Truett George, Ft. White, Florida.

2. Sealed Bids should be clearly identified and list the following:

   Sealed Bid for Restoration of Ft. White Railroad Depot

   Contractors Name and Address
   Telephone and Fax numbers

   Owner's Name & Address: Truett George, Mayor
   Town of Ft. White, Office Building
   118 SW Wilson Springs Road, Suite 105
   Ft. White, Florida 32038

3. Bid Form is included in this package for your use.

4. The opening will be conducted on December 10, 2007 at the regularly scheduled Ft. White Town Council @ 7:30 pm. The apparent low bidder will be announced at the public opening. The participants will be notified by Friday December 14, 2007, of which contractor was selected for the project after discussion & evaluations of submitted bids.

5. Construction Contract will consist of a 'Standard Form of Agreement between Owner and Contractor' (AIA DOCUMENT A101).

6. Currently it is anticipated that 180 days (6 months) will be allowed for the construction of the project. Assuming the project is awarded on December 10, 2007 the final completion of the project 180 days later would be June 10, 2008. Should the project not be awarded on December 10, 2007 the calendar would be adjusted accordingly.

7. Questions regarding the construction documents should be directed in writing to the HAMMOND DESIGN GROUP for clarification. Answers will be issued in writing to all bidding participants.

8. Questions shall be submitted prior to December 1, 2007 to allow a thorough answer to the question and a faxed response to all bidding participants. Questions submitted after December 1, 2007 @ 4:30 PM will not be responded too prior to bid submittal and opening.

9. A $100.00 refundable deposit is required to secure Architectural drawings and specifications. Costs for shipping will be additional and should be assumed the vendors cost. The deposit will be refunded upon delivery of the construction documents, provided the documents are not damaged. Construction documents should be returned by January 15, 2008 if the

contractor wishes to be refunded their deposit. Returned drawings will be available to the contractor awarded the project for their use and distribution.

10. Building Permit is being applied for concurrently with the bidding process.

11. Contractor shall provide two references for projects similar in size and scope (preferably restoration projects) and a contact name and telephone number for that project reference.

BID FORM

SUBMIT IN DUPLICATE ON CONTRACTOR'S LETTERHEAD

FT. RAILROAD DEPOT RESTORATION DATE:_____

FT. WHITE FLORIDA TIME:_____

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 **the Restoration of the Ft. White Railroad Depot** in full accordance with the drawings and specifications prepared by Hammond Design Group, in full accordance with the request for Bids, Instruction to Bidders, Agreement and all other Contract Documents; and if awarded the Contract, I (We) will contract with the Town of Ft. White, 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($_____).

With the foregoing as a Base Bid, the following Alternate Prices are submitted in accordance with the Drawings and Specifications.

ALTERNATE NO. 1: PERMITTING & INSTALLATION OF SEPTIC SYSTEM Dollars ($_____).

ALTERNATE NO. 2_____Dollars ($_____).

ALTERNATE NO. 3:_____Dollars ($_____).

The undersigned further agree(s) to bear the full responsibility 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 eight (8) "Business Days" after the award of the Contract, the accompanying Proposal Guaranty, made payable to the TOWN OF FT. WHITE, 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: _____

INCLUDED

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.

Major Subcontractors are to be completed on AIA G805 and included with this bid form package.

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 TOWN OF FT. WHITE, 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

INCLUDED ON CD

AIA Contract Administration
G805 List of Subcontractors Instructions

GENERAL INFORMATION

PURPOSE. AIA Document G805 is an administrative form intended for use in maintaining a list of proposed Subcontractors to be employed by the Contractor for various portions of any project.

RELATED DOCUMENTS. AIA Document G805 relates to AIA Document A201-1997, *General Conditions of the Contract for Construction*, and AIA Document A107-1997, *Abbreviated Standard Form of Agreement Between Owner and Contractor for Construction Projects of Limited Scope, Stipulated Sum.*

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COMPLETING THE G805 DOCUMENT

As a requirement of AIA Document A201-1997 and AIA Document A107-1997, the Contractor will complete this list of proposed Subcontractors for submission to the Owner, through the Architect, after award of the Contract.

Subcontractors are persons or entities who have a direct contract with the Contractor to perform a portion of the Work at a project site.

For A201-1997, this list should include both Subcontractors and the names of persons or entities, including those who furnish materials or equipment fabricated to a special design, proposed for each principal portion of the Work.

After the Owner and Architect review AIA Document G805, it is the Owner's or Architect's responsibility under A201-1997 to reply, in writing, to the Contractor if there is reasonable objection to any proposed persons or entities.

Instructions for AIA Document G805 List of Subcontractors © 2001 The American Institute of Architects • Washington, DC • *www.aia.org* • **WARNING: Reproduction, unlicensed photocopying or substantial quotation of the material herein without written permission of the AIA violates the copyright laws of the United States and will subject the violator to legal prosecution.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, *copyright@aia.org.*

Cal-Tech Testing, Inc.

- Engineering
- Geotechnical
- Environmental

LABORATORIES

P.O. Box 1625 • Lake City, FL 32056 Tel. (386) 755-3633 • Fax (386) 752-5456
4784 Rosselle Street • Jacksonville, FL 32254 Tel. (904) 381-8901 • Fax (904) 381-8902
2230 Greensboro Highway • Quincy, FL 32351 Tel. (850) 442-3495 • Fax (850) 442-4008

July 31, 2007

Mr. Truett George, Mayor
Town of Fort White
P.O. Box 129
Fort White, Florida 32038

Attention: Mr. Truett George, Mayor

Reference: Subsurface Exploration
Visitors Center Restoration
Fort White, Florida
Cal-Tech Project No. 07-00349

Dear Mr. George,

Cal-Tech Testing, Inc. (**CTI**) has completed the subsurface exploration and engineering evaluation for the restoration of the visitors center located in the southwestern quadrant of 3RD Street and U.S. Highway 27 intersection in Fort White, Florida. Our work was performed in general accordance with our proposal dated June 26, 2007.

INTRODUCTION

We understand the subject structure is a one-story, wood-framed building that was constructed in 1888, as part of the plant rail system. This building was purchased by a private entity and transported off-site in 1982. In 2002, the building was purchased back by the Town of Fort White, Florida and was transported back to its original site (placed approximately 200 feet from its original location).

The restoration will include placing this "historic" structure back at its original location. We understand the new foundation system will consist of constructing five (5) continuous footings each supporting five (5) shallow piers. The building will be directly supported by these piers. The piers are expected to be 12" by 12" in cross-section. We assume no structural fill placement is planned in this area.

FIELD PROGRAM

Our field program consisted of performing four (4) Standard Penetration Test (SPT) borings extending to depths ranging from 10 to 15 feet below the existing ground surface. The borings were performed at the approximate locations indicated on the attached Field Exploration Plan.

The boring locations were determined in the field and measured by tape and turning approximate right angles from existing features, the boring locations should be considered only as accurate as the method used.

The sampling and penetration procedures of the Standard Penetration Test (SPT) borings were accomplished in general accordance with ASTM D-1586, using a power rotary drill rig. The SPT borings were performed by driving a standard 1-3/8'' I.D. and 2.0'' 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 depths. The penetration resistance is used as an index to derive soil parameters from various empirical correlations.

FINDINGS

In general, the soil profile as disclosed by SPT borings B-1 through B-4 initially consisted of about 12 inches of gray to brown, silty fine sand (SM). This surficial cover was underlain by about 6 to 11.5 feet of brown to tan or gray to light tan, fine sand (SP). Below this stratum, about 1.5 to 3 feet of light gray and reddish tan, clayey fine sand (SP/SC or SC) was encountered to the boring termination depths.

Ground water was not encountered in any of the borings at the time of our exploration. However, it should be anticipated the groundwater level will fluctuate due to seasonal climatic variations, surface water runoff patterns, construction activities and other interrelated factors.

For a more detailed description of the subsurface conditions encountered, please refer to the attached Generalized Subsurface Profile. Note that the transition between soil types may be gradual and not abrupt as indicated by the boring logs; therefore, the thickness of soil layers should be considered approximate.

DISCUSSION AND RECOMMENDATIONS

Based on the results of the test borings, it is our opinion the site soils are suitable for the support of the proposed structure. A shallow foundation for the proposed building may be designed using a maximum allowable bearing pressure of 2,000 psf. It is recommended that a minimum width of 18 and 24 inches be provided for strip and isolated footings, respectively. The bottoms of foundations should be embedded a minimum of 18 inches below the lowest adjacent grade (i.e., finished subgrade).

Due to the varying density of the immediate bearing soils, we recommend that exposed subgrade be proof-rolled and proof-compacted prior to concrete placement (including bottom of footings and slab areas). Soils should be proof-compacted to a minimum of 95% of the modified Proctor maximum dry density (ASTM D 1557) to a minimum depth of 5 feet below finished subgrade elevation.

Our evaluation is based upon subsurface conditions encountered at specific locations and time as presented within this report. However, subsurface conditions may exist that differ from our findings. We request that we be notified if dissimilar subsurface conditions are encountered. Assessment of site environmental conditions for presence of pollutants on the surface or below ground was beyond the scope of this exploration.

We appreciate the opportunity to be of service on this project and look forward to a continued association. Please do not hesitate to contact us should you have questions concerning this report or if we may be further service.

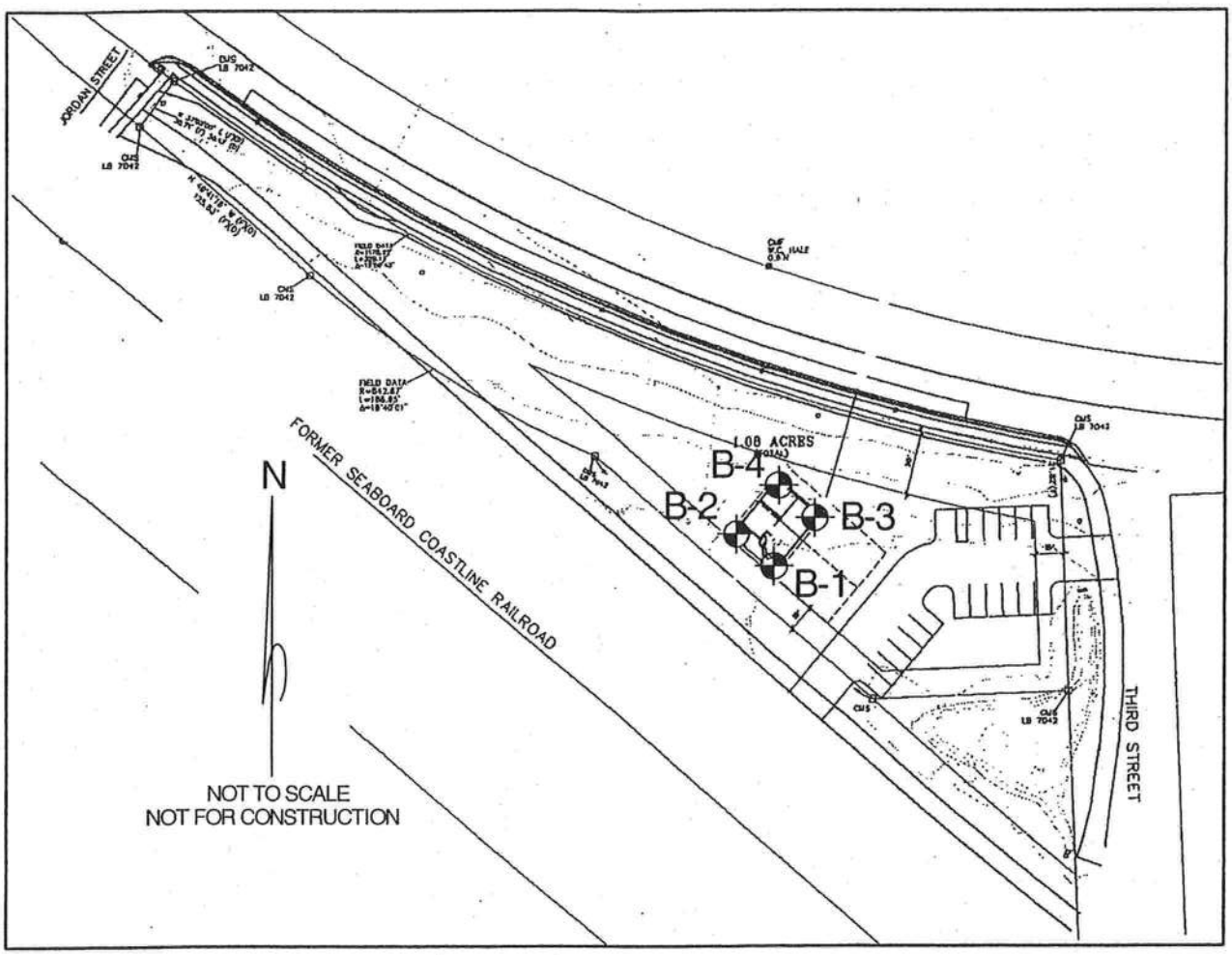
Respectfully submitted,
Cal-Tech Testing, Inc.

Linda Creamer, CEO

Linda Creamer
President / CEO

7/31/07

Nabil O. Hmeidi, P.E.
Senior Geotechnical Engineer
Licensed, Florida No. 57842



SUBSURFACE EXPLORATION
STRUCTURE RESTORATION
FORT WHITE, FLORIDA

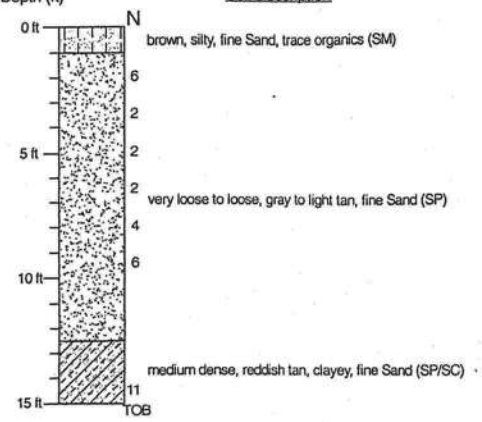
FIELD EXPLORATION PLAN

FIGURE: 1

DRAWN BY:	CHECKED BY:	DATE	JOB NO.
S.C. YOUNG	N.O. HMEIDI	7/27/07	07-00349

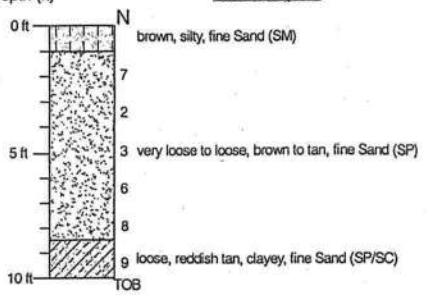
B-1

Water Table: N/A



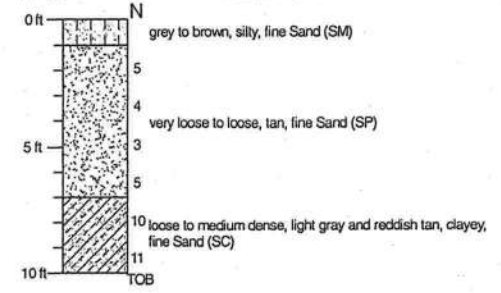
B-2

Water Table: N/A



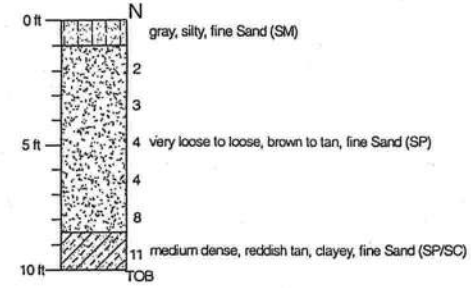
B-3

Water Table: N/A



B-4

Water Table: N/A



ENGINEERING CLASSIFICATION

GRANULAR MATERIALS-

Relative Density	SPT (Blows/12 inches)
Very Loose	Less than 4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	Greater than 50

SILTS AND CLAYS-

Consistency	SPT (Blows/12 inches)
Very Soft	Less than 2
Soft	2-4
Medium Stiff	5-8
Stiff	9-15
Very Stiff	16-30
Hard	Greater than 30

LEGEND:

TOB	Termination of Boring
GSE	Ground Surface Elevation
▽	Ground Water at Time of Drilling
V	Wet Season Water Table
N	Standard Penetration Resistance in Blows Per 12 inches (18- inch Spoon, ASTM D-1586)
WOR	Weight of Rod
WOH	Weight of Hammer
MC	Moisture Content (%)
OC	Organic Content (%)
-200	Percent Passing No. 200 U.S. Standard Sieve
LL	Liquid Limit
PI	Plasticity Index
(SP)	Unified Soil Classification Based on Visual Observation and Laboratory Tests

SAND | SILTY SAND
SAND with SILT | CLAYEY SAND
SAND with CLAY | SANDY CLAY
CLAY | LIMESTONE
MARL | ORGANICS

REVISIONS							NAMES	DATE
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DRAWN BY	S.C. Young	7/27/07
						CHECKED BY		
						DRILLED BY	J. Derringer	7/12/07
						APPROVED BY		
						CAL-TECH JOB NO.	07-00349	

ENGINEER OF RECORD
CAL- TECH TESTING, INC.
P.O. BOX 1625
LAKE CITY, FL. 32056
PHONE NO. (386) 755-3633
FAX NO. (386) 752-5456

SUBSURFACE EXPLORATION
STRUCTURE RESTORATION
FORT WHITE, FLORIDA

ROAD NO.	COUNTY	FINANCIAL PROJECT I.D.
	COLUMBIA	

GENERALIZED SUBSURFACE PROFILE

FIGURE: 2

HAMMOND DESIGN GROUP
317 East Park Ave
Tallahassee, Florida 32301

Ft. White Railroad Depot
Ft. White, Florida

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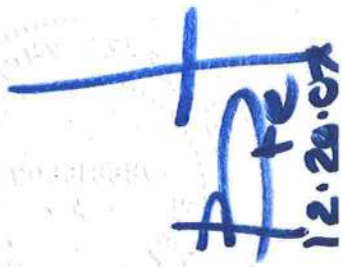

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LIGHT FIXTURE SUBMITTAL CUT SHEETS

12/21/07

AIA® Document A201™ – 1997

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address):

Ft. White Railroad Depot
Ft. White, Florida

THE OWNER:
(Name and address):

Town of Ft. White
P.O. Box 129
Ft.White, Florida 32038

THE ARCHITECT:
(Name and address):

HAMMOND DESIGN GROUP
317 East Park Ave
Tallahassee, Florida 32301

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document has been approved and endorsed by The Associated General Contractors of America

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of Addenda relating to bidding requirements).

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Owner and a Subcontractor or Sub-subcontractor, (3) between the Owner and Architect or (4) between any persons or entities other than the Owner and Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 THE PROJECT MANUAL

The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

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§ 1.3 CAPITALIZATION

§ 1.3.1 Terms capitalized in these General Conditions include those which are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

§ 1.4.1 In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 EXECUTION OF CONTRACT DOCUMENTS

§ 1.5.1 The Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request.

§ 1.5.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.6.1 The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' copyrights or other reserved rights.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 The Owner shall, at the written request of the Contractor, prior to commencement of the Work and thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Furnishing of such evidence shall be a condition precedent to commencement or

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continuation of the Work. After such evidence has been furnished, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees, including those required under Section 3.7.1, which are the responsibility of the Contractor under the Contract Documents, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 Information or services required of the Owner by the Contract Documents shall be furnished by the Owner with reasonable promptness. Any other information or services relevant to the Contractor's performance of the Work under the Owner's control shall be furnished by the Owner after receipt from the Contractor of a written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, such copies of Drawings and Project Manuals as are reasonably necessary for execution of the Work.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

§ 2.3.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

§ 2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such seven-day period give the Contractor a second written notice to correct such deficiencies within a three-day period. If the Contractor within such three-day period after receipt of such second notice fails to commence and continue to correct any deficiencies, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the

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Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered by the Contractor shall be reported promptly to the Architect as a request for information in such form as the Architect may require.

§ 3.2.2 Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect, but it is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or made known to the Contractor shall be reported promptly to the Architect.

§ 3.2.3 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect in response to the Contractor's notices or requests for information pursuant to Sections 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Sections 4.3.6 and 4.3.7. If the Contractor fails to perform the obligations of Sections 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any resulting loss or damage.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 The Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

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§ 3.5 WARRANTY

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

§ 3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES AND NOTICES

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

§ 3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Architect and Owner, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents:

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances;

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner in sufficient time to avoid delay in the Work.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important

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communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare and keep current, for the Architect's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Architect reasonable time to review submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

§ 3.11.1 The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

§ 3.12.6 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

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§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services which constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

§ 3.13 USE OF SITE

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

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§ 3.16 ACCESS TO WORK

§ 3.16.1 The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

§ 3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law and to the extent claims, damages, losses or expenses are not covered by Project Management Protective Liability insurance purchased by the Contractor in accordance with Section 11.3, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

§ 4.1 ARCHITECT

§ 4.1.1 The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a new Architect against whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the former Architect.

§ 4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents, and will be an Owner's representative (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Section 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

§ 4.2.2 The Architect, as a representative of the Owner, will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and

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deficiencies in the Work, and (3) to determine in general if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect will have authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion, will receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

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§ 4.2.11 The Architect will interpret and decide matters concerning performance under and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made for them.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and initial decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.3 CLAIMS AND DISPUTES

§ 4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be initiated by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 4.3.2 Time Limits on Claims. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be initiated by written notice to the Architect and the other party.

§ 4.3.3 Continuing Contract Performance. Pending final resolution of a Claim except as otherwise agreed in writing or as provided in Section 9.7.1 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 4.3.4 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the Architect has given notice of the decision. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Section 4.4.

§ 4.3.5 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.6.

§ 4.3.6 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with this Section 4.3.

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§ 4.3.7 Claims for Additional Time

§ 4.3.7.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

§ 4.3.7.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 4.3.8 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 4.3.9 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 4.3.10 Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 4.3.10 shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 4.4 RESOLUTION OF CLAIMS AND DISPUTES

§ 4.4.1 Decision of Architect. Claims, including those alleging an error or omission by the Architect but excluding those arising under Sections 10.3 through 10.5, shall be referred initially to the Architect for decision. An initial decision by the Architect shall be required as a condition precedent to mediation, arbitration or litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered by the Architect. The Architect will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 4.4.2 The Architect will review Claims and within ten days of the receipt of the Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Architect is unable to resolve the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Architect concludes that, in the Architect's sole discretion, it would be inappropriate for the Architect to resolve the Claim.

§ 4.4.3 In evaluating Claims, the Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Architect in rendering a decision. The Architect may request the Owner to authorize retention of such persons at the Owner's expense.

§ 4.4.4 If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either provide a response on the requested supporting data, advise the Architect when the response or supporting data will be furnished or advise the Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part.

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§ 4.4.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefor and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be final and binding on the parties but subject to mediation and arbitration.

§ 4.4.6 When a written decision of the Architect states that (1) the decision is final but subject to mediation and arbitration and (2) a demand for arbitration of a Claim covered by such decision must be made within 30 days after the date on which the party making the demand receives the final written decision, then failure to demand arbitration within said 30 days' period shall result in the Architect's decision becoming final and binding upon the Owner and Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence, but shall not supersede arbitration proceedings unless the decision is acceptable to all parties concerned.

§ 4.4.7 Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect or the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Architect or the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 4.4.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines prior to resolution of the Claim by the Architect, by mediation or by arbitration.

§ 4.5 MEDIATION

§ 4.5.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Sections 4.3.10, 9.10.4 and 9.10.5 shall, after initial decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to mediation as a condition precedent to arbitration or the institution of legal or equitable proceedings by either party.

§ 4.5.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Request for mediation shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

§ 4.5.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 4.6 ARBITRATION

§ 4.6.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Sections 4.3.10, 9.10.4 and 9.10.5, shall, after decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to arbitration. Prior to arbitration, the parties shall endeavor to resolve disputes by mediation in accordance with the provisions of Section 4.5.

§ 4.6.2 Claims not resolved by mediation shall be decided by arbitration which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. The demand for arbitration shall be filed in writing with the other party to the Contract and with the American Arbitration Association, and a copy shall be filed with the Architect.

§ 4.6.3 A demand for arbitration shall be made within the time limits specified in Sections 4.4.6 and 4.6.1 as applicable, and in other cases within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to Section 13.7.

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§ 4.6.4 Limitation on Consolidation or Joinder. No arbitration arising out of or relating to the Contract shall include, by consolidation or joinder or in any other manner, the Architect, the Architect's employees or consultants, except by written consent containing specific reference to the Agreement and signed by the Architect, Owner, Contractor and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the Owner, Contractor, a separate contractor as described in Article 6 and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the Owner, Contractor or a separate contractor as described in Article 6 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a Claim not described therein or with a person or entity not named or described therein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 4.6.5 Claims and Timely Assertion of Claims. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 4.6.6 Judgment on Final Award. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner or the Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Architect to reply promptly shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitute.

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§ 5.3 SUBCONTRACTUAL RELATIONS

§ 5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement which may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Section 4.3.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights which apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

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§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

§ 6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

§ 6.3.1 If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect, stating their agreement upon all of the following:

.1 change in the Work;
.2 the amount of the adjustment, if any, in the Contract Sum; and
.3 the extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Section 7.3.3.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

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§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 unit prices stated in the Contract Documents or subsequently agreed upon;

.3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 as provided in Section 7.3.6.

§ 7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Architect on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.6 shall be limited to the following:

.1 costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Architect will make an interim determination for purposes of monthly certification for payment for those costs. That determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a claim in accordance with Article 4.

§ 7.3.9 When the Owner and Contractor agree with the determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

§ 7.4 MINOR CHANGES IN THE WORK

§ 7.4.1 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

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ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner pending mediation and arbitration, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Section 4.3.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

§ 9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to

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payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.8, such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Such applications may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of:

.1 defective Work not remedied;

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.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or another contractor;

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 persistent failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by arbitration, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

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§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.4.1.5 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in

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the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

§ 10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

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§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 The Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. The Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 7.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) and provided that such damage, loss or expense is not due to the sole negligence of a party seeking indemnity.

§ 10.4 The Owner shall not be responsible under Section 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.

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§ 10.5 If, without negligence on the part of the Contractor, the Contractor is held liable for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.6 EMERGENCIES

§ 10.6.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Section 4.3 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;

.2 claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

.3 claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 claims for damages insured by usual personal injury liability coverage;

.5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

.7 claims for bodily injury or property damage arising out of completed operations; and

.8 claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Section 9.10.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

§ 11.2 OWNER'S LIABILITY INSURANCE

§ 11.2.1 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE

§ 11.3.1 Optionally, the Owner may require the Contractor to purchase and maintain Project Management Protective Liability insurance from the Contractor's usual sources as primary coverage for the Owner's, Contractor's and Architect's vicarious liability for construction operations under the Contract. Unless otherwise required by the Contract Documents, the Owner shall reimburse the Contractor by increasing the Contract Sum to pay the cost of purchasing and maintaining such optional insurance coverage, and the Contractor shall not be responsible for purchasing any other liability insurance on behalf of the Owner. The minimum limits of liability purchased with such coverage shall be equal to the aggregate of the limits required for Contractor's Liability Insurance under Sections 11.1.1.2 through 11.1.1.5.

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§ 11.3.2 To the extent damages are covered by Project Management Protective Liability insurance, the Owner, Contractor and Architect waive all rights against each other for damages, except such rights as they may have to the proceeds of such insurance. The policy shall provide for such waivers of subrogation by endorsement or otherwise.

§ 11.3.3 The Owner shall not require the Contractor to include the Owner, Architect or other persons or entities as additional insureds on the Contractor's Liability Insurance coverage under Section 11.1.

§ 11.4 PROPERTY INSURANCE

§ 11.4.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.4 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.4.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.4.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.4.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.4.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.4.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.4.2 Boiler and Machinery Insurance. The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.4.3 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

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§ 11.4.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.4.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.4.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.4.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.4. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.4.7 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.4 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.4.8 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.4.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.4.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with an arbitration award in which case the procedure shall be as provided in Section 4.6. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.4.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved as provided in Sections 4.5 and 4.6. The Owner as fiduciary shall, in the case of arbitration, make settlement with insurers in accordance with directions of the arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

§ 11.5 PERFORMANCE BOND AND PAYMENT BOND

§ 11.5.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

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§ 11.5.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered which the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

§ 12.2.1.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract

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Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

§ 12.3.1 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

§ 13.1.1 The Contract shall be governed by the law of the place where the Project is located.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to an institutional lender providing construction financing for the Project. In such event, the lender shall assume the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

§ 13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

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§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

§ 13.6.1 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

§ 13.7.1 As between the Owner and Contractor:

- **.1** Before Substantial Completion. As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;
- **.2** Between Substantial Completion and Final Certificate for Payment. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and
- **.3** After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- **.1** issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped;
- **.2** an act of government, such as a declaration of national emergency which requires all Work to be stopped;
- **.3** because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** the Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work

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by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has persistently failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

- **.1** persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- **.3** persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Architect that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** finish the Work by whatever reasonable method the Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Architect, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

- **.1** that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of the Contract.

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§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

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SECTION 01100 - SUMMARY

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 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Project consists of restoration of the Ft. White Railroad Depot.

1. Project Location: Ft. White, Florida
2. Owner: Town of Ft. White

B. Architect Identification: The Contract Documents, dated August 24, 2007, were prepared for Project by Hammond Design Group, 317 East Park Ave, Tallahassee, Florida 32301.

C. Project Coordinator: Will be determined.

1. The Work consists of the renovation of the existing wood structure. The building comprises approximately 1260 s.f.. Work includes the lifting and relocation of the building, construction of new brick foundation, new roofing, insulation , mechanical electrical, plumbing, entry steps and h/c access ramp

1.3 CONTRACT[S]

A. Project will be constructed under a general construction contract.

1.4 WORK SEQUENCE

A. The Work shall be conducted in one phase.

1. Phase One: Work of this phase shall be substantially complete and ready for occupancy within 6 months (180 days) of the Notice to Proceed.

1.5 USE OF PREMISES

A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

1.6 WORK UNDER OTHER CONTRACTS

A. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.7 PRODUCTS ORDERED IN ADVANCE

A. General: Owner has negotiated Purchase Orders with suppliers of material and equipment to be incorporated into the Work. Owner has assigned these Purchase Orders to Contractor. Costs for receiving, handling, storage if required, and installation of material and equipment are included in the Contract Sum.

1. Contractor's responsibilities are the same as if Contractor had negotiated Purchase Orders, including responsibility to renegotiate purchase and to execute final Purchase-Order agreements.
2. The Schedule of Products Ordered in Advance is included at the end of this Section.

1.8 OWNER-FURNISHED PRODUCTS

A. Owner will furnish The Work includes providing support systems to receive Owner's equipment.
1. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
2. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
3. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
4. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
5. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.

1.9 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.

1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words

shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

   a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.10 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF PRODUCTS ORDERED IN ADVANCE

END OF SECTION 01100

SECTION 01140 - WORK RESTRICTIONS

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 USE OF PREMISES

A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.

1. Limits: Confine constructions operations to property immediately around the Depot Building and designated property.
2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1.3 OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: Owner will occupy site and existing building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations.

B. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On

occupancy, Owner will provide, operate, and maintain mechanical and electrical systems serving occupied portions of building.

4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01140

SECTION 01270 - UNIT PRICES

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 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. Related Sections include the following:
   1. Division 1 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

A. Unit price is a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A list of unit prices is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

END OF SECTION 01270

SECTION 01732 - SELECTIVE DEMOLITION

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 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected portions of a building or structure.
2. Demolition and removal of selected site elements.
3. Repair procedures for selective demolition operations.

B. Related Sections include the following:

1. Division 1 Section "Summary" for use of the premises and phasing requirements.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

B. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1.5 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project

names and addresses, names and addresses of architects and owners, and other information specified.

B. Schedule of Selective Demolition Activities: Indicate the following:
   1. Coordination for shutoff, capping, and continuation of utility services.
   2. Locations of temporary partitions and means of egress.
   3. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

D. Predemolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Professional Engineer Qualifications: Comply with Division 1 Section "Quality Requirements."

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

1.7 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

   1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Owner assumes no responsibility for condition of areas to be selectively demolished.

   1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Hazardous Materials: Hazardous materials are present in building to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

F. Storage or sale of removed items or materials on-site will not be permitted.

G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

C. Pest Control: Employ a certified, licensed exterminator to treat building and to control rodents and vermin before and during selective demolition operations.

D. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
3. Protect existing site improvements, appurtenances, and landscaping to remain.
4. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

E. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.

F. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.3 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.4 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
5. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
7. Dispose of demolished items and materials promptly.
8. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

D. Roofing: Remove no more existing roofing than can be covered in one day by new roofing. Refer to applicable Division 7 Section for new roofing requirements.

3.5 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

C. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Do not burn demolished materials.

C. Burning: Burning of demolished materials will be permitted only at designated areas on Owner's property, providing required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Transport demolished materials and dispose of at designated spoil areas on Owner's property.

E. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION 01732

SECTION 01770 - CLOSEOUT PROCEDURES

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 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
3. Division 1 Section "Photographic Documentation" for submitting Final Completion construction photographs and negatives.
4. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
5. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
6. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
7. Division 1 Section "Demonstration and Training" for requirements for instruction of Owner's personnel.
8. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.

3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of lis Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
2. Include the following information at the top of each page:

   a. Project name.
   b. Date.
   c. Name of Architect
   d. Name of Contractor.
   e. Page number.

1.6 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

   a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
   b. Accurately record information in an understandable drawing technique.
   c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
   d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Mark important additional information that was either shown schematically or omitted from original Drawings.
4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

E. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.7 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data:

   a. Emergency instructions and procedures.
   b. System, subsystem, and equipment descriptions, including operating standards.
   c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
   d. Description of controls and sequence of operations.
   e. Piping diagrams.

2. Maintenance Data:

a. Manufacturer's information, including list of spare parts.
b. Name, address, and telephone number of Installer or supplier.
c. Maintenance procedures.
d. Maintenance and service schedules for preventive and routine maintenance.
e. Maintenance record forms.
f. Sources of spare parts and maintenance materials.
g. Copies of maintenance service agreements.
h. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.8 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
c. Remove tools, construction equipment, machinery, and surplus material from Project site.
d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
e. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

SECTION 02361 - TERMITE CONTROL

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 the following for termite control:

1. Soil treatment.
2. Bait station system.

1.3 DEFINITIONS

A. EPA: Environmental Protection Agency.

B. PCO: Pest control operator.

1.4 SUBMITTALS

A. Product Data: Treatments and application instructions, including EPA-Registered Label.

B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:

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.

E. Bait Station System Application Report: Submit report for Owner's records information, including the following as applicable:

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

F. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.

B. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is an experienced installer who employs workers trained and approved by bait station system manufacturer to install manufacturer's products.

C. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

1.7 COORDINATION

A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

B. Install bait station system after construction, including landscaping, is completed.

1.8 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, 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.

C. Warranty Period: Three years from date of Substantial Completion.

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

1.9 MAINTENANCE SERVICE

A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

B. 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:

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

1. AgrEvo Environmental Health, Inc.; a Company of Hoechst and Schering, Berlin.
2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
3. Bayer Corp.; Garden & Professional Care.
4. DowElanco.
5. FMC Corp.; Pest Control Specialties.
6. Zeneca Professional Products.

2.2 BAIT STATION SYSTEM

A. General: Provide bait stations and, if applicable, monitoring stations, according to manufacturer's EPA-Registered Label for product, manufacturer's written instructions, and the following:

1. Provide number of stations, based on the dimensions of building perimeter indicated on Drawings, according to manufacturer's written instructions.
2. Comply with manufacturer's written instructions for termite management system. Provide not less than one cluster of stations per 20 linear feet (6 linear meters), based on the linear dimensions of building perimeter indicated on Drawings, consisting of not less than three stations per cluster.

B. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, the following:

C. Product: Subject to compliance with requirements, provide the following product:

1. Hexaflumuron: Sentricon System, Recruit II; DowElanco.
2. Hydramethylnon: Subterfuge; American Cyanamid Co., Agricultural Products Group, Specialty Products Department.
3. Sulfluramid: Systematic Termite Control, FirstLine GT; FMC Corp., Pest Control Specialties.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. 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 and around foundations.

B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. 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 by termiticide manufacturer.

C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.3 APPLICATION, GENERAL

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

3.4 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 the 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 entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along 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.

3.5 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 driplines 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 the PCO.

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

1. Service Frequency: Inspect monitoring stations not less than once every three months.

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

1. Service Frequency: For supplementary and preventive treatment, inspect not less than once every three months.

END OF SECTION 02361

SECTION 02751 - CEMENT CONCRETE PAVEMENT

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 exterior cement concrete pavement for the following:
   1. Parking lots.
   2. Curbs and gutters.
   3. Walkways.

B. Related Sections include the following:
   1. Division 3 Section "Cast-in-Place Concrete" for general building applications of concrete.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, expansive hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

C. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mix Concrete Association's Plant Certification Program.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixes.

G. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Obtain Architect's approval of mockups before starting construction.
4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves of a radius 100 feet (30.5 m) or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

C. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars; assembled with clips.

E. Plain Steel Wire: ASTM A 82, as drawn.

F. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.

G. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

H. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. General: Use the same brand and type of cementitious material from the same manufacturer throughout the Project.

B. Portland Cement: ASTM C 150, Type I or II.

1. Fly Ash: ASTM C 618, Class F or C.
2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

C. Blended Hydraulic Cement: ASTM C 595M, Type IS, portland blast-furnace slag cement.

D. Blended Hydraulic Cement: ASTM C 595M, Type IP portland pozzolan cement.

E. Blended Hydraulic Cement: ASTM C 595M, Type I (PM) pozzolan-modified portland cement.

F. Blended Hydraulic Cement: ASTM C 595M, Type I (SM) slag-modified portland cement.

G. Water: ASTM C 94.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 FIBER REINFORCEMENT

A. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches (13 to 38 mm) long.

B. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches (13 to 38 mm) long.

C. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

D. Products: Subject to compliance with requirements, provide one of the following:

1. Fibrillated Fibers:

    a. Fibrasol F; Axim Concrete Technologies.
    b. Fibermesh; Fibermesh, Div. of Synthetic Technologies.
    c. Forta; Forta Corporation.
    d. Grace Fibers; W. R. Grace & Co., Construction Products Div.

2. Monofilament Fibers:

    a. Fibrasol IIP; Axim Concrete Technologies.
    b. Fiberstrand 100; Euclid Chemical Co.
    c. Fibermix Stealth; Fibermesh, Div. of Synthetic Industries.
    d. Forta Mono; Forta Corporation.
    e. Grace MicroFiber; W. R. Grace & Co., Construction Products Div.
    f. Polystrand 1000; Metalcrete Industries.

2.6 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

E. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

G. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.

H. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

I. Products: Subject to compliance with requirements, provide one of the following:

1. Evaporation Retarder:

   a. Cimfilm; Axim Concrete Technologies.
   b. Finishing Aid Concentrate; Burke Group, LLC (The).
   c. Spray-Film; ChemMasters.
   d. Aquafilm; Conspec Marketing & Manufacturing Co., Inc.
   e. Sure Film; Dayton Superior Corporation.
   f. Eucobar; Euclid Chemical Co.
   g. Vapor Aid; Kaufman Products, Inc.
   h. Lambco Skin; Lambert Corporation.
   i. E-Con; L&M Construction Chemicals, Inc.
   j. Confilm; Master Builders, Inc.
   k. Waterhold; Metalcrete Industries.
   l. Rich Film; Richmond Screw Anchor Co.
   m. SikaFilm; Sika Corporation.
   n. Finishing Aid; Symons Corporation.
   o. Certi-Vex EnvioAssist; Vexcon Chemicals, Inc.

2. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound:

   a. AH Curing Compound #2 DR; Anti-Hydro International, Inc.
   b. Res-X Cure All Resin; Burke Group, LLC (The).
   c. RX Cure; Conspec Marketing & Manufacturing Co., Inc.
   d. Day-Chem Rez Cure; Dayton Superior Corporation.
   e. Kurez DR; Euclid Chemical Co.
   f. Nitocure S; Fosroc.
   g. #64 Resin Cure; Lambert Corporation.
   h. L&M Cure DR; L&M Construction Chemicals, Inc.
   i. 3100-Clear; W. R. Meadows, Inc.
   j. Seal N Kure FDR; Metalcrete Industries.
   k. Rich Cure; Richmond Screw Anchor Co.
   l. Resi-Chem C309; Symons Corporation.
   m. Horncure 30; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.

n. Uni Res 150; Unitex.
o. Certi-Vex RC; Vexcon Chemicals, Inc.

3. Clear Waterborne Membrane-Forming Curing Compound:

a. AH Curing Compound #2 DR WB; Anti-Hydro International, Inc.
b. Aqua Resin Cure; Burke Group, LLC (The).
c. Safe-Cure Clear; ChemMasters.
d. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
e. Day Chem Rez Cure (J-11-W); Dayton Superior Corporation.
f. Nitocure S; Fosroc.
g. Aqua Kure-Clear; Lambert Corporation.
h. L&M Cure R; L&M Construction Chemicals, Inc.
i. 1100 Clear; W. R. Meadows, Inc.
j. Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
k. Rich Cure E; Richmond Screw Anchor Co.
l. Resi-Chem Clear Cure; Symons Corporation.
m. Horncure 100; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
n. Hydro Cure; Unitex.
o. Certi-Vex Enviocure; Vexcon Chemicals, Inc.

4. White Waterborne Membrane-Forming Curing Compound:

a. AH Curing Compound #2 WB WP; Anti-Hydro International, Inc.
b. Aqua Resin Cure; Burke Group, LLC (The).
c. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
d. Thinfilm 450; Kaufman Products, Inc.
e. Aqua Kure-White; Lambert Corporation.
f. L&M Cure R-2; L&M Construction Chemicals, Inc.
g. 1200-White; W. R. Meadows, Inc.
h. White Pigmented Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
i. Rich Cure White E; Richmond Screw Anchor Co.
j. Resi-Chem High Cure; Symons Corporation.
k. Horncure 200-W; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
l. Hydro White 309; Unitex.

2.7 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

C. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

D. Coloring Agent: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.
1. Color: As selected by Architect from manufacturer's full range.

E. Pavement-Marking Paint: Alkyd-resin type; ready mixed; complying with FS TT-P-115, Type I, or AASHTO M 248, Type N.

F. Pavement-Marking Paint: Latex, water-base emulsion; ready mixed; complying with FS TT-P-1952.
1. Color: Blue for handicapped requirements, white elsewhere.

G. Wheel Stops: Precast, air-entrained concrete; 2500-psi (17.2-MPa) minimum compressive strength; approximately 6 inches (150 mm) high, 9 inches (225 mm) wide, and 84 inches (2130 mm) long. Provide chamfered corners and drainage slots on underside, and provide holes for dowel-anchoring to substrate.

1. Dowels: Galvanized steel, diameter of 3/4 inch (19 mm), minimum length 10 inches (254 mm).

H. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

I. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

J. Chemical Surface Retarder: Water-soluble, liquid set retarder with color dye, for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/8 to 1/4 inch (3 to 6 mm).

K. Colored Dry-Shake Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, coloring pigments, and plasticizing admixture. Use coloring pigments that are finely ground, nonfading mineral oxides interground with cement.
1. Color: As selected by Architect from manufacturer's full range.

L. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

M. Products: Subject to compliance with requirements, provide one of the following:

1. Chemical Surface Retarder:

a. True Etch Surface Retarder; Burke Group, LLC (The).
b. Exposee; ChemMasters.
c. Delay S; Conspec Marketing & Manufacturing Co., Inc.
d. Concrete Surface Retarders; Euclid Chemical Co.
e. Expose; Kaufman Products, Inc.
f. Surftard; Metalcrete Industries.
g. Crete-Nox TA; Nox-Crete Products Group, Kinsman Corporation.
h. Lithotex; L. M. Scofield Co.
i. Rugasol-S; Sika Corporation.
j. Certi-Vex Envioset; Vexcon Chemicals, Inc.

2. Colored Dry-Shake Hardener:

a. Conshake 600 Colortone; Conspec Marketing & Manufacturing Co., Inc.
b. Quartz Tuff; Dayton Superior Corporation.
c. Surflex; Euclid Chemical Co.
d. Colorhard; Lambert Corporation.
e. Quartz Plate; L&M Construction Chemicals, Inc.
f. Colorcron; Master Builders, Inc.
g. Floor Quartz; Metalcrete Industries.
h. Richmond Hard Top; Richmond Screw Anchor Co.
i. Lithochrome Color Hardener; L. M. Scofield Co.
j. Harcol; Sonneborn, Div. of ChemRex, Inc.
k. Hard Top; Symons Corporation.

2.8 CONCRETE MIXES

A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.

1. Do not use Owner's field quality-control testing agency as the independent testing agency.

C. Proportion mixes to provide concrete with the following properties:

1. Compressive Strength (28 Days): 4000 psi (27.6 MPa).
2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 4 inches (100 mm).

a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches (200 mm) after adding admixture to plant- or site-verified, 2- to 3-inch (50- to 75-mm) slump.

D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals.

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Ground Granulated Blast-Furnace Slag: 50 percent.
4. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.

G. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus or minus 1.5 percent:

1. Air Content: 5.5 percent for 1-1/2-inch (38-mm) maximum aggregate.

H. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m).

I. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd. (0.9 kg/cu. m).

J. Coloring Agent: Add coloring agent to mix according to manufacturer's written instructions.

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.

B. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.

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

C. Project-Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixers of 1 cu. yd. (0.76 cu. m) or smaller capacity, continue mixing at least one and one-half minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixers of capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 PREPARATION

A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.

1. Apply epoxy repair coating to uncoated or damaged surfaces of epoxy-coated reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

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

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch (50-mm) overlap to adjacent mats.

3.4 JOINTS

A. General: Construct construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.

1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
2. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
3. Provide tie bars at sides of pavement strips where indicated.

4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
5. Use epoxy bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet (15.25 m), unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler less than 1/2 inch (12 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

E. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the following radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.

   a. Radius: 1/4 inch (6 mm).
   b. Radius: 3/8 inch (10 mm).

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

F. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

1. Radius: 1/4 inch (6 mm).

3.5 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.

D. Comply with requirements and with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery, at Project site, or during placement.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

H. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

1. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.

I. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.

J. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.

K. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.

L. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

M. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

N. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 CONCRETE FINISHING

A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.7 SPECIAL FINISHES

A. Monolithic Exposed Aggregate Finish: Expose coarse aggregate to pavement surfaces as follows:

1. Immediately after floating, spray-apply chemical surface retarder to pavement according to manufacturer's written instructions.
2. Cover with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon bristle broom.
4. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required.

B. Seeded Exposed Aggregate Finish: Immediately after floating, broadcast a single layer of aggregate uniformly onto the pavement surface. Tamp seeded aggregate into plastic concrete, and float to entirely embed aggregate with mortar cover of 1/16 inch (1.6 mm).

1. Spray-apply chemical surface retarder to pavement according to manufacturer's written instructions.
2. Cover pavement surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon bristle broom.
4. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required.

C. Slip-Resistant Aggregate Finish: Before final floating, apply slip-resistant aggregate finish to pavement surfaces according to manufacturer's written instructions and as follows:

1. Uniformly spread 25 lb/100 sq. ft. (12 kg/10 sq. m) of dampened nonslip aggregate over the surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
2. After curing, lightly work surface with a steel wire brush or an abrasive stone, and water to expose nonslip aggregate.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch (6 mm).
2. Thickness: Plus 3/8 inch (9 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/4 inch (6 mm).
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch (25 mm).
5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch (6 mm).
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch (13 mm).
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches (6 mm per 300 mm).
8. Joint Spacing: 3 inches (75 mm).
9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

3.11 WHEEL STOPS

A. Securely attach wheel stops into pavement with not less than two galvanized steel dowels embedded in holes cast into wheel stops. Firmly bond each dowel to wheel stop and to pavement. Extend upper portion of dowel 5 inches (125 mm) into wheel stop and lower portion a minimum of 5 inches (125 mm) into pavement.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Testing Agency: Owner will engage a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

C. Testing Services: Testing shall be performed according to the following requirements:

1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C 172, except modified for slump to comply with ASTM C 94.
2. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
3. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
6. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m). One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
7. When total quantity of a given class of concrete is less than 50 cu. yd. (38 cu. m), Architect may waive compressive-strength testing if adequate evidence of satisfactory strength is provided.
8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.

9. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive compressive-strength test results equal or exceed specified compressive strength and no individual compressive-strength test result falls below specified compressive strength by more than 500 psi (3.4 MPa).

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

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

F. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.13 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.

B. Drill test cores where directed by Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

SECTION 03301 - CAST-IN-PLACE CONCRETE (LIMITED APPLICATIONS)

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 specifies cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.

1.3 SUBMITTALS

A. General: In addition to the following, comply with submittal requirements in ACI 301.

B. Product Data: For each type of manufactured material and product indicated.

C. Design Mixes: For each concrete mix.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

C. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

D. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.

1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
2. Formwork and form accessories.
3. Steel reinforcement and supports.
4. Concrete mixtures.
5. Handling, placing, and constructing concrete.
6. Lightweight concrete.

PART 2 - PRODUCTS

2.1 FORMWORK

A. Furnish formwork and form accessories according to ACI 301.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Plain-Steel Wire: ASTM A 82, as drawn.

C. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

D. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

2.3 CONCRETE MATERIALS

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

B. Portland Cement: ASTM C 150, Type II.

C. Portland Cement: ASTM C 150, Types I or II or Type I/II.

D. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch (38-mm) nominal size.

E. Lightweight Aggregate: ASTM C 330.

F. Water: Potable and complying with ASTM C 94.

G. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches (13 to 38 mm) long.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 RELATED MATERIALS

A. Vapor Retarder: Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, not less than 7.8 mils (0.18 mm) thick; or polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick.

B. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 (4.75-mm) sieve and 10 to 30 percent passing a No. 100 (0.15-mm) sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

C. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Compressive Strength (28 Days): 4000 psi (27.6 MPa).

2. Slump: 4 inches (100 mm).

C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.

D. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6.0 percent within a tolerance of plus 1.0 or minus 1.5 percent.

1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

E. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m).

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with ASTM C 94.

B. Ready-Mixed Concrete: Comply with ASTM C 94 and ASTM C 1116.

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

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.

3.2 VAPOR RETARDER

A. Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

1. Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch (0 mm) or minus 3/4 inch (19 mm).

3.3 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect.

C. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

D. Contraction (Control) Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch (3 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.5 CONCRETE PLACEMENT

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Consolidate concrete with mechanical vibrating equipment.

3.6 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch (6 mm) in height rubbed down or chipped off.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
2. Do not apply rubbed finish to smooth-formed finish.
3. Apply the following rubbed finish, defined in ACI 301, to smooth-formed finished concrete.

    a. Smooth-rubbed finish.
    b. Grout-cleaned finish.
    c. Cork-floated finish.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.7 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finish, unless otherwise indicated.

D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

E. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

G. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.8 TOLERANCES

A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.9 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article. Perform tests according to ACI 301.

B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301.

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mix placed each day.

3.11 REPAIRS

A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION 03301

SECTION 04810 - UNIT MASONRY ASSEMBLIES

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 unit masonry assemblies consisting of the following:

1. Concrete masonry units.
2. Mortar and grout.
3. Reinforcing steel.
4. Masonry joint reinforcement.
5. Ties and anchors.
6. Miscellaneous masonry accessories.

B. Related Sections include the following:

1.3 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops the following net-area compressive strengths (f'm) at 28 days. Determine compressive strength of masonry from net-area compressive strengths of masonry units and mortar types according toTables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

B. Provide unit masonry that develops the following net-area compressive strengths (f'm) at 28 days. Determine compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1. For Concrete Unit Masonry: f'm = 2000 psi (13.8 MPa).

1.5 SUBMITTALS

A. Product Data: For each different masonry unit, accessory, and other manufactured product specified.

B. Shop Drawings: Show fabrication and installation details for the following:

1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection: For the following:

1. Unit masonry Samples in small-scale form showing the full range of colors and textures available for each different exposed masonry unit required.

D. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents, unless such deviations are specifically brought to the attention of the Architect and approved in writing.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

F. Material Test Reports: From a qualified testing agency indicating and interpreting test results of the following for compliance with requirements indicated:

1. Each type of masonry unit required.

   a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.
   b. Include test results, measurements, and calculations establishing net-area compressive strength of masonry units.

2. Mortar complying with property requirements of ASTM C 270.
3. Grout mixes complying with compressive strength requirements of ASTM C 476. Include description of type and proportions of grout ingredients.

G. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Each type of masonry unit required.

   a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.
   b. Include test data, measurements, and calculations establishing net-area compressive strength of masonry units.

2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
3. Each combination of masonry unit type and mortar type. Include statement of net-area compressive strength of masonry units, mortar type, and net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
4. Each material and grade indicated for reinforcing bars.
5. Each type and size of joint reinforcement.

6. Each type and size of anchor, tie, and metal accessory.

H. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.

B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

D. Preconstruction Testing Service: Engage a qualified independent testing agency to perform the following preconstruction testing:

E. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Payment for these services will be made by Owner Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.
1. Concrete Masonry Unit Test: For each concrete masonry unit indicated, per ASTM C 140.
2. Mortar Test: For mortar properties per [ASTM C 270] [UBC Standard 21-16].

F. Sample Panels: Before installing unit masonry, build sample panels, using materials indicated for the completed Work, to verify selections made under sample Submittals and to demonstrate aesthetic effects. Build sample panels for each type of exposed unit masonry assembly in sizes approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness.

1. Locate panels in the locations indicated or, if not indicated, as directed by Architect.
2. Clean exposed faces of panels with masonry cleaner.
3. Build mockups for the following types of masonry in sizes approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness, including face and backup wythes and accessories. Include a sealant-filled joint at least 16 inches (400 mm) long in each mockup.
   a. Typical exterior wall.
   b. Typical exterior wall with through-wall flashing installed for a 24-inch (600-mm) length in corner of mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch (300-mm) length of flashing left exposed to view (omit masonry above half of flashing).
4. Clean exposed faces of mockups with masonry cleaner as indicated.
5. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.

6. Notify Architect seven days in advance of dates and times when mockups will be constructed.
7. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

1. Protect Type I concrete masonry units from moisture absorption so that, at the time of installation, the moisture content is not more than the maximum allowed at the time of delivery.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

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

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

1.8 PROJECT CONDITIONS

A. Protection of Masonry: During construction, 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 (600 mm) down both sides and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover 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. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by 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.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

1. When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners.

B. Concrete Masonry Units: ASTM C 90 UBC Standard 21-4 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi (19.3 MPa).
2. Weight Classification: Normal weight.
3. Provide Type I, moisture-controlled units.
4. Provide Type II, nonmoisture-controlled units.
5. Size (Width): Manufactured to the following dimensions:
   a. 8 inches (203 mm) nominal; 7-5/8 inches (194 mm) actual.

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

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2500 psi (17.3 MPa) .
2. Weight Classification: Normal weight.
3. Provide Type I, moisture-controlled units.
4. Provide Type II, nonmoisture-controlled units.
5. Size: Manufactured to the following actual dimensions:

    a. Modular: 3-5/8 inches (92 mm) wide by 2-1/4 inches (57 mm) high by 7-5/8 inches (194 mm) long.

2.2 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 or white cement as required to produce mortar color indicated.

B. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.

1. White-Mortar Aggregates: Natural white sand or ground white stone.

C. Aggregate for Grout: ASTM C 404.

D. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.

E. Water: Potable.

F. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Cold-Weather Admixture:

    a. Accelguard 80; Euclid Chemical Co.
    b. Morseled; W. R. Grace & Co., Construction Products Division.
    c. Trimix-NCA; Sonneborn, Div. of ChemRex, Inc.

2. Water-Repellent Admixture:

    a. Mortar Tite; Addiment Inc.
    b. Dry-Block Mortar Admixture; W. R. Grace & Co., Construction Products Division.
    c. Rheopel; Master Builders.

2.3 REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).

B. Epoxy-Coated Reinforcing Steel: ASTM A 615/A 615M, Grade 60 (Grade 400); epoxy coated to comply with ASTM A 775/A 775M.

2.4 MASONRY JOINT REINFORCEMENT

A. General: ASTM A 951 and as follows:

1. Mill galvanized, carbon-steel wire for interior walls.
2. Hot-dip galvanized, carbon-steel wire for exterior walls.
3. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
4. Hot-dip galvanized, carbon-steel wire for interior walls.
5. Stainless-steel wire for exterior walls.
6. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units where indicated.

B. For single-wythe masonry, provide either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches (407 mm) o.c.

2.5 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.

B. Mill Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 641 (ASTM A 641M), Class 1 coating.

C. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

D. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180), commercial-quality, steel sheet zinc coated by hot-dip process on continuous lines before fabrication.

E. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153.

F. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.6 MISCELLANEOUS ANCHORS

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

B. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) 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. Nonheaded bolts, bent in manner indicated.

C. Postinstalled Anchors: 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 agency.

1. Type: Chemical anchors.
2. Type: Expansion anchors.
3. Type: Undercut anchors.
4. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
5. For Postinstalled Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from [neoprene]

B. Preformed Control-Joint Gaskets: 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: ASTM D 2000, Designation M2AA-805.

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

D. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch (9-mm) OD by 4 inches (100 mm) long.

E. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches (9 by 38 by 89 mm).

F. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.187-inch (4.8-mm) steel wire, hot-dip galvanized after fabrication.

1. Provide units with either two loops or four loops as needed for number of bars indicated.

G. Available Products: Subject to compliance with requirements, cavity drainage materials that may be incorporated into the Work include, but are not limited to, the following:

2.8 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2-cup (0.14-L) dry measure tetrasodium polyphosphate and 1/2-cup (0.14-L) dry measure laundry detergent dissolved in 1 gal. (4 L) of water.

2.9 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, 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.
2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270 UBC Standard 21-15 Proportion Specification.

1. Extended-Life Mortar for Unit Masonry: Mortar complying with ASTM C 1142 may be used instead of mortar specified above, at Contractor's option.
2. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
3. Limit cementitious materials in mortar for exterior and reinforced masonry to portland cement, mortar cement, and lime.
4. For masonry below grade, in contact with earth, and where indicated, use Type [M] [M or RM] [S] [S or RS].

D. Grout for Unit Masonry: Comply with ASTM C 476 UBC Standard 21-19.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 UBC Table 21-C for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143.

2.10 SOURCE QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform source quality-control testing indicated below:

1. Payment for these services will be made by Owner.
2. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.

B. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).

F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets.

Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

1. .

B. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-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 before laying fresh masonry.

D. 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.

E. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

F. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

G. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
3. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 7 Section "Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow 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. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

1. For glazed masonry units, use a nonmetallic jointer 3/4 inch (19 mm) or more in width.

C. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.6 BONDING OF MULTIWYTHE MASONRY

A. Use individual metal ties installed in horizontal joints to bond wythes together. Provide ties as shown, but not less than one metal tie for 4.5 sq. ft. (0.42 sq. m) 2.67 sq. ft. (0.25 sq. m) 1.77 sq. ft. (0.16 sq. m) of wall area spaced not to exceed 36 inches (914 mm) 24 inches (610) 16 inches (406 mm) o.c. horizontally and 16 inches (406 mm) o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches (305 mm) of openings and space not more than 36 inches (915 mm) apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches (610 mm) o.c. vertically.

B. Use masonry joint reinforcement installed in horizontal mortar joints to bond wythes together.

C. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.

D. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
   1. Provide continuity with masonry joint reinforcement by using prefabricated "T" units.

3.7 CAVITIES

A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

   1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

3.8 MASONRY-CELL INSULATION

A. Fill void spaces completely. Maintain inspection ports to show the presence of insulation at the extremities of each pour area. Close the ports after complete coverage has been confirmed. Limit the fall of insulation to 1 story in height, but not to exceed 20 feet (6 m).

3.9 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

   1. Space reinforcement not more than 16 inches (406 mm) o.c.

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

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

3.10 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 (25 mm) 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 (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.11 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as 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 concrete masonry units on one side of control joint. Fill resultant core with grout and rake joints in exposed faces.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake joint.
4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete.

5. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.12 LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.

1. Provide precast lintels made from concrete matching concrete masonry units in color, texture, and compressive strength and with reinforcing bars indicated or required to support loads indicated. Cure precast lintels by the same method used for concrete masonry units.
2. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.
3. Provide either of above at Contractor's option or provide precast or formed-in-place concrete lintels complying with requirements in Division 3 Section "Cast-in-Place Concrete."

C. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

3.13 FLASHING, WEEP HOLES, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

3.14 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make it 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.
2. 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.

B. Placing Reinforcement: Comply with requirements of ACI 530.1/ASCE 6/TMS 602.

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

1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.15 FIELD QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform field quality-control testing indicated below.

1. Payment for these services will be made by Owner.
2. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.

B. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. (465 sq. m) of wall area or portion thereof.

C. Mortar properties will be tested per ASTM C 780.

D. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.

3.16 REPAIRING, POINTING, AND CLEANING

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

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

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly 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 one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

3.17 MASONRY WASTE DISPOSAL

A. Recycling: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Disposal as Fill Material: Dispose of clean masonry waste, including broken masonry units, waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than 4 inches (100 mm) in each dimension.
2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Division 2 Section "Earthwork."
3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.

C. Excess Masonry Waste: Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04810

SECTION 06105 - MISCELLANEOUS CARPENTRY

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 the following:

1. Framing with dimension lumber.
2. Wood blocking, cants, and nailers.
3. Wood furring and grounds.
4. Plywood Sheathing.

B. Related Sections include the following:
1. Division 6 Section "Exterior Architectural Woodwork."

1.3 DEFINITIONS

A. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NELMA - Northeastern Lumber Manufacturers Association.
2. NLGA - National Lumber Grades Authority.
3. SPIB - Southern Pine Inspection Bureau.
4. WCLIB - West Coast Lumber Inspection Bureau.
5. WWPA - Western Wood Products Association.

1.4 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 wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D 5516 and ASTM D 5664.

3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Wood Structural Panels:

1. Plywood: DOC PS 1.
2. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
3. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
4. Factory mark panels according to indicated standard.

2.2 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.

B. Other Framing: Construction or No. 2 grade and any of the following species:
1. Southern pine; SPIB.
2. Mixed southern pine; SPIB.
3. Milled Cypress

2.3 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including the following:
1. Blocking.
2. Cants.
3. Nailers.
4. Furring.
5. Grounds.

B. For items of dimension lumber size, provide No. 2 grade lumber with 19 percent maximum moisture content and any of the following species:

1. Mixed southern pine; SPIB.

2. Eastern softwoods; NELMA.

C. For exposed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 1 grade; SPIB.
2. Milled Cypress.

D. For concealed boards, provide lumber with 19 percent maximum moisture content and **[any of]** the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.
2. Eastern softwoods, No. 2.

2.4 PANEL PRODUCTS

A. Miscellaneous Concealed Plywood: Exterior sheathing, span rating to suit framing in each location, and thickness as indicated but not less than 1/2 inch (13 mm).

B. Plywood Underlayment: DOC PS 1, Exposure 1 Underlayment with fully sanded face, thickness as indicated but not less than 1/2 inch (13 mm).

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 carpentry is 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.

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

C. Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M).

G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

D. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.

E. Countersink fastener heads on exposed carpentry work and fill holes with wood filler.

F. Use fasteners of appropriate type and length. Predrill members when necessary to avoid splitting wood.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 WOOD TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

1. Match color and grain pattern across joints.
2. Install trim after gypsum board joint-finishing operations are completed.
3. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads and fill holes.
4. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.6-mm) maximum offset for reveal installation.

END OF SECTION 06105

SECTION 06401 - EXTERIOR ARCHITECTURAL WOODWORK

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 the following:

1. Exterior standing and running trim.
2. Exterior frames and jambs.
3. Shop priming exterior woodwork.

B. Related Sections include the following:

1. Division 6 Section "Misc. Carpentry" for exposed framing.
2. Division 9 Section "Exterior Wood Stains" for field finishing of exterior architectural woodwork.

1.3 SUBMITTALS

A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of blocking and nailers, including concealed blocking and reinforcement specified in other Sections.

B. Product Certificates: Signed by manufacturers of woodwork certifying that products furnished comply with requirements.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Fabricator Qualifications: A firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of exterior architectural woodwork, construction, finishes, and other requirements.

1. Provide AWI Quality Certification Program indicating that woodwork complies with requirements of grades specified.

1.5 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation of exterior woodwork only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.6 COORDINATION

A. Coordinate sizes and locations of framing, blocking, reinforcements, and other related units of Work specified in other Sections to ensure that exterior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 WOODWORK FABRICATORS

A. Available Fabricators: Subject to compliance with requirements, fabricators offering exterior architectural woodwork that may be incorporated into the Work include, but are not limited to, the following:

B. Fabricators: Subject to compliance with requirements, provide exterior architectural woodwork by one of the following:

2.2 MATERIALS

A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade indicated and, where the following products are part of exterior woodwork, with requirements of the referenced product standards that apply to product characteristics indicated:

B. General: Provide materials that comply with requirements of the WIC quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
1. Softwood Plywood: DOC PS 1, Exterior.

2.3 INSTALLATION MATERIALS

A. Blocking, Shims, and Nailers: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Nails: hot-dip galvanized.

C. Screws: hot-dip galvanized.

1. For metal framing supports, provide self-drilling screws as recommended by metal-framing manufacturer.

D. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts, unless otherwise indicated. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.4 FABRICATION, GENERAL

A. Wood Moisture Content: 10 to 15 percent.

B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).

C. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

D. Shop-cut openings, to maximum extent possible, to receive hardware, 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 seal with a water-resistant coating suitable for exterior applications.

2.5 EXTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

A. Quality Standard: Comply with AWI Section 300.

B. Quality Standard: Comply with WIC Section 7.

C. Grade: Custom.

D. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.

E. Assemble casings in plant except where shipping limitations require field assembly.

F. Wood Species: Cypress.

1. Do not use plain-sawn lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.

2.6 EXTERIOR ORNAMENTAL WORK FOR OPAQUE FINISH

A. Quality Standard: Comply with AWI Section 700.

B. Quality Standard: Comply with WIC Section 8.

C. Grade: Custom.

D. Wood Species: Cypress.

1. Do not use plain-sawn lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.

PART 3 - EXECUTION

3.1 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.

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 removal of packing and backpriming.

3.2 INSTALLATION

A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.

B. Quality Standard: Install woodwork to comply with WIC Section 26 for the same grade specified in Part 2 of this Section for type of woodwork involved.

C. Install woodwork true and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

D. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with recommendations of chemical treatment manufacturer, including those for adhesives used to install woodwork.

F. 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. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork.

G. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches (900 mm) long, except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.

1. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).

H. Complete the finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail and screw holes with matching filler where exposed.

I. Refer to Division 9 Sections for final finishing of installed architectural woodwork.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06401

SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK

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 the following:

1. Interior standing and running trim.
2. Flush wood paneling and wainscots.
3. Interior ornamental work.
4. Stairwork and rails.
5. Interior frames and jambs.

B. Related Sections include the following:
1. Division 6 Section "Paneling."
2. Division 8 Section "Stile and Rail Wood Doors."
3. Division 8 Section "Wood Windows" for stock wood windows.
4. Division 9 Section "Wood Flooring."
5. Division 9 Section "Painting" for field finishing of interior architectural woodwork.

1.3 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items, unless concealed within other construction before woodwork installation.

B. Rough carriages for stairs are a part of interior architectural woodwork. Platform framing, headers, partition framing, and other rough framing associated with stairwork are specified in Division 6 Section "Rough Carpentry."

1.4 SUBMITTALS

A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

4. Apply WIC-certified compliance label to first page of Shop Drawings.
5. . Delete paragraph and subparagraphs above if colors and other characteristics are preselected and specified or scheduled. Retain paragraph and subparagraphs below with or without above.

B. Product Certificates: Signed by manufacturers of woodwork certifying that products furnished comply with requirements.

C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Fabricator Qualifications: A firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Quality Standard: Unless otherwise indicated, comply with WIC's "Manual of Millwork" for grades of interior architectural woodwork, construction, finishes, and other requirements.

1. Provide WIC-certified compliance certificate indicating that woodwork complies with requirements of grades specified.
2. Provide WIC-certified compliance certificate for installation.
3. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with such selections and requirements in addition to the quality standard.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 WOODWORK FABRICATORS

A. Available Fabricators: Subject to compliance with requirements, fabricators offering interior architectural woodwork that may be incorporated into the Work include, but are not limited to, the following:

B. Fabricators: Subject to compliance with requirements, provide interior architectural woodwork by one of the following:

2.2 MATERIALS

A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. General: Provide materials that comply with requirements of the WIC quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
1. Products: Subject to compliance with requirements, provide one of the following:

2.3 INSTALLATION MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln-dried to less than 15 percent moisture content.

C. Rough Carriages for Stairs: Comply with requirements in Division 6 Section "Rough Carpentry." Kiln-dry to less than 15 percent moisture content.

D. Anchors: Select material, type, size, and finish required for 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 sleeves for drilled-in-place anchors.

E. Handrail/Bumper Rail Brackets: Pairs of extruded-aluminum channels; one for fastening to back of rail and one for fastening to face of wall. They are then assembled in overlapping fashion and fastened together top and bottom with self-tapping screws. Sized to provide 1-1/2-inch (38-mm) clearance between handrail and wall.

2.4 FABRICATION, GENERAL

A. Interior Woodwork Grade: Provide Premium grade interior woodwork complying with the referenced quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm).

D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

E. Shop 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. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of openings in countertops with a coat of varnish.

F. Install glass to comply with applicable requirements in Division 8 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

2.5 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

A. Quality Standard: Comply with AWI Section 300.

B. Quality Standard: Comply with WIC Section 10.

C. Grade: Premium.

D. For trim items wider than available lumber, use veneered construction. Do not glue for width.

E. For rails wider or thicker than available lumber, use veneered construction. Do not glue for width or thickness.

F. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.

G. Assemble casings in plant except where limitations of access to place of installation require field assembly.

H. Assemble moldings in plant to maximum extent possible. Miter corners in plant and prepare for field assembly with bolted fittings designed to pull connections together.

2.6 FLUSH WOOD PANELING AND WAINSCOTS

A. Quality Standard: Comply with AWI Section 500 requirements for flush wood paneling.

B. Quality Standard: Comply with WIC Section 11.

C. Grade: Premium.

D. Wood Species and Cut: match existing species and cut>.

1. Lumber Trim and Edges: At fabricator's option, trim and edges indicated as solid wood (except moldings) may be either lumber or veneered construction compatible with grain and color of veneered panels.

E. Panel-Matching Method: No matching between panels is required. Select and arrange panels for similarity of grain pattern and color between adjacent panels.

2.7 INTERIOR ORNAMENTAL WORK FOR TRANSPARENT FINISH

A. Quality Standard: Comply with AWI Section 700.

B. Quality Standard: Comply with WIC Section 11.

C. Grade: Premium.

2.8 STAIRWORK AND RAILS

A. Quality Standard: Comply with AWI Section 800.

B. Quality Standard: Comply with WIC Section 13.

C. Grade: Premium

2.9 INTERIOR FRAMES AND JAMBS FOR TRANSPARENT FINISH

A. Quality Standard: Comply with AWI Section 900.

B. Quality Standard: Comply with WIC Section 12.

C. Grade: Premium.

D. For frames or jambs wider than available lumber, use veneered construction. Do not glue for width.

PART 3 - EXECUTION

3.1 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.

B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.

D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

E. Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening, unless covered by trim

F. Refer to Division 9 Sections for final finishing of installed architectural woodwork.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; 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 shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06402

SECTION 07131 - SELF-ADHERING SHEET WATERPROOFING

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 the following:

1. Rubberized-asphalt sheet waterproofing.

B. Related Sections include the following:

1.3 PERFORMANCE REQUIREMENTS

A. Provide waterproofing that prevents the passage of water.

1.4 SUBMITTALS

A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.

B. Sample Warranty: Copy of special waterproofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions before starting waterproofing.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is acceptable to waterproofing manufacturer to install manufacturer's products.

B. Source Limitations: Obtain waterproofing materials, protection course, through one source from a single manufacturer.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review requirements for waterproofing, including surface preparation specified under other Sections, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver liquid materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by waterproofing manufacturer.

C. Remove and replace liquid materials that cannot be applied within their stated shelf life.

D. Store rolls according to manufacturer's written instructions.

E. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

1. Do not apply waterproofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.8 WARRANTY

A. Special Manufacturer's Warranty: Written warranty, signed by waterproofing manufacturer agreeing to replace waterproofing material that does not comply with requirements or that does not remain watertight during specified warranty period.

1. Warranty does not include failure of waterproofing due to failure of substrate prepared and treated according to requirements or formation of new joints and cracks in substrate exceeding 1/16 inch (1.6 mm) in width.
2. Warranty Period: Five years after date of Substantial Completion.

B. Special Installer's Warranty: Written waterproofing Installer's warranty, signed by Installer, covering Work of this Section, for warranty period of two years.

1. Warranty includes removing and reinstalling protection board, drainage panels, insulation, pedestals, and pavers on plaza decks.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

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

1. Rubberized-Asphalt Sheet Waterproofing:
   a. W. R. Grace & Co.; Ice & Watershield.
   b. Tamko Roofing Products, Inc.; TW-60.

2.2 RUBBERIZED-ASPHALT SHEET WATERPROOFING

A. Rubberized-Asphalt Sheet: 60-mil- (1.5-mm-) thick, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated to a 4-mil- (0.10-mm-) thick, polyethylene film with release liner on adhesive side.

1. Physical Properties: As follows, measured per standard test methods referenced:

   a. Tensile Strength: 250 psi (1.7 MPa) minimum; ASTM D 412, Die C, modified.
   b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
   c. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D 1970.
   d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C 836.
   e. Puncture Resistance: 40 lbf (180 N) minimum; ASTM E 154.
   f. Hydrostatic-Head Resistance: 150 feet (45 m) minimum; ASTM D 5385.
   g. Water Absorption: 0.15 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
   h. Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m); ASTM E 96, Water Method.

2.3 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

B. Sheet Strips: Self-adhering, rubberized-asphalt composite sheet strips of same material and thickness as sheet waterproofing.

C. Substrate Patching Membrane: Low-viscosity, two-component, asphalt-modified coating.

D. Mastic, Adhesives, and Tape: Liquid mastic and adhesives, and adhesive tapes recommended by waterproofing manufacturer.

E. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (225-mm) centers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.

1. Verify that concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
2. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
3. Verify that compacted subgrade is dry, smooth, and sound; ready to receive HDPE sheet.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.

E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Install sheet strips and center over treated construction and contraction joints and cracks exceeding a width of 1/8 inch (3 mm).

F. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.3 RUBBERIZED-ASPHALT SHEET APPLICATION

A. Install self-adhering sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.

B. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.

1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, rubberized-asphalt sheets produced for low-

temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).

D. Two-Ply Application: Install sheets to form a membrane with lap widths not less than 50 percent of sheet widths to provide a minimum of 2 thicknesses of sheet membrane over areas to receive waterproofing.

E. Horizontal Application: Apply sheets from low point to high point of decks to ensure that side laps shed water.

F. Apply continuous sheets over sheet strips bridging substrate cracks, construction, and contraction joints.

G. Seal exposed edges of sheets at terminations not concealed by metal counterflashings or ending in reglets with mastic or sealant.

H. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing.

I. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheets extending 6 inches (150 mm) beyond repaired areas in all directions.

J. Correct deficiencies in or remove sheet waterproofing that does not comply with requirements, repair substrates, reapply waterproofing, and repair sheet flashings.

3.4 PROTECTION AND CLEANING

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07131

SECTION 07210 - BUILDING INSULATION

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 the following:
   1. Cavity wall insulation.
   2. Loose-fill building insulation.

B. Related Sections include the following:
   1. Division 6 Section "Rough Carpentry" for foam-plastic board sheathing over wood framing.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of building insulation through one source.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

   1. Surface-Burning Characteristics: ASTM E 84.
   2. Fire-Resistance Ratings: ASTM E 119.
   3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

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. Glass-Fiber Insulation:

a. CertainTeed Corporation.
b. Johns Manville Corporation.
c. Knauf Fiber Glass.
d. Owens Corning.

2.2 INSULATING MATERIALS

A. General: Provide insulating materials that comply with requirements and with referenced standards.

1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.

B. Unfaced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA; ASTM C 553, Types I, II, and III; or ASTM C 665, Type I; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties:

1. Nominal density of 1.0 lb/cu. ft. (16 kg/cu. m), thermal resistivity of 3.7 deg F x h x sq. ft./Btu x in. at 75 deg F (25.7 K x m/W at 24 deg C).
2. Combustion Characteristics: Passes ASTM E 136.

C. Foil-Faced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA or ASTM C 553, Types I, II, and III; faced on one side with foil-scrim-kraft vapor retarder; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties:

1. Nominal density of 1.0 lb/cu. ft. (16 kg/cu. m), thermal resistivity of 3.7 deg F x h x sq. ft./Btu x in. at 75 deg F (25.7 K x m/W at 24 deg C).

D. Unfaced, Glass-Fiber Board Insulation: ASTM C 612, Type IA or Types IA and IB; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties:

1. Nominal density of 2.25 lb/cu. ft. (36 kg/cu. m), thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F (29.8 K x m/W at 24 deg C).

E. Foil-Faced, Glass-Fiber Board Insulation: ASTM C 612, Type IA or Types IA and IB; faced on one side with foil-scrim-kraft or foil-scrim-polyethylene vapor retarder, with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties:

1. Nominal density of 2.25 lb/cu. ft. (36 kg/cu. m), thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F (29.8 K x m/W at 24 deg C).

F. Glass-Fiber Loose-Fill Insulation: ASTM C 764 for type (method of application) indicated below; maximum flame-spread and smoke-developed indices of 5, and as follows:

1. Type 1 for pneumatic application.
2. Type 2 for poured application.

2.3 VAPOR RETARDERS

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

B. Products: Subject to compliance with requirements, provide one of the following:

1. Reinforced-Polyethylene Vapor Retarders:

a. Raven Industries, Inc.; DURA-SKRIM 6WW.
b. Reef Industries, Inc.; Griffolyn T-65.

C. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils (0.15 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).

D. Reinforced-Polyethylene Vapor Retarders: 2 outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nylon cord or polyester scrim and weighing not less than 25 lb/1000 sq. ft. (12 kg/100 sq. m), with maximum permeance rating of 0.0507 perm (2.9 ng/Pa x s x sq. m).

E. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.4 AUXILIARY INSULATING MATERIALS

A. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

2.5 INSULATION FASTENERS

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

B. Products: Subject to compliance with requirements, provide one of the following:

1. Adhesively Attached, Spindle-Type Anchors:

a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
b. Eckel Industries of Canada Limited; Stic-Klip Type N Fasteners.

c. Gemco; Spindle Type.

2. Adhesively Attached, Angle-Shaped, Spindle-Type Anchor:

a. Gemco; 90-Degree Insulation Hangers.

3. Insulation-Retaining Washers:

a. AGM Industries, Inc.; RC150.
b. AGM Industries, Inc.; SC150.
c. Gemco; Dome-Cap.
d. Gemco; R-150.

4. Insulation Standoff:

a. Gemco; Clutch Clip.

5. Anchor Adhesives:

a. AGM Industries, Inc.; TACTOO Adhesive.
b. Eckel Industries of Canada Limited; Stic-Klip Type S Adhesive.
c. Gemco; Tuff Bond Hanger Adhesive.

C. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:

D. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:

1. Angle: Formed from 0.030-inch- (0.762-mm-) thick, perforated, galvanized carbon-steel sheet with each leg 2 inches (50 mm) square.
2. Spindle: Copper-coated, low carbon steel, fully annealed, 0.105 inch (2.67 mm) in diameter, length to suit depth of insulation indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.

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

3.2 PREPARATION

A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Seal joints between closed-cell (nonbreathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

C. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.

D. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:

1. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
2. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce airtight installation after concealing finish material is in place.

E. Place loose-fill insulation into spaces and onto surfaces as shown, either by pouring or by machine blowing to comply with ASTM C 1015. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.

F. Stuff glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

3.5 INSTALLATION OF VAPOR RETARDERS

A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

B. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches (406 mm) o.c.

C. Seal overlapping joints in vapor retarders with adhesives or vapor-retarder tape according to vapor-retarder manufacturer's instructions. Seal butt joints and fastener penetrations with vapor-retarder tape. Locate all joints over framing members or other solid substrates.

D. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor-retarder manufacturer.

E. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.

F. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

3.6 PROTECTION

A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07210

SECTION 07411 - MANUFACTURED ROOF PANELS

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 the following:

1. Lap-seam roof panels.
2. Formed roof panels of type and profile indicated.

B. Related Sections include the following:
1. Division 6 Section "Rough Carpentry" for wood framing and sheathing.
2. Division 7 Section "Sheet Metal Roofing" for field-formed sheet metal roofing.
3. Division 9 Section "Painting" for priming and painting installed roof panels.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide manufactured roof panel assemblies complying with performance requirements indicated and capable of withstanding structural movement, thermally induced movement, and exposure to weather without failure or infiltration of water into the building interior.

B. Air Infiltration: Provide manufactured roof panel assemblies with permanent resistance to air leakage through assembly of not more than 0.09 cfm/sq. ft. (0.45 L/s/sq. m) of fixed roof area when tested according to ASTM E 1680 at a static-air-pressure difference of 4.0 lbf/sq. ft. (192 Pa).

C. Water Penetration: Provide manufactured roof panel assemblies with no water penetration as defined in the test method when tested according to ASTM E 1646 at a minimum differential pressure of 20 percent of inward acting, wind-load design pressure of not less than 6.24 lb/sq. ft. (300 Pa) and not more than 12.0 lb/sq. ft. (575 Pa).

D. Wind-Uplift Resistance: Provide roof panel assemblies that meet requirements of UL 580 for Class 90 wind-uplift resistance.

E. Structural Performance: Provide manufactured roof panel assemblies capable of safely supporting design loads indicated under in-service conditions with vertical deflection no greater than the following, based on testing manufacturer's standard units according to ASTM E 1592 by a qualified independent testing and inspecting agency.

1. Maximum Deflection: 1/180 of the span.

2. Maximum Deflection: 1/140 of the span.

1.4 SUBMITTALS

A. Product Data: Include manufacturer's product specifications, standard details, certified product test results, and general recommendations, as applicable to materials and finishes for each component and for total panel assemblies.

B. Shop Drawings: Show layouts of panels on roofs, details of edge conditions, joints, panel profiles, supports, anchorages, trim, flashings, underlayment, closures, snow guards, and special details. Distinguish between factory- and field-assembled work.

1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Initial Selection: Manufacturer's color charts or chips showing the full range of colors, textures, and patterns available for roof panels with factory-applied finishes.

D. Samples for Verification: Provide sample panels 12 inches (300 mm) long by actual panel width, in the profile, style, color, and texture indicated. Include clips, caps, battens, fasteners, closures, and other exposed panel accessories.

E. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Product Test Reports: Indicate compliance of manufactured roof panel assemblies and materials with performance and other requirements based on comprehensive testing of current products.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed metal roof panel projects similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated without delaying the Work, as documented according to ASTM E 699.

D. Fire-Test-Response Characteristics: Where fire-resistance-rated roof panel assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire

resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: As indicated by design designations in UL's "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver panels and other components so they will not be damaged or deformed. Package panels for protection against damage during transportation or handling.

B. Handling: Exercise care in unloading, storing, and erecting roof panels to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight and ventilated covering. Store panels to ensure dryness. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, either establish opening dimensions and proceed with fabricating roof panels without field measurements or allow for trimming panel units. Coordinate roof construction to ensure actual locations of structural members and to ensure opening dimensions correspond to established dimensions.

1.8 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Finish Warranty: Submit a written warranty, signed by manufacturer, covering failure of the factory-applied exterior finish on metal roof panels within the specified warranty period and agreeing to repair finish or replace roof panels that show evidence of finish deterioration. Deterioration of finish includes, but is not limited to, color fade, chalking, cracking, peeling, and loss of film integrity.

C. Finish Warranty Period: 20 years from date of Substantial Completion.

D. Special Weathertight Warranty: Submit a written warranty executed by manufacturer agreeing to repair or replace metal roof panel assembly that fails to remain weathertight within the specified warranty period.

E. Weathertight Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

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

1. Steel Roof Panels:
   a. Englert, Inc.
   b. Fabral/Gentec Building Products, Inc.
   c. McElroy Metal, Inc.
   d. Merchant & Evans, Inc.
   e. Metal Building Components, Inc.

2.2 METALS AND FINISHES

A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755 (ASTM A 755M) and the following requirements:

1. Galvanized Steel Sheet: ASTM A 653, G90 (ASTM A 653M, Z275); structural quality.
2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792, Class AZ-50 coating, Grade 40 (ASTM A 792M, Class AZ-150 coating, Grade 275); structural quality.
3. Aluminum-Coated Steel Sheet: ASTM A 463, T1-40 (ASTM A 463M, T1-120) coating.
4. Thickness: 0.034 inch (0.85 mm), unless otherwise indicated.
5. Thickness: 0.028 inch (0.7 mm), unless otherwise indicated.

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M) for alclad alloy 3003 or 3004, with temper as required to suit forming operations and complying with the following requirements:

1. Surface: Smooth, flat, mill finish.
2. Surface: Manufacturer's standard stucco-embossed finish.
3. Alternative alloys include 1100; alclad 3003, 3004, 3105, 5005, and 5050; in A14, H14, H24, H32, or H34 temper.
4. Thickness: 0.032 inch (0.8 mm), unless otherwise indicated.
5. Thickness: 0.040 inch (1.0 mm), unless otherwise indicated.
6. Batten Caps: 0.032 inch (0.8 mm) thick.

C. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 temper, unless otherwise indicated.

1. Weight (Thickness): 16 oz./sq. ft. (0.55 mm), unless otherwise indicated.
2. Batten Caps: 20-oz./sq. ft. (0.7-mm-thick) copper, unless otherwise indicated.

2.3 ROOF PANEL ASSEMBLIES

A. Lap-Seam Roof Panels: Manufacturer's standard factory-formed, lap-seam roof panel assembly designed for mechanical attachment of panels to roof purlins or deck using exposed fasteners and sealants.

2.4 THERMAL INSULATION

A. Building Insulation: Glass-fiber-blanket insulation, complying with ASTM C 991, Type II, of 0.5-lb/cu. ft. (8-kg/cu. m) density, thickness as indicated, with a flame-spread rating of 25 or less, and 2-inch- (50-mm-) wide, continuous, vapor-tight edge tabs.
   1. Facing: Foil-reinforced kraft paper.

2.5 UNDERLAYMENT MATERIALS

A. Fabric Underlayment: Manufacturer's standard nonwoven polyester fabric marketed for use in cold-applied, single-ply roofing weighing 6.0 oz./sq. yd. (200 g/sq. m), white, nonswelling, rot and mildew resistant.

   1. Product: Subject to compliance with requirements, provide "E6N Rufon Fabric" by Amoco Fabric and Fiber Co.

B. Self-Adhering, Polymer-Modified, Bituminous Sheet Underlayment: ASTM D 1970, minimum of 40 mils (1 mm) thick. Provide primer when recommended by underlayment manufacturer.

   1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. Bituthene Ice and Water Shield; Grace: W.R. Grace & Co.
      b. Moisture Guard; Tamko Asphalt Products, Inc.

C. Building Paper: Minimum 5 lb/100 sq. ft. (2.4 kg/sq. m), rosin sized.

D. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.

E. Felts: ASTM D 226, Type I (No. 15), asphalt-saturated organic felts.

2.6 MISCELLANEOUS MATERIALS

A. General: Provide materials and accessories required for a complete roof panel assembly and as recommended by panel manufacturer, unless otherwise indicated.

B. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads.

   1. Use stainless-steel fasteners for exterior applications and galvanized steel fasteners for interior applications.
   2. Provide metal-backed neoprene washers under heads of exposed fasteners bearing on weather side of panels.

3. Locate and space exposed fasteners in true vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.

C. Accessories: Unless otherwise specified, provide components required for a complete roof panel assembly including trim, copings, fasciae, mullions, sills, corner units, ridge closures, clips, seam covers, battens, flashings, gutters, sealants, gaskets, fillers, closure strips, and similar items. Match materials and finishes of panels.

1. Closure Strips: Closed-cell, self-extinguishing, expanded, cellular, rubber or cross-linked, polyolefin-foam flexible closure strips. Cut or premold to match configuration of panels. Provide closure strips where indicated or necessary to ensure weathertight construction.
2. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
3. Elastomeric Joint Sealant: ASTM C 920, of base polymer, type, grade, class, and use classifications required to seal joints in panel roofing and remain weathertight. Provide sealant recommended by panel manufacturer.

D. Expansion-Joint Sealant: For hooked-type expansion joints that must be free to move, provide nonsetting, nonhardening, nonmigrating, heavy-bodied polyisobutylene sealant.

E. Primer: Rust-inhibitive primer recommended by panel manufacturer for finish coat.

2.7 FABRICATION

A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Sound Control: Where sound-absorption requirement is indicated, fabricate interior liner panels with 1/8-inch- (3-mm-) diameter holes uniformly spaced approximately 1000 holes per square foot (10 750 holes per square meter). Cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.

C. Fabricate panel joints with captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will minimize noise from movements within panel assembly.

2.8 PANEL SUPPORTS AND ANCHORAGE

A. Secondary Framing: Provide components complying with the Light Gage Structural Institute's "Guide Specifications," Section 07410, "Manufactured Roof and Wall Panels."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements indicated for conditions affecting performance of metal panel roofing.

1. Panel Supports and Anchorage: Examine roof framing to verify that sheathing and substrate, and other secondary structural panel support members and anchorage have been installed according to wind loads outlined within the 2004 Florida Building Code w/2006 modifications.
2. Do not proceed with roof panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate metal panel roofing with rain drainage work; flashing; trim; and construction of decks, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

B. Promptly remove protective film, if any, from exposed surfaces of metal panels. Strip with care to avoid damage to finish.

3.3 PANEL INSTALLATION

A. General: Comply with panel manufacturer's written instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cutting exterior panels by torch is not permitted.
2. Install panels with exposed exterior and interior fasteners, prefinished to match panel finishes.
3. Install panels over solid substrate with minimum 3:12 (1:4) slope. Install 1 ply of W.R. Grace, Ice & Water Shield and one layer of 30 lb. felt over entire substrate, with at least 3-inch (75-mm) side laps and 4-inch (100-mm) end laps.

B. Accessories: Install components required for a complete roof panel assembly including trim, copings, fasciae, ridge closures, clips, seam covers, battens, flashings, gutters, sealants, gaskets, fillers, closure strips, and similar items.

C. Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating, by applying rubberized-asphalt underlayment to each metal surface, or by other permanent separation as recommended by manufacturers of dissimilar metals.

D. Install Ice & Water Shield and felt underlayment and building-paper slip sheet on roof deck under metal panels, unless otherwise recommended by panel manufacturer. Use adhesive for temporary anchorage, where possible, to minimize use of mechanical fasteners under metal panels. Apply from eave to ridge in single panels.

E. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not otherwise indicated, types recommended by panel manufacturer.

1. Install weatherseal under ridge cap. Flash and seal panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
2. Seal panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by panel manufacturer.

F. Lap-Seam Roof Panels: Provide sealant tape at lapped joints of ribbed or fluted panels and between panels and protruding equipment, vents, and accessories.

1. Apply a continuous ribbon of sealant tape to clean, dry surface of the weather side of fastenings on end laps; on side laps of corrugated nesting-type, ribbed, or fluted panels; and elsewhere as needed to make panels weatherproof to driving rains.

G. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.4 CLEANING AND PROTECTING

A. Damaged Units: Replace panels and other components of the Work that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

B. Cleaning: Remove temporary protective coverings and strippable films, if any, as soon as each panel is installed. On completion of panel installation, clean finished surfaces as recommended by panel manufacturer and maintain in a clean condition during construction.

END OF SECTION 07411

SECTION 08212 - STILE AND RAIL WOOD DOORS

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 the following:

1. Exterior stile and rail wood doors with raised panels.
2. Interior stile and rail wood doors with raised panels.
3. Shop priming stile and rail wood doors.

B. Related Sections include the following:

1. Division 6 Section "Interior Architectural Woodwork" for requirements for custom veneers from the same flitches for both stile and rail wood doors and architectural woodwork.
2. Division 6 Section "Interior Architectural Woodwork" for wood door frames.

1.3 SUBMITTALS

A. Product Data: For each type of door. Include details of construction and glazing.

1. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate doors to be factory finished and finish requirements.

C. Samples for Initial Selection: Color charts consisting of actual materials in small sections for faces of factory-finished doors with transparent finish. Show the full range of colors available for stained finishes.

D. Samples for Verification: Corner sections of doors approximately 8 by 10 inches (200 by 250 mm) showing edges, faces, joinery, and material qualities of typical stile, rail, molding, and panel for each species and door type.

1. Finish sample with same materials proposed for factory-finished doors.

E. Product Certificates: Signed by door manufacturers certifying that the products furnished comply with requirements.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain stile and rail wood doors through one source from a single manufacturer.

B. Quality Standard: Comply with the following standard:

1. NWWDA Quality Standard: NWWDA I.S.6, "Industry Standard for Wood Stile and Rail Doors."

2. AWI Quality Standard: AWI's "Architectural Woodwork Quality Standards" for grade of door, construction, finish, and other requirements.
3. WIC Quality Standard: WIC's "Manual of Millwork" for grade of door, construction, finish, and other requirements.

a. Provide WIC Certified Compliance Certificate indicating that doors meet requirements of grades specified.
b. Provide WIC Certified Compliance Certificate for Installation.

4. Test Pressure: Test at atmospheric pressure.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's written instructions.
1. Individually package doors in cardboard cartons and wrap bundles of doors in plastic sheeting.
2. Comply with WIC's Technical Bulletin 420-R for delivery, storage, and handling of doors.

B. Mark each door with individual opening numbers used on Shop Drawings. Use removable tags or concealed markings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

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. Stile and Rail Doors of Stock Design and Construction:

   a. Eggers Industries; Architectural Door Division.
   b. Jeld-Wen, Inc.
   c. Louisiana Pacific Corp.
   d. Morgan Manufacturing.
   e. Simpson Door Company.

2. Stile and Rail Doors of Special Design and Construction:

   a. Artistic Doors and Windows.
   b. ENJO Doors and Windows.
   c. Karona, Inc.
   d. Maiman Company (The).
   e. Pinecrest.
   f. Woodtech Trading Company.

2.2 STILE AND RAIL DOORS OF STOCK DESIGN AND CONSTRUCTION

A. Exterior Doors Assemble with wet-use adhesives and comply with the following requirements:

1. NWWDA Grade for Transparent Finish: Premium or Select.
2. NWWDA Grade for Opaque Finish: Standard.
3. Wood Species for Transparent Finish: Idaho white, lodgepole, ponderosa, or sugar pine, plain sawed/sliced.
4. Wood Species for Opaque Finish: Manufacturer's standard softwood species and cut for stiles and rails; with panels of same species or wood-base construction materials, as standard with manufacturer.
5. Raised Panel Thickness: Manufacturer's standard, but not less than that required by NWWDA I.S.6 for design group indicated.
6. Raised Panel Thickness: As indicated.
7. Design and Layout: Panel design as described below under NWWDA design group, with minimum dimensions for stiles, rails, panels, mullions, and bars complying with NWWDA I.S.6.

   a. NWWDA Design Group: 1-3/4 Front Entrance Doors (Exterior).

      1) Panel Design: As indicated.

B. Interior Doors: Comply with the following requirements:

1. NWWDA Grade for Transparent Finish: Premium or Select.
2. NWWDA Grade for Opaque Finish: Standard.

3. Wood Species for Transparent Finish: Idaho white, lodgepole, ponderosa, or sugar pine, plain sawed/sliced.

2.3 FABRICATION

A. Fabricate stile and rail wood doors in sizes indicated for Project site fitting.

B. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/2 inch (13 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 3/8 inch (10 mm) from bottom of door to top of threshold.

a. Comply with NFPA 80 for fire-rated doors.

C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

D. Exterior Doors: Factory treat exterior doors after fabrication with water repellent to comply with NWWDA I.S.4. Flash top of outswinging doors with manufacturer's standard metal flashing.

2.4 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime exposed portions of doors for paint finish with one coat of wood primer specified in Division 9 Section "Painting."

B. Transparent Finish: Shop seal faces and edges of doors for transparent finish with stain (if required), other required pretreatments, and first coat of finish as specified in the following:

1. Division 9 Section "Painting."
2. Division 9 Section "Exterior Wood Stains."

2.5 FACTORY FINISHING

A. General: Comply with referenced quality standard's requirements for factory finishing.

B. Finish wood doors at factory.

C. Finish wood doors at factory that are indicated to receive transparent finish. Field finish wood doors indicated to receive opaque finish.

D. Finish wood doors at factory where indicated in schedules or on Drawings as factory finished.

E. Transparent Finish: Comply with requirements indicated for grade, finish system, staining effect, and sheen.

1. Grade: Premium.
2. Staining: As selected by Architect from manufacturer's full range of colors.
3. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine installed door frames before hanging doors.

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
2. Reject doors with defects.

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

3.2 INSTALLATION

A. Hardware: For installation, see Division 8 Section "Door Hardware."

B. Manufacturer's Written Instructions: Install wood doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.

C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.

   a. Comply with NFPA 80 for fire-rated doors.

2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

D. Field-Finished Doors: Refer to the following for finishing requirements:

1. Division 9 Section "Painting."

3.3 ADJUSTING AND PROTECTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Refinish or replace doors damaged during installation.

C. Protect doors as recommended by door manufacturer to ensure that wood doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08212

SECTION 08550 - WOOD WINDOWS

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 the following unfinished wood-framed window product types:
   1. Double-hung windows.
   2. Decorative non-operative fixed windows.

B. Related Sections include the following:
   1. Division 8 Section "Glazing" for glazing requirements for wood windows, including those specified to be factory glazed.

1.3 DEFINITIONS

A. C: Commercial.

B. Performance grade number, included as part of the AAMA/NWWDA product designation code, is actual design pressure in pounds force per square foot (pascals) used to determine structural test pressure and water test pressure.

C. Structural test pressure, for uniform load structural test, is equivalent to 150 percent of design pressure.

D. Minimum test size is smallest size permitted for performance class (gateway test size). Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide wood windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified and that are of test size indicated below:

   1. Minimum size required by AAMA/NWWDA 101/I.S.2.
   2. Minimum size required by gateway performance requirements for determining compliance with AAMA/NWWDA 101/I.S.2 for both gateway performance requirements and optional performance grades.
   3. Size indicated.

B. AAMA/NWWDA Performance Requirements: Provide wood windows of the performance class and grade indicated that comply with AAMA/NWWDA 101/I.S.2.

1. Performance Class: C.

C. Structural Performance: Provide wood windows capable of withstanding the following, including wind loads based on passing AAMA/NWWDA 101/I.S.2, Uniform Load Structural Test, at basic wind speed indicated:

1. Deflection: Based on passing AAMA/NWWDA 101/I.S.2, Uniform Load Deflection Test.
2. Basic Wind Speed: As indicated in miles per hour (meters per second) at 33 feet (10 m) above grade. Determine wind loads and resulting design pressures applicable to Project according to the following, based on mean roof heights above grade as indicated on Drawings:

   a. ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 6.4.2, "Analytic Procedure."
   b. Appendix B in AAMA/NWWDA 101/I.S.2.

3. Design Pressure: 40 lbf/sq. ft. (1920 Pa).

D. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/NWWDA 101/I.S.2, Air Infiltration Test.

1. Maximum Rate: 0.3 cfm/sq. ft. (5 cu. m/h x sq. m) of area at an inward test pressure of 1.57 lbf/sq. ft. (75 Pa).

E. Water Resistance: No water leakage as defined in AAMA/NWWDA referenced test methods at a water test pressure equaling that indicated, when tested according to AAMA/NWWDA 101/I.S.2, Water Resistance Test.

1. Hardware Load Test.

1.5 SUBMITTALS

A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of wood window indicated.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other Work, operational clearances, and the following:

1. Mullion details, including reinforcement and stiffeners.
2. Joinery details.
3. Weather-stripping details.
4. Glazing details.
5. Architect reserves the right to require additional samples that show fabrication techniques, workmanship, and design of hardware and accessories.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An installer acceptable to wood window manufacturer for installation of units required for this Project.

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

C. Source Limitations: Obtain wood windows through one source from a single manufacturer.

D. Product Options: Information on Drawings and in Specifications establishes requirements for wood windows' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

E. Glazing Publications: Comply with published recommendations of glass manufacturers and GANA's "Glazing Manual" unless more stringent requirements are indicated.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify wood window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating wood windows without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace wood windows that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

1. Failure to meet performance requirements.
2. Structural failures including excessive deflection.
3. Water leakage, air infiltration, or condensation.
4. Faulty operation of movable sash and hardware.
5. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
6. Insulting glass failure.

B. Warranty Period: Two years from date of Substantial Completion.

C. Warranty Period for Glass: Five years from date of Substantial Completion.

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:

2.2 MATERIALS, GENERAL

A. Wood: Clear ponderosa pine or another suitable fine-grained lumber; kiln-dried to a moisture content of 6 to 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch (0.8 mm) deep by 2 inches (51 mm) wide; water-repellent preservative treated.

2.3 GLAZING

A. Glass and Glazing Materials: Refer to Division 8 Section "Glazing" for glass units and glazing requirements applicable to glazed wood window units.

B. Glass: **[Clear float glass] [Clear, insulating-glass] [Clear, insulating-glass with low-e coating or film] [Clear, insulating-glass with low-e coating or film, argon-gas filled] <Insert glass type, description, and performance requirements for>** units complying with Division 8 Section "Glazing."

2.4 HARDWARE

A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with wood; designed to smoothly operate, tightly close, and securely lock wood windows and sized to accommodate sash or ventilator weight and dimensions. Do not use aluminum in frictional contact with other metals. Where exposed, provide solid bronze.

B. Locks and Latches: Designed to allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.

2.5 FABRICATION

A. General: Fabricate wood windows, in sizes indicated, that comply with AAMA/NWWDA 101/I.S.2 for performance class and performance grade indicated. Include a complete system for assembling components and anchoring windows.

B. General: Fabricate wood windows, in sizes indicated, that comply with requirements and that meet or exceed AAMA/NWWDA 101/I.S.2 performance requirements for the following window type and performance class. Include a complete system for assembling components and anchoring windows.
1. Double-Hung Windows: **C.**

C. Fabricate wood windows that are reglazable without dismantling sash or ventilator framing.

D. Weather Stripping: Provide full-perimeter weather stripping for each operable sash and ventilator, unless otherwise indicated.

1. Double-Hung Windows: Provide weather stripping only at horizontal rails of operable sash.

E. Factory machine windows for openings and hardware that is not surface applied.

F. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.

G. Factory-Glazed Fabrication: Except for light sizes in excess of 100 united inches (2500 mm width plus length), glaze wood windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 8 Section "Glazing" and with AAMA/NWWDA 101/I.S.2.

1. Groove Glazing: Factory-glazed units without removable stops or other provision permitting convenient field disassembly to facilitate replacement of broken glass will not be accepted.

H. [

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances; rough opening dimensions; levelness of sill plate; coordination with wall flashings, vapor retarders, and other built-in components; and other conditions affecting performance of work.

1. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.

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

3.2 INSTALLATION

A. General: Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components; Drawings; and Shop Drawings.

B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.

D. Metal Protection: Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in "Dissimilar Materials" Paragraph in Appendix B in AAMA/NWWDA 101/I.S.2.

3.3 ADJUSTING

A. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.4 PROTECTION AND CLEANING

A. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

C. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels and clean surfaces.

D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 08550

SECTION 09640 - WOOD FLOORING

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 the following:

1. Solid-wood strip or plank flooring.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for wood substrates, including sleepers and subflooring.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show installation details including location and layout of each type of wood flooring and accessory.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed wood flooring similar in material, design, and extent to that indicated for this Project and whose work has resulted in wood flooring installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of material and product from one source with resources to provide materials and products of consistent quality in appearance and physical properties.

C. Hardwood Flooring: Comply with NOFMA grading rules for species, grade, and cut.

D. Southern Pine Flooring: Comply with SPIB grading rules for species, grade, and cut.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood flooring materials in unopened cartons or bundles.

B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.

C. Store wood flooring materials in a dry, warm, well-ventilated, weathertight location.

D. Move wood flooring into spaces where it will be installed, at least seven days before installation.

1.6 PROJECT CONDITIONS

A. Conditioning: Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75 deg F (18 and 24 deg C) in spaces to receive wood flooring for at least seven days before installation, during installation, and for at least seven days after installation. After post-installation period, maintain relative humidity and ambient temperature planned for building occupants.

1. For unfinished products, open sealed packages to allow wood flooring to acclimatize.
2. Do not install flooring until it adjusts to the relative humidity of and is at the same temperature as the space where it is to be installed.
3. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by flooring and finish manufacturers.

B. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

1.7 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Engineered-Wood Flooring Warranty: Written warranty, signed by manufacturer agreeing to repair or replace engineered-wood flooring that fails in materials or workmanship. Failures include, but are not limited to, buckling, cupping, warping, and delamination.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wood Flooring: Equal to 1 percent of amount installed for each type and finish indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products indicated in the Wood Flooring Schedule at the end of Part 3.

B. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Wood Flooring Schedule at the end of Part 3.

2.2 SOLID-WOOD STRIP AND PLANK FLOORING

2.3 FINISHING MATERIALS

A. Urethane Finish System: Complete system of compatible components that is recommended by finish manufacturer for application indicated.

1. Type: Solvent based, oil modified.
2. Type: Water based.
3. Stain: Penetrating and nonfading type.
    a. Color: Match Architect's sample.
    b. Color: As selected by Architect from manufacturer's full range.
4. Floor Sealer: Pliable, penetrating type.
5. Finish Coats: Formulated for multicoat application on wood flooring.
6. 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:
7. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Basic Coatings.
    b. BonaKemi USA, Inc.
    c. Dura Seal Division; Minwax Co., Inc.
    d. Hillyard Floor Treatments.
    e. Huntington Laboratories, Inc.
    f. National Coatings Co.

B. Wood Filler: Formulated to fill and repair seams, defects, and open-grain hardwood floors; compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved samples, provide pigmented filler.

2.4 ACCESSORY MATERIALS

A. Vapor Retarder: ASTM D 4397, polyethylene sheet not less than 6.0 mils (0.15 mm) thick.

B. Felt Underlayment: ASTM D 226, Type I, No. 15, asphalt-saturated felt.

C. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.

D. Fasteners: As recommended by manufacturer, but not less than that recommended in NOFMA's "Installing Hardwood Flooring."

E. Cork Expansion Strip: Composition cork strip complying with FS HH-C-576, Type I-B, Class 2.

F. Wood Feature Strips: 2-inch- (51-mm-) wide, square-edged walnut strips furnished in lengths as long as practical and in thickness to match wood flooring.

G. Wood Trim: In same species and grade as wood flooring, unless otherwise indicated.

1. Wood Base: 5/8 inch (16 mm) thick by 4 inches (100 mm) high.
2. Base Shoe Molding: 1/2 by 3/4 inch (13 by 19 mm).
3. Threshold: Tapered on each side and routed at bottom of one side to accommodate wood flooring.
4. Reducer Strip: 2 inches (51 mm) wide, tapered on one side, and in thickness matching flooring.

H. Wood air vents and grilles of same species and grade as wood flooring.

I. Metal Feature Strip: 1/8-by-1/8-inch (3-by-3-mm) solid brass strip, designed for inlaying into routed reveal in wood flooring surface.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of wood flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Concrete Slabs: Verify that concrete slabs comply with requirements specified Division 3 Section "Cast-in-Place Concrete."

1. Verify that slabs are dry according to test methods recommended by flooring manufacturer or, if none, by test methods in NOFMA's "Installing Hardwood Flooring."
2. Where wood flooring is installed directly over concrete slabs, grind high spots and fill low spots to provide a maximum 1/4-inch (6-mm) deviation in any direction when checked with a 10-foot (3-m) straight edge.
3. Where wood flooring is adhesively attached to concrete slabs, verify that slabs are free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond.

3.2 INSTALLATION

A. General: Comply with flooring manufacturer's written instructions, but not less than recommendations in NOFMA's "Installing Hardwood Flooring," as applicable to flooring type.

B. Pattern: Lay wood flooring in pattern indicated on Drawings or, if not indicated, as directed by Architect.

C. Expansion Space: Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch (19 mm), unless otherwise indicated on Drawings.

1. Unless fully concealed by trim, fill expansion space with flush cork expansion strip.

D. Felt Underlayment: Where strip or plank flooring is nailed to solid-wood subfloor, install flooring over a layer of asphalt-saturated felt.

E. Vapor Retarder: Where strip or plank flooring is nailed to sleepers over concrete, install flooring over a layer of polyethylene sheet with edges overlapped over sleepers and turned up behind baseboards.

F. Vapor Retarder: Where wood flooring is installed on concrete slabs, install a layer of polyethylene sheet according to flooring manufacturer's written instructions.

G. Solid-Wood Strip and Plank Flooring: Blind nail or staple flooring to substrate according to NOFMA's written recommendations.

1. Plank Flooring: For flooring of face width more than 3 inches (75 mm), install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.

H. Accessories: Nail baseboard to wall and nail shoe molding or other trim to baseboard; do not nail to flooring.

3.3 SANDING AND FINISHING

A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.

B. Apply filler according to manufacturer's written instructions.

1. Fill open-grained hardwood.
2. Fill and repair seams and defects.

C. Apply stain to match approved Sample if required.

D. Apply floor sealer according to finish manufacturer's written instructions.

E. Apply floor finish according to finish manufacturer's written instructions. Apply in number of coats recommended by finish manufacturer for application indicated, but not less than three.

F. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.

3.4 PROTECTION

A. Cover installed wood flooring to protect it from damage or deterioration, before and after finishing, during remainder of construction period. Use heavy kraft-paper or other suitable covering. Do not use plastic sheet or film that could cause condensation.

1. Do not cover site-finished floors with kraft paper, or any other material, until finish reaches full cure, but not less than seven days after applying last coat.

END OF SECTION 09640

SECTION 09912 - PAINTING (PROFESSIONAL LINE PRODUCTS)

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 surface preparation and field painting of exposed [exterior] [and] [interior] items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Architectural woodwork.
b. Acoustical wall panels.
c. Metal toilet enclosures.
d. Finished mechanical and electrical equipment.
e. Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Foundation spaces.
b. Furred areas.
c. Ceiling plenums.

3. Finished metal surfaces include the following:

a. Anodized aluminum.
b. Stainless steel.

c. Chromium plate.

4. Operating parts include moving parts of operating equipment and the following:

a. Valve and damper operators.
b. Linkages.
c. Sensing devices.

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections include the following:

1. Division 2 Section "Hot-Mix Asphalt Paving" for traffic-marking paint.
2. Division 2 Section "Cement Concrete Pavement" for traffic-marking paint.
3. Division 5 Section "Structural Steel" for shop priming structural steel.
4. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
5. Division 6 Section "Exterior Architectural Woodwork" for shop priming exterior architectural woodwork.
6. Division 6 Section "Interior Architectural Woodwork" for shop priming interior architectural woodwork.
7. Division 8 Section "Steel Doors and Frames" for factory priming steel doors and frames.
8. Division 8 Section "Custom Steel Doors and Frames" for factory priming steel doors and frames.
9. Division 8 Section "Wood Windows" for shop priming unclad wood windows.
10. Division 9 Section "Gypsum Board Assemblies" for surface preparation of gypsum board.
11. Division 9 Section "Exterior Wood Stain."
12. Division 9 Section "Multicolored Interior Coatings" for spray-applied multicolored coatings.
13. Division 9 Section "Wall Coverings" for substrate sealer under wall coverings.
14. Division 9 Section "High-Performance Coatings" for industrial paints and maintenance and for special coatings.

E. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

A. Product Data: For each paint system indicated. Include block fillers and primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

B. Samples for Initial Selection: For each type of finish-coat material indicated.

1. After color selection, Architect will furnish color chips for surfaces to be coated.

C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
3. Submit 5 Samples on the following substrates for Architect's review of color and texture only:

a. Concrete: [4-inch- (100-mm-) square] [4-by-6-inch (100-by-150-mm)] Samples for each color and finish.
b. Concrete Unit Masonry: [4-by-8-inch (100-by-200-mm)] [6-by-10-inch (150-by-250-mm)] Samples of masonry, with mortar joint in the center, for each finish and color.
c. Painted Wood: [8-inch- (200-mm-)] [12-inch- (300-mm-)] square Samples for each color and material on hardboard.
d. Stained or Natural Wood: [4-by-8-inch (100-by-200-mm)] [6-by-10-inch (150-by-250-mm)] Samples of natural- or stained-wood finish on representative surfaces.
e. Ferrous Metal: [3-inch- (75-mm-)] [4-inch- (100-mm-)] square Samples of flat metal and [6-inch- (150-mm-)] [8-inch- (200-mm-)] long Samples of solid metal for each color and finish.

D. Qualification Data: For Applicator.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain [block fillers] [and] [primers] for each coating system from the same manufacturer as the finish coats.

C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.

1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.

a. Wall Surfaces: Provide samples on at least [100 sq. ft. (9 sq. m)].
b. Small Areas and Items: Architect will designate items or areas required.

2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.

a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.7 PROJECT CONDITIONS

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

C. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Benjamin Moore & Co. (Benjamin Moore).
2. Coronado Paint Company (Coronado).
3. ICI Paint Stores, Inc. (Dulux Paint).
4. Kelly-Moore Paint Co. (Kelly-Moore).
5. M. A. Bruder & Sons, Inc. (M. A. B. Paint).
6. PPG Industries, Inc. (Pittsburgh Paints).
7. Sherwin-Williams Co. (Sherwin-Williams).

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: [As selected by Architect from manufacturer's full range].

2.3 CONCRETE UNIT MASONRY BLOCK FILLERS

A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.

1. Benjamin Moore; Moorcraft Super Craft Latex Block Filler No. 285: Applied at a dry film thickness of not less than 8.1 mils (0.206 mm).
2. Benjamin Moore; Moore's IMC Latex Block Filler No. M88: Applied at a dry film thickness of not less than 8.1 mils (0.206 mm).
3. Coronado; 946-11 Super Kote 5000 Commercial Latex Block Filler: Applied at a dry film thickness of not less than 8.4 mils (0.214 mm).
4. Dulux Paint; Bloxfil 4000-1000 Interior/Exterior Heavy Duty Acrylic Block Filler: Applied at a dry film thickness of not less than 7.0 to 14.5 mils (0.178 to 0.368 mm).

2.4 EXTERIOR PRIMERS

A. Exterior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic-latex primer for exterior application.

1. Benjamin Moore; Moore's Acrylic Masonry Sealer No. 066: Applied at a dry film thickness of not less than 0.7 mils (0.018 mm).
2. Benjamin Moore; Moore's Alkyd Masonry Sealer No. 077: Applied at a dry film thickness of not less than 2.7 mils (0.069 mm).
3. Coronado; 48-11 Elast-O-Meric Acrylic Masonry Sealer: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
4. Dulux Paint; 2000-1200 Dulux Professional Exterior 100 Percent Acrylic Latex Primer: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

B. Exterior Gypsum Soffit Board Primer: Factory-formulated alkyd- or alkali-resistant acrylic-latex primer for exterior application.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Exterior Primer No. 176: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).
2. Coronado; 8-11 Supreme Acrylic Bonding Primer: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
3. Dulux Paint; 2000-1200 Dulux Professional Exterior 100 Percent Acrylic Latex Primer: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).
4. Kelly-Moore; 250 Color Shield Exterior Acrylic Primer: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).

C. Exterior Wood Primer for Acrylic Enamels: Factory-formulated alkyd or latex wood primer for exterior application.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Exterior Primer No. 176: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).
2. Coronado; 8-11 Supreme Acrylic Bonding Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Dulux Paint; 2000-1200 Dulux Professional Exterior 100 Percent Acrylic Latex Primer: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).
4. Kelly-Moore; 255 Stain--Lock II Stain Resistant Acrylic Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).

D. Exterior Wood Primer for Alkyd Enamels: Factory-formulated alkyd or latex wood primer for exterior application.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Exterior Primer No. 176: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).
2. Coronado; 5-11 Supreme Collection Oil House Paint Primer: Applied at a dry film thickness of not less than 2.2 mils (0.056 mm).
3. Dulux Paint; 2110-1200 Ultra-Hide Durus Exterior Alkyd Primecoat: Applied at a dry film thickness of not less than 1.9 mils (0.048 mm).
4. Kelly-Moore; 220 Weather Shield Exterior Alkyd Primer: Applied at a dry film thickness of not less than 2.3 mils (0.058 mm).

E. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.

2.5 INTERIOR PRIMERS

A. Interior Concrete and Masonry Primer: Factory-formulated alkali-resistant acrylic-latex interior primer for interior application.

1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer No. 253: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
2. Coronado; 40-11 Super Kote 5000 Latex Primer-Sealer: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
3. Dulux Paint; 1030-1200 Ultra-Hide PVA Interior Primer-Sealer General Purpose Wall Primer: Applied at a dry film thickness of not less than 1.9 mils (0.048 mm).
4. Kelly-Moore; 971 Acry-Prime Interior Latex Primer/Sealer: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

B. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.

1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer No. 253: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
2. Coronado; 40-11 Super Kote 5000 Latex Primer-Sealer: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
3. Dulux Paint; 1000-1200 Dulux Ultra Basecoat Interior Latex Wall Primer: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
4. Dulux Paint; 3210-1200 Ultra-Hide Aquacrylic GRIPPER Stain Killer Primer Sealer: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).

C. Interior Plaster Primer: Factory-formulated latex-based primer for interior application.

1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer No. 253: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
2. Coronado; 40-11 Super Kote 5000 Latex Primer-Sealer: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
3. Dulux Paint; 3210-1200 Ultra-Hide Aquacrylic GRIPPER Stain Killer Primer Sealer: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).
4. Kelly-Moore; 247 Chem-Guard Acrylic Masonry Primer: Applied at a dry film thickness of not less than 1.9 mils (0.048 mm).

D. Interior Wood Primer for Acrylic-Enamel and Semigloss Alkyd-Enamel Finishes: Factory-formulated alkyd- or acrylic-latex-based interior wood primer.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Enamel Underbody and Primer Sealer No. 245: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).
2. Coronado; 7-11 Super Kote 5000 Alkyd Primer Undercoat: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Dulux Paint; 3210-1200 Ultra-Hide Aquacrylic GRIPPER Stain Killer Primer Sealer: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).
4. Kelly-Moore; 975 Acry Plex Interior Latex Enamel Undercoat: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

E. Interior Wood Primer for Full-Gloss Alkyd-Enamel Finishes: Factory-formulated alkyd- or acrylic-latex-based interior wood primer.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Enamel Underbody and Primer Sealer No. 245: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).
2. Coronado; 7-11 Super Kote 5000 Alkyd Primer Undercoat: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Dulux Paint; 1120-1200 Ultra-Hide Oil/Alkyd Interior Wood Undercoat: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
4. Kelly-Moore; 985 Flo-Cote Alkyd Enamel Undercoater: Applied at a dry film thickness of not less than 2.5 mils (0.064 mm).

F. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.

1. Benjamin Moore; Moore's IMC Alkyd Metal Primer No. M06: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. Coronado; 35-147 Rust Scat Alkyd Metal Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Dulux Paint; 4130-6130 Devshield Rust Penetrating Metal Primer: Applied at a dry film thickness of not less than 2.2 mils (0.056 mm).
4. Dulux Paint; 4160-6130 Devguard Multi-Purpose Tank & Structural Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).

G. Interior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer.

1. Benjamin Moore; Moore's IMC Acrylic Metal Primer No. M04: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. Coronado; 36-11 Rust Scat Acrylic Metal Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Dulux Paint; 4160-6130 Devguard Multi-Purpose Tank & Structural Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
4. Kelly-Moore; 1722 Kel-Guard Acrylic Galvanized Iron Primer: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).

2.6 EXTERIOR FINISH COATS

A. Exterior Flat Acrylic Paint: Factory-formulated flat acrylic-emulsion latex paint for exterior application.

1. Benjamin Moore; Moorcraft Super Spec Flat Latex House Paint No. 171: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
2. Coronado; 8-Line Supreme Acrylic Latex Flat: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).
3. Dulux Paint; 2200-XXXX Dulux Professional Exterior 100 Percent Acrylic Flat Finish: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
4. Kelly-Moore; 1205 Color Shield Exterior Flat Acrylic House Paint: Applied at a dry film thickness of not less than 1.9 mils (0.048 mm).

B. Exterior Low-Luster Acrylic Paint: Factory-formulated low-sheen (eggshell) acrylic-latex paint for exterior application.

1. Benjamin Moore; Moorcraft Super Spec Low Lustre Latex House Paint No. 185: Applied at a dry film thickness of not less than 1.0 mil (0.025 mm).
2. Coronado; 408-Line Supreme Acrylic Satin Exterior: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).
3. Dulux Paint; 2402-XXXX Dulux Professional Exterior 100 Percent Acrylic Satin Finish: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
4. Kelly-Moore; 1245 Acry-Velvet Exterior Low Sheen Acrylic Finish: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).

C. Exterior Semigloss Acrylic Enamel: Factory-formulated semigloss waterborne acrylic-latex enamel for exterior application.

1. Benjamin Moore; Moorcraft Super Spec Latex House & Trim Paint No. 170: Applied at a dry film thickness of not less than 1.1 mils (0.028 mm).
2. Coronado; 12-Line Supreme Acrylic Semi-Gloss: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).
3. Dulux Paint; 2406-XXXX Dulux Professional Exterior 100 Percent Acrylic Semi-Gloss Finish applied at a dry film thickness of not less than 1.3 mils (0.033 mm).
4. Kelly-Moore; 1250 Acry-Lustre Exterior Semi-Gloss Acrylic Finish: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

D. Exterior Full-Gloss Acrylic Enamel for Concrete, Masonry, and Wood: Factory-formulated full-gloss waterborne acrylic-latex enamel for exterior application.

1. Benjamin Moore; Moore's IMC Acrylic Gloss Enamel M28: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. Coronado; 414 Super Kote 5000 Acrylic Gloss Enamel: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).
3. Dulux Paint; 3028-XXXX Dulux Interior/Exterior Acrylic Gloss Finish: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).
4. Kelly-Moore; 1780 Kel-Guard Acrylic Gloss Enamel: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).

E. Exterior Full-Gloss Acrylic Enamel for Ferrous and Other Metals: Factory-formulated full-gloss waterborne acrylic-latex enamel for exterior application.

1. Benjamin Moore; Moore's IMC Acrylic Gloss Enamel M28: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).

2. Coronado; 80 Line Rust Scat Acrylic Latex High Gloss Enamel: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
3. Dulux Paint; 3028-XXXX Dulux Interior/Exterior Acrylic Gloss Finish: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).
4. Kelly-Moore; 5780 DTM Acrylic Gloss Enamel: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).

F. Exterior Full-Gloss Alkyd Enamel: Factory-formulated full-gloss alkyd enamel for exterior application.

1. Benjamin Moore; Moore's IMC Urethane Alkyd Enamel M22: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. Coronado; 123 Line Super Kote 5000 High Gloss Alkyd Enamel: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).
3. Dulux Paint; 4308-XXXX Devguard Alkyd Industrial Gloss Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
4. Kelly-Moore; 1700 Kel-Guard Gloss Alkyd Rust Inhibitive Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).

2.7 INTERIOR FINISH COATS

A. Interior Flat Acrylic Paint: Factory-formulated flat acrylic-emulsion latex paint for interior application.

1. Benjamin Moore; Moorecraft Super Spec Latex Flat No. 275: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
2. Coronado; 28 Line Super Kote 5000 Latex Flat Paint: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
3. Dulux Paint; 1200-XXXX Dulux Professional Velvet Matte Interior Flat Latex Wall & Trim Finish: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
4. Kelly-Moore; 450 Pro-Wall Interior Flat Latex Wall Paint: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).

B. Interior Flat Latex-Emulsion Size: Factory-formulated flat latex-based interior paint.

1. Benjamin Moore; Moorecraft Super Spec Latex Flat No. 275: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
2. Coronado; 28 Line Super Kote 5000 Vinyl Latex Flat Wall: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
3. Dulux Paint; 1200-XXXX Dulux Professional Velvet Matte Interior Flat Latex Wall & Trim Finish: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
4. Kelly-Moore; 450 Pro-Wall Interior Flat Latex Wall Paint: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).

C. Interior Low-Luster Acrylic Enamel: Factory-formulated eggshell acrylic-latex interior enamel.

1. Benjamin Moore; Moorcraft Super Spec Latex Eggshell Enamel No. 274: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).
2. Coronado; 30-Line Super Kote 5000 Latex Eggshell Enamel: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).

3. Dulux Paint; 1402-XXXX Dulux Professional Acrylic Eggshell Interior Wall & Trim Enamel: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
4. Kelly-Moore; 1610 Sat-N-Sheen Interior Latex Low Sheen Wall and Trim Finish: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

D. Interior Semigloss Acrylic Enamel: Factory-formulated semigloss acrylic-latex enamel for interior application.

1. Benjamin Moore; Moorcraft Super Spec Latex Semi-Gloss Enamel No. 276: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
2. Coronado; 32-Line Super Kote 5000 Latex Semi-Gloss Enamel: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).
3. Dulux Paint; 1406-XXXX Dulux Professional Acrylic Semi-Gloss Interior Wall & Trim Enamel: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).
4. Kelly-Moore; 1649 Acrylic-Latex Semi-Gloss Enamel: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).

E. Interior Full-Gloss Acrylic Enamel: Factory-formulated full-gloss acrylic-latex interior enamel.

1. Benjamin Moore; Moore's IMC Acrylic Gloss Enamel No. M28: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. Coronado; 414 Line Super Kote 5000 Acrylic High Gloss Enamel: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
3. Dulux Paint; 3028-XXXX Dulux Interior/Exterior Acrylic Gloss Finish: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).
4. Kelly-Moore; 1680 Dura-Poxy Gloss Acrylic Enamel: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

F. Interior Semigloss Alkyd Enamel: Factory-formulated semigloss alkyd enamel for interior application.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Semi-Gloss Enamel No. 271: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
2. Coronado; 27-Line Super Kote 5000 Alkyd Semi-Gloss Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Dulux Paint; 1516-XXXX Ultra-Hide Alkyd Semi-Gloss Interior Wall & Trim Enamel: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).
4. Kelly-Moore; 1630--Kel-Cote Interior Alkyd Semi-Gloss Enamel: Applied at a dry film thickness of not less than 2.2 mils (0.056 mm).

G. Interior Full-Gloss Alkyd Enamel for Gypsum Board and Plaster: Factory-formulated full-gloss alkyd interior enamel.

1. Benjamin Moore; Moore's IMC Urethane Alkyd Enamel No. M22: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. Coronado; 123 Line Super Kote 5000 High Gloss Alkyd Enamel: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).
3. Dulux Paint; 4308-XXXX Devguard Alkyd Industrial Gloss Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
4. Kelly-Moore; 1700 Kel-Guard Gloss Alkyd Rust Inhibitive Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).

H. Interior Full-Gloss Alkyd Enamel for Wood and Metal Surfaces: Factory-formulated full-gloss alkyd interior enamel.

1. Benjamin Moore; Moore's IMC Urethane Alkyd Enamel No. M22: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. Coronado; 123 Line Super Kote 5000 High Gloss Alkyd Enamel: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).
3. Dulux Paint; 4308-XXXX Devguard Alkyd Industrial Gloss Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
4. Kelly-Moore; 1630--Kel-Cote Interior Alkyd Semi-Gloss Enamel: Applied at a dry film thickness of not less than 2.2 mils (0.056 mm).

2.8 INTERIOR WOOD STAINS AND VARNISHES

A. Open-Grain Wood Filler: Factory-formulated paste wood filler applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Benwood Paste Wood Filler No. 238.
2. Coronado; none required.
3. Dulux Paint; none required.
4. Kelly-Moore; none required.
5. M. A. B. Paint; Paste Wood Filler.
6. Pittsburgh Paints; none required.
7. Sherwin-Williams; Sher-Wood Fast-Dry Filler.

B. Interior Wood Stain: Factory-formulated alkyd-based penetrating wood stain for interior application applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Benwood Penetrating Stain No. 234.
2. Coronado; 3601-Line Quick-Seal Alkyd Stain.
3. Dulux Paint; 1700-XXX WoodPride Interior Solventborne Wood Finishing Stain.
4. Kelly-Moore; McCloskey Stain.
5. M. A. B. Paint; Wood Stain 062 Line.
6. Pittsburgh Paints; 77-560 Rez Interior Semi-Transparent Oil Stain.
7. Sherwin-Williams; Wood Classics Interior Oil Stain A-48 Series.

C. Clear Sanding Sealer: Factory-formulated fast-drying alkyd-based clear wood sealer applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Moore's Interior Wood Finishes Quick-Dry Sanding Sealer No. 413.
2. Coronado; 81-10 Dual Seal.
3. Dulux Paint; 1902-0000 WoodPride Interior Satin Polyurethane Varnish.
4. Kelly-Moore; 2164 E Z Sand Alkyd Q. D. Sealer.
5. M. A. B. Paint; Minit Dri Sanding Sealer 037-005 Line.
6. Pittsburgh Paints; 6-10 SpeedHide Quick-Drying Interior Sanding Wood Sealer and Finish.
7. Sherwin-Williams; Wood Classics Fast Dry Sanding Sealer B26V43.

D. Interior Alkyd- or Polyurethane-Based Clear Satin Varnish: Factory-formulated alkyd- or polyurethane-based clear varnish.

1. Benjamin Moore; Benwood Interior Wood Finishes Polyurethane Finishes Low Lustre No. 435.
2. Coronado; 67-100 Polyurethane Liquid Plastic Satin Varnish.
3. Dulux Paint; 1902-0000 WoodPride Interior Satin Polyurethane Varnish.
4. Kelly-Moore; 2050 Kel--Aqua Stain Base.
5. M. A. B. Paint; Rich Lux Water Based Satin Polyurethane.
6. Pittsburgh Paints; 77-7 Rez Varnish, Interior Satin Oil Clear.
7. Sherwin-Williams; Wood Classics Fast Dry Oil Varnish, Satin A66-300 Series.

E. Interior Waterborne Clear Satin Varnish: Factory-formulated clear satin acrylic-based polyurethane varnish applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Stays Clear Acrylic Polyurethane No. 423, Satin.
2. Coronado; 70-10 Aqua-Plastic Urethane Clear Satin.
3. Dulux Paint; 1802-0000 WoodPride Interior Waterborne Aquacrylic Satin Varnish.
4. Kelly-Moore; 2097 Kel-Thane II Clear Acrylic Urethane--Satin.
5. M. A. B. Paint; Rich Lux Water Based Satin Polyurethane 088-900s.
6. Pittsburgh Paints; 77-49 Rez Satin Acrylic Clear Polyurethane.
7. Sherwin-Williams; Wood Classics Waterborne Polyurethane Satin, A68 Series.

F. Interior Waterborne Clear Gloss Varnish: Factory-formulated clear gloss acrylic-based polyurethane varnish applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Benwood Interior Wood Finishes Polyurethane Finishes High Gloss No. 428.
2. Coronado; 70-10 Aqua-Plastic Urethane Clear Gloss.
3. Dulux Paint; 1808-0000 WoodPride Interior Waterborne Aquacrylic Gloss Varnish.
4. Kelly-Moore; 2096 Kel-Thane II Clear Acrylic Urethane--Gloss.
5. M. A. B. Paint; Rich Lux Water Based Gloss Polyurethane 088-899 Line.
6. Pittsburgh Paints; 77-45 Rez Full-Gloss Acrylic Clear Polyurethane.
7. Sherwin-Williams; Wood Classics Waterborne Polyurethane Gloss, A68 Series.

G. Paste Wax: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
c. If transparent finish is required, backprime with spar varnish.

d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
10. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by

manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.

2. Omit primer over metal surfaces that have been shop primed and touchup painted.
3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Uninsulated metal piping.
2. Uninsulated plastic piping.
3. Pipe hangers and supports.
4. Tanks that do not have factory-applied final finishes.
5. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
6. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.

G. Electrical items to be painted include, but are not limited to, the following:

1. Switchgear.
2. Panelboards.
3. Electrical equipment that is indicated to have a factory-primed finish for field painting.

H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime

coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

L. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

M. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:

1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.

2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE

A. Concrete, Stucco, and Masonry (Other Than Concrete Unit Masonry): Provide the following finish systems over exterior concrete, stucco, and brick masonry substrates:

1. Flat Acrylic Finish: [Two finish coats] over a primer.

a. Primer: Exterior concrete and masonry primer.
b. Finish Coats: Exterior flat acrylic paint.

2. Low-Luster Acrylic Finish: [Two finish coats] over a primer.

a. Primer: Exterior concrete and masonry primer.
b. Finish Coats: Exterior low-luster acrylic paint.

3. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

a. Primer: Exterior concrete and masonry primer.
b. Finish Coats: Exterior semigloss acrylic enamel.

4. Full-Gloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

a. Primer: Exterior concrete and masonry primer.
b. Finish Coats: Exterior full-gloss acrylic enamel for concrete, masonry, and wood.

B. Concrete Unit Masonry: Provide the following finish systems over exterior concrete unit masonry:

1. Flat Acrylic Finish: [Two finish coats] over a block filler.

a. Block Filler: Concrete unit masonry block filler.
b. Finish Coats: Exterior flat acrylic paint.

2. Low-Luster Acrylic Finish: [Two finish coats] over a block filler.

a. Block Filler: Concrete unit masonry block filler.
b. Finish Coats: Exterior low-luster acrylic paint.

3. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a block filler.

a. Block Filler: Concrete unit masonry block filler.
b. Finish Coats: Exterior semigloss acrylic enamel.

4. Full-Gloss Acrylic-Enamel Finish: [Two finish coats] over a block filler.

   a. Block Filler: Concrete unit masonry block filler.
   b. Finish Coats: Exterior full-gloss acrylic enamel for concrete, masonry, and wood.

C. Smooth Wood: Provide the following finish systems over smooth wood siding, wood trim, and other smooth exterior wood surfaces:

1. Flat Acrylic Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior flat acrylic paint.

2. Low-Luster Acrylic Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior low-luster acrylic paint.

3. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior semigloss acrylic enamel.

4. Full-Gloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior full-gloss acrylic enamel for concrete, masonry, and wood.

5. Full-Gloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for alkyd enamels.
   b. Finish Coats: Exterior full-gloss alkyd enamel.

D. Wood Trim: Provide the following finish systems over exterior wood trim:

1. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior semigloss acrylic enamel.

2. Full-Gloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior full-gloss acrylic enamel for concrete, masonry, and wood.

3. Full-Gloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood trim primer for full-gloss alkyd enamels.
   b. Finish Coats: Exterior full-gloss alkyd enamel.

E. Plywood: Provide the following finish systems over exterior plywood:

1. Flat Acrylic Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior flat acrylic paint.

2. Low-Luster Finish: [Two finish coats] over a primer.

   a. Primer: Exterior wood primer for acrylic enamels.
   b. Finish Coats: Exterior low-luster acrylic paint.

3.8 INTERIOR PAINT SCHEDULE

A. Concrete and Masonry (Other Than Concrete Unit Masonry): Provide the following paint systems over interior concrete and brick masonry substrates:

1. Flat Acrylic Finish: [Two finish coats] over a primer.

   a. Primer: Interior concrete and masonry primer.
   b. Finish Coats: Interior flat acrylic paint.

2. Low-Luster Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior concrete and masonry primer.
   b. Finish Coats: Interior low-luster acrylic enamel.

3. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior concrete and masonry primer.
   b. Finish Coats: Interior semigloss acrylic enamel.

4. Semigloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior concrete and masonry primer.
   b. Finish Coats: Interior semigloss alkyd enamel.

B. Concrete Unit Masonry: Provide the following finish systems over interior concrete masonry:

1. Flat Acrylic Finish: [Two finish coats] over a block filler.

   a. Block Filler: Concrete unit masonry block filler.
   b. Finish Coats: Interior flat acrylic paint.

2. Low-Luster Acrylic-Enamel Finish: [Two finish coats] over a block filler.

   a. Block Filler: Concrete unit masonry block filler.
   b. Finish Coats: Interior low-luster acrylic enamel.

3. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a block filler.

   a. Block Filler: Concrete unit masonry block filler.
   b. Finish Coats: Interior semigloss acrylic enamel.

4. Semigloss Alkyd-Enamel Finish: [Two finish coats] over a filled surface.

   a. Block Filler: Concrete unit masonry block filler.
   b. Finish Coat: Interior semigloss alkyd enamel.

C. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:

1. Flat Acrylic Finish: [Two finish coats] over a primer.

   a. Primer: Interior gypsum board primer.
   b. Finish Coats: Interior flat acrylic paint.

2. Low-Luster Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior gypsum board primer.
   b. Finish Coats: Interior low-luster acrylic enamel.

3. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior gypsum board primer.
   b. Finish Coats: Interior semigloss acrylic enamel.

4. Semigloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior gypsum board primer.
   b. Finish Coats: Interior semigloss alkyd enamel.

5. Full-Gloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior gypsum board primer.
   b. Finish Coats: Interior full-gloss acrylic enamel.

6. Full-Gloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior gypsum board primer.
   b. Finish Coats: Interior full-gloss alkyd enamel for gypsum board and plaster.

D. Plaster: Provide the following finish systems over new interior plaster surfaces:

1. Flat Acrylic Finish: [Two finish coats] over a primer.

   a. Primer: Interior plaster primer.
   b. Finish Coats: Interior flat acrylic paint.

2. Low-Luster Acrylic-Enamel Finish: [Two finish coats] over a primer.

   a. Primer: Interior plaster primer.
   b. Finish Coats: Interior low-luster acrylic enamel.

3. Semigloss Acrylic-Enamel Finish: [**Two finish coats**] over a primer.

   a. Primer: Interior plaster primer.

b. Finish Coats: Interior semigloss acrylic enamel.

4. Semigloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

a. Primer: Interior plaster primer.
b. Finish Coats: Interior semigloss alkyd enamel.

5. Full-Gloss Acrylic-Enamel Finish: [Two finish coats] over a primer.

a. Primer: Interior plaster primer.
b. Finish Coats: Interior full-gloss acrylic enamel.

6. Full-Gloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

a. Primer: Interior plaster primer.
b. Finish Coats: Interior full-gloss alkyd enamel for gypsum board and plaster.

E. Acoustical Plaster: Provide the following finish system over interior acoustical plaster surfaces:

1. Flat Acrylic-Latex Finish: [Two] finish coats.

a. Finish Coats: Interior flat acrylic paint.

F. Wood and Hardboard: Provide the following paint finish systems over new interior wood surfaces:

1. Low-Luster Acrylic-Enamel Finish: [Two finish coats] over a primer.

a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes.
b. Finish Coats: Interior low-luster acrylic enamel.

2. Semigloss Acrylic-Enamel Finish: [Two finish coats] over a wood undercoater.

a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes.
b. Finish Coats: Interior semigloss acrylic enamel.

3. Semigloss Alkyd-Enamel Finish: [Two finish coats] over a primer.

a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes.
b. Finish Coats: Interior semigloss alkyd enamel.

4. Full-Gloss Acrylic-Enamel Finish: [Two finish coats] over a wood primer.

a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes.
b. Finish Coats: Interior full-gloss acrylic enamel.

5. Full-Gloss Alkyd-Enamel Finish: [Two finish coats] over a wood primer.

a. Primer: Interior wood primer for full-gloss alkyd-enamel finishes.
b. Finish Coats: Interior full-gloss alkyd enamel for wood and metal surfaces.

3.9 INTERIOR STAIN AND NATURAL-FINISH WOODWORK SCHEDULE

A. Stained Woodwork: Provide the following stained finishes over new interior woodwork:

1. Alkyd-Based Stain Satin-Varnish Finish: [Two] finish coats of alkyd-based clear satin varnish over a sealer coat and interior wood stain. Wipe wood filler before applying stain.

   a. Filler Coat: Open-grain wood filler.
   b. Stain Coat: Interior wood stain.
   c. Sealer Coat: Clear sanding sealer.
   d. Finish Coats: Interior alkyd- or polyurethane-based clear satin varnish.

2. Waterborne Stain Satin-Varnish Finish: [Two] finish coats of waterborne clear satin varnish over a sealer coat and waterborne interior wood stain. Wipe wood filler before applying stain.

   a. Filler Coat: Open-grain wood filler.
   b. Stain Coat: Interior wood stain.
   c. Sealer Coat: Clear sanding sealer.
   d. Finish Coats: Interior waterborne clear satin varnish.

3. Waterborne Stain Full-Gloss Varnish Finish: [Two] finish coats of waterborne clear full-gloss varnish over a sealer coat and interior wood stain. Wipe filler before applying stain.

   a. Filler Coat: Open-grain wood filler.
   b. Stain Coat: Interior wood stain.
   c. Sealer Coat: Clear sanding sealer.
   d. Finish Coats: Interior waterborne clear gloss varnish.

4. Alkyd-Based Stain Wax-Polished Finish: [Three] finish coats of paste wax over a sealer coat and alkyd-based interior wood stain.

   a. Stain Coat: Interior wood stain.
   b. Sealer Coat: Clear sanding sealer.
   c. Finish Coats: Paste wax.

B. Natural-Finish Woodwork: Provide the following natural finishes over new interior woodwork:

1. Alkyd-Based Satin-Varnish Finish: [Two] finish coats of alkyd-based clear satin varnish over a sanding sealer. Provide wood filler on open-grain wood before applying first varnish coat.

   a. Filler Coat: Open-grain wood filler.
   b. Sealer Coat: Clear sanding sealer.
   c. Finish Coats: Interior alkyd- or polyurethane-based clear satin varnish.

2. Waterborne Satin-Varnish Finish: [Two] finish coats of waterborne clear satin varnish over a sanding sealer. Wipe wood filler before applying stain.

   a. Filler Coat: Open-grain wood filler.
   b. Sealer Coat: Clear sanding sealer.
   c. Finish Coats: Interior waterborne clear satin varnish.

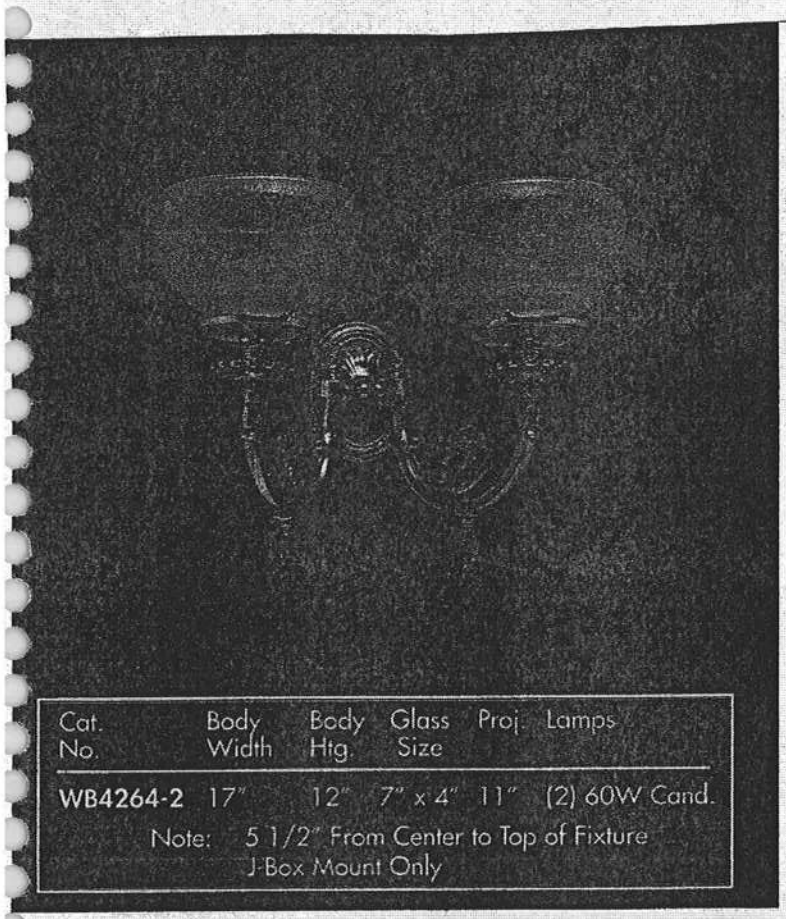
3. Waterborne Full-Gloss Varnish Finish: [Two] finish coats of waterborne clear full-gloss varnish over a sealer coat. Wipe filler before applying stain.

   a. Filler Coat: Open-grain wood filler.
   b. Sealer Coat: Clear sanding sealer.
   c. Finish Coats: Interior waterborne clear gloss varnish.

4. Wax-Polished Finish: [Three] finish coats of paste wax over a sanding-sealer first coat.

   a. Sealer Coat: Clear sanding sealer.
   b. Finish Coats: Paste wax.

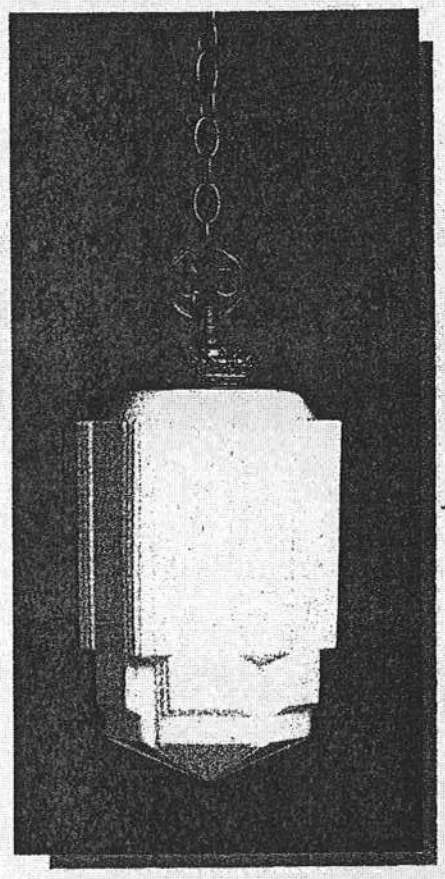
END OF SECTION 09912



Cat. No.	Body Width	Body Htg.	Glass Size	Proj.	Lamps
WB4264-2	17"	12"	7" x 4"	11"	(2) 60W Cand.

Note: 5 1/2" From Center to Top of Fixture
J-Box Mount Only

Type C ↑



Type A ↑

CAT. NO.	BODY SIZE	O'ALL LGT.	LAMPS
1840	10" x 16"	36"	1-300W

Type B →

CAT. NO.	BODY SIZE	O'ALL LGT.	LAMPS
~~1841~~	~~9" dia., 12" hgt.~~	~~12"~~	~~1-60W~~
1842	8" dia., 12" hgt.	9" ext.	1-75W

GLASS: White Opal

METAL FINISHES ON 1800 SERIES: **Antique Shaded Gold, Traditional Bronze, Statuary Bronze & Gold, Swedish Iron, See Page 43.**

METAL FINISHES ON 4200 SERIES: **Polished Chrome, Polished Brass, or Painted**

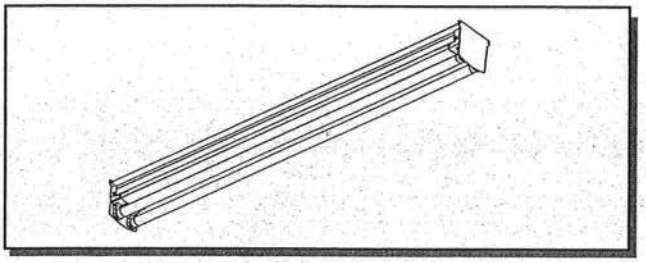
TREND Lighting

2700 SYDNEY ST. • ST. LOUIS, MO 63104 • 800-325-9532
314-773-1340

TYPE D

Day-Brite® Lighting

HEAVY DUTY STRIP



4' or 8'
1 or 2 Lamp
T8 or T12

CONSTRUCTION/FINISH

- Premium heavy duty industrial channel for added rigidity.
- Suitable for unit or row mounting in surface or suspended applications.
- Housing and end caps are multi-stage phosphate treated for maximum corrosion resistance and painted after fabrication with high reflectance white polyester powder coating.
- Thumbscrews secure channel cover for easy wireway access.

ELECTRICAL

- All 380mA, 800mA, and 1500mA models must be suspended a minumum of 1-1/2" from surface.
- High output 380mA (44HO, 86HO), high output 800mA (48HO, 96HO) and very high output 1500mA (48VH, 96VH) models come standard with -20°F start ballast where available.
- 32wT8, 40wT12, and Slimline models UL listed for direct mounting on low density ceilings.
- UL listed for damp locations. Units incorporating emergency ballasts UL listed for dry locations.
- Class P, HPF ballasts comply with ℗Federal Ballast Law (Public Law 100-357,1988).
- Green grounding screw installed in channel.
- Lampholders may be individually replaced or rewired.

ACCESSORIES

- **CG-4** – 4' Wire guard
- **3395** – Adjustable conduit hangers
- **5988W/5977W** – Hydee hangers
- **CS-400** – Rigid stem canopy
- **CS-500** – Swivel stem canopy
- **CS series stems**
- **FL-111** – Sliding hanger, conduit/stem/screw
- **FL-116** – Sliding hanger, chain suspension
- **FL-117** – Hook, chain
- **FL-118** – Sliding hanger, messenger cable
- **FL-119** – Hook, messenger cable
- **FL-123** – 5' chain (w/S-hooks) set
- **N-3380/3381** – Universal joint aligner, octagonal box, 1/2" / 3/4" I.P.S.
- **N-3385** – Universal joint aligner, square box, 1/2" I.P.S.

CATALOG NUMBER

[ ] [ ] [ ] – [ ] – [ ]

FIXTURE FAMILY
- **HDS** – Heavy Duty Strip
- **THDS** – Tandem Version

LAMP TYPE/WATTAGE
- **28** – 28wT5 (46")
- **32** – 32wT8 (48")
- **40** – 40wT12 (48")
- **48** – 38wT12 Slimline (48")
- **44HO** – 44wT8 380mA (48")
- **48HO** – 60wT12 800mA (48")
- **48VH** – 110wT12 1500mA (48")
- **54HO** – 54wT5HO (46")
- **59** – 59wT8 (96")
- **96** – 75wT12 Slimline (96")
- **86HO** – 86wT8 380mA (96")
- **96HO** – 110wT12 800mA (96")
- **96VH** – 215wT12 1500mA (96")

NO. OF LAMPS PER CROSS SECTION
(not included)
- **1**
- **2**

VOLTAGE
- **120**
- **277**
- **347**
- **UNV** – Universal voltage, 120-277 volt (with t8 or T5 electronic ballast only)

OPTIONS
- **CM** – Canadian Market
- **1/2** – One 2-lamp ballast (electronic or non-standard)
- **1/4** – One 4-lamp ballast (electronic or non-standard)
- **2/2** – Two 2-lamp ballasts (electronic or non-standard)
- **EB** – Electronic ballast, <20% THD
- **EBH** – High ballast factor electronic ballast (F32T8 only)
- **EB10I** – Electronic ballast, instant start, <10% THD
- **EB10R** – Electronic ballast, program rapid start, <10% THD
- **E1** – DEB-1 emerg. ballast, 350-450 lumens, UL dry loc.
- **E7** – DEB-7 emerg. ballast, 600-700 lumens, UL dry loc.
- **E5** – DEB-5 emerg. ballast, 1100-1400 lumens, UL dry loc.
- **E5ST** – DEB-5ST emerg. ballast w/self test, 1100-1400 lumens, UL dry loc.
- **GLR#** – Fusing, fast blow (# = number of ballasts)
- **LT** – Low temperature (0°F) start ballast (standard on F32T8, HO, VHO)

Power-Connect modular wiring – see sheet 1604-OA

See section 1600-OA for option info.

JOB INFORMATION

1107-S

Job Name:

Type:

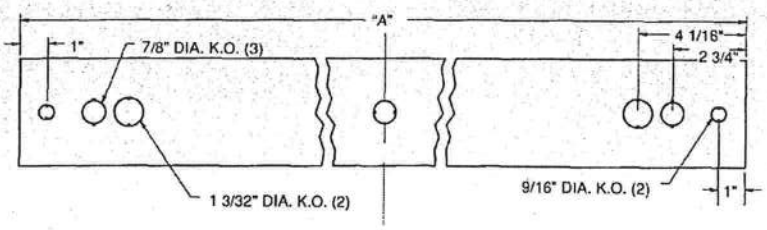
HEAVY DUTY STRIP

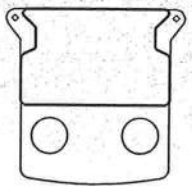
TYPE D

Day-Brite® Lighting

DIMENSIONS

		DIM "A"
4' CHANNEL	(1219 mm)	48"
8' CHANNEL	(2439 mm)	96"





PHOTOMETRIC DATA

CATALOG # HDS232-1/2-EB **LAMPS =** F32T8 **INPUT WATTS =** 61
TEST # 14719 **S/MH=** 1.6 **BALLAST =** ELECTRONIC **BALLAST FACTOR =** .88

LER = FS-78

COMPARATIVE YEARLY LIGHTING ENERGY COST PER 1000 LUMENS = **$3.08** BASED ON 3000 HRS. AND $.08 PER KWH.

FIXTURE EFFICIENCY= 93.3%

CANDLEPOWER

Angle	End	45	Cross
0	1019	1019	1019
5	1015	1018	1019
15	976	1009	1034
25	901	990	1059
35	793	958	1059
45	656	898	1019
55	494	800	956
65	320	688	911
75	154	590	718
85	28	308	432
95	2	325	452
105	3	305	512
115	2	230	379
125	2	160	334
135	6	104	236
145	6	46	133
155	7	5	42
165	8	6	6
175	9	5	6

MAINTAINED ILLUMINATION TABLE- Square Feet/Fixture*

- 80-50-20 Reflectances (Ceiling-Wall-Floor)
- LLF = 0.75 2900 Lumens/Lamp Clean
- Room width divided by room height = 5 or more, 2 or 1

Fixture Size & # of Lamps	Room Width / Room Height =	Approx. Area (sq. ft.) per Fixture 10 ft-c	30 ft-c	50 ft-c	70 ft-c	100 ft-c
2-Lamp 32 watt	5	-	130	78	56	39
	2	-	84	50	36	-
	1	-	59	36	-	-

*Observe Fixture S/MH Requirements for Specific Applications

AVERAGE LUMINANCE CD/SQ.M WITH 2900 LUMEN LAMPS

ANGLE	END	45°	CROSS
45	6257	6389	6686
55	5693	6243	6738
65	4843	6152	7171
75	3551	6404	6627
85	1448	4423	5003

TYPICAL V.C.P.'s

Room Size	Mounting Height Lengthwise 8.5	Lengthwise 10	Crosswise 8.5	Crosswise 10
30x30	22	27	16	20
40x40	19	22	14	17
60x30	23	26	19	23
60x60	17	19	13	14
100x100	17	18	12	13

LLF = .75 LLF = LIGHT LOSS FACTOR LLF = LDD X LLD X BF LDD = VERY CLEAN 0.94 CLEAN 0.90
LLD = 0.91 @ 40% RATED LAMP LIFE BF = 0.88 ELECTRONIC BALLAST & T8 LAMP (RELAMP AT 70% LAMP LIFE)

COEFFICIENT OF UTILIZATION

pfc	20							
pcc	80			70			50	
pw	70	50	30	70	50	30	50	30
RCR								
0	107	107	107	102	102	102	93	93
1	94	89	83	90	84	81	78	73
2	84	76	68	80	72	66	66	60
3	77	66	56	71	63	55	56	51
4	69	56	48	66	55	46	50	42
5	64	51	41	59	48	40	44	36
6	57	45	36	55	42	34	40	33
7	54	40	32	51	39	30	35	28
8	50	36	28	46	35	28	33	26
9	46	34	26	44	32	25	29	23
10	44	30	23	40	29	23	28	20

LIGHT DISTRIBUTION

DEGREES	LUMENS	% LAMP	% FIXTURE
0-30	839	14.5	15.5
0-40	1429	24.6	26.4
0-60	2793	48.1	51.6
0-90	4316	74.4	79.8
90-180	1094	18.9	20.2
0-180	5410	93.3	100.0

PHOTOMETRIC DATA

CATALOG # HDS296HO-1/2-EB **LAMPS =** F96T12HOES **INPUT WATTS =** 165
TEST # 10973 **S/MH=** 1.6 **BALLAST =** ELECTRONIC **BALLAST FACTOR =** 1.00

LER = FS-94

COMPARATIVE YEARLY LIGHTING ENERGY COST PER 1000 LUMENS = **$2.55** BASED ON 3000 HRS. AND $.08 PER KWH.

FIXTURE EFFICIENCY= 97.1%

CANDLEPOWER

Angle	End	45	Cross
0	3029	3029	3029
5	3035	3033	3029
15	2932	3014	3091
25	2724	2961	3152
35	2423	2850	3148
45	2039	2659	3054
55	1553	2371	2804
65	1042	1956	2379
75	575	1453	1948
85	205	1098	1488
95	37	897	1342
105	1	734	1186
115	1	550	987
125	1	414	739
135	1	290	531
145	1	169	347
155	1	79	190
165	1	29	52
175	1	13	20

MAINTAINED ILLUMINATION TABLE- Square Feet/Fixture*

- 80-50-20 Reflectances (Ceiling-Wall-Floor)
- LLF = 0.88 8000 Lumens/Lamp very clean
- Room width divided by room height = 5 or more, 2 or 1

Fixture Size & # of Lamps	Room Width / Room Height =	Approx. Area (sq. ft.) per Fixture 10 ft-c	30 ft-c	50 ft-c	70 ft-c	100 ft-c
1' X 4' 2 Lamp	5	-	-	-	-	130
	2	-	-	-	120	84
	1	-	-	120	86	60

*Observe Fixture S/MH Requirements for Specific Applications

AVERAGE LUMINANCE CD/SQ.M WITH 2550 LUMEN LAMPS

ANGLE	END	45°	CROSS
45	11569	11885	12633
55	10789	11918	12756
65	9714	11634	12441
75	8540	10991	12423
85	8088	11903	12650

LLF = .88 LLF = LIGHT LOSS FACTOR LLF = LDD X LLD X BF LDD = VERY CLEAN 0.94 CLEAN 0.90
LLD = 0.93 @ 40% RATED LAMP LIFE BF = 1.00 ELECTRONIC BALLAST T8 & T12 LAMP (RELAMP AT 70% LAMP LIFE)

COEFFICIENT OF UTILIZATION

pfc	20							
pcc	80			70			50	
pw	70	50	30	70	50	30	50	30
RCR								
0	111	111	111	107	107	107	97	97
1	98	93	88	93	89	83	81	78
2	89	79	71	83	76	68	69	64
3	80	68	59	76	66	57	59	54
4	72	59	51	68	57	48	53	46
5	67	53	44	63	51	41	46	40
6	60	47	38	57	46	36	41	34
7	56	42	34	54	40	33	38	30
8	52	39	29	50	36	28	34	28
9	48	34	27	46	34	26	32	25
10	46	33	25	44	30	23	28	23

LIGHT DISTRIBUTION

DEGREES	LUMENS	% LAMP	% FIXTURE
0-30	2502	15.6	16.1
0-40	4264	26.7	27.4
0-60	8315	52.0	53.5
0-90	12735	79.6	82.0
90-180	2802	17.5	18.0
0-180	15536	97.1	100.0

DAY-BRITE LIGHTING • www.daybritelighting.com
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CANADIAN DIVISION
189 Bullock Drive • Markham, Ontario L3P 1W4 • PH: (905) 294-9570 • FAX: (905) 294-9811

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Day-Brite® Lighting
a Genlyte company

TYPE E1

mcPhilben® emergency lighting

Xtest™

CODES AND STANDARDS
UL Listed to Standard 924. Low profile meets NFPA 101 (Life Safety Code)
NFPA 70 (NEC)
ADA specifications on lighting fixtures.
All units are UL listed for damp locations as an optional feature.

VOLTAGE INPUT
120/277 VAC selectable input.

FINISH
All units are available in white or black.

HOUSING
Flame rated, UV stable, ABS thermoplastic housing.

INSTALLATION
Snap-together quick mount design. Wall mounted only. Mounts up to a standard 4" square outlet box. Pop-out chevron directional indicators are easily removed when required.

BATTERY
6 volt maintenance-free lead calcium battery provides 90 minutes of emergency illumination, temperature range 65°F to 85°F.

LAMP HEADS
CCAX Series emergency unit contains 6 volt, 6 watt halogen MR16 lamps, semi-recessed eyeball style lighting heads.

LED LAMPS
Available with bright red or green energy efficient LED lamps. Uniform 6" letter illumination (3/4" stroke). Long-life LED's have an expected life of 10 years.

ELECTRONICS
All combo units are standard with Xtest™ self-diagnostic/self testing circuitry. The Xtest™ management system controls test parameters within the embedded micro-controller to verify that all system components are functioning properly. This is accomplished using various system checks on a continuous basis, as well as hourly and monthly tests. Several manual tests can also be initiated or cancelled at any time by pressing the test switch. During automatic self-test or manual test the green AC status indicator will flash. Any malfunction is reported via the appropriate LED indicators. Xtest™ complies with all the latest UL924 and NFPA 101 requirements for self-diagnostic/self-testing operation. For complete details on many of the exclusive features that the Xtest™ System offers, including the correction of input wiring errors before applying power, refer to specification sheet ERC2001.1.

CATALOG NUMBER (Example: CCAXL1RW)

FAMILY	NUMBER OF FACES	PANEL COLOR	HOUSING COLOR	OPTIONS
CCAXL				
CCAXL - LED Combo with Xtest Self-Diagnostics	**1** - Single Face **3** - Universal*	**R** - Red **G** - Green	**W** - White **B** - Black	**F** - Flasher **FI** - Fire Alarm Flashing Interface **DR** - Damp Location Rating **TD** - Time Delay [1,2,3] **LS** - Less Self-test Feature of Lamps[1,3] **LX** - Manual test activation via remote laser[1] **FB** - Flashing/Audible Buzzer Alarm **SA** - Salida **H** - 6v, 9W halogen MR16 Lamps

Footnotes:
*Includes extra stencil face and ceiling mount canopy.
[1] Refer to spec sheet ERC2001.1 for details.
[2] 15 minute time delay.
[3] Cannot have LS and TD options together on combo.

ACCESSORIES CCAX SERIES

CCFCK	Field mounted ceiling kit for mounting CCAX combo to ceiling.
WG5	Wire Guard
RLT	Remote Laser Tester
PVS3	Polycarbonate Vandal Shield

Job Name:

Type: _____

Voltage: _____

TYPE E2

mcPhilben emergency lighting

CCAX SERIES COMPAC® Thermoplastic Combo

SPECIFICATIONS

CONSTRUCTION

Front housing cover and back plate of CCAX unit and the stencil face plates, housing, canopy, pop-out chevrons, and back plate of the exit sign are constructed of a flame-rated, UV stable, ABS thermoplastic material.

BATTERY/ELECTRONICS

Six volt maintenance free lead calcium battery, temperature range from 65°F to 85°F. Standard emergency electronics provide a state-of-the-art self-test/self-diagnostic circuit. Features an exclusive system that aids in correcting wiring mistakes by checking power and wiring before applying a load to system components. All emergency units have built in circuitry protection/low-voltage battery disconnect and transformer isolation. solid state charger, test switch and green LED AC status indicator, along with three red fault indicators

Xtest™ TESTING SPECIFICATIONS

Automatic Test:

The system charger and lamps are continually being controlled via pre-determined parameters specific to each model configuration, automatically.

The battery is controlled via a true open circuit test each hour after initial installation.

Every thirty days the Xtest™ System illuminates lamps under load for 30 minutes, simulating a power outage with a true charger off condition, without affecting long-term battery life. This is above and beyond the requirements of the National Electric Code and /or the National Fire Protection Association, which only requires a full load 30 second test once each month. This gives you unequaled control and confidence, knowing you are meeting self-test code requirements each and every month.

Manual Test:

A manual test switch allows for the Xtest™ system to perform the following tests at any time:

Press Button:

Once– 5 second, charger off, no load
Twice– 60 second, charger off, lamps on
Three – 30 minute, charger off, lamps on
6 second hold – fully reinitializes microprocessor
Pressing once during any test will cancel/abort testing.

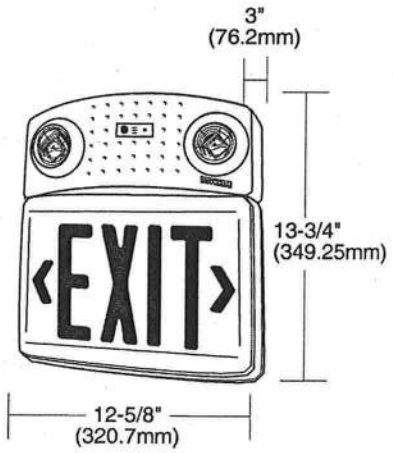
Fault Indications:

Four LED indicators provide visible indication of system status:

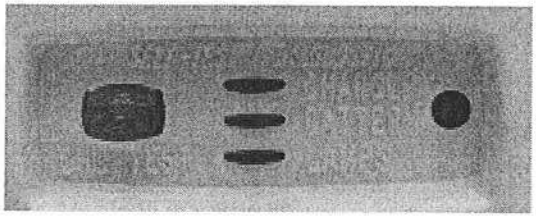
AC/Green	Charger/Red	Batt/Red	Lamp/Red	Status/Fault	Action
ON				AC Power is on/ok	None
F				Performing Test	None
ON	F	F	F	Incorrect AC supply voltage	Correct input voltage/Retry
ON	F			Charger fault	Replace circuit
ON		F		Battery disconnected/fault	Check connection or replace battery
ON			F	Lamp bad or disconnected	Press manual test once to determine bad lamp/replace lamp

ON=On Steady F=Flashing OFF=Blank

DIMENSIONS



Xtest STATUS INDICATOR PANEL



mcPhilben Lighting
776 South Green Street • Tupelo, Mississippi 38804 • PH: (662) 842-7212 • FAX: (662) 841-5501
www.dcolighting.com

Canadian Division
189 Bullock Drive • Markham, Ontario • Canada L3P 1W4 • PH: (905) 294-9570 • FAX: (905) 294-9811

Day-Brite® Lighting
a Genlyte company

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TYPE F1 (FAN)

PRODUCT SHOWCASE

DECOR-SPECIFIC FANS
- MARRAKESH
- MISSION
- SEACOAST
- WILDERNESS

ORNAMENTAL FANS
- BAROLO
- CHELSEA
- HANOVER
- MIDDLEBURY
- REVERIE

CONTEMPORARY FANS
- ASTRO
- LE GRANDE
- S3
- SCANDIA
- STEALTH
- VERRAZANO

PERIOD CLASSIC FANS
- 19th CENTURY
- COMMODORE VANDERBILT
- NEW ORLEANS CENTENNIAL
- VICTORIAN

CASUAL FANS
- COTTAGE
- MALIBU STAR

TRADITIONAL FANS
- CONCENTRA
- FOUR SEASONS III
- HAMPSHIRE
- PANAMA
- PANAMA HALO
- PANAMA XTR200
- VENTURA

TRANSITIONAL FANS
- BEL AIR
- BEL AIR HALO
- BRESCIA
- BRESCIA GALLERY
- CAPISTRANO
- METROPOLITAN
- SILHOUETTE II

INDOOR/OUTDOOR FANS
- ESTRADA
- FOUR SEASONS III OUTSIDER
- LANAI
- PANAMA DAMP
- UTOPIAN
- WAILEA

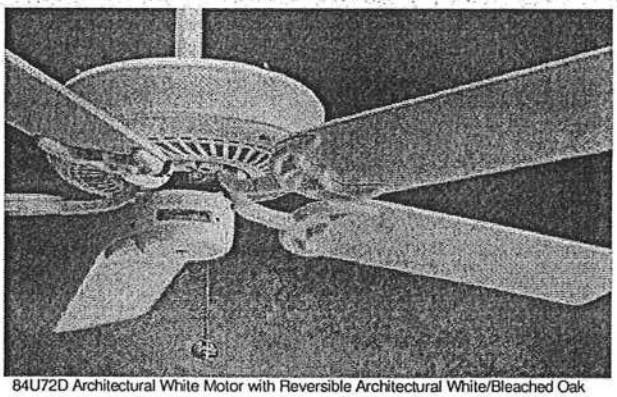
COSMOPOLITAN COLLECTION
- BUNGALOW
- LA FLEUR
- SERRA
- SIENA
- TRIDENT

PORTABLE FANS
- MODERNE
- ZEPHAIR

LIGHTING
- MISSION COLLECTION
- WILDERNESS COLLECTION

LIGHT FIXTURES/GLASS
- COMPLETE FIXTURES
- SOCKET RING FIXTURES

FOUR SEASONS® III

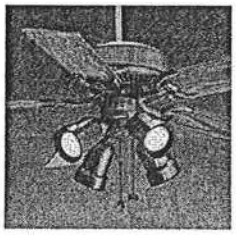


84U72D Architectural White Motor with Reversible Architectural White/Bleached Oak Blades

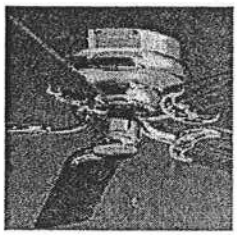
JUMP TO:

» Features
» Controls
» 52" Fan Finishes
» 42" Fan Finishes
» Hugger Fan Finishes
» Outsider Fan Finishes
» Specifications
» Charts

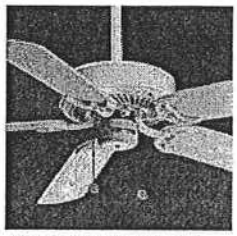
Casablanca quality, excellent value, and luxury of choice make the Four Seasons III the best ceiling fans in their class. Traditional in styling, these versatile fans offer selection and features worthy of the Casablanca name. All models (except Hugger) feature the exclusive Hang-Tru® canopy and Perma•Lock downrods, which simplifies installation while providing solid performance and improved appearance.



74U4D [Four Seasons® III 42"] Antique Brass Motor with Reversible Antique Oak/Bleached Oak Blades, shown with K4K-4 Four Light Center Stem Bullet Fixture [Enlarge]



82U2D [Four Seasons® III Hugger] Bright Brass Motor with Reversible Antique Oak/Bleached Oak Blades [Enlarge]



83U11D [Four Seasons® III Outsider™] Snow White Motor with White ABS Blades [Enlarge]

TOP

Four Season III Features:

- Direct Drive™ Motor
- Lifetime motor warranty (30 Year motor warranty on Outsider series)
- Reversible blades included (Outsider blades not reversible)

• SOCKET RING GLASS
• BOWL FIXTURES
• BOWL GLASS
• LOW PROFILE FIXTURES
• LOW PROFILE GLASS
• THUMBSCREW FIXTURES
• THUMBSCREW GLASS
• SHADE FIXTURES
• SHADES

ACCESSORIES
•BLADE FINISHES
•CONTROL OPTIONS
•FAN FINISHES
•HANGING SYSTEM

FAN FINISH & BLADE FINISH COMPARISON

- **Remote control adaptable, order control #WRF-* or #W-52** (WRF not for use with Outsider; W-52 not for use with Hugger)
- **Hang-Tru® Canopy (except Hugger)**
- **Uses Perma-Lock (PL) Downrods**
- **Optional controls available (view here)**

Compatible Light Fixtures:

K134, K164, K3K, K4BM, K4K, K4M, KG1B, KG1K, KG1X, KG210,KG3H, KG3L, KG3R, KG3S, KG3T, KG3S, KG4V, KG4W

☒ ☒ 3-SPEED ☒ **FOUR SEASONS III CONTROLS**

[Options]

TOP

Four Seasons III
52" Fan Finishes with Reversible Blades

☒ 84U2D Bright Brass Motor with reversible Antique Oak / Bleached Oak Blades

☒ 84U4D Antique Brass Motor with reversible Antique Oak / Bleached Oak Blades

☒ 84U8D Matte Black Motor with reversible Black [Matte] / Bleached Oak Blades

☒ 84U9D Classic White Motor with reversible Classic White / Bleached Oak Blades

☒ 84U11D Snow White Motor with reversible Snow White / Bleached Oak Blades

☒ ☒ 84U112D Snow White/Bright Brass Motor with reversible Snow White / Bleached Oak Blades

☒ 84U26D Navajo White Motor with reversible Navajo White / Bleached Oak Blades

☒ 84U49D Washed Bronze Motor with reversible Weathered Pine / Washed Light Oak Blades

☒ 84U72D Architectural White Motor with reversible Architectural White / Bleached Oak Blades

☒ 84U73D Oil Rubbed Bronze Motor with reversible Walnut / Antique Oak Blades

☒ 84U45D Brushed Nickel Motor with reversible Platnum / Cherrywood Blades

☒ 84U91D Mocha Motor with Bleached Oak / Mocha ABS Blades

Four Seasons III
42" Fan Finishes with Reversible Blades

74U4D Antique Brass Motor with reversible Antique Oak / Bleached Oak Blades

74U9D Classic White Motor with reversible Classic White / Bleached Oak Blades

74U11D Snow White Motor with reversible Snow White / Bleached Oak Blades

74U72D Architectural White Motor with reversible Architectural White / Bleached Oak Blades

74U73D Oil Rubbed Bronze Motor with reversible Walnut / Antique Oak Blades

74U45D Brushed Nickel Motor with reversible Platnum / Cherrywood Blades

Four Seasons III: Hugger
Fan Finishes with Reversible Blades

82U2D Bright Brass Motor with reversible Antique Oak / Bleached Oak Blades

82U4D Antique Brass Motor with reversible Antique Oak / Bleached Oak Blades

82U11D Snow White Motor with reversible Snow White / Bleached Oak Blades

82U72D Architectural White Motor with reversible Architectural White / Bleached Oak Blades

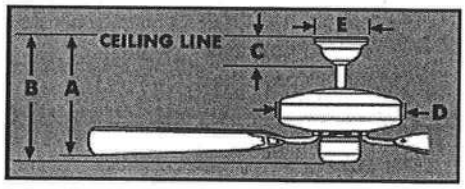
Four Seasons III: Outsider [UL Rated for Damp Locations]
Fan Finishes with All Weather Blades

83U11D Snow White Motor with Snow White ABS Blades

83U46D Rustic Iron Motor with Rustic Iron Blades

83U91D Mocha Motor with Bleached Oak / Mocha ABS Blades

TOP



	Dimensions					Blade Sweep	
PRODUCT SPECIFICATIONS	A	B*	C	D	E	Long	Short
Four Seasons III	10.75"	12.75"	3"	11.5"	5.56"	52"	42"

Blade Pitch	Weight (lbs.)	Speed (RPM)	Power (Watts)	Motor Type	Tech**	Warranty (Motor)
13°	14	50-200	25-80	172mm x 12mm Casablanca Direct	3S W-52	Lifetime

TYPE F1 SPECS

Drive Motor

PRODUCT SPECIFICATIONS	Dimensions A	B*	C	D	E	Blade Sweep Long	Short
Four Seasons III: Hugger	7"	8"	N/A	11"	N/A	52"	-

Blade Pitch	Weight (lbs.)	Speed (RPM)	Power (Watts)	Motor Type	Tech**	Warranty (Motor)
13°	11	50-200	25-85	172mm x 12mm Casablanca Direct Drive Motor	3S	Lifetime

PRODUCT SPECIFICATIONS	Dimensions A	B*	C	D	E	Blade Sweep Long	Short
Four Seasons III: Outsider	10.75"	12.75"	3"	11.5"	5.56"	52"	-

Blade Pitch	Weight (lbs.)	Speed (RPM)	Power (Watts)	Motor Type	Tech**	Warranty (Motor)
13°	17	50-200	20-80	172mm x 15mm Casablanca Direct Drive Motor	3S W-52	30 Years

** Tech (Fan Controls): 3S=Three-Speed, W-52 = Optional Adapt-Touch remote control purchased separately

TOP

VIEW CHARTS:

- [593K] Blade Selection
- [48K] Light Fixture Compatibility and Dimensions
- [103K] Light Fixture Finish & Bulb Specifications
- [108K] Product Specifications
- [430K] Model Number Reference
- [877K] Warranty & In-Home Service

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TYPE F2 (FAN)

PRODUCT SHOWCASE

DECOR-SPECIFIC FANS
- MARRAKESH
- MISSION
- SEACOAST
- WILDERNESS

ORNAMENTAL FANS
- BAROLO
- CHELSEA
- HANOVER
- MIDDLEBURY
- REVERIE

CONTEMPORARY FANS
- ASTRO
- LE GRANDE
- S3
- SCANDIA
- STEALTH
- VERRAZANO

PERIOD CLASSIC FANS
- 19th CENTURY
- COMMODORE VANDERBILT
- NEW ORLEANS CENTENNIAL
- VICTORIAN

CASUAL FANS
- COTTAGE
- MALIBU STAR

TRADITIONAL FANS
- CONCENTRA
- FOUR SEASONS III
- HAMPSHIRE
- PANAMA
- PANAMA HALO
- PANAMA XTR200
- VENTURA

TRANSITIONAL FANS
- BEL AIR
- BEL AIR HALO
- BRESCIA
- BRESCIA GALLERY
- CAPISTRANO
- METROPOLITAN
- SILHOUETTE II

INDOOR/OUTDOOR FANS
- ESTRADA
- FOUR SEASONS III OUTSIDER
- LANAI
- PANAMA DAMP
- UTOPIAN
- WAILEA

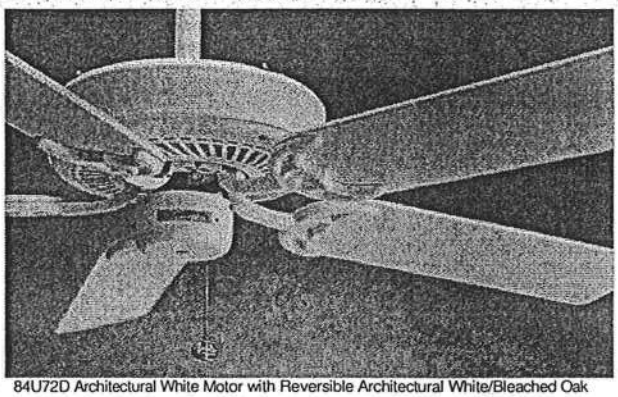
COSMOPOLITAN COLLECTION
- BUNGALOW
- LA FLEUR
- SERRA
- SIENA
- TRIDENT

PORTABLE FANS
- MODERNE
- ZEPHAIR

LIGHTING
- MISSION COLLECTION
- WILDERNESS COLLECTION

LIGHT FIXTURES/GLASS
- COMPLETE FIXTURES
- SOCKET RING FIXTURES

FOUR SEASONS® III



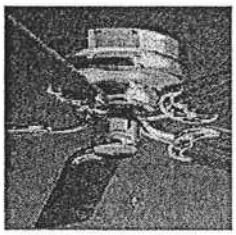
84U72D Architectural White Motor with Reversible Architectural White/Bleached Oak Blades

JUMP TO:

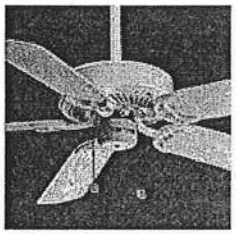
» Features
» Controls
» 52" Fan Finishes
» 42" Fan Finishes
» Hugger Fan Finishes
» Outsider Fan Finishes
» Specifications
» Charts

Casablanca quality, excellent value, and luxury of choice make the Four Seasons III the best ceiling fans in their class. Traditional in styling, these versatile fans offer selection and features worthy of the Casablanca name. All models (except Hugger) feature the exclusive Hang-Tru® canopy and Perma•Lock downrods, which simplifies installation while providing solid performance and improved appearance.

74U4D [Four Seasons® III 42"] Antique Brass Motor with Reversible Antique Oak/Bleached Oak Blades, shown with K4K-4 Four Light Center Stem Bullet Fixture [Enlarge]



82U2D [Four Seasons® III Hugger] Bright Brass Motor with Reversible Antique Oak/Bleached Oak Blades [Enlarge]



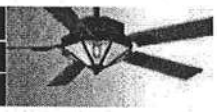
83U11D [Four Seasons® III Outsider™] Snow White Motor with White ABS Blades [Enlarge]

TOP

Four Season III Features:

- Direct Drive™ Motor
- Lifetime motor warranty (30 Year motor warranty on Outsider series)
- Reversible blades included (Outsider blades not reversible)

TYPE F2 . (LT. KIT)



LIGHT FIXTURES
•PAGE 1
•PAGE 2
•PAGE 3

PRODUCT SHOWCASE

DECOR-SPECIFIC FANS
•CATHAY
•MARRAKESH
•MISSION
•SEACOAST
•WILDERNESS

ORNAMENTAL FANS
•BAROLO
•BELLA
•CHELSEA
•HANOVER
•MIDDLEBURY
•REVERIE

CONTEMPORARY FANS
•ASTRO
•LE GRANDE
•MODENA
•S3
•SCANDIA
•STEALTH
•VERRAZANO

PERIOD CLASSIC FANS
•19th CENTURY
•COMMODORE VANDERBILT
•NEW ORLEANS CENTENNIAL
•NOUVELLE
•VICTORIAN

CASUAL FANS
•COTTAGE
•KAWAYAN
•KEY LARGO
•MALIBU STAR

TRADITIONAL FANS
•CONCENTRA
•FOUR SEASONS III
•HAMPSHIRE
•PANAMA
•PANAMA HALO
•PANAMA XTR200
•VENTURA

TRANSITIONAL FANS
•BEL AIR
•BEL AIR HALO
•BRESCIA
•BRESCIA GALLERY
•CAPISTRANO
•METROPOLITAN
•SILHOUETTE II

INDOOR/OUTDOOR FANS
•ESTRADA
•FOUR SEASONS III OUTSIDER
•LANAI
•PANAMA DAMP
•UTOPIAN
•WAILEA

COSMOPOLITAN COLLECTION
•BUNGALOW
•LA FLEUR
•MONACO
•MOOREA
•MYKONOS
•POLYNESIAN
•PORTOFINO
•SANTORINI
•SERRA
•SIENA
•TRIDENT

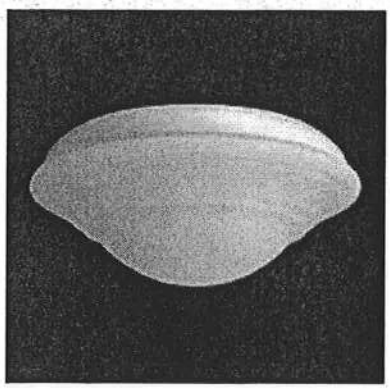
LIGHT FIXTURES

KG2L

Two Light Outdoor Incandescent Fixture

UL WET

UL Rated for WET locations



SPECS*

HEIGHT	5 1/2"
WIDTH	10 1/4"
HANGING WEIGHT	4 lbs
BULB SPECS	Two 60W Type "A15" Medium Base Bulbs Base Bulbs

AVAILABLE FINISHES

Architectural White (-72)
Navajo White (-26)
Washed Bronze (-49)
Black [Matte] (-8)
Mocha (-91)
Snow White (-11)
Rustic Iron (-46)

COMPATIBLE FANS

Brescia (IT/3S)
Campana (VT2/3S)
Capistrano (VT2/3S)
Concentra (VT2/3S)
Estrada (3S)**
Lanai (3S)***
Metropolitan (AT/IT)
Panama (AT/IT)
Panama (4S)
Panama Damp (4S)**
Utopian (3S)**
Ventura (IT)
Ventura (3S)

AT=Advan•Touch • IT=Inteli•Touch - VT2=Versa•Touch2 - 3S=3 Speed • 4S=4 Speed

* Height: measured with a typical glass piece, height may vary. Width: measured with a typical glass piece, width may vary. Hanging Weight: including weight for a typical glass, weight may vary. Rounded to the nearest pound.
** Denotes Damp rated fans that are compatible when used in DAMP or HUMID locations (DO NOT use in exposed WET environments)
**** Denotes Wet rated fans that are compatible when used in WET locations

BACK

VIEW CHARTS:

[36K] Light Fixture Finish and Bulb Specification
[41K] Light Fixture Compatibility and Dimensions

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TYPE F2 SPECS

PORTABLE FANS
•MODERNE
•ZEPHAIR

LIGHTING
•MISSION COLLECTION
•WILDERNESS COLLECTION

LIGHT FIXTURES/GLASS
• COMPLETE FIXTURES
• SOCKET RING FIXTURES
• SOCKET RING GLASS
• BOWL FIXTURES
• BOWL GLASS
• LOW PROFILE FIXTURES
• LOW PROFILE GLASS
• THUMBSCREW FIXTURES
• THUMBSCREW GLASS
• SHADE FIXTURES
• SHADES

ACCESSORIES
•BLADE FINISHES
•SOUTH SEAS BLADE COLLECTION
•AVALON BLADE COLLECTION
•CARVED WOOD BLADE COLLECTION
•BEADBOARD BLADE COLLECTION
•CONTROL OPTIONS
•FAN FINISHES
•HANGING SYSTEM

FAN FINISH & BLADE FINISH COMPARISON

[SEARCH]

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TYPE F3 (FAN)

PERFORMANCE

PRODUCT SHOWCASE

DECOR-SPECIFIC FANS
- MARRAKESH
- MISSION
- SEACOAST
- WILDERNESS

ORNAMENTAL FANS
- BAROLO
- CHELSEA
- HANOVER
- MIDDLEBURY
- REVERIE

CONTEMPORARY FANS
- ASTRO
- LE GRANDE
- S3
- SCANDIA
- STEALTH
- VERRAZANO

PERIOD CLASSIC FANS
- 19th CENTURY
- COMMODORE VANDERBILT
- NEW ORLEANS CENTENNIAL
- VICTORIAN

CASUAL FANS
- COTTAGE
- MALIBU STAR

TRADITIONAL FANS
- CONCENTRA
- FOUR SEASONS III
- HAMPSHIRE
- PANAMA
- PANAMA HALO
- PANAMA XTR200
- VENTURA

TRANSITIONAL FANS
- BEL AIR
- BEL AIR HALO
- BRESCIA
- BRESCIA GALLERY
- CAPISTRANO
- METROPOLITAN
- SILHOUETTE II

INDOOR/OUTDOOR FANS
- ESTRADA
- FOUR SEASONS III OUTSIDER
- LANAI
- PANAMA DAMP
- UTOPIAN
- WAILEA

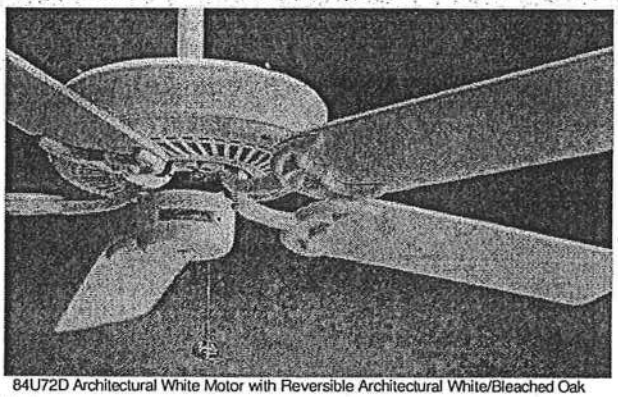
COSMOPOLITAN COLLECTION
- BUNGALOW
- LA FLEUR
- SERRA
- SIENA
- TRIDENT

PORTABLE FANS
- MODERNE
- ZEPHAIR

LIGHTING
- MISSION COLLECTION
- WILDERNESS COLLECTION

LIGHT FIXTURES/GLASS
- COMPLETE FIXTURES
- SOCKET RING FIXTURES

FOUR SEASONS® III

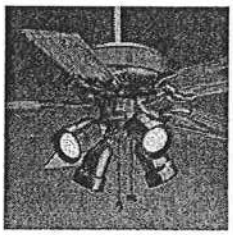


84U72D Architectural White Motor with Reversible Architectural White/Bleached Oak Blades

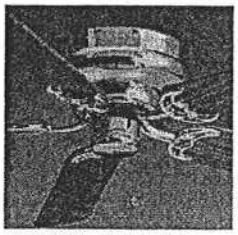
JUMP TO:

» Features
» Controls
» 52" Fan Finishes
» 42" Fan Finishes
» Hugger Fan Finishes
» Outsider Fan Finishes
» Specifications
» Charts

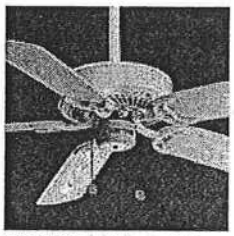
Casablanca quality, excellent value, and luxury of choice make the Four Seasons III the best ceiling fans in their class. Traditional in styling, these versatile fans offer selection and features worthy of the Casablanca name. All models (except Hugger) feature the exclusive Hang-Tru® canopy and Perma•Lock downrods, which simplifies installation while providing solid performance and improved appearance.



74U4D [Four Seasons® III 42"] Antique Brass Motor with Reversible Antique Oak/Bleached Oak Blades, shown with K4K-4 Four Light Center Stem Bullet Fixture [Enlarge]



82U2D [Four Seasons® III Hugger] Bright Brass Motor with Reversible Antique Oak/Bleached Oak Blades [Enlarge]



83U11D [Four Seasons® III Outsider™] Snow White Motor with White ABS Blades [Enlarge]

TOP

Four Season III Features:

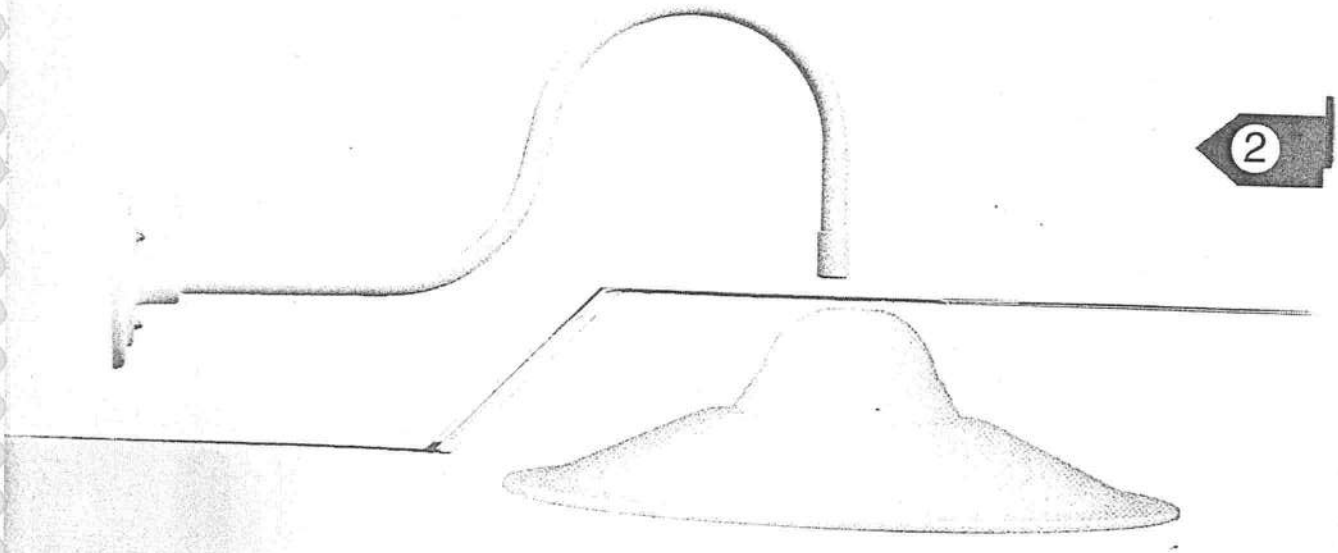
- Direct Drive™ Motor
- Lifetime motor warranty (30 Year motor warranty on Outsider series)
- Reversible blades included (Outsider blades not reversible)

For Outdoor Use Specify OD

TYPE H

ARM WALL	STANDARD ARM PROJECTION	STANDARD ARM HEIGHT
B2	24"	9½"

ARM FINISHES: PAINTED ONLY (SEE BACK COVER)
OPTIONAL PROJECTION: 17" MIN. - 33" MAX.
TOP OF ARM TO CENTER OF BACKPLATE 10"
BACKPLATE:
6" ROUND MOUNTS TO 4" OCTAGON BOX
OUTDOOR (OD) SUPPORT BOX PROPERLY



2

SHADE	DIA.	HGT.	LAMP TYPE	MAXIMUM WATTAGE ARM/STEM	MAXIMUM WATTAGE CORD/CHAIN
A27	18½"	5"	INC. CF* MH**	100W CFTR32 70W	75W CFQ13USA N/A
A28	23"	7"	INC. CF* MH**	150W CFTR32 100W	100W CFQ13USA N/A

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NOTE:
*CF - BALLAST MUST BE IC CANOPY 120 OR 277 VOLT
**MH - STANDARD SOCKET FOR OPEN FIXTURE LAMP
INDOOR USE ONLY
BALLAST REMOTE F-CAN 120/277 VOLT
OUTDOOR (OD) - CF AND MH LAMPING MUST HAVE ENCLOSURE ADDED
SHADE FINISH: SEE BACK COVER