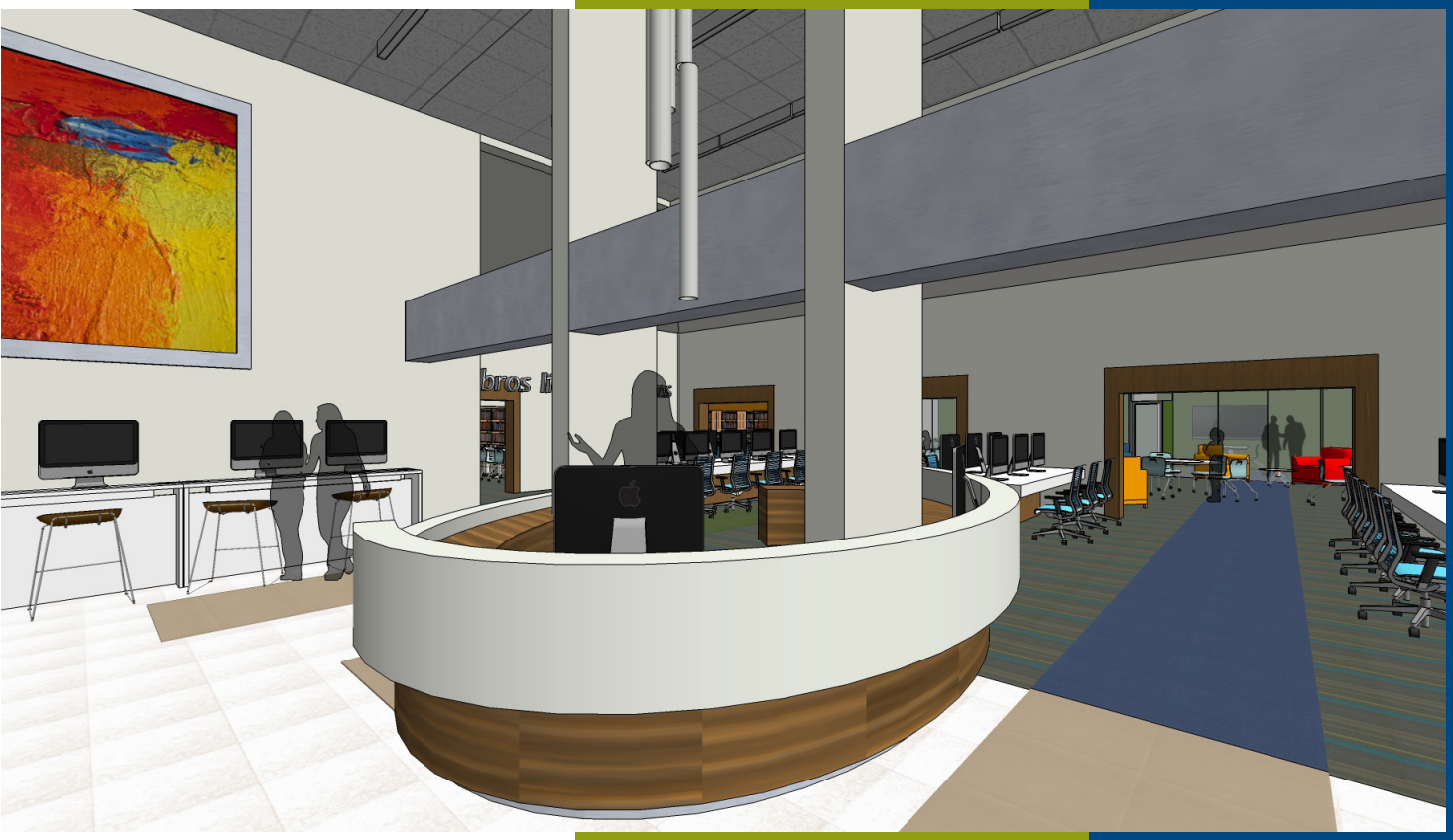
NORTH MIAMI
FLORIDA

CITY OF NORTH MIAMI

NORTH MIAMI PUBLIC LIBRARY
INTERIOR RENOVATION



PROJECT SPECIFICATIONS
VOLUME I OF I
Divisions 00-16

ZYSCOVICH
ARCHITECTS

DOCUMENT 00 00 01
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100% CONSTRUCTION DOCUMENTS
PROJECT SPECIFICATIONS MANUAL
VOLUME I OF I

MAY 2014

CITY OF NORTH MIAMI
PUBLIC LIBRARY RENOVATION
NORTH MIAMI, FL

CITY OF NORTH MIAMI, FLORIDA
ZYSCOVICH Project No. 1342LRNM

Section Number	Item Title/Description	100% Const. Doc
DIV 07	**THERMAL AND MOISTURE PROTECTION**	
07212	BOARD AND BATT INSULATION	X
07920	JOINT SEALERS	X
DIV 08	**OPENINGS**	
08110	STEEL METAL DOORS AND FRAMES	X
08210	FLUSH WOOD DOORS	X
08310	ACCESS DOORS AND PANELS	X
08410	METAL-FRAMED STOREFRONTS	X
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08800	GLAZING	X
XDIV 09	**FINISHES**	
09051	COMMON WORK RESULTS FOR FLOORING PREPARATION	X
09220	PORTLAND CEMENT PLASTER	X
09260	GYPSUM BOARD SYSTEMS	X
09300	TILE	X
09511	SUSPENDED ACOUSTICAL CEILING	X
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09720	WALL COVERING	X
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DIV 10	**SPECIALTIES**	

Section Number	Item Title/Description	100% Const. Doc
16010	BASIC ELECTRICAL GENERAL REQUIREMENTS	X
16023	CODES AND STANDARDS	X
16101	RACEWAYS AND CONDUIT	X
16105	OUTLET, PULL AND JUNCTION BOXES	X
16120	WIRE AND CABLE	X
16140	WIRING DEVICES	X
16150	MOTOR POWER AND CONTROL WIRING	X
16440	DISCONNECT SWITCHES	X
16452	GROUNDING	X
16470	PANELBOARDS	X
16475	OVERCURRENT PROTECTIVE DEVICES	X
16515	LIGHTING FIXTURES AND LAMPS	X
16740	TELEPHONE RACEWAY SYSTEMS	X
16781	SPECIAL SYSTEMS	X

DOCUMENT 00007
LIST OF PROFESSIONALS

Project:

North Miami Public Library Interior Renovation
835 N.E. 132nd Street
City of North Miami
North Miami, FL 33161

Owner's Representative:

City of North Miami
North Miami, FL 33161
Hoyt Jackson
Phone: **(**786) 262-7664
Hjackson@northmiamifl.gov

Architect:

Zyscovich Inc.
100 N. Biscayne Boulevard, 27th Floor
Miami, FL 33132
Juan M. Socorro
Phone: (305) 372-5222
Fax: (305) 577-4521
juan@zyscovich.com

Structural Engineer:

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800 Douglas Road, Suite 300
Coral Gables, FL 33134
Paul Zilio
Phone: 305-442-7086
Fax: 866-881-0087
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Fine Line Engineering, Inc.
5975 West Sunrise Blvd., Suite 216
Sunrise, FL 33313
Sergio Vazquez
Phone: (954) 584-3360
Fax: (954) 584-3393
svazquez@flengineers.com

SECTION 00046
TRENCH ACT COMPLIANCE CERTIFICATE

Project No: 38-09-10
Project Title: North Miami Public Library Renovation
Facility Name: North Miami Public Library
Facility Address: 835 NE 132nd Street, North Miami, FL 33161

Instructions

Chapter 90-96 of the Laws of Florida requires all contractors engaged by The City of North Miami , Florida to comply with Occupational Safety and Health Administration Standard 29 C.F.R. s. 1926.650 Subpart P. All prospective contractors are required to sign the compliance statement and provide compliance cost information where indicated below. The costs for complying with the Trench Safety Act must be incorporated into this project's base bid as shown on page 1 of this document.

Certify this form in the presence of a notary public or other officer authorized to administer oaths.

Certification

1. **I understand that Chapter 90-96 of the Laws of Florida (The Trench Safety Act) requires me to comply with OSHA Standard 29 C.F.R. s. 1926.650 Subpart P. I will comply with The Trench Safety Act, and I will design and provide trench safety systems at all trench excavations in excess of five feet in depth for this project.**

2. **The estimated cost imposed by compliance with The Trench Safety Act will be:**

_____ **Dollar** **$** _____
Written Figures

3. **The amount listed above has been included within the Base Bid as listed on Document 00410, Bid Form.**

Certified By:
Company Name & Address: _____ Signature _____

Phone: _____ Title _____

Notarization

State of: _____)
County of: _____)

Sworn to and subscribed before me, the undersigned authority, by _____
Who is personally known to me or did produce: _____
As identification and who did take an oath.

Notary Public: _____ **Affix Seal**
Commission Expires on: _____

SECTION 00050

ASBESTOS REPORT

SITECH ENVIRONMENTAL CORPORATION

2518 Island Drive
Miramar, Florida 33023

Phone 954 962-7804
Fax 954 962-8875

REPORT OF PRE-RENOVATION INTERIOR BUILDING SURVEY, SAMPLING AND EVALUATION OF ASBESTOS-CONTAINING MATERIALS

NORTH MIAMI PUBLIC LIBRARY
835 NE 132ND STREET
NORTH MIAMI, FLORIDA 33161

SITECH PROJECT: 1576006

PREPARED FOR:

ADAPTIVE ENVIRONMENTAL CONSULTING
1234 SOUTH DIXIE HIGHWAY, # 310
GORAL GABLES, FLORIDA 33146

PREPARED BY:

SITECH ENVIRONMENTAL CORPORATION
2518 ISLAND DRIVE
MIRAMAR, FLORIDA 33023

OCTOBER 31, 2013

REPORT OF PRE-RENOVATION INTERIOR BUILDING SURVEY, SAMPLING AND EVALUATION OF ASBESTOS-CONTAINING MATERIALS

NORTH MIAMI PUBLIC LIBRARY
835 NE 132ND STREET
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PREPARED BY:

SITECH ENVIRONMENTAL CORPORATION
2518 ISLAND DRIVE
MIRAMAR, FLORIDA 33023

OCTOBER 31, 2013

Winston Radhay
Senior Project Manager

Michael A. Lawn, R.A.
Florida Asbestos Consultant
License # AF0000017

EXECUTIVE SUMMARY

Sitech Environmental Corporation (Sitech) has been contracted by Adaptive Environmental Consulting to conduct a pre-renovation interior asbestos survey of the North Miami Public Library located at 835 NE 132nd Street, North Miami, Florida ("the Site").

The purpose of this survey was to evaluate the site and identify suspect accessible asbestos-containing materials, obtain and analyze bulk samples to verify the presence and quantity of asbestos, and to make recommendations for treatment of identified materials.

According to the U.S. Environmental Protection Agency (EPA), any material containing over one percent (1%) of any type of asbestos by volume is considered to be an asbestos containing material.

The results of our observation and laboratory analysis indicate that friable asbestos containing acoustic ceiling tile, and category I non-friable asbestos containing HVAC duct mastic materials were identified at the site.

Additionally, one sample of floor mastic (Sample # L1) collected on the floor within the garage area revealed a <1% chrysotile asbestos content.

Category I non-friable materials containing <1% asbestos are not regulated by the EPA NESHAP standards. However, in accordance with the Occupational Safety and Health Administration (OSHA) Construction Standards for Asbestos, CFR 1926.1101, any quantity of asbestos detected in a building material that will be disturbed by renovation or demolition activities must comply with OSHA regulations.

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APPENDICES

1.0 INTRODUCTION

A survey for asbestos-containing building materials (ACBM) was conducted within the North Miami Public Library located at 835 NE 132nd Street, North Miami, Florida. The survey was performed on October 18, 2013 by Sitech representative Mr. Winston Radhay and Mr. Wylie White with Adaptive Environmental Consulting.

The purpose of the survey was to locate and identify ACBM within the interior of the site. The abandoned (lower) roof within the ceiling plenum and all interior materials were accessed and surveyed.

The current (higher) roof and exterior finishes were outside the scope of this survey and excluded at the request of the client. Additionally, we did not damage or perform invasive testing on any sealed fire doors or mirrors with mastic in the restrooms etc. If planned renovation will disturb these materials, they should be regarded as presumed asbestos containing materials (PACM) unless and until sampling indicates otherwise.

The scope of services for this project consisted of the following five steps:

- Building Walk-Through and Observations,
- Bulk Sampling of Suspect Asbestos-Containing Building Materials (ACBM),
- Polarized Light Microscopy (PLM) Analysis of Bulk Samples,
- Hazard Assessment and Evaluation, and
- Final Report Development.

2.0 FACILITY DESCRIPTION

The North Miami Public Library located at 835 NE 132nd Street, North Miami, Florida, consists of a single-story commercial building of approximately 20,000 square feet.

The building is constructed of concrete block on a concrete slab-on-grade. The ceilings are finished with a combination of acoustic ceiling tile, plaster and wallboard systems. The walls are finished with drywall and plaster systems. Floor coverings include carpet, ceramic floor tile and vinyl floor tile on the concrete slab floor.

3.0 SURVEY METHODS AND LABORATORY ANALYSIS

The sampling protocol used in this asbestos survey are those detailed in Title 40, Code of Federal Regulations (CFR), Part 763.86 for the sampling of friable surfacing materials and miscellaneous materials (i.e. ceiling tiles). The Environmental Protection Agency (EPA) regulations require that sample locations be randomly selected. Suspect ACBM were identified and samples of each different type of material were obtained.

The bulk sampling procedure utilized for the collection of samples suspected of being ACBM required the establishment of homogeneous sampling areas. A homogeneous sampling area is defined as an area of friable or non-friable material of similar type that appeared to be applied or constructed during the same general period of time. This is the most acceptable and cost-effective method for the sampling of suspect ACBM.

Samples of suspect materials were collected and the location of each sample duly noted. Samples which were collected from these predetermined homogeneous sampling areas were labeled and transported to Dove Environmental laboratory (NVLAP # 102053-0) for analysis, using polarized light microscopy (PLM) coupled with dispersion staining. The samples were analyzed in accordance with Title 61 Code of Federal Regulation.

Polarized light microscopy is a method of analysis that utilizes the unique optical crystallographic properties of the various crystalline forms in the samples. These properties, such as refractive indices, birefringence, sign of elongation and extinction angle, are unique to crystalline asbestos forms and therefore can be used to identify the type of asbestos mineral as chrysotile, amosite, crocidolite, anthophyllite, tremolite, or actinolite. Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Attempts are made to mix the sample thoroughly to provide a more accurate percentage. Any material containing over one percent (1%) of any type of asbestos by volume is considered by the U.S. Environmental Protection Agency (EPA) to be an asbestos containing material and if disturbed must be handled according to specific state and federal regulations.

4.0 SUSPECTED ASBESTOS-CONTAINING MATERIALS

The materials sampled and tested during the survey and evaluation of the building consisted of accessible materials within the site.

Thirty-seven (37) homogeneous areas (HA) of suspect materials were identified and a total of one-hundred and ten (110) samples including multiple-layered materials were collected and analyzed. In accordance with industry standard, each layer of a material sample is analyzed by the laboratory. Sample descriptions and laboratory results can be found in Appendix A - "Laboratory Analysis Report & Asbestos Bulk Survey Form(s)". Certifications for asbestos survey can be found in Appendix B "Certifications".

The following is a summary of the materials sampled and tested during the survey and evaluation of the site:

- Acoustic Ceiling Tile
- Cementitious Material (Frame)
- Wall Plaster System
- Ceiling Plaster System
- Stucco Material
- Acoustic Ceiling Texture
- Floor Mastic
- Vibration Gasket (HVAC)
- Paper Insulation at AC Pipe
- Wall Penetration Seal
- Built-up Roofing & Felt (Old Roof)
- Vinyl Floor Tile & Mastic
- Vinyl Floor Coving & Mastic (Baseboard)
- Carpet mastic
- Cementitions Mop Sink
  -Grout & Stone Base
- Ceramic Tile/Grout & Mastic
- Black HVAC Duct Mastic
- Bituminous Pipe Insulation Wrap
- Wallboard & Joint Compound (System)

5.0 FINDINGS AND RECOMMENDATIONS

This section describes the asbestos-containing materials (ACM) which were observed during the inspection. The quantities of material described herein are all approximate and are not to be relied upon by asbestos abatement contractors for bidding purposes. The recommendations which follow each material are based on material condition, friability of the material, water damage, frequency of room or area use, physical accessibility of the material to persons using the room or area, and the presence of air movements or currents.

Due to the non-destructive nature of the survey, only accessible suspect materials were addressed. Any suspect materials subsequently in inaccessible areas (ie. within doors, wall cavities, behind mirrors and above hard ceilings etc.) should be treated as asbestos-containing materials and not disturbed until identified as non-asbestos containing material.

The results of the sampling may be found on the enclosed Appendix A"Laboratory Analysis and Summary".

In any areas not specifically noted or mentioned, no ACM was observed by the inspector.

Please note that the recommendations given are always the minimum action which in our professional opinion should be taken. This does not necessarily preclude other options, including removal. If any renovations or change in room or area use will cause any ACM to become exposed, damaged, or otherwise altered, removal should be considered at that time.

Asbestos containing building materials which were identified can be classified into three (3) main categories: Surfacing Materials, Thermal System Insulation, and Miscellaneous Materials. The results of our building survey and laboratory analysis indicate that asbestos was detected in the form of miscellaneous material.

HVAC duct mastic and acoustic ceiling tile are classified as miscellaneous materials.

Any recommended asbestos removal should be performed by a Florida licensed asbestos abatement contractor in accordance with all applicable Federal, State, and Local Regulations.

5.0 FINDINGS AND RECOMMENDATIONS (Continued)

The materials sampled at the site that were found to contain more than one percent (1%) asbestos are listed below according to the following homogeneous areas.

Homogeneous Area Number AD	
Sample No.:	AD1, AD2, AD3 & AD4
Material:	Black HVAC duct mastic
Location:	Throughout the lower ceiling plenum area of the building
Results:	2% chrysotile asbestos
*Quantity:	Approximately 500 linear feet
The material is in fair condition and is non-friable.	

*Quantities are estimated based on visual inspection and must be verified by contractors prior to bidding on removal project.

Homogeneous Area Number AG & AH	
Sample No.:	AG1, AG2 AG3, AH1 & AH2
Material:	Old white 8” x 12” acoustic ceiling tile with mastic (samples AH1 & AH2 did not have any mastic)
Location:	Throughout the following areas: attic lower area, main room, back office, computer area, librarian’s office & non-fiction area
Results:	ND to 2% amosite asbestos in the ceiling tile, no asbestos detected in the mastic
*Quantity:	Approximately 11,000 square feet
The material is in fair condition and is friable.	

*Quantities are estimated based on visual inspection and must be verified by contractors prior to bidding on removal project.

6.0 CONCLUSIONS

According to the U.S. Environmental Protection Agency (EPA), any material containing over one percent (1%) of any type of asbestos by volume is considered to be an asbestos containing material.

The results of our observation and laboratory analysis indicate that friable asbestos containing acoustic ceiling tile, and category I non-friable asbestos containing HVAC duct mastic materials were identified at the site.

Friable asbestos containing materials means any material containing more than one percent asbestos, that when dry can be crumbled, pulverized or reduced to powder by hand pressure.

The friable asbestos containing acoustic ceiling tile is presently in fair to good condition and does not need to be removed; however in the event of renovation; where the material will be disturbed and removed, all work should be performed by a Florida licensed asbestos abatement contractor in accordance with all applicable Federal, State, and Local Regulations and under the supervision of a Florida licensed asbestos consulting firm.

Non-friable ACM are those in which the asbestos fibers are bound with other materials in such a way that the release of those fibers into the air from casual contact or normal wear is unlikely. If the material is left undisturbed, it presents a low threat to release harmful asbestos fibers. Non-friable materials should not be removed, cut, or abraded in any way as these activities may result in a significant fiber release episode.

The category I non-friable asbestos containing HVAC duct mastic material is presently in good condition and does not need to be removed; however in the event of renovation; where the material will be disturbed and removed, all work should be performed by a Florida licensed asbestos abatement contractor in accordance with all applicable Federal, State, and Local Regulations and under the supervision of a Florida licensed asbestos consulting firm.

However, in the case removal is not scheduled in the near future, an operation and maintenance plan (O&M), is recommended to minimize tenant and worker exposure to potential fiber release.

Additionally, one sample of floor mastic (Sample # L1) collected on the floor within the garage area revealed a <1% chrysotile asbestos content.

Category I non-friable materials containing <1% asbestos are not regulated by the EPA NESHAP standards. However, in accordance with the Occupational Safety and Health Administration (OSHA) Construction Standards for Asbestos, CFR 1926.1101, any quantity of asbestos detected in a building material that will be disturbed by renovation or demolition activities must comply with OSHA regulations.

6.0 CONCLUSIONS (Continued)

Please note that the recommendations given are always the minimum action which in our professional opinion should be taken. This does not necessarily preclude other options, including additional testing, analysis by point count method and or removal. If any renovations or change will cause any ACM to become exposed, damaged, or otherwise altered, removal should be considered at that time.

This report is designed to aid the building owner, construction manager and general contractors in locating any identified ACM. Under no circumstances is this report to be utilized as a proposal or a project specification document.

7.0 QUALIFICATIONS

Sitech Environmental Corporation has performed the survey using generally accepted procedures. Due to the non-destructive nature of the survey, only accessible suspect materials were addressed. The scope of the inspection did not include the removal of surface materials to inspect areas of the building or materials beneath the surface. We do not claim to have identified all of the ACBM present within the site. If during the course of demolition activity, suspect materials become exposed, all activities should cease and the suspect materials brought to our attention for evaluation and recommendation.

APPENDIX A

LABORATORY ANALYSIS REPORT
& ASBESTOS BULK SURVEY FORM(S)

DOVE ENVIRONMENTAL CORP.
8910 MIRAMAR PARKWAY, SUITE 200 MIRAMAR FL 33025
Tel. (954) 374-9274 Fax: (954) 639-7426

ASBESTOS TEST REPORT

CLIENT : SITECH ENVIRONMENTAL CORP.
ADDRESS: 2518 ISLAND DRIVE
MIRAMAR FL 33023
PROJECT: NORTH MIAMI PUBLIC LIBRARY
835 NE 132 ST N. MIAMI, FL 33161
CONSULT: WINSTON RADHAY

PAGE : 1
DATE : 10/23/13
SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. : 01 SAMPLE NO.: A1
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT LG PATTERN RANE HOLES LIGHT BACKING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 02 SAMPLE NO.: A2
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT LG PATTERN RANE HOLES LIGHT BACKING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 03 SAMPLE NO.: A3
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT LG PATTERN RANE HOLES LIGHT BACKING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

Dove Environmental Corporation is solely responsible for analysis performed on sample content supplied by client and method 40 CFR Part 763 Subpart F App. BPA/600/R-93/116. Measurement Uncertainty information is available by contacting the Laboratory. Laboratory Reports will be kept for a period of three (3) years electronically. Percentages are visually estimated. Point count performed at clients request only.Results relates only to item analyzed. This report should not be reproduced by client or anyone without written permision from Dove Environmental Corporation. All samples will be stored for a period of 1 month. Our laboratory uses various microscopes and is NVLAP accredited.Floor-Tile is non-homogeneous and results only reflect sample content.

Analyst 1

R. Pepe Ramnath, PhD
LABORATORY MANAGER

DOVE ENVIRONMENTAL CORP.
8910 MIRAMAR PARKWAY, SUITE 200 MIRAMAR FL 33025
Tel. (954) 374-9274 Fax: (954) 639-7426

ASBESTOS TEST REPORT

CLIENT : SITECH ENVIRONMENTAL CORP. PAGE : 2
ADDRESS: 2518 ISLAND DRIVE
MIRAMAR FL 33023 DATE : 10/23/13
PROJECT: NORTH MIAMI PUBLIC LIBRARY SAMPLE ID : D310316
835 NE 132 ST N. MIAMI. FL 33161
CONSULT: WINSTON RADHAY NVLAP Lab Code: 102053-0

LAB NO. : 04 SAMPLE NO.: A4
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT LG PATTERN RANE HOLES LIGHT BACKING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 05 SAMPLE NO.: A5
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT LG PATTERN RANE HOLES LIGHT BACKING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 06 SAMPLE NO.: A6
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT LG PATTERN RANE HOLES LIGHT BACKING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

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Analyst 1

R. Pepe Ramnath, PhD
LABORATORY MANAGER

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Tel. (954) 374-9274 Fax: (954) 639-7426

ASBESTOS TEST REPORT

CLIENT : SITECH ENVIRONMENTAL CORP.
ADDRESS: 2518 ISLAND DRIVE
MIRAMAR FL 33023
PROJECT: NORTH MIAMI PUBLIC LIBRARY
835 NE 132 ST N. MIAMI, FL 33161
CONSULT: WINSTON RADHAY

PAGE : 3
DATE : 10/23/13
SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. : 07 SAMPLE NO.: A7
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT LG PATTERN RANE HOLES LIGHT BACKING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 08 SAMPLE NO.: B1
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X4, 2X2 ACT LIGHT BROWN BACK SM HOLES
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 09 SAMPLE NO.: B2
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X4, 2X2 ACT LIGHT BROWN BACK SM HOLES
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

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Analyst 1

R. Pepe Ramnath, PhD
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Tel. (954) 374-9274 Fax: (954) 639-7426

ASBESTOS TEST REPORT

CLIENT : SITECH ENVIRONMENTAL CORP.
ADDRESS: 2518 ISLAND DRIVE
MIRAMAR FL 33023
PROJECT: NORTH MIAMI PUBLIC LIBRARY
835 NE 132 ST N. MIAMI, FL 33161
CONSULT: WINSTON RADHAY

PAGE : 4
DATE : 10/23/13
SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. : 10 — SAMPLE NO.: B3
FRI/HOM : YES/NO LAYERS: 02 — DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X4, 2X2 ACT LIGHT BROWN BACK SM HOLES
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE — 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM — 10% PAINT
5% GLASS-SHOTS — 5% PERLITES

LAB NO. : 11 — SAMPLE NO.: C1
FRI/HOM : YES/NO LAYERS: 02 — DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT WHITE BACK "USG RADAR"
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE — 10% FIBER-GLASS
20% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM — 10% PAINT
5% GLASS-SHOTS — 5% PERLITES

LAB NO. : 12 — SAMPLE NO.: C2
FRI/HOM : YES/NO LAYERS: 02 — DATE OF ANALYSIS: 10/23/13
DESCRIPTION : 2X2, 2X4 ACT WHITE BACK "USG RADAR"
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE — 10% FIBER-GLASS
20% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM — 10% PAINT
5% GLASS-SHOTS — 5% PERLITES

Analyst 1

R. Pepe Ramnath, PhD
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DOVE ENVIRONMENTAL CORP.
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ASBESTOS TEST REPORT

CLIENT : SITECH ENVIRONMENTAL CORP.
ADDRESS: 2518 ISLAND DRIVE
MIRAMAR FL 33023
PROJECT: NORTH MIAMI PUBLIC LIBRARY
835 NE 132 ST N. MIAMI, FL 33161
CONSULT: WINSTON RADHAY

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DATE : 10/23/13
SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO.	: 13	SAMPLE NO.: C3
FRI/HOM	: YES/NO LAYERS: 02	DATE OF ANALYSIS: 10/23/13
DESCRIPTION	: 2X2, 2X4 ACT WHITE BACK "USG RADAR"	
ASBESTOS TYPE:	NONE-DETECTED	
OTHER FIBERS	: 40% CELLULOSE	10% FIBER-GLASS
	20% MINERAL WOOL	
NON FIBERS	: 10% POLYSTYRENE-FOAM	10% PAINT
	5% GLASS-SHOTS	5% PERLITES

LAB NO.	: 14	SAMPLE NO.: C4
FRI/HOM	: YES/NO LAYERS: 02	DATE OF ANALYSIS: 10/23/13
DESCRIPTION	: 2X2, 2X4 ACT WHITE BACK "USG RADAR"	
ASBESTOS TYPE:	NONE-DETECTED	
OTHER FIBERS	: 40% CELLULOSE	10% FIBER-GLASS
	20% MINERAL WOOL	
NON FIBERS	: 10% POLYSTYRENE-FOAM	10% PAINT
	5% GLASS-SHOTS	5% PERLITES

LAB NO.	: 15	SAMPLE NO.: C5
FRI/HOM	: YES/NO LAYERS: 02	DATE OF ANALYSIS: 10/23/13
DESCRIPTION	: 2X2, 2X4 ACT WHITE BACK "USG RADAR"	
ASBESTOS TYPE:	NONE-DETECTED	
OTHER FIBERS	: 40% CELLULOSE	10% FIBER-GLASS
	20% MINERAL WOOL	
NON FIBERS	: 10% POLYSTYRENE-FOAM	10% PAINT
	5% GLASS-SHOTS	5% PERLITES

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LAB NO. : 16 SAMPLE NO.: D1
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 LIGHT BACK W/STRIPES LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 30% MINERAL WOOL
NON FIBERS : 20% POLYSTYRENE-FOAM 10% PAINT

LAB NO. : 17 SAMPLE NO.: D2
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 LIGHT BACK W/STRIPES LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 30% MINERAL WOOL
NON FIBERS : 20% POLYSTYRENE-FOAM 10% PAINT

LAB NO. : 18 SAMPLE NO.: D3
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 LIGHT BACK W/STRIPES LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 30% MINERAL WOOL
NON FIBERS : 20% POLYSTYRENE-FOAM 10% PAINT

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MIRAMAR FL 33023 DATE : 10/23/13
PROJECT: NORTH MIAMI PUBLIC LIBRARY SAMPLE ID : D310316
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CONSULT: WINSTON RADHAY NVLAP Lab Code: 102053-0

LAB NO. : 19 SAMPLE NO.: E1
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 DARK BACK UNMARKED LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 20 SAMPLE NO.: E2
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 DARK BACK UNMARKED LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 21 SAMPLE NO.: E3
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 DARK BACK UNMARKED LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

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LAB NO. : 22 SAMPLE NO.: E4
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 DARK BACK UNMARKED LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 23 SAMPLE NO.: E5
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 DARK BACK UNMARKED LG PATTERN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

LAB NO. : 24 SAMPLE NO.: F1
FRI/HOM : YES/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : ACT 2X4, 2X2 LARGE PATTERN DARK BACK
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE 15% FIBER-GLASS
15% MINERAL WOOL
NON FIBERS : 10% POLYSTYRENE-FOAM 10% PAINT
5% GLASS-SHOTS 5% PERLITES

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LAB NO.	: 25	SAMPLE NO.: F2
FRI/HOM	: YES/NO LAYERS: 02	DATE OF ANALYSIS: 10/23/13
DESCRIPTION	: ACT 2X4, 2X2 LARGE PATTERN DARK BACK	
ASBESTOS TYPE:	NONE-DETECTED	
OTHER FIBERS	: 40% CELLULOSE	15% FIBER-GLASS
	15% MINERAL WOOL	
NON FIBERS	: 10% POLYSTYRENE-FOAM	10% PAINT
	5% GLASS-SHOTS	5% PERLITES

LAB NO.	: 26	SAMPLE NO.: F3
FRI/HOM	: YES/NO LAYERS: 02	DATE OF ANALYSIS: 10/23/13
DESCRIPTION	: ACT 2X4, 2X2 LARGE PATTERN DARK BACK	
ASBESTOS TYPE:	NONE-DETECTED	
OTHER FIBERS	: 40% CELLULOSE	15% FIBER-GLASS
	15% MINERAL WOOL	
NON FIBERS	: 10% POLYSTYRENE-FOAM	10% PAINT
	5% GLASS-SHOTS	5% PERLITES

LAB NO.	: 27	SAMPLE NO.: G1
FRI/HOM	: NO/NO LAYERS: 02	DATE OF ANALYSIS: 10/23/13
DESCRIPTION	: CEMENTITIOUS FRAME	
ASBESTOS TYPE:	NONE-DETECTED	
OTHER FIBERS	: 1% CELLULOSE	
NON FIBERS	: 80% MINERALS	19% PAINT

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LAB NO. : 28 SAMPLE NO.: H1
FRI/HOM : YES/YES LAYERS: 01 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : INTERIOR PLASTER OVER CUP BOARD & PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 90% MINERALS 8% PAINT

LAB NO. : 29 SAMPLE NO.: H2
FRI/HOM : YES/YES LAYERS: 01 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : INTERIOR PLASTER OVER CUP BOARD & PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 90% MINERALS 8% PAINT

LAB NO. : 30 SAMPLE NO.: H3
FRI/HOM : YES/YES LAYERS: 01 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : INTERIOR PLASTER OVER CUP BOARD & PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 90% MINERALS 8% PAINT

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LAB NO. : 31 SAMPLE NO.: H4
FRI/HOM : YES/YES LAYERS: 01 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : INTERIOR PLASTER OVER CUP BOARD & PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 90% MINERALS 8% PAINT

LAB NO. : 32 SAMPLE NO.: H5
FRI/HOM : YES/YES LAYERS: 01 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : INTERIOR PLASTER OVER CUP BOARD & PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 90% MINERALS 8% PAINT

LAB NO. : 33 SAMPLE NO.: I1
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : EXTERIOR TYPE CEMENTITIOUS PLASTER SMOOTH OVER BLACK W/PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 80% MINERALS 19% PAINT

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LAB NO. : 34 SAMPLE NO.: I2
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : EXTERIOR TYPE CEMENTITIOUS PLASTER SMOOTH OVER BLACK W/PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 80% MINERALS 19% PAINT

LAB NO. : 35 SAMPLE NO.: I3
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : EXTERIOR TYPE CEMENTITIOUS PLASTER SMOOTH OVER BLACK W/PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 80% MINERALS 19% PAINT

LAB NO. : 36 SAMPLE NO.: I4
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : EXTERIOR TYPE CEMENTITIOUS PLASTER SMOOTH OVER BLACK W/PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 80% MINERALS 19% PAINT

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LAB NO. : 37 SAMPLE NO.: I5
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : EXTERIOR TYPE CEMENTITIOUS PLASTER SMOOTH OVER BLACK W/PAINT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 80% MINERALS 19% PAINT

LAB NO. : 38 SAMPLE NO.: J1
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PLASTER OVER GYP BOARD @ MAIN RM CEILING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 90% MINERALS 10% PAINT

LAB NO. : 39 SAMPLE NO.: J2
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PLASTER OVER GYP BOARD @ MAIN RM CEILING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 90% MINERALS 10% PAINT

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LAB NO. : 40 SAMPLE NO.: J3
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PLASTER OVER GYP BOARD @ MAIN RM CEILING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 90% MINERALS 10% PAINT

LAB NO. : 41 SAMPLE NO.: J4
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PLASTER OVER GYP BOARD @ MAIN RM CEILING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 90% MINERALS 10% PAINT

LAB NO. : 42 SAMPLE NO.: J5
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PLASTER OVER GYP BOARD @ MAIN RM CEILING
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 90% MINERALS 10% PAINT

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LAB NO. : 43 SAMPLE NO.: K1
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : CEILING ACOUSTIC TECTURE @ RESTROOMS
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 20% POLYSTYRENE-FOAM 65% MINERALS
10% PAINT

LAB NO. : 44 SAMPLE NO.: K2
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : CEILING ACOUSTIC TECTURE @ RESTROOMS
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 20% POLYSTYRENE-FOAM 65% MINERALS
10% PAINT

LAB NO. : 45 SAMPLE NO.: K3
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : CEILING ACOUSTIC TECTURE @ RESTROOMS
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 20% POLYSTYRENE-FOAM 65% MINERALS
10% PAINT

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LAB NO. : 46 SAMPLE NO.: L1
FRI/HOM : YES/YES LAYERS: 01 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : BLACK FLOOR TILE MASTIC RESIDUAL
ASBESTOS TYPE: <1% CHRYSOTILE
OTHER FIBERS : 3.8 % CELLULOSE
NON FIBERS : 66% RESINS 30% POLYMERS

LAB NO. : 47 SAMPLE NO.: M1
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : VIBRATION GASKET @ AC SOUTH HVAC UNIT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% SYNTHETIC
NON FIBERS : 60% POLYMERS 30% RESINS

LAB NO. : 48 SAMPLE NO.: N1
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PETROLEUM IMPREGNATED PAPER
USED TO SUPPORT PIPES
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 40% CELLULOSE
NON FIBERS : 30% MINERALS
10% POLYMERS 20% RESINS

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ASBESTOS TEST REPORT

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CONSULT: WINSTON RADHAY

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LAB NO. : 49
FRI/HOM : NO/NO LAYERS: 03
DESCRIPTION : WALL PENETRATION SEALANT GRAY
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 30% CELLULOSE
NON FIBERS : 50% MINERALS
10% POLYMERS
SAMPLE NO.: 01
DATE OF ANALYSIS: 10/23/13
10% PAINT

LAB NO. : 50
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : OLD ROOFING ROOF PAPER & FELT W/SOME MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 30% CELLULOSE
NON FIBERS : 10% MINERALS
SAMPLE NO.: P1
DATE OF ANALYSIS: 10/23/13
60% BITUMEN

LAB NO. : 51
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : OLD ROOFING ROOF PAPER & FELT W/SOME MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 30% CELLULOSE
NON FIBERS : 10% MINERALS
SAMPLE NO.: P2
DATE OF ANALYSIS: 10/23/13
60% BITUMEN

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NVLAP Lab Code: 102053-0

LAB NO. : 52
FRI/HOM : NO/NO LAYERS: 02
SAMPLE NO.: P3
DATE OF ANALYSIS: 10/23/13
DESCRIPTION : OLD ROOFING ROOF PAPER & FELT W/SOME MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 30% CELLULOSE
NON FIBERS : 10% MINERALS
60% BITUMEN

LAB NO. : 53
FRI/HOM : NO/NO LAYERS: 02
SAMPLE NO.: Q1
DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PINK VINYL BASE COVE W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 28% MINERALS
20% POLYMERS
50% RESINS

LAB NO. : 54
FRI/HOM : NO/NO LAYERS: 02
SAMPLE NO.: Q2
DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PINK VINYL BASE COVE W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 28% MINERALS
20% POLYMERS
50% RESINS

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NVLAP Lab Code: 102053-0

LAB NO. : 55
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : PINK VINYL FLOOR TILE 12X12 W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 40% MINERALS
25% POLYMERS
30% RESINS

SAMPLE NO.: R1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 56
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : PINK VINYL FLOOR TILE 12X12 W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 40% MINERALS
25% POLYMERS
30% RESINS

SAMPLE NO.: R2
DATE OF ANALYSIS: 10/23/13

LAB NO. : 57
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : PINK VINYL FLOOR TILE 12X12 W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 40% MINERALS
25% POLYMERS
30% RESINS

SAMPLE NO.: R3
DATE OF ANALYSIS: 10/23/13

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NVLAP Lab Code: 102053-0

LAB NO. : 58
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : BLUE VINYL FLOOR TILE W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 50% MINERALS
20% RESINS
25% POLYMERS

SAMPLE NO.: S1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 59
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : BLUE VINYL FLOOR TILE W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 50% MINERALS
20% RESINS
25% POLYMERS

SAMPLE NO.: S2
DATE OF ANALYSIS: 10/23/13

LAB NO. : 60
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : BLUE VINYL FLOOR TILE W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 50% MINERALS
20% RESINS
25% POLYMERS

SAMPLE NO.: S3
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NVLAP Lab Code: 102053-0

LAB NO. : 61
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : BLUE VINYL BASE TRIM W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% PAINT
20% POLYMERS
60% RESINS

SAMPLE NO.: T1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 62
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : BLUE VINYL BASE TRIM W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% PAINT
20% POLYMERS
60% RESINS

SAMPLE NO.: T2
DATE OF ANALYSIS: 10/23/13

LAB NO. : 63
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : BLUE VINYL BASE TRIM W/MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% PAINT
20% POLYMERS
60% RESINS

SAMPLE NO.: T3
DATE OF ANALYSIS: 10/23/13

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NVLAP Lab Code: 102053-0

LAB NO. : 64
FRI/HOM : YES/YES LAYERS: 01
DESCRIPTION : CARPET MASTIC (YELLOW)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 10% MINERALS
78% POLYMERS
10% RESINS
SAMPLE NO.: U1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 65
FRI/HOM : YES/YES LAYERS: 01
DESCRIPTION : CARPET MASTIC (YELLOW)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 10% MINERALS
78% POLYMERS
10% RESINS
SAMPLE NO.: U2
DATE OF ANALYSIS: 10/23/13

LAB NO. : 66
FRI/HOM : YES/YES LAYERS: 01
DESCRIPTION : CARPET MASTIC (YELLOW)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% CELLULOSE
NON FIBERS : 10% MINERALS
78% POLYMERS
10% RESINS
SAMPLE NO.: U3
DATE OF ANALYSIS: 10/23/13

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NVLAP Lab Code: 102053-0

LAB NO. : 67
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : MOP SINK CEMENTITIOUS
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 92% MINERALS

SAMPLE NO.: V1
DATE OF ANALYSIS: 10/23/13

8% PAINT

LAB NO. : 68
FRI/HOM : NO/YES LAYERS: 01
DESCRIPTION : RED GROUT @ STONE BASE IN RECEPTION
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% SYNTHETIC
NON FIBERS : 98% MINERALS

SAMPLE NO.: W1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 69
FRI/HOM : NO/YES LAYERS: 01
DESCRIPTION : RED GROUT @ STONE BASE IN RECEPTION
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% SYNTHETIC
NON FIBERS : 98% MINERALS

SAMPLE NO.: W2
DATE OF ANALYSIS: 10/23/13

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NVLAP Lab Code: 102053-0

LAB NO. : 70
FRI/HOM : NO/YES LAYERS: 01
DESCRIPTION : RED GROUT @ STONE BASE IN RECEPTION
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 2% SYNTHETIC
NON FIBERS : 98% MINERALS
SAMPLE NO.: W3
DATE OF ANALYSIS: 10/23/13

LAB NO. : 71
FRI/HOM : NO/YES LAYERS: 01
DESCRIPTION : LOBBY CEMENTITIOUS TILE GROUT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 99% MINERALS
SAMPLE NO.: X1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 72
FRI/HOM : NO/YES LAYERS: 01
DESCRIPTION : LOBBY CEMENTITIOUS TILE GROUT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 99% MINERALS
SAMPLE NO.: X2
DATE OF ANALYSIS: 10/23/13

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NVLAP Lab Code: 102053-0

LAB NO. : 73
FRI/HOM : NO/YES LAYERS: 01
DESCRIPTION : LOBBY CEMENTITIOUS TILE GROUT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 1% CELLULOSE
NON FIBERS : 99% MINERALS

SAMPLE NO.: X3
DATE OF ANALYSIS: 10/23/13

LAB NO. : 74
FRI/HOM : NO/NO LAYERS: 03
DESCRIPTION : MENS ROOM WALL TILE W/GROUT & MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 70% MINERALS
20% POLYMERS

SAMPLE NO.: Y1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 75
FRI/HOM : NO/NO LAYERS: 03
DESCRIPTION : MENS ROOM WALL TILE W/GROUT & MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 70% MINERALS
20% POLYMERS

SAMPLE NO.: Y2
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NVLAP Lab Code: 102053-0

LAB NO. : 76
FRI/HOM : NO/YES LAYERS: 01
DESCRIPTION : WOMENS FLOOR TILE GROUT & CEMENT
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 100 % MINERALS

SAMPLE NO.: Z1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 77
FRI/HOM : NO/NO LAYERS: 03
DESCRIPTION : WOMENS WALL TILE GROUT & MASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 85% MINERALS
10% POLYMERS

SAMPLE NO.: AA1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 78
FRI/HOM : NO/NO LAYERS: 03
DESCRIPTION : BACK OFFICE MENS TILE GROUT & MASTIC CEMENT OR BLUE
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 85% MINERALS
10% POLYMERS

SAMPLE NO.: AB1
DATE OF ANALYSIS: 10/23/13

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NVLAP Lab Code: 102053-0

LAB NO. : 79
FRI/HOM : NO/NO LAYERS: 03
SAMPLE NO.: AB2
DESCRIPTION : BACK OFFICE MENS TILE GROUT & MASTIC CEMENT OR BLUE
DATE OF ANALYSIS: 10/23/13
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 85% MINERALS
10% POLYMERS

LAB NO. : 80
FRI/HOM : NO/NO LAYERS: 02
SAMPLE NO.: AC1
DESCRIPTION : PINK TILE W/CEMENT & GROUT (WOMENS @ BACK OFFICE)
DATE OF ANALYSIS: 10/23/13
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS :
NON FIBERS : 95% MINERALS
5% POLYMERS

LAB NO. : 81
FRI/HOM : YES/NO LAYERS: 02
SAMPLE NO.: AD1
DESCRIPTION : DUCT WRAP (ABANDONDED) W/INSULATION PAPER&MASTIC (CHRY FOUND IN BLACK MASTIC LAYER ONLY)
DATE OF ANALYSIS: 10/23/13
ASBESTOS TYPE: 2% CHRYSOTILE
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% RESINS
78% FIBER-GLASS

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SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. : 82
FRI/HOM : YES/NO LAYERS: 02 SAMPLE NO.: AD2
DESCRIPTION : DUCT WRAP (ABANDONDED) W/INSULATION PAPER&MASTIC DATE OF ANALYSIS: 10/23/13
(CHRY FOUND IN BLACK MASTIC LAYER ONLY)
ASBESTOS TYPE: 2% CHRYSOTILE
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% RESINS 78% FIBER-GLASS

LAB NO. : 83
FRI/HOM : YES/NO LAYERS: 02 SAMPLE NO.: AD3
DESCRIPTION : DUCT WRAP (ABANDONDED) W/INSULATION PAPER&MASTIC DATE OF ANALYSIS: 10/23/13
(CHRY FOUND IN BLACK MASTIC LAYER ONLY)
ASBESTOS TYPE: 2% CHRYSOTILE
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% RESINS 78% FIBER-GLASS

LAB NO. : 84
FRI/HOM : YES/NO LAYERS: 02 SAMPLE NO.: AD4
DESCRIPTION : DUCT WRAP (ABANDONDED) W/INSULATION PAPER&MASTIC DATE OF ANALYSIS: 10/23/13
(CHRY FOUND IN BLACK MASTIC LAYER ONLY)
ASBESTOS TYPE: 2% CHRYSOTILE
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% RESINS 78% FIBER-GLASS

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Tel. (954) 374-9274 Fax: (954) 639-7426

ASBESTOS TEST REPORT

CLIENT : SITECH ENVIRONMENTAL CORP.
ADDRESS: 2518 ISLAND DRIVE
MIRAMAR FL 33023
PROJECT: NORTH MIAMI PUBLIC LIBRARY
835 NE 132 ST N. MIAMI, FL 33161
CONSULT: WINSTON RADHAY

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SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. : 85
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : DUCT WRAP W/WHITE PLASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 70% FIBER-GLASS
NON FIBERS : 10% MINERALS
10% POLYMERS
SAMPLE NO.: AE1
DATE OF ANALYSIS: 10/23/13
10% RESINS

LAB NO. : 86
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : DUCT WRAP W/WHITE PLASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 70% FIBER-GLASS
NON FIBERS : 10% MINERALS
10% POLYMERS
SAMPLE NO.: AE2
DATE OF ANALYSIS: 10/23/13
10% RESINS

LAB NO. : 87
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : DUCT WRAP W/WHITE PLASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 70% FIBER-GLASS
NON FIBERS : 10% MINERALS
10% POLYMERS
SAMPLE NO.: AE3
DATE OF ANALYSIS: 10/23/13
10% RESINS

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NVLAP Lab Code: 102053-0

LAB NO. : 88
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : DUCT WRAP W/WHITE PLASTIC
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 70% FIBER-GLASS
NON FIBERS : 10% MINERALS
10% POLYMERS
10% RESINS

SAMPLE NO.: AE4
DATE OF ANALYSIS: 10/23/13

LAB NO. : 89
FRI/HOM : YES/YES LAYERS: 01
DESCRIPTION : BITUMINOUS PIPE INSULATION WRAP BLACK
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 10% MINERALS
95% BITUMEN

SAMPLE NO.: AF1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 90
FRI/HOM : YES/YES LAYERS: 01
DESCRIPTION : BITUMINOUS PIPE INSULATION WRAP BLACK
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 5% CELLULOSE
NON FIBERS : 10% MINERALS
95% BITUMEN

SAMPLE NO.: AF2
DATE OF ANALYSIS: 10/23/13

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SAMPLE ID : D310316

NVLAP Lab Code: 102053-0

LAB NO. : 91
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : OLD ACT 8X12 WHITE GLUES
TO WALL BOARD W/MASTIC BROWN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% PAINT

SAMPLE NO.: AG1
DATE OF ANALYSIS: 10/23/13

60% FIBER-GLASS
20% RESINS

LAB NO. : 92
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : OLD ACT 8X12 WHITE GLUES
TO WALL BOARD W/MASTIC BROWN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% PAINT

SAMPLE NO.: AG2
DATE OF ANALYSIS: 10/23/13

60% FIBER-GLASS
20% RESINS

LAB NO. : 93
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : OLD ACT 8X12 WHITE GLUES
TO WALL BOARD W/MASTIC BROWN
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 10% PAINT

SAMPLE NO.: AG3
DATE OF ANALYSIS: 10/23/13

60% FIBER-GLASS
20% RESINS

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SAMPLE ID : D310316

NVLAP Lab Code: 102053-0

LAB NO. : 94
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : OLD ACT 8X12 WHITE
ASBESTOS TYPE: 2% AMOSITE
OTHER FIBERS : 68% FIBER-GLASS
NON FIBERS : 5% MINERALS
10% GLASS-SHOTS
10% PAINT
5% PERLITES
SAMPLE NO.: AH1
DATE OF ANALYSIS: 10/23/13

LAB NO. : 95
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : OLD ACT 8X12 WHITE
ASBESTOS TYPE: 2% AMOSITE
OTHER FIBERS : 68% FIBER-GLASS
NON FIBERS : 5% MINERALS
10% GLASS-SHOTS
10% PAINT
5% PERLITES
SAMPLE NO.: AH2
DATE OF ANALYSIS: 10/23/13

LAB NO. : 96
FRI/HOM : NO/NO LAYERS: 02
DESCRIPTION : WALLBOARD & JOINT COMPOUND FIRE TAPED ONLY
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 75% MINERALS
5% FIBER-GLASS
10% PAINT
SAMPLE NO.: AJ1
DATE OF ANALYSIS: 10/23/13

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SAMPLE ID : D310316

NVLAP Lab Code: 102053-0

LAB NO. : 97 SAMPLE NO.: AJ2
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND FIRE TAPED ONLY
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE 5% FIBER-GLASS
NON FIBERS : 75% MINERALS 10% PAINT

LAB NO. : 98 SAMPLE NO.: AJ3
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND FIRE TAPED ONLY
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE 5% FIBER-GLASS
NON FIBERS : 75% MINERALS 10% PAINT

LAB NO. : 99 SAMPLE NO.: AJ4
FRI/HOM : NO/NO LAYERS: 02 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND FIRE TAPED ONLY
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE 5% FIBER-GLASS
NON FIBERS : 75% MINERALS 10% PAINT

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DATE : 10/23/13
SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. :100 SAMPLE NO.: AK1
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PROGRAM RM & SURROUNDING WALLBOARD & JOINT COMPOUND
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE 10% SYNTHETIC
NON FIBERS : 70% MINERALS 10% PAINT

LAB NO. :101 SAMPLE NO.: AK2
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PROGRAM RM & SURROUNDING WALLBOARD & JOINT COMPOUND
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE 10% SYNTHETIC
NON FIBERS : 70% MINERALS 10% PAINT

LAB NO. :102 SAMPLE NO.: AK3
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : PROGRAM RM & SURROUNDING WALLBOARD & JOINT COMPOUND
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE 10% SYNTHETIC
NON FIBERS : 70% MINERALS 10% PAINT

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DATE : 10/23/13
SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. :103 SAMPLE NO.: AL1
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND
(1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS 10% PAINT

LAB NO. :104 SAMPLE NO.: AL2
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND
(1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS 10% PAINT

LAB NO. :105 SAMPLE NO.: AL3
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND
(1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS 10% PAINT

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DATE : 10/23/13
SAMPLE ID : D310316
NVLAP Lab Code: 102053-0

LAB NO. :106 SAMPLE NO.: AL4
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND (1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS 10% PAINT

LAB NO. :107 SAMPLE NO.: AL5
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND (1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS 10% PAINT

LAB NO. :108 SAMPLE NO.: AL6
FRI/HOM : NO/NO LAYERS: 03 DATE OF ANALYSIS: 10/23/13
DESCRIPTION : WALLBOARD & JOINT COMPOUND (1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS 10% PAINT

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DATE : 10/23/13
SAMPLE ID : D310316

NVLAP Lab Code: 102053-0

LAB NO. :109
FRI/HOM : NO/NO LAYERS: 03
DESCRIPTION : WALLBOARD & JOINT COMPOUND (1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS

SAMPLE NO.: AL7
DATE OF ANALYSIS: 10/23/13

10% PAINT

LAB NO. :110
FRI/HOM : NO/NO LAYERS: 03
DESCRIPTION : WALLBOARD & JOINT COMPOUND (1983 DEMOVER ARIL)
ASBESTOS TYPE: NONE-DETECTED
OTHER FIBERS : 10% CELLULOSE
NON FIBERS : 80% MINERALS

SAMPLE NO.: AL8
DATE OF ANALYSIS: 10/23/13

10% PAINT

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SITECH ENVIRONMENTAL CORPORATION, 2518 Island Drive, Miramar, Florida 33023 Phone 954 962-7804 Fax 954 962-8875

ASBESTOS BULK SURVEY FORM

Project No.:

Client: NORTH MIAMI PUBLIC LIBRARY

Location: 835 NE 132 ST
N. MIAMI FL 33161

Date: 10/18/13

Inspector: Winston Radhay & WYLIE WHITE

Signature:

D310316

Turn around time required: 24hrs ☐ 48hrs ☐ 72hrs ☐ 96hrs ☐ 120hrs ☐

HSA	Sample No.	Material Description (Include size/color)	Sample Location	Homogeneous Area Locations (Check box if locations are only where samples were collected)	Results	Quantity	Cond			Pot. Disturb			Friable	
							G	F	P	H	M	L	Y	N
A	A1	2x2 2x4 ACT LG. PATTERN RAISE HOLES LIGHT BACKING	MAIN RM E & N	☐ MIXED IN EACH AREA W/ ACT		TOTAL POSSIBLY UP TO 8000 SF THROUGHOUT FACILITY	✓					✓	✓	
	A2		LIBRARIAN'S OFC											
	A3		COMPUTER AREA											
	A4		MAIN RM E				✓					✓	✓	
	A5		BACK OFFICE											
	A6		SIDE RM & COMPUTER AREA											
			COMPUTER AREA				✓			✓		✓	✓	
B	B1	2x4, 2x2 ACT LIGHT BROWN BACK SM. HOLES	CENTER RM & S	☐ MIXED IN EA. AREA		UP TO 1000 SF IN FACILITY	✓					✓	✓	
	B2		SW ROOM, CTR N											
	B3		COMPUTER AREA											
C	C1	2x2, 2x4 ACT WHITE BACK "USG RADAR"	RECEPTION	☐ MIXED IN EACH AREA W/ ACT		UP TO 5000 SF IN FACILITY	✓					✓	✓	
	C2		MAIN AREA S, SCE											
	C3		MAIN AREA E, N											
	C4		LIBRARIAN OFC				✓					✓	✓	
	C5		PROJ. ROOM RM											

Samples Relinquished By: Winston Radhay
Signature:
Date:

Samples Received By:
Signature:
Date: 10/24/13

G=Good, F=Fair, P=Poor; H=High, M=Moderate, L=Low

SITECH ENVIRONMENTAL CORPORATION, 2518 Island Drive, Miramar, Florida 33023 Phone 954 962-7804 Fax 954 962-8875

ASBESTOS BULK SURVEY FORM

Project No.: P810316 Date:

HSA	Sample No.	Material Description (Include size/color)	Sample Location	Homogeneous Area Locations (Check box if locations are only where samples were collected)	Results	Quantity	Cond G	Cond F	Cond P	Pot. Disturb H	Pot. Disturb M	Pot. Disturb L	Friable Y	Friable N
D	D 1	ACT 2x4, 2x2 LIGHT BACK W/ STRIPES	MAIN RM E	☐ MIXED IN EACH AREA W/ ACT		UP TO 1000 SF IN PROPERTY	✓					✓	✓	
	D 2		LOBBY											
	D 3	LG PATTERN	PROGRAM RM											
E	E 1	ACT 2x4, 2x2 DARK BACK UNMARKED LG. PATTERN	SE ROOM CE	☐ MIXED IN		UP TO 5000 SF IN PROPERTY	✓					✓	✓	
	E 2		LOBBY											
	E 3		RECEPTION											
	E 4		RECEPTION	☐ EACH AREA W/ ACT			✓					✓	✓	
	E 5		COMPUTER AREA											
F	F 1	ACT 2x4, 2x2 LARGE PATTERN DARK BACK	LOBBY	☐ MIXED IN EACH AREA W/ ACT		UP TO 1000 SF IN PROPERTY	✓					✓	✓	
	F 2		LOBBY											
	F 3		RECEPTION											
G	G 1	CEMENTITIOUS FRAME	MAINT OFC W. WALL	☒		5 SF	✓					✓		✓
H	H 1	INTERIOR PLASTER OVER GYP BOARD + PAINT	RECEPTION SW	☑ RECEPTION COMPUTER AREA LIBRARIANS OFC		UP TO 5000 SF IN PROPERTY	✓					✓		✓
	H 2		COMPUTER AREA SE											
	H 3		MAIN RM E N. WALL											
	H 4		MAIN RM E E.WL	☑ BACK OFFICE MAIN AREA EAST			✓					✓		✓
	H 5		MAIN RM E S. CTR											

G=Good, F=Fair, P=Poor; H=High, M=Moderate, L=Low

SITECH ENVIRONMENTAL CORPORATION, 2518 Island Drive, Miramar, Florida 33023 Phone 954 962-7804 Fax 954 962-8875

ASBESTOS BULK SURVEY FORM

Project No.: _____ Date: D310316

HSA	Sample No.	Material Description (Include size/color)	Sample Location	Homogeneous Area Locations (Check box if locations are only where samples were collected)	Results	Quantity	Cond			Pot. Disturb			Friable	
							G	F	P	H	M	L	Y	N
I	I 1	EXTERIOR-TYPE CEMENTITIOUS PLASTER SMOOTH OVER BLOCK	LOBBY N WALL @ W	☐ - LOBBY - GARAGE - MAINTENANCE		UP TO 3000 SF IN PROPERTY	✓					✓		✓
	I 2		LOBBY S WALL @ E											
	I 3		LOBBY @ MENS E WL											
	I 4	W/ PAINT	GARAGE S. WL CTR	☐ OFFICE			✓					✓		✓
	I 5		MAINT OFC W. WL CTR											
J	J 1	PLASTER OVER GYP BOARD @ MAIN RM CEILING	CENTER N. MAIN RM	☑		UP TO 5000 SF IN PROPERTY	✓					✓		✓
	J 2		CENTER N MAIN RM											
	J 3		EAST @ N MAIN RM											
K	K 1	CEILING ACOUSTIC TEXTURE @ RESTROOMS	MENS BY DOOR	☑		300 SF		✓			✓		✓	
	K 2		MENS BY STALLS											
	K 3		WOMENS BY DOOR											
L	L 1	BLACK FLOOR TILE MASTIC RESIDUAL	GARAGE FLOOR	☑		100 SF		✓		✓				✓
M	M 1	VIBRATION GASKET @ AC. SOUTH HVAC UNIT	AC. SOUTH	☑ A/C ROOMS ONLY		50 SF	✓					✓		✓
N	N 1	PETROLEUM IMPREGNATED PAPER USED TO SUPPORT PIPES	AC NORTH S. WALL	☑ A/C NORTH		5 SF	✓				✓			✓

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ASBESTOS BULK SURVEY FORM

Project No.: Date:

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							G	F	P	H	M	L	Y	N
O	01	WALL PENETRATION SEALANT GRAY	AC SOUTH	☑		1/2 CF	✓					✓		✓
P	P1	OLD ROOFING ROOF PAPER & FELT W/ SOME MASTIC	ATTIC - UPPER E	☐ ATTIC ONLY		UP TO 11000 SF		✓				✓		✓
	P2		ATTIC LOWER NE											
	P3		ATTIC UPPER NE CTR											
Q	Q1	PINK VINYL BASE COVE W/ MASTIC	LIBRARIANS OFC	☐ - LIBRARIAN'S OFC - BREAK ROOM - STORAGE/PANTRY		UP TO 300 LF	✓					✓		✓
	Q2		BREAK ROOM											
R	R1	PINK VINYL FLOOR TILE 12x12 W/ MASTIC	BREAK ROOM SW	☐ - PANTRY - BREAK ROOM		300-500 SF								
	R2		BREAK ROOM N											
	R3		BREAK RM BY LOBBY											
S	S1	BLUE VINYL FLOOR TILE W/MASTIC	BACK OFC C BREAK RM	☐ - STORAGE SW - BACK OFFICE		1500-2000 SF	✓					✓		✓
	S2		BACK OFC C EXIT											
	S3		PROGRAM RM AC RM											
T	T1	BLUE VINYL BASE TRIM W/ MASTIC	LIBRARIAN OFC	☐ - MAIN ROOM E, - LIBRARIANS OFC'S - BACK OFFICE - PROGRAM RM/STORAGE		500-1000 LF	✓					✓		✓
	T2		MAIN ROOM E											
	T3		PROGRAM RM STORAGE											
U	U1	CARPET MASTIC (YELLOW)	READING/LITERACY ROOM	☐ ALL CARPETED AREAS		12000-15000 SF	✓					✓		✓
	U2		LIBRARIAN'S ASST.											
	U3		MAIN ROOM E.											

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ASBESTOS BULK SURVEY FORM

Project No.: _____ Date: D310316

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							G	F	P	H	M	L	Y	N
V	V1	MOP SINK CEMENTITIOUS	BACK OFC MOP CLOSET	☑		3 cf	✓					✓		✓
W	W1	RED GROUT @ STONE BASE IN RECEPTION	RECEPTION/MAIN AREA EAST	☑		4805F	✓					✓		✓
	W2		RECEPTION NE											
	W3		RECEPTION N											
X	X1	LOBBY CEMENTITIOUS TILE GROUT	LOBBY NE	☑		700SF	✓					✓		✓
	X2		LOBBY SW											
	X3		LOBBY NW											
Y	Y1	MENS ROOM WALL TILE W/ GROUT & MASTIC	MENS ROOM DOORC BASE	☑		400 SF	✓	✓			✓	✓		✓
	Y2		MEN'S RM BEHIND DOOR											
Z	Z1	WOMANS FLOOR TILE GROUT & CEMENT	WOMENS NE	☑		150SF	✓					✓		✓
AA	AA1	WOMENS WALL TILE GROUT & MASTIC	WOMENS N	☑		400 SF	✓					✓		✓
AB	AB 1	BACK OFFICE MEN'S TILE GROUT & CEMENT OR MASTIC	BACK OFFICE MENS SW	☑		100 SF	✓					✓		✓
	AB 2		BACK OFFICE MENS SW											

BLUE

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ASBESTOS BULK SURVEY FORM

Project No.: _____ Date: D310316

HSA	Sample No.	Material Description (Include size/color)	Sample Location	Homogeneous Area Locations (Check box if locations are only where samples were collected)	Results	Quantity	Cond			Pot. Disturb			Friable	
							G	F	P	H	M	L	Y	N
AC	AC 1	PINK TILE W/ CEMENT & GROUT (WOMEN'S @ BACK OFC)	BACK OFFICE WOMEN'S SW	☑ BACK OFFICE WOMEN'S ROOM		100 SF	✓					✓		✓
AD	AD 1	DUCT WRAP (ABANDONED) W/ INSULATION PAPER & PLASTIC BLACK	ATTIC (LOWER) NE	☑ ONLY IN ATTIC (LOWER)		UP TO 500 LF		✓				✓		✓
	AD 2		ATTIC (LOWER) E											
	AD 3		ATTIC (LOWER) SE											
	AD 4	↓	ATTIC (LOWER) E	☐ ↓		↓		✓				✓		✓
AE	AE 1	DUCT WRAP W/ WHITE PLASTIC	UPPER ATTIC E CTR	☑ ONLY IN ATTIC &		UP TO 600 LF	✓					✓		✓
	AE 2		UPPER ATTIC N CTR											
	AE 3		AC NORTH SMALL DUCT											
	AE 4	↓	PROGRAM ROOM AC ROOM	☑ AC ROOMS ↓			✓					✓		✓
AF	AF 1	BITUMINOUS PIPE INSULATION WRAP BLACK	AC NORTH	☑ ONLY IN AC NORTH & AC AREA & PROGRAM RM		10 LF	✓					✓		✓
	AF 2		PROGRAM ROOM AC ROOM											
AG	AG 1	OLD ACT 8X12 WHITE GLUED TO WALLBOARD W/ MASTIC BROWN	BACK OFFICE CTR	☐ BACK OFFICE COMPUTER AREA LIBRARIAN'S OFFICE FICTION AREA		UP TO 11000 SF	✓	✓				✓		✓
	AG 2		BACK OFFICE S											
	AG 3		COMPUTER AREA SE											

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ASBESTOS BULK SURVEY FORM

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							G	F	P	H	M	L	Y	N
AH	AH-1	OLD ACT 8x12 WHITE	ATTIC (LOWER) SE	☐ BACK OFFICE COMPUTER AREA LIBRARIAN'S OFFICE NON-FICTION AREA		TOGETHER W/ AH UP TO 1000 SF		✓				✓		✓
	AH 2		MAIN RM, E & N											
AJ	AJ 1	WALLBOARD & JOINT COMPOUND	A/C SOUTH	☐ - UPPER ATTIC - LOWER ATTIC - RECEPTION - ATTIC		UP TO 5000 SF TOTAL IN PROPERTY	✓					✓	✓	
	AJ 2		ATTIC UPPER E & CTR											
	AJ 3	FIRE TAPED ONLY	MAIN RM E & CLG											
	AJ 4	(UNOCCUPIED AREAS)	RECEPTION & CLG	☐ - CEILING @ MAIN RM - A/C ROOM 3		↓	✓					✓	✓	
AK	AK 1	PROGRAM RM & SURROUNDING WALLBOARD & JOINT COMP	KITCHEN & PGM RM	☑ PROGRAM ROOM AND ASSOCIATED AREAS (1989 REMODEL)		UP TO 5000 SF IN PROPERTY	✓					✓	✓	
	AK 2		A/C ROOM & PGM RM											
	AK 3		S WALL & W PGM RM											
AL	AL 1	WALLBOARD & JOINT COMPOUND	RECEPTION CLG WHITE	☐ - LOBBY - RECEPTION - LIBRARIAN'S OFFICE AREA - COMPUTER AREA - BACK OFFICE - EAST RM - SE, CTR & SW ROOMS		UP TO 15000 SF IN PROPERTY	✓					✓	✓	
	AL 2		COMPUTER AREA N CW											
	AL 3		SE ROOM E WALL & CTR											
	AL 4	(1983 REMODEL AREA)	SW ROOM W WALL & CTR				✓					✓	✓	
	AL 5		LOBBY S & WEST											
	AL 6		LOBBY N CLG, WHITE											
	AL 7		LIBRARIANS SECY BLUE				✓					✓	✓	
	AL 8		BACK OFFICE WEST CTR COUNTER											

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APPENDIX B

CERTIFICATIONS

THIS DOCUMENT HAS A COLORED BACKGROUND • MICROPRINTING • LINEMARK™ PATENTED PAPER

AC# 5821961

STATE OF FLORIDA

DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
ASBESTOS LICENSING UNIT

SEQ# L11101102296

DATE	BATCH NUMBER	LICENSE NBR
10/11/2011	118072940	ZA0000267

The ASBESTOS BUSINESS ORGANIZATION
Named below IS LICENSED
Under the provisions of Chapter 469 FS.
Expiration date: NOV 30, 2013

SITECH ENVIRONMENTAL CORPORATION
MICHAEL A. LAWN
2518 ISLAND DRIVE
MIRAMAR FL 33023

RICK SCOTT
GOVERNOR

KEN LAWSON
SECRETARY

DISPLAY AS REQUIRED BY LAW

Asbestos Consulting & Training Systems

39935.5008CERT/BIR

900 N.W. 5TH Avenue, Fort Lauderdale, Florida 33311 (954) 524-7208

Processed By:

Seagull

To Authenticate Certificate:
www.seagulltraining.com
1-800-966-9933

This is to Certify that

Winston Radhay

XXX-XX-0815

2518 Island Drive , Miramar,FL

has successfully completed an English

Asbestos Building Inspection Refresher

3-May-13 TO 3-May-13

Individual above has completed the requsite training for accreditation under TSCA Title II

Meets state requirements of FL49-0001020/CN-0006273 and UT (6.0 core).

NDAAC Provider #451 Trainer(s): Mark Knick

Training Address: 900 NW 5 AV, Fort Lauderdale, FL, 33311

Successful course completion based on exam score on: 3-May-13

UNDER CIVIL AND CRIMINAL PENALTIES OF LAW FOR MAKING OR SUBMISSION OF FALSE OR FRAUDULENT STATEMENTS OR REPRESENTATIONS (18 U.S.C. 1001 AND 15 U.S.C. 2615), I CERTIFY THAT THIS TRAINING COMPLIES WITH ALL APPLICABLE REQUIREMENTS OF TITLE IV OF THE "TOXIC SUBSTANCES CONTROL ACT", 40 CFR PART 745 OR 763, AND ANY OTHER APPLICABLE FEDERAL, STATE, OR LOCAL REQUIREMENTS, AS AMENDED.

James F. Stump, Course Sponsor

Certificate Number..... 156923

This Certificate Expires:

05/03/14

3-May-14

Course Number SE1318

Vern Roberts Environmental Training, Inc.

13987 94th Avenue N Seminole, FL 33776

727-593-3067

Asbestos Survey & Mechanical (Inspector) Training

This is to Certify that

William Wylie White

Training was in accordance with Title II of TSCA, 40 CFR Part 763. Appendix C to Subpart E as revised

Date of Examination 4/29/13

Date of Course: 4/27 - 4/29/13 Expiration Date 4/29/14

Certificate #429132

Course # FL490006318 Provider # FL490003810

Vernon H Roberts

Instructor

1

DIVISION

SECTION 01011
SUMMARY OF WORK

PART 1 GENERAL

1.01 PROJECT

A. Project Name: North Miami Public Library Renovation.

B. Owner's Name: City of North Miami, Florida.

C. Architect's Name: Zyscovich Architects.

D. The Project consists of the interior renovations and improvements of North Miami Public Libary.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Invitation for Bid document from the City of North Miami found under Section 00200.

1.03 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is shown on drawings.

B. Scope of alterations work is shown on drawings.

C. Renovate the following areas, complete including operational mechanical and electrical work and finishes:
   1. Fiction/Non-Fiction areas.
   2. Lobby area, Technology Hub area, Reference Area and Meeting Rooms.
   3. Childrens and Young Adults areas, new restrooms.
   4. Multipurpose Room and existing toilet rooms.

1.04 WORK BY OWNER

A. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Substantial Completion. Some items include:
   1. Movable cabinets.
   2. Furnishings.
   3. Small equipment.
   4. Artwork.
   5. All items noted as NIC on the plans.

1.05 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Owner intends to occupy a certain portion of the Project prior to the completion date for voting during specified times.

C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

D. Schedule the Work to accommodate Owner occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and premises to allow:
   1. Use of site and premises by the public.
   2. Multipurpose Room.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Utility Outages and Shutdown:
   1. Prevent accidental disruption of utility services to other facilities.

1.07 WORK SEQUENCE

A. Construct Work in stages during the construction period:
   1. Stage 1: Demolition and removal work in all areas except Multipurpose Room.
   2. Stage 2: New work areas; replace finishes in all areas except Multipurpose Room.
   3. Stage 3: Remove old finishes and replace new finishes in Multipurpose Room and existing toilet rooms.

B. Coordinate construction schedule and operations with Owner.

1.08 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS

A. Unless otherwise noted, all provisions of the sections listed below apply to all contracts. Specific items of work listed under individual contract descriptions constitute exceptions.

B. Section 01230 - Alternatives.

C. Section 01300 - Administrative Requirements.

D. Section 01325 - Construction Progress Schedule.

E. Section 01565 - Security Measures.

F. Section 01400 - Quality Requirements.

G. Section 01425 - Reference Standards.

H. Section 01500 - Temporary Facilities and Controls.

I. Section 01510 - Temporary Utilities.

J. Section 01525 - Field Offices.

K. Section 01600 - Product Requirements.

L. Section 01700 - Execution Requirements.

M. Section 01780 - Closeout Submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01025
FIELD ENGINEERING

GENERAL

1.01 SUMMARY

A. Related Sections:

1.02 01410 - Testing Laboratory Services.

1.03 01700 - Contract Closeout.

A. SUBMITTALS
   1. Name and address of a Florida registered professional engineer or Florida registered land surveyor to A/E.
   2. On request of A/E, submit documentation to verify accuracy of field survey work.
   3. Written certification signed by Florida registered professional engineer or Florida registered land surveyor verifying elevations and locations of improve-ments are in conformance or non-conformance with Construction Documents.

B. QUALITY ASSURANCE
   1. Qualifications of Engineer or Surveyor: Florida registered professional engineer or Florida registered land surveyor, acceptable to A/E and the City of North Miami.

1.04 NOT USED

1.05 EXECUTION

1.06 Utility slopes and invert elevations.

1.07 Batter boards.

1.08 Building foundation, column locations, floor levels, and roof levels.

1.09 Controlling lines and levels required for mechanical and electrical trades.

A. Verify layouts by same methods periodically.

1.10 Do not proceed with the Work until written instructions involving the discrepancies have been received from A/E.

1.11 Contractor shall be responsible for any loss or damage when proceeding with the Work before consulting A/E.

A. Locate and protect control points before starting site work, and preserve permanent reference points during construction.

1.12 Do not change or relocate control points without prior written notice to A/E.

1.13 Report to A/E when reference point is lost or destroyed, or requires relocation because of accepted changes in grades or locations.

1.14 Maintain a complete, accurate log of control and survey work as the Work progresses.

END OF SECTION

SECTION 01030
ALTERNATES

GENERAL

1.01 SUMMARY

A. The Alternates described in this Section have been established to enable the Owner to compare total costs where alternative materials and methods might be used.
   1. This Section identifies each Alternate by number. The changes described in each Alternate are to be incorporated into the work only when that Alternate is made a part of such work by specific provision in the Owner-Contractor Agreement.
      a. Submit a price for each Alternate listed below in the Bid Form.
      b. If the Owner elects to proceed on the basis of one or more of the described Alternates, make modifications to the work required in furnishing and installing the selected Alternate to the acceptance of the Architect and at no additional cost to the Owner other than as proposed.
   2. Referenced Sections:
      a. Section 01600 - Materials and Equipment.
      b. Section 10660 - Interior Single Glazed Office Glass Fronts.

B. SUBMITTALS

C. Alternates described in this Section are required to be included in the bid proposal submitted. However, do not submit Alternates other than those described in this Section, except as provided in Section 01600.

1.02 PRODUCTS

A. Bid Alternate for Interior Single Glazed Office Glass Fronts
   1. Provide as per Owner and Architect direction. GC to provide final list of alternates prior to final bid for confirmation.
      a. Provide alternate bid proposal for using "Infinium" Single glazed glass partition wall system at Meeting Rooms as per Spec Section 10660 and notes on drawing sheet A-800 in lieu of aluminum framed storefronts for said Meeting Rooms.

B. Bid Alternate for Cafe
   1. Provide as per Owner and Architect direction. GC to provide final list of alternates prior to final bid for confirmation.
   2. Provide alternate bid proposal for all work associated with interior remodeling, renovation and new work related to new Cafe in existing Staff Lounge area as per sheet A-ALT-201 and A-ALT-741.

1.03 EXECUTION

A. ADVANCE COORDINATION
   1. Immediately after award of the Contract, or as soon thereafter as the Owner has stipulated which, if any, Alternates will be selected, advise all necessary personnel and suppliers as to the nature and extent of Alternates selected by the Owner.
      a. Alert those personnel and suppliers involved as to the changes in the schedule resulting from the Owner's selection or rejection of Alternates.

END OF SECTION

SECTION 01040
COORDINATION

GENERAL

1.01 BUILDING CODE INSPECTIONS

1.02 The City of North Miami building code inspectors (CNM) will make periodic inspections.

1.03 CNM will inspect specific construction phases as noted in the General Conditions (Article 13.5.8) and at any other times as often as decided by the inspectors.

1.04 ARCHITECT/ENGINEER (A/E)

1.05 References in the General Conditions to A/E refer to the firm of;

1.06 Zyscovich, Inc. 100 N Biscayne Blvd. 27th Floor, Miami, FL 33132 .

1.07 SURVEYOR'S AFFIDAVIT

1.08 Furnish a Florida registered land surveyor's affidavit verifying the location of buildings and elevations of building floors are according to Construction Documents.

1.09 COORDINATION OF DRAWINGS AND SPECIFICATIONS

1.10 Where discrepancies occur between the Drawings and specifications, between large scale Drawings and small scale Drawings, or within a document itself, the use of the item or arrangement of better quality, greater quantity, or higher cost shall be decided by the A/E.

1.11 If any such discrepancies occur in the Drawings or specifications, notify A/E and the Board for interpretations or decisions before proceeding with the Work. A/E interpretations or decisions shall be final.

1.12 Drawings are diagrammatic and show general arrangement of systems and work included in the Contract.

1.13 Coordinate Drawings and verify dimensions before laying out work and be responsible for conflicts.

1.14 Comply with Drawings in laying out Work and coordinate drawings of various trades involved in the project to verify spaces receiving work.

1.15 Notify A/E if space conditions appear inadequate before proceeding.

1.16 If directed by A/E, make reasonable modifications in layout as needed to prevent conflict with work of various trades or for proper execution of Work without extra charge.

1.17 UTILITY SHUT-OFF

1.18 Notify the City of North Miami, by letter through the A/E, at least 2 weeks before required shut-off of any utilities, security, fire protection, or energy management systems or equipment.

1.19 Letter shall state date, time, and duration of shut-off.

1.20 Protection of water and heat-using equipment shall comply with the following:

1.21 Immediately before water shut-off, coordinate with the Board's electrical shut-off to water heaters, boilers, and other equipment damaged by lack of water.

1.22 Upon restoration of water supply, coordinate with the Board re-energizing water and heat-using equipment.

1.23 Make immediate shut-off without notice if life or property are endangered.

1.24 Emergency Shut-Off: In case of a need for emergency cutoff during evenings, weekends, holidays, or other times when A/E or City of North Miami is not immediately available, contact CNM Department of Energy and Recycling Management.

1.25 SCHOOL ACTIVITIES

1.26 If areas of work required under this Contract are next to school activities, establish a work procedure acceptable to the City of North Miami.

1.27 Arrange, with the Board and A/E, for:

1.28 Site access and deliveries.

1.29 Construction staging and proper storage and protection of materials and equipment.

1.30 Removals of any type from site and premises.

1.31 Protection of life and property.

1.32 JOB MEASUREMENTS

1.33 When measurements are affected by new or existing conditions, verify job measurements and consult A/E for final decision.

1.34 SECURITY

1.35 If Contractor or the City of North Miami determine protection of property is necessary, provide a watchman's service or other means of security accepted by the CNM.

1.36 VENTILATION AND AIR-CONDITIONING OF BUILDINGS

1.37 Provide necessary temporary ventilation fans, power, temporary heat, or place air-conditioning systems in operation to provide proper humidity and temperature conditions for installation or application of flooring, paint, coatings, acoustical ceilings, and any other items requiring climate control at appropriate locations or any other means acceptable to A/E.

1.38 TEMPORARY LIGHT AND POWER

1.39 After installation of temporary power connections provide the following:

1.40 Temporary Lighting: As the building is enclosed, provide temporary lighting as required or according to A/E's direction consisting of one 100-watt lamp for each 250 square feet of area, but not less than 1 lamp per area.

1.41 Temporary Power Outlets: Provide as required for execution of the Work.

1.42 CONSTRUCTION PROJECT SIGNS

1.43 Before project sign acceptance by the A/E as to size, design, type, location, and local regulations, Contractor and subcontractors may erect temporary signs for purposes of identification and controlling traffic.

1.44 Furnish, erect, and maintain signs as required by applicable safety regulations or as necessary to safeguard life and property.

1.45 NOT USED

1.46 EXECUTION

1.47 CLEANING

1.48 In addition to removal of rubbish and leaving buildings "Broom Clean":

1.49 Replace broken glass.

1.50 Remove paint spots and smears, stains, marks, and dirt to provide clean surfaces.

1.51 Clean glass, hardware, fixtures, casework, and equipment.

1.52 Vacuum carpeting.

1.53 Wash concrete surfaces, tile floors, tile walls and any other impervious floor and wall surfaces.

1.54 CONSTRUCTION DOCUMENTS

1.55 The Drawings listed in the Index of Drawings are a part of the Contract Documents:

END OF SECTION

SECTION 01045
CUTTING AND PATCHING

GENERAL

1.01 SUMMARY

A. Section Includes: Cutting, fitting, patching, excavation, and backfill as required to complete the Work.
   1. Related Sections:

1.02 02072 - Removals.

1.03 04530 - Masonry Patchwork.

1.04 06100 - Carpentry.

1.05 Mechanical - Division 15.

1.06 Electrical - Division 16.

A. SUBMITTALS
   1. Written Request:

1.07 Submit a written request to A/E before any cutting or alteration affecting:

1.08 Work of other general contractor hired by the City of North Miami.

1.09 Structural value or integrity of any element of the Work.

1.10 Integrity of weather-exposed or moisture-resistant elements or systems.

1.11 Efficiency, operational life, maintenance, or safety of building elements.

1.12 Visual qualities of sight-exposed elements.

1.13 Security of facility.

1.14 Written request shall include:

1.15 Identification of the Work.

1.16 Description of proposed work:

1.17 Scope of cutting, patching, alteration, or excavation.

1.18 Trades executing the work.

1.19 Products proposed to be used.

1.20 Extent of refinishing to be done.

1.21 Description of affected work.

1.22 The need for cutting, alteration, or excavation.

1.23 Effect on work of any separate contractor.

1.24 Effect on structural or weatherproof integrity of the Work.

1.25 Alternatives to cutting and patching.

1.26 Written permission of any separate contractor whose work will be affected.

1.27 Date and time the Work will be uncovered.

1.28 Date and time the Work shall be completed or restored.

A. INSPECTION

1. Inspect existing conditions of the Work, including elements subject to damage or to movement during cutting and patching.

1.29 After uncovering work, inspect conditions affecting instal-lation of products or performance of work.

1.30 Report unsatisfactory or questionable conditions to A/E in writing. Do not proceed with the Work until A/E has provided further written instruc-tions.

A. PREPARATION
   1. Provide adequate temporary support as necessary to ensure structural integrity of the Work.
   2. Provide devices and methods to protect other portions of the Work from damage.
   3. Provide protection from elements for portions of the Work exposed by cutting and patching work. Maintain excavations free from water.

B. PERFORMANCE
   1. Execute cutting and demolition by methods preventing damage to other work and providing proper surfaces to receive installation of new work.

1.31 Removal of chalkboards, tackboards, and millwork installed using plaster grounds also requires removal of plaster grounds. Patch and paint to match adjacent wall surfac-es.

1.32 Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:

1.33 For continuous surfaces, refinish to nearest intersec-ting plane.

1.34 For an assembly, refinish entirely.

A. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, func-tions, tolerances, and finishes.
B. Restore temporarily cut or removed work.
C. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations.
D. Excavate and backfill using methods preventing settlement or damage to other work.
E. Restore work in a timely manner coordinated with the A/E and the City of North Miami.

1.35 NOT USED

1.36 NOT USED

END OF SECTION

SECTION 01300
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electronic document submittal service.
B. Preconstruction meeting.
C. Site mobilization meeting.
D. Progress meetings.
E. Construction progress schedule.
F. Coordination drawings.
G. Submittals for review, information, and project closeout.
H. Number of copies of submittals.
I. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01100 - Summary: Stages of the Work, Work covered by each contract, occupancy, _____.
B. Section 01325 - Construction Progress Schedule: Form, content, and administration of schedules.
C. Section 01700 - Execution Requirements: Additional coordination requirements.
D. Section 01780 - Closeout Submittals: Project record documents.

1.03 PROJECT COORDINATION

A. Project Coordinator: Owner Representative.
B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for vehicular access, traffic, and parking facilities.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator:
    1. Requests for interpretation.
    2. Requests for substitution.
    3. Shop drawings, product data, and samples.
    4. Test and inspection reports.
    5. Manufacturer's instructions and field reports.
    6. Applications for payment and change order requests.
    7. Progress schedules.
    8. Coordination drawings.
    9. Closeout submittals.
    10. Warrantees.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in PDF format.
   4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
   5. Users of the service need an email address, Internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed PDF documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the contract sum.

C. The Owner will determine which service will be used, likely from one of the following services;
   1. Submittal Exchange (tel: 1-800-714-0024): www.submittalexchange.com.
   2. EADOC LLC (tel: 1-877-305-3844): www.eadocsoftware.com.
   3. Newforma Project Cloud: www.newformaprojectcloud.com.

D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Owner will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.
   4. Sub contractor(s) when appropriate.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.

4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties to Contract, OWNER and Architect.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Owner will schedule a meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Special Consultants.
5. Contractor's Superintendent.
6. Major Subcontractors.

C. Agenda:
1. Use of premises by Owner and Contractor.
2. Owner's requirements and occupancy prior to completion.
3. Construction facilities and controls provided by Owner.
4. Temporary utilities provided by Owner.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.
11. Requirements for start-up of equipment.
12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within five days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at typical bi-monthly intervals. (weekly as needed- minimum once per month.)

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.

D. Agenda:
1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Maintenance of progress schedule.
7. Corrective measures to regain projected schedules.

8. Planned progress during succeeding work period.
9. Maintenance of quality and work standards.
10. Effect of proposed changes on progress schedule and coordination.
11. Other business relating to Work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

3.06 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Review drawings prior to submission to Architect.

3.07 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.
   5. Sample Warrantees.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01780 - CLOSEOUT SUBMITTALS.

3.08 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Sub-contractor's certifications.
   8. Installer's qualifications.
   9. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

C. Note: According to M-DCPS

3.09 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. As-built construction documents in native file format (ACAD).
   6. Other types as indicated.

B. Submit for Owner's benefit during and after project completion.

3.10 NUMBER OF COPIES OF SUBMITTALS

A. Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Extra Copies at Project Closeout: See Section 01780.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.11 SUBMITTAL PROCEDURES

A. Transmit each submittal with a copy of approved submittal form.

B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

F. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

G. Provide space for Contractor and Architect review stamps.

H. When revised for resubmission, identify all changes made since previous submission.

I. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

J. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01325
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 RELATED SECTIONS

A. Section 01100 - Summary: Work sequence.

1.03 REFERENCES

A. AGC (CPSM) - Construction Planning and Scheduling Manual; Associated General Contractors of America; 2004.

B. M-H (CPM) - CPM in Construction Management - Project Management with CPM, O'Brien, McGraw-Hill Book Company; 2006.

1.04 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.

1.05 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

B. Contractor's Administrative Personnel: 5 years minimum experience in using and monitoring CPM schedules on comparable projects.

1.06 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches or width required.

C. Sheet Size: Multiples of 8-1/2 x 11 inches.

D. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Provide sub-schedules for each stage of Work identified in Section 01100.

E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

F. Indicate delivery dates for owner-furnished products.

G. Coordinate content with schedule of values specified in Section 01200.

H. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

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

END OF SECTION

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

GENERAL

1.01 SUMMARY

A. Section Includes: Shop drawings, manufacturer's catalog cuts, product data, samples, and attached Shop Drawing/ Catalog Cut Submittal form necessary to satisfy requirements specified.
   1. Related Sections:
   2. 01310 - Construction Progress Schedule

1.02 01600 - Material and Equipment.

1.03 01710 - Contract Closeout.

1.04 01740 - Warranties.

A. DATES FOR SUBMISSION AND REVIEW
   1. Designate in the CPM the dates for submission to A/E and review completion dates needed for shop drawings, product data, and samples to maintain the project schedule.

B. SHOP DRAWINGS/MANUFACTURER'S CATALOG CUTS
   1. Shop Drawings: Submit 2 prints and 1 reproducible sepia with the image on the back, for each required shop drawing.

1.05 Identify each shop drawing with the following information placed on each drawing:

1.06 Name of the facility.

1.07 Name of project at the facility.

1.08 Board's project number.

1.09 Name of company submitting the shop drawing.

1.10 Date of drawing.

1.11 Provide a blank space 6 inches wide by 4 inches high in the lower right corner of each shop drawing page for the A/E's shop drawing stamp.

A. Manufacturer's Catalog Cuts: Submit 8 copies of each catalog cut or 8 edited catalogs.

B. The Shop Drawing/Product Data Submittal form shall be attached to each required shop drawing, manufacturer's catalog cut, or other product data.

C. Submittal of Samples, Color Charts, Color Chips, or Color Samples for Selection and Coordination:

1.12 Submit 3 copies of all material color charts, color chips, or color samples within 30 days after start of construction to allow for selection, color coordination, and final acceptance by A/E. Material color charts, color chips, or color samples shall be manufacturer's full color range and of standard sizes unless specified otherwise.

1.13 Where architectural precast or poured-in-place architectural concrete is required, submit at least 4 architectural concrete finish color and texture samples.

1.14 SUBMITTALS

A. Prints, samples, and color charts shall be at the expense of Contractor.

B. Submit all color selection materials for complete coordination of color scheme. No individual color selections will be approved before receipt of all the colors.

C. SUBMITTAL IDENTIFICATION
   1. Submit only 1 item or system per letter of transmittal properly identified to include the appropriate specification section and section paragraphs.
   2. When shop drawings, edited catalog cuts of components, product data, diagrams, or charts are sub-mitted with more than 1 type of specified product, identify the particular item, including options, intended for use in the Work.
   3. Resubmittals shall be identified with original shop drawing number and followed with a dash (-) and a letter A, B, etc. corresponding to the resubmittal sequence.

D. SUBMITTAL COMPLETENESS
   1. Submit catalog sheets, product data, shop drawings, material samples, color chips, color charts, test data, and warranties at the same time for each item.

1.15 Submit shop drawings with appropriate data and with the Drawing identification mark numbers as shown, specified, or scheduled.

1.16 Shop drawings without identification mark numbers or with incomplete performance information will not be reviewed until submission is complete.

A. PREPARATION
   1. Clearly mark each submittal to identify each appropriate product or model.
   2. Show performance characteristics and capacities.
   3. Show dimensions and clearances required.
   4. Show wiring or piping diagrams and controls.

B. IDENTIFICATION
   1. Identify details by reference to sheets and details, schedules, or room numbers as shown on Drawings.
   2. Manufacturer's standards, schematic drawings, and diagrams:

1.17 Modify drawings and diagrams to delete information not applicable to the Work.

1.18 Supplement standard information to provide information specifically applicable to the Work.

A. SAMPLES
   1. Submit samples of sufficient size and quantity to clearly illustrate:

1.19 Functional characteristics of product, integrally related parts, and attachment devices.

1.20 Full range of color, texture, and pattern.

A. FIELD SAMPLES AND MOCK-UPS
   1. Erect at project site, at a location acceptable to the A/E.
   2. Size and Area: As shown on Drawings or specified in respective specification section.
   3. Fabricate each sample and complete as acceptable to A/E.
   4. Remove mockups at completion of work and when acceptable to A/E.

B. CONTRACTOR RESPONSIBILITIES
   1. Review shop drawings, catalog cuts, product data, and samples before submission. Determine and verify:

1.21 Field measurements.

1.22 Field construction criteria.

1.23 Catalog numbers and similar data.

1.24 Conformance with Construction Documents.

A. Coordinate each submittal with requirements of the Work and of Construction Documents.

B. Notify the A/E, in writing at time of submission, of any deviations in submittals from requirements of Construction Documents.

C. Shop drawings shall be stamped, approved, and signed by the Contractor before submittal to A/E, otherwise they will be sent back to the Contractor without being processed by the A/E.

D. Do not ship apparatus or equipment from stock or fabricate until shop drawings have been reviewed and approved by A/E.

E. Always maintain and have available for reference a field copy of accepted shop drawings at the job site.

1.25 NOT USED

1.26 NOT USED

END OF SECTION

SECTION 01400
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quality assurance submittals.
B. Mock-ups.
C. Control of installation.
D. Tolerances.
E. Testing and inspection services.
F. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

A. Section 01300 - Administrative Requirements: Submittal procedures.
B. Section 01425 - Reference Standards.
C. Section 01600 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008.
B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2013a.
C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2012.
D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
E. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2011.
F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2009.

1.04 SUBMITTALS

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.

e. Identification of product and specifications section.
f. Location in the Project.
g. Type of test/inspection.
h. Date of test/inspection.
i. Results of test/inspection.
j. Conformance with Contract Documents.
k. When requested by Architect, provide interpretation of results.

2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.05 REFERENCES AND STANDARDS - See Section 01 4219

1.06 TESTING AND INSPECTION AGENCIES

A. Owner will employ and pay for services of an independent testing agency to perform specified testing.

B. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

D. Contractor Employed Agency:
1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM C1021, ASTM C1077, and ASTM C1093.
2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
3. Laboratory: Authorized to operate in the State of Florida.
4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
a. To provide access to Work to be tested/inspected.
b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.
d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01410
REGULATORY REQUIREMENTS

PART 1 GENERAL

2.01 SUMMARY

A. All work on this Project shall be done in strict accordance with, but not limited to, applicable requirements and portions of the latest editions of the currently adopted codes, revisions, amendments, and their references, in the Jurisdiction Having Authority.

B. Regulatory requirements applicable to this project are the following:

C. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition; (ADA Standards for Accessible Design).

D. 29 CFR 1910 - Occupational Safety and Health Standards; current edition; as a work place.

E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010

F. Florida Building Code, 2010:
   1. Florida Building Code - Building
   2. Florida Accessibility Code: http://dlis.dos.state.fl.us/fgils/government.html.
      a. The Florida Accessibility Code for Building Construction is established by Florida law, Part II, Chapter 553, Florida Statutes, (sections 553.501 - 553.513, Florida Statutes
      b. The law was amended in 2011 and its resulting requirements are integrated into this code. The revisions are established by chapter 2011-222, Laws of Florida.
   3. Florida Building Code - Fuel Gas
   4. Florida Building Code - Mechanical
   5. Florida Building Code - Plumbing
   6. National Electrical Code - FBC Chapter 27
   7. FBC Referenced Codes and Standards -- Chapter 35
   8. Florida Fire Prevention Code, Ch. 69A-60, Florida Administrative Code, which includes:
      a. NFPA 1
      b. Referenced Mandatory Codes and Standards listed in 69A-60.005, FAC
      c. Florida Administrative Code: State Fire Marshal's rule 69A-58
      d. Referenced Mandatory Codes and Standards listed in NFPA 101

G. Miami -Dade County (APD) - Approved Products Directory; Miami-Dade County; database at www.miamidade.gov/buildingcode.

H. Building Code: Florida Building Code - Existing.

2.02 RELATED REQUIREMENTS

A. Section 01400 - Quality Requirements.

2.03 QUALITY ASSURANCE

A. Designer Qualifications: Where delegated engineering design is to be performed under the construction contract provide the direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State of Florida.

B. Federal Environmental Regulatory Requirements: Comply with applicable regulations. The following is for Contractor's information only:
   1. Storm water permits; refer to The Office of Wastewater Management, NPDES Storm Water Program: http://www.epa.gov/npdes/stormwater

2. Dredge and fill (Section 404) permits; refer to U.S. EPA Office of Wetlands, Oceans, and Watersheds (OWOW): http://www.epa.gov/owow/
3. RCRA hazardous and non-hazardous solid waste requirements; refer to EPA's Office of Solid Waste and Emergency Response: http://www.epa.gov/epaoswer/osw/laws-reg.htm
4. Oil spill requirements for construction activities; refer to EPA Oil Program web site: http://www.epa.gov/oilspill/
5. Hazardous substances (Superfund Liability) requirements for construction activities; refer to EPA's Superfund website: http://www.epa.gov/superfund/index.htm
6. Polychlorinated Biphenyl (PCB) waste requirements; refer to EPA's Polychlorinated Biphenyl (PCB) Homepage: http://www.epa.gov/pcb/
7. Air quality requirements for construction activities; refer to EPA'S Air Program Mobile Sources Page: http://www.epa.gov/ebtpages/airmobilesources.html
8. National Environmental Policy Act (NEPA) requirements for construction activities

C. State and Local Environmental Regulatory Requirements: Comply with applicable regulations. The following is for Contractor's information only:
1. State Office/Department of Environmental Quality.
2. Local Office/Department of Environmental Quality.
3. The Construction Industry Compliance Assistance Center: www.cicacenter.org/index.cfm
4. The National Environmental Compliance Assistance Clearinghouse: http://cfpub.epa.gov/clearinghouse/
5. The Associated General Contractors of America (AGC): www.agc.org/

D. Code Standards: All work shall conform to applicable portions of the adopted, or if not adopted, except when more rigid requirements are specified or are required by applicable codes, the latest edition of the standards listed which shall include, but is not limited to, the following:
1. Aluminum Association Inc. (AA)
2. Architectural Aluminum Manufacturer's Association (AAMA)
3. American Concrete Institute International (ACI)
4. American Institute of Steel Construction Inc (AISC)
5. American National Standards Institute (ANSI)
6. American Society for Testing and Materials (ASTM)
7. American Society of Mechanical Engineers (ASME)
8. American Society of Heating, Refrigeration and Air Conditioning Engineers Inc (ASHRAE)
9. American Welding Society (AWS)
10. Architectural Woodworking Institute (AWI).
11. Commercial Standards (CS)
12. Federal Specifications and Standards (FSS)
13. National Occupations Safety and Health Administration (OSHA)
14. National Institute for Standards and Technology (NIST)
15. Architectural Sheet Metal Manual (SMACNA)
16. Underwriter's Laboratories (UL)

E. Compliance with Codes: A permit issued by the municipality having jurisdiction will be construed as permission to proceed with construction, and not as authority to violate, cancel, alter, or set aside any of the provisions of any Codes, nor shall issuance of a permit prevent the Building Official from thereafter requiring a correction of errors in plans, construction, or violations of any Codes.

F. Code Descrepancies: In case of discrepancy between the codes, standards, and specifications listed, the most strict or most stringent requirement shall govern.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01415
TESTING LABORATORY SERVICES

GENERAL

1.01 TESTING LABORATORY

A. The City of North Miami (CNM) will employ and pay for the services of an independent testing laboratory to perform specified testing as noted in Section 15991 - Testing and Balancing.

1.02 Contractor shall cooperate with laboratory to perform its required services.

1.03 Employment of laboratory shall not relieve Contractor's obligations to perform the Work.

A. LIMITATIONS OF AUTHORITY OF TESTING LABORATORY
   1. Laboratory is not authorized to:

1.04 Release, revoke, alter, or expand requirements of Construction Documents.

1.05 Approve any portion of the Work.

1.06 Perform any duties of the Contractor.

A. CONTRACTOR'S RESPONSIBILITIES
   1. Cooperate with laboratory personnel and provide access to work or manufacturer's operations.
   2. Secure and deliver to the laboratory adequate quantities of representative samples of materials requiring testing.
   3. Furnish copies of products test reports as required to A/E.
   4. Furnish incidental labor and facilities:

1.07 To provide access to work to be tested.

1.08 To obtain and handle samples at project site or at source of product to be tested.

1.09 To facilitate inspections and tests.

1.10 For storage and curing of test samples.

A. Notify the City of North Miami before testing operation to allow for laboratory assignment.

B. AUTHORIZATION FOR TESTS
   1. A/E will designate tests to be performed and Con-trac-tor shall not obligate the Board for tests without A/E's acceptance.

C. TESTING COSTS PAID BY THE CITY OF NORTH MIAMI
   1. Tests of various materials, methods, and equipment are required by the CNM and will be performed by the CNM Testing Laboratory.
   2. The CNM will only pay for initial CNM required tests of materials, methods, and equipment to verify compliance with Construction Documents.

D. TESTING COSTS PAID BY CONTRACTOR
   1. Tests:

1.11 Specified tests of Work with non-compliance results shall be retested at no cost to the Board until satisfactory compliance is achieved.

1.12 Not Specified in Construction Documents: Tests determined by Contractor to be of Contractor's benefit and ordered by Contractor, shall be paid by Contractor.

1.13 Contractor's Option: Contractor may employ the CNM testing laboratory or may employ a separate, equally quali-fied independent testing laboratory, acceptable to the CNM and A/E, to perform additional in-spec-tions, sampling, and testing the Contractor has determined to be of Contractor's benefit or obligated to perform due to failure of specified initial testing.

A. Contractor shall furnish gas, water, electricity, and expendable chemicals as necessary for construction and testing purposes.

B. If substitute materials or equipment are proposed by Contractor, Contractor shall pay testing costs deemed necessary by the A/E to satisfy the A/E and Contract Documents.

C. THRESHOLD INSPECTIONS
   1. Comply with Florida Statute Section 553.79(5).
   2. The A/E is required to certify the referenced structures have been designed according to the Florida Building Code, 2010 edition, and other applicable codes. The Contractor shall prepare and submit to the CNM and A/E the structural inspection plans showing the proposed schedule and procedures of inspections for:

1.14 Gymnasium Building.

A. Submit a signed and sealed shoring and reshoring plan, prepared by a Florida registered professional engineer for the CNM's use before beginning the structural portions of the Work.

B. The CNM will engage a certified threshold building inspector to carry out the inspections and certifications of the structural elements and the shoring plans.

1.15 NOT USED

1.16 NOT USED

END OF SECTION

SECTION 01425
REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements relating to referenced standards.

B. Reference standards full title and edition date.

1.02 QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue specified in this section, except where a specific date is established by applicable code.

C. Obtain copies of standards when required by the Contract Documents.

D. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.

E. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

A. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009 (part of AAMA 501).

B. AAMA 607.1 - Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes For Architectural Aluminum; 1977.

C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

D. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels; 2013.

E. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2012.

F. AAMA/WDMA/CSA 101/I.S.2/A440 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors; 2011

2.02 ACI -- AMERICAN CONCRETE INSTITUTE INTERNATIONAL

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2002).

C. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; 1998 (Reapproved 2004).

D. ACI 308R - Guide to Curing Concrete; 2001 (Reapproved 2008).

E. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.

F. ACI 347 - Recommended Practice For Concrete Formwork;.

G. ACI 347 - Guide to Formwork for Concrete; 2004.

H. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2008.

I. ACI SP-66 - ACI Detailing Manual; 2004.

2.03 AGC -- ASSOCIATED GENERAL CONTRACTORS OF AMERICA

A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.

2.04 AISC -- AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.

A. AISC (MAN) - Steel Construction Manual; 2005.

B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.

2.05 AISI -- AMERICAN IRON AND STEEL INSTITUTE

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement.

2.06 ALSC -- AMERICAN LUMBER STANDARDS COMMITTEE

2.07 AMCA -- AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.

A. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2012.

B. AMCA 511 - Certified Ratings Program for Air Control Devices; 2010.

2.08 ANSI -- AMERICAN NATIONAL STANDARDS INSTITUTE

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.

B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2013.1.

C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar; 2013.1.

D. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex Portland Cement; 2013.1.

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2013.1.

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 2013.1.

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 2013.1.

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2013.1.

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2013.1.

K. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 2013.1.

L. ANSI A118.1 - American National Standard Specifications for Dry-Set Portland Cement Mortar; 2013.1.

M. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive; 2013.1.

N. ANSI A118.4 - American National Standard Specifications for Latex-Portland Cement Mortar; 2013.1.

O. ANSI A118.5 - American National Standard Specifications for Chemical Resistant Furan Mortars and Grouts for Tile Installation; 2013.1.

P. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2013.1.

Q. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2013.1.

R. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation; 2013.1.

S. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.

T. ANSI A136.1 - American National Standard for Organic Adhesives for Installation of Ceramic Tile; 2013.1.

U. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.

V. ANSI A224.1 - American National Standard Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1990.

W. ANSI A250.3 - American National Standard Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames; 2007 (R2011).

X. ANSI A250.4 - American National Standard Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings; 2011.

Y. ANSI A250.6 - Hardware on Standard Steel Doors (Reinforcement--Application); 2003 (R2009).

Z. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.

AA. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2011).

2.09 APA -- APA - THE ENGINEERED WOOD ASSOCIATION

A. APA PRP-108 - Performance Standards and Qualification Policy for Structural-Use Panels (Form E445); 2001.

B. APA J20 - Grades & Specifications; Current Edition.

C. APA Y510 - Plywood Design Specification; 1997.

2.10 ASCE -- AMERICAN SOCIETY OF CIVIL ENGINEERS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010.

2.11 ASHRAE -- AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.

A. ASHRAE Guideline 1.1 - The HVAC Commissioning Process; 2012

B. ASHRAE Std 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings; 2013, Including All Addenda (ANSI/ASHRAE/IES Std 90.1).

2.12 ASME -- THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

A. ASME A112.6.1M - Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2002).

B. ASME A112.6.3 - Floor and Trench Drains; 2001 (R2007).

C. ASME A112.19.14 - Six Liter Water Closets Equipped with Dual Flushing Device; 2013.

D. ASME B31.9 - Building Services Piping; 2011 (ANSI/ASME B31.9).

2.13 ASTM A Series -- ASTM INTERNATIONAL

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2006.

C. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire; 2013.

D. ASTM A135/A135M - Standard Specification for Electric-Resistance-Welded Steel Pipe; 2009.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

F. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2007.

G. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2013.

H. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2001.

J. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 0094.

K. ASTM A366/A366M - Standard Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled; 1997.

L. ASTM A370- Standard Test Methods and Definitions for Mechanical Testing of Steel Products; 2012a.

M. ASTM A385-385 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip); 2011.

N. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a.

O. ASTM A416/A416M - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete; 2006.

P. ASTM A424 - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.

Q. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

R. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2007.

S. ASTM A513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing; 2012.

T. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984 (Reapproved 2009).

U. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2004.

V. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

W. ASTM A924/A924M - Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process; 2013.

X. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2011.

Y. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2006.

Z. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement; 2009b.

AA. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2013.

AB. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2013.

AC. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2013.

2.14 ASTM B Series -- ASTM INTERNATIONAL

A. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2012.

B. ASTM B32 - Standard Specification for Solder Metal; 2008.

C. ASTM B85/85M - Standard Specification for Aluminum-Alloy Die Castings; 2013.

D. ASTM B101 - Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction; 2012.

E. ASTM B108/B108M - Standard Specification for Aluminum-Alloy Permanent Mold Castings; 2012.

F. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011.

G. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011.

H. ASTM B179 - Standard Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes; 2011.

I. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2012.

J. ASTM B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes (Metric); 2012.

K. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2012e1.

L. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); 2012e1.

M. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

N. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2012.

O. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011e1.

2.15 ASTM C Series -- ASTM INTERNATIONAL

A. ASTM C12 - Standard Practice for Installing Vitrified Clay Pipe Lines; 2013.

B. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.

C. ASTM C55 - Standard Specification for Concrete Building Brick; 2001.

D. ASTM C78 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading); 2010.
E. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2006.
F. ASTM C91/C91M - Standard Specification for Masonry Cement; 2005.
G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2007.
H. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2003.
I. ASTM C150/C150M - Standard Specification for Portland Cement; 2007.
J. ASTM C206 - Standard Specification for Finishing Hydrated Lime; 2003 (Reapproved 2009).
K. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
L. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
M. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2007.
N. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
O. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2013.
P. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
Q. ASTM C476 - Standard Specification for Grout for Masonry; 2010.
R. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 0099.
S. ASTM C495 - Standard Test Method for Compressive Strength of Lightweight Insulating Concrete; 0099a.
T. ASTM C510 - Standard Test Method For Staining And Color Change Of Single- Or Multicomponent Joint Sealants; 2011.
U. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2007.
V. ASTM C580 - Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes; 2002 (Reapproved 2012).
W. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
X. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2008.
Y. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
Z. ASTM C728 - Standard Specification for Perlite Thermal Insulation Board; 2013.
AA. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
AB. ASTM C790 - Use of Latex Sealants; 1990
AC. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2012.
AD. ASTM C847 - Standard Specification for Metal Lath; 2012.
AE. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
AF. ASTM C882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear; 2012.
AG. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

AH. ASTM C1015 - Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation; 2006 (Reapproved 2011)e1.

AI. ASTM C1019 - Standard Test Method for Sampling and Testing Grout; 2005.

AJ. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008.

AK. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

AL. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2012a.

AM. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2013a.

AN. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2012.

AO. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry; 1995 (Reapproved 2013).

AP. ASTM C1167 - Standard Specification for Clay Roof Tiles; 2011.

AQ. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.

AR. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

AS. ASTM C1248 - Standard Test Method For Staining Of Porous Substrate By Joint Sealants; 2012.

AT. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2007a (Reapproved 2011).

AU. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.

AV. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts; 2011.

AW. ASTM C1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings; 2008.

AX. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.

AY. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008.

2.16 ASTM D Series -- ASTM INTERNATIONAL

A. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011.

B. ASTM D312 - Standard Specification for Asphalt Used in Roofing; 2000 (Reapproved 2006).

C. ASTM D523 - Standard Test Method for Specular Gloss; 2008.

D. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

E. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position; 2007.

F. ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint; 2002 (Reapproved 2009).

G. ASTM D822/D822M - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings; 2013.

H. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2012.

I. ASTM D905 - Standard Test Method for Strength Properties of Adhesive Bonds in Shear by Compression Loading; 2008 (Reapproved 2013).

J. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics; 2011e1.

K. ASTM D1079 - Standard Terminology Relating to Roofing and Waterproofing; 2013.

L. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments; 2008.

M. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).

N. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).

O. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2006.

P. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test); 2008,

Q. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.

R. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 2013a.

S. ASTM D2244 - Standard Practice for Calculation of Color Differences from Instrumentally Measured Color Coordinates; 2011.

T. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2004.

U. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact); 1993 (Reapproved 2010).

V. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings; 96(2002).

W. ASTM D3019 - Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non Fibered, Asbestos Fibered, and Non Asbestos Fibered; 2008.

X. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

Y. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test; 2009e2.

Z. ASTM D3363 - Standard Test Method for Film Hardness by Pencil Test; 2005 (Reapproved 2011)e2.

AA. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.

AB. ASTM D 3746 - Standard Test Method for Impact Resistance of Bituminous Roofing System

AC. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

AD. ASTM D4601/D4601M - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing; 2004 (Reapproved 2012)e1.

AE. ASTM D4674 - Standard Practice for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Office Environments; 2002a (Reapproved 2010).

AF. ASTM D 5147 - Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.

AG. ASTM D 5849 - Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement)

AH. ASTM D6162 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements; 2000a (Reapproved 2008).

AI. ASTM D6163 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements; 2000 (Reapproved 2008).

AJ. ASTM D6164/D6164M - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements; 2011.

AK. ASTM D6298 - Standard Specification for Fiberglass Reinforced Styrene Butadiene Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface; 2013.

AL. ASTM D6662 - Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards; 2013.

AM. ASTM D 7379 - Standard Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive.

2.17 ASTM E Series -- ASTM INTERNATIONAL

A. ASTM E1 - Standard Specification for ASTM Liquid in Glass Thermometers; 2013.

B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.

C. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2013.

D. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2011.

E. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

F. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

G. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing; 2011.

H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

I. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

J. ASTM E336 - Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings; 2011.

K. ASTM E413 - Classification for Rating Sound Insulation; 2010.

L. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2009.

M. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2011.

N. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.

O. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2000 (Reapproved 2008)

P. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.

Q. ASTM E1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems; 2011.

R. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.

2.18 ASTM F Series -- ASTM INTERNATIONAL

A. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2011.

B. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric; 2011.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

D. ASTM F793 - Standard Classification of Wall Covering by Use Characteristics; 2010a.

E. ASTM F842 - Standard Test Methods for Measuring the Forced Entry Resistance of Sliding Door Assemblies, Excluding Glazing Impact; 2013.

F. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework; 2012.

G. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2010)e1.

H. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2010.

I. ASTM F1292 - Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment; 2009.

J. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use; 2011.

K. ASTM F1665 - Standard Specification for Poly(Vinyl Chloride)(PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence; 2008 (Reapproved 2013).

L. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).

M. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004 (Reapproved 2010).

N. ASTM F2408 - Ornamental Fences Employing Galvanized Steel Tubular Pickets; 2011.

2.19 ASTM G Series -- ASTM INTERNATIONAL

A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2009.

2.20 AWI -- ARCHITECTURAL WOODWORK INSTITUTE

A. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

B. AWI P-201 - Architectural Casework; 1989.

C. AWI P-205 - Fire Code Summary; 1986.

D. AWI P-206 - Guide to Wood Species; 1977.

E. AWI P-211 - Source Book; current edition.

F. AWI (QCP) - Quality Certification Program; current edition at www.awiqcp.org.

2.21 AWI/AWMAC/WI -- JOINT PUBLICATION OF ARCHITECTURAL WOODWORK INSTITUTE/ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA/WOODWORK INSTITUTE

2.22 AWPA -- AMERICAN WOOD-PRESERVERS' ASSOCIATION

A. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.

2.23 AWS -- AMERICAN WELDING SOCIETY

A. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2004.
C. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2003.
D. AWS D1.3 - Structural Welding Code - Sheet Steel; 1993.
E. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; 1998.
F. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2007.
G. AWS D9.1M/D9.1 - Sheet Metal Welding Code; 2012.
H. AWS D10.9 - Specification for Qualification of Welding Procedures and Welders for Piping and Tubing; 1980.

2.24 AWWA -- AMERICAN WATER WORKS ASSOCIATION

A. AWWA B301 - Liquid Chlorine; 2010 (ANSI/AWWA B301).
B. AWWA C652 - Disinfection of Water-Storage Facilities; 2011.
C. AWWA C950 - Fiberglass Pressure Pipe; 2013 (ANSI/AWWA C950).

2.25 BAAQMD -- BAY AREA AIR QUALITY MANAGEMENT DISTRICT

A. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; 2002.

2.26 BHMA -- BUILDERS HARDWARE MANUFACTURERS ASSOCIATION

A. BHMA A156.5 - Cylinders and Input Devices for Locks; 2010 (ANSI/BHMA A156.5).
B. BHMA A156.6 - American National Standard for Architectural Door Trim; 2010 (ANSI/BHMA A156.6).
C. BHMA A156.7 - American National Standard for Template Hinge Dimensions; 2003 (ANSI/BHMA A156.7).
D. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; 2010 (ANSI/BHMA A156.8).
E. BHMA A156.9 - American National Standard for Cabinet Hardware; 2010 (ANSI/BHMA A156.9).
F. BHMA A156.10 - American National Standard for Power Operated Pedestrian Doors; 2011 (ANSI/BHMA A156.10).
G. BHMA A156.12 - American National Standard for Interconnected Locks; 2005 (ANSI/BHMA A156.12).
H. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000; 2012 (ANSI/BHMA A156.13).
I. BHMA A156.14 - American National Standard for Sliding & Folding Door Hardware; 2007 (ANSI/BHMA A156.14).

J. BHMA A156.16 - American National Standard for Auxiliary Hardware; 2008 (ANSI/BHMA A156.16).

K. BHMA A156.17 - American National Standard for Self Closing Hinges & Pivots; 2004 (ANSI/BHMA A156.17).

L. BHMA A156.18 - American National Standard for Materials and Finishes; 2012 (ANSI/BHMA A156.18).

M. BHMA A156.19 - American National Standard for Power Assist and Low Energy Power Operated Doors; 2013 (ANSI/BHMA A156.19).

N. BHMA A156.23 - American National Standard for Electromagnetic Locks; 2010 (ANSI/BHMA A156.23).

O. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.

P. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006 (ANSI/BHMA A156.115W).

2.27 CAL -- STATE OF CALIFORNIA

A. CAL (EESR) - California Energy Efficiency Standards Residential Alternative Calculation Method (ACM) Approval Manual; 2005.

2.28 CLFMI -- CHAIN LINK FENCE MANUFACTURERS INSTITUTE

A. CLFMI CLF 2445 - Product Manual; 1997.

2.29 CONSENSUSDOCS -- CONSENSUSDOCS, LLC

A. ConsensusDOCS 200 - Standard Agreement and General Conditions Between Owner and Contractor (Where the Contract Price is a Lump Sum); 2011.

B. ConsensusDOCS 471 - Design-Build Performance Bond (Where the Surety is NOT Liable for Design Services); 2011.

2.30 CRI -- CARPET AND RUG INSTITUTE

A. CRI 104 - Standard for Installation of Commercial Textile Floorcovering Materials; 2002.

B. CRI (CIS) - Carpet Installation Standard; 2009.

C. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; www.carpet-rug.org; current edition.

D. CRI (GLC) - Green Label Testing Program - Approved Product Categories for Carpet; www.carpet-rug.org; current edition.

E. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; www.carpet-rug.org; current edition.

F. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; www.carpet-rug.org; current edition.

2.31 CRSI -- CONCRETE REINFORCING STEEL INSTITUTE

2.32 CTI -- CERAMIC TILE INSTITUTE

A. CTI (CTM) - Ceramic Tile Manual; 1991.

2.33 DHI -- DOOR AND HARDWARE INSTITUTE

A. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.

B. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.

C. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; 2000 (ANSI/DHI A115 Series).

D. DHI A115.1 - Specifications for Preparation of 1-3/8" and 1-3/4" Standard Steel Doors and Steel Frames for Series 1000 Mortise Locks and Latches; 1990 (ANSI/DHI A115.1).

E. DHI A115.2 - Specifications for Preparation of 1-3/8" and 1-3/4" Standard Steel Doors and Frames for Series 4000 Bored Locks and Latches; 1996 (ANSI/DHI A115.2).

F. DHI A115W Series - Specifications for Wood Door and Frame Preparation for Hardware; 2000.

2.34 EJCDC - ENGINEERS' JOINT CONTRACT DOCUMENTS COMMITTEE

A. EJCDC C-525 - Standard Form of Agreement Between Owner & Contractor, Cost-Plus; 2007.

B. EJCDC C-615 - Construction Payment Bond; 2007.

C. EJCDC C-942 - Field Order; 2007.

2.35 FLA - STATE OF FLORIDA

A. FLA (FBC-B) - Florida Building Code: Building; 2010.

B. FLA (PAD) - Florida Building Code Online - Product Approval Directory; database at www.floridabuilding.org.

2.36 FM -- FACTORY MUTUAL RESEARCH CORPORATION

A. FM 4410 - Protected Metal Panels, Class 1, Fire Rated; current edition.

B. FM 4880 - Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall Systems; 2010.

C. FM DS 1-28 - Wind Design; 2007.

D. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System; 2006.

E. FM P7825 - Approval Guide; current edition.

2.37 GA -- GYPSUM ASSOCIATION

A. GA-214 - Recommended Levels of Gypsum Board Finish; 2010.

B. GA-216 - Application and Finishing of Gypsum Board; 2013.

C. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.

D. GA-600 - Fire Resistance Design Manual; 2012.

2.38 GANA -- GLASS ASSOCIATION OF NORTH AMERICA

A. GANA (GM) - GANA Glazing Manual; 2009.

B. GANA (SM) - GANA Sealant Manual; 2008.

C. GANA (LGDG) - Laminated Glazing Reference Manual; 2009.

2.39 GREENSEAL -- GREEN SEAL, INC.

A. GreenSeal GS-11 - Architectural Paints; 1993.

B. GreenSeal GS-36 - Commercial Adhesives; 2011.

2.40 HPVA -- HARDWOOD PLYWOOD VENEER ASSOCIATION

2.41 IAS -- INTERNATIONAL ACCREDITATION SERVICE

A. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2012.

2.42 ICC - INTERNATIONAL CODE COUNCIL, INC.

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; 2009.

B. ICC (IFC) - International Fire Code; 2012.

2.43 ICC-ES - ICC EVALUATION SERVICE, INC.

2.44 IESNA -- ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA

2.45 ISO -- INTERNATIONAL STANDARDS ORGANIZATION

A. ISO 9000 - ISO Standards Compendium: ISO 9000 - Quality management; 2005.

B. ISO 9001 - Quality Management Systems-Requirements; 2008.

C. ISO 9002 - Quality Systems - Model for Quality Assurance in Production, Installation and Servicing; 1994.

2.46 ITS -- INTERTEK TESTING SERVICES NA, INC.

2.47 M-H -- MCGRAW-HILL BOOK COMPANY

2.48 MFMA -- METAL FRAMING MANUFACTURERS ASSOCIATION

A. MFMA-4 - Metal Framing Standards Publication; 2004

B. MFMA (GU) - Guidelines for the Use of Metal Framing; current edition.

2.49 MIAMI -- MIAMI-DADE COUNTY

A. Miami (APD) - Approved Products Directory; Miami-Dade County; database at www.miamidade.gov/development/product-control.asp.

B. MDC OES4 - Miami-Dade County Office of Elevator Safety

2.50 ML/SFA -- METAL LATH/STEEL FRAMING ASSOCIATION - See NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

2.51 MPI - MASTER PAINTERS INSTITUTE (MASTER PAINTERS AND DECORATORS ASSOCIATION)

A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; 2004.

2.52 MSS -- MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY, INC.

A. MSS SP-85 - Cast Iron Globe & Angle Valves, Flanged and Threaded Ends; 2011.

2.53 NAAMM -- THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

A. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.

B. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.

C. NAAMM ML/SFA 540 - Lightweight Steel Framing Systems Manual; 1987, Third Edition.

D. NAAMM ML/SFA 920 - Guide Specifications for Metal Lathing and Furring; 2009.

2.54 NEBB -- NATIONAL ENVIRONMENTAL BALANCING BUREAU

2.55 NECA -- NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION

A. NECA/EGSA 404 - Standard for Installing Generator Sets; 2007.

2.56 NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

A. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2003.

B. NEMA TP 2 - Standard Test Method for Measuring the Energy Consumption of Distribution Transformers; 2005.

C. NEMA TP 3 - Standard for the Labeling of Distribution Transformer Efficiency; 2000.

2.57 NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION

A. NFPA 1 - Uniform Fire Code; 2012.

B. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2012.

E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.

F. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2012.

G. NFPA 92 - Standard for Smoke Control Systems; 2012.

H. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2014.

I. NFPA 101 - Life Safety Code; 2012.

J. NFPA 204 - Guide for Smoke and Heat Venting; 2012.

K. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances; 2013.

L. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

M. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.

N. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2011.

O. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; 2006.

P. NFPA 259 - Standard Test Method for Potential Heat of Building Materials; 2013.

Q. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2010.

R. NFPA 5000 - Building Construction and Safety Code; 2012.

2.58 NFRC -- NATIONAL FENESTRATION RATING COUNCIL, INC.

2.59 NHLA -- NATIONAL HARDWOOD LUMBER ASSOCIATION

A. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; 2011.

2.60 NRCA -- NATIONAL ROOFING CONTRACTORS ASSOCIATION

A. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; Fifth Edition, with interim updates.

2.61 NSF -- NSF INTERNATIONAL (National Sanitation Foundation)

A. NSF 35 - High Pressure Decorative Laminates for Surfacing Food Service Equipment; 2009.

B. NSF 372 - Drinking Water System Components - Lead Content; 2011.

2.62 NTMA -- NATIONAL TERRAZZO AND MOSAIC ASSOCIATION, INC., THE

A. NTMA (SPECS) - [NTMA Terrazzo Specifications]; current edition located at www.ntma.com.

2.63 NTMA -- NATIONAL TILE AND MARBLE ASSOCIATION

2.64 OWMA -- OPERABLE WALL MANUFACTURERS ASSOCIATION

A. OWMA (SC) - Sound Control Performance of Operable Walls; 1987.

2.65 PDCA -- PAINTING AND DECORATING CONTRACTORS OF AMERICA

2.66 SCAQMD -- SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

A. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition; www.aqmd.gov.

B. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

2.67 SCS - SCIENTIFIC CERTIFICATION SYSTEMS

A. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scscertified.com.

2.68 SDI -- STEEL DOOR INSTITUTE

A. SDI 100 - Recommended Specifications Standard Steel Doors and Frames; 1991 (ANSI/SDI 100).

B. SDI 105 - Recommended Erection Instructions for Steel Frames; 1998.

C. SDI 107 - Hardware on Steel Doors (Reinforcement--Application); 1984.

D. SDI 111 - Recommended Standard Details for Steel Doors & Frames; 2009.

E. SDI 114 - Test Procedure and Acceptance Criteria for Acoustical Performance for Steel Door and Frame Assemblies; 1979.

F. SDI 116 - Standard Test Procedure and Acceptance Criteria for Rate of Air Flow Through Closed Steel Door and Frame Assemblies; 1979.

2.69 SEFA - SCIENTIFIC EQUIPMENT AND FURNITURE ASSOCIATION

A. SEFA 2.3 - Installation of Scientific Laboratory Furniture and Equipment; 2010.

B. SEFA 3 - Work Surfaces; 2010.

2.70 SJI -- STEEL JOIST INSTITUTE

A. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; 2008.

2.71 SMACNA -- SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.

A. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

B. SMACNA (KVS) - Kitchen Ventilation Systems & Food Service Equipment Fabrication & Installation Guidelines; 2001.

2.72 SPIB -- SOUTHERN PINE INSPECTION BUREAU, INC.

A. SPIB (GR) - Grading Rules; 2002.

2.73 SPRI -- SINGLE PLY ROOFING INDUSTRY

A. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems; 2003. (ANSI/SPRI ES-1)

2.74 SSPC -- THE SOCIETY FOR PROTECTIVE COATINGS

A. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Fourth Edition.

B. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

C. SSPC-SP 1 - Solvent Cleaning; 1982 (Ed. 2004).

D. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

E. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).

F. SSPC-SP 5 - White Metal Blast Cleaning; 2007.

G. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

H. SSPC-SP 7 - Brush-Off Blast Cleaning; 2007.

2.75 SWRI -- SEALANT, WATERPROOFING AND RESTORATION INSTITUTE

2.76 TCNA -- TILE COUNCIL OF NORTH AMERICA, INC.

A. TCNA (HB) - Handbook for Ceramic Tile Installation; 2013.1.

2.77 UL -- UNDERWRITERS LABORATORIES INC.

A. UL (BMD) - Building Materials Directory; current edition.

B. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; current edition.

C. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

D. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

E. UL 58 - Steel Underground Tanks for Flammable and Combustible Liquids; Current Edition, Including All Revisions.

F. UL 246 - Hydrants for Fire-Protection Service; Current Edition, Including All Revisions.

G. UL 262 - Gate Valves for Fire-Protection Service; Current Edition, Including All Revisions.

H. UL 273 - Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

I. UL 294 - Access Control System Units; Current Edition, Including All Revisions.

J. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

K. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

L. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

M. UL 1994 - Luminous Egress Path Marking Systems; Current Edition, Including All Revisions.

N. UL 2111 - Standard for Safety Overheating Protection for Motors-First Edition; Current Edition, Including All Revisions.

2.78 VSI - VINYL SIDING INSTITUTE, A DIVISION OF THE SOCIETY OF THE PLASTICS INDUSTRY, INC.

A. VSI (INST) - Vinyl Siding Installation Manual; online at http://www.vinylsiding.org; 2011.

2.79 WCMA -- WINDOW COVERING MANUFACTURERS ASSOCIATION

A. WCMA A100.1 - Safety of Corded Window Covering Products; Window Covering Manufacturers Association; 2012. (ANSI/WCMA A101.1)

2.80 WDMA -- WINDOW AND DOOR MANUFACTURERS ASSOCIATION (formerly NWWDA)

A. WDMA I.S.1-A - Architectural Wood Flush Doors; 2011.

2.81 WI -- WOODWORK INSTITUTE

A. WI (CCP) - Certified Compliance Program (CCP); current edition at www.woodworkinstitute.com/certification.

PART 3 UNITED STATES GOVERNMENT AND RELATED AGENCIES DOCUMENTS

3.01 CFR -- CODE OF FEDERAL REGULATIONS

A. 16 CFR 260 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; current edition.

B. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

C. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.

D. 29 CFR 1910.132-138 - Personal Protective Equipment; current edition.

E. 29 CFR 1910.134 - Respiratory protection; current edition.

F. 29 CFR 1910.1000 - Air Contaminants; current edition.

G. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition. (for construction work)

H. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition; (ADA Standards for Accessible Design).

3.02 EPA - ENVIRONMENTAL PROTECTION AGENCY

3.03 FAA -- FEDERAL AVIATION ADMINISTRATION

A. FAA AC 150/5345-46 - Runway and Taxiway Light Fixtures; Revision D, 2009.

3.04 FHWA - FEDERAL HIGHWAY ADMINISTRATION

A. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; Current Edition.

B. FHWA (SHS) - Standard Highway Signs; Federal Highway Administration; 2004.

3.05 FS -- FEDERAL SPECIFICATIONS AND STANDARDS (General Services Administration)

A. FED-STD-795 - Uniform Federal Accessibility Standards; 1988 (UFAS).

B. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber; Revision A, 1996.

C. FS L-P-1040 - Plastic Sheets and Strips (Polyvinyl Fluoride); Revision B, 1977.

D. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, and Vinyl Composition; Revision B, 1974, and Amendment 1, 1979.

E. FS W-C-596 - Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.

3.06 PS - PRODUCT STANDARDS

A. PS 1 - Structural Plywood; 2009.

B. PS 20 - American Softwood Lumber Standard; 2010.

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.

B. Temporary telecommunications services.

C. Temporary sanitary facilities.

D. Temporary Controls: Barriers, enclosures, and fencing.

E. Security requirements.

F. Waste removal facilities and services.

G. Field offices.

1.02 RELATED REQUIREMENTS

A. Section 01510 - Temporary Utilities.

B. Section 01525 - Field Offices.

1.03 TEMPORARY UTILITIES - See Section 01510

A. Owner will provide the following:
   1. Electrical power and metering, consisting of connection to existing facilities.
   2. Water supply, consisting of connection to existing facilities.

B. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.04 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:
   1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Telephone Land Lines: One line, minimum; one handset per line.
   3. Internet Connections: Minimum of one; DSL modem or faster.
   4. Email: Account/address reserved for project use.
   5. Facsimile Service: Minimum of one dedicated fax machine/printer, with dedicated phone line.
   6. Facsimile Service: Fax-to-email software on personal computer.

1.05 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

C. At end of construction, return facilities to same or better condition as originally found.

1.06 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

A. Construction: Contractor's option.

1.08 INTERIOR ENCLOSURES

A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.09 SECURITY - See Section 01565

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

1.10 VEHICULAR ACCESS AND PARKING - See Section 01550

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 FIELD OFFICES - See Section 01525

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01510
TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS

A. Section 01500 - Temporary Facilities and Controls:
   1. Temporary telecommunications services for administrative purposes.
   2. Temporary sanitary facilities required by law.

1.03 TEMPORARY ELECTRICITY

A. Cost: By Contractor.

B. Provide power service required from utility source.

C. Connect to Owner's existing power service.
   1. Do not disrupt Owner's need for continuous service.
   2. Exercise measures to conserve energy.
   3. Provide separate metering and reimburse Owner for cost of energy used.

D. Complement existing power service capacity and characteristics as required.

E. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.

F. Provide main service disconnect and over-current protection at convenient location and meter.

G. Permanent convenience receptacles may be utilized during construction.

H. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft .

B. Provide and maintain 0.25 watt/sq ft H.I.D. lighting to interior work areas after dark for security purposes.

C. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.

D. Maintain lighting and provide routine repairs.

E. Permanent building lighting may be utilized during construction.

1.05 TEMPORARY HEATING

A. Cost of Energy: By Contractor.

B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.

C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

D. Owner's existing heat plant may be used.
   1. Exercise measures to conserve energy.
   2. Enclose building prior to activating temporary heat.

3. Provide separate metering and reimburse Owner for cost of energy used.

E. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.06 TEMPORARY COOLING

A. Cost of Energy: By Contractor.

B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.

C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

D. Owner's existing cooling plant may be used.
   1. Exercise measures to conserve energy.
   2. Enclose building prior to activating temporary cooling.
   3. Provide separate metering and reimburse Owner for cost of energy used.

E. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.07 TEMPORARY VENTILATION

A. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.08 TEMPORARY WATER SERVICE

A. Cost of Water Used: By Contractor.

B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.

C. Connect to existing water source.
   1. Exercise measures to conserve water.
   2. Provide separate metering and reimburse Owner for cost of water used.

D. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01525
FIELD OFFICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary field offices for use of Contractor.

B. Maintenance and removal.

1.02 RELATED REQUIREMENTS

A. Section 01100 - Summary: use of premises and responsibility for providing field offices.

B. Section 01500 - Temporary Facilities and Controls:

1.03 USE OF EXISTING FACILITIES

A. Designated existing spaces may be used for field offices: Conference Room, Staff Lounge.

1.04 USE OF PERMANENT FACILITIES

A. When permanent facilities are enclosed with operable utilities, relocate offices into building, with written agreement of Owner, and remove temporary buildings.

PART 2 PRODUCTS

2.01 MATERIALS, EQUIPMENT, FURNISHINGS

A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.

2.02 CONSTRUCTION

A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.

B. Construction: Structurally sound, secure, weather tight enclosures for office. Maintain during progress of Work; remove when no longer needed.

C. Temperature Transmission Resistance of Floors, Walls, and Ceilings: Compatible with occupancy requirements.

D. Exterior Materials: Weather resistant, finished in one color.

E. Interior Materials in Offices: Sheet type materials for walls and ceilings, prefinished or painted; resilient floors and bases.

F. Lighting for Offices: 50 fc at desk top height, exterior lighting at entrance doors.

G. Fire Extinguishers: Appropriate type fire extinguisher at each office.

2.03 ENVIRONMENTAL CONTROL

A. Heating, Cooling, and Ventilating: Automatic equipment to maintain comfort conditions.

2.04 Contractor OFFICE AND FACILITIES

A. Size: For Contractor's needs and to provide space for project meetings.

B. Telephone: As specified in Section 01500.

C. Furnishings in Meeting Area: Conference table and chairs to seat at least eight persons; racks and files for Contract Documents, submittals, and project record documents.

D. Other Furnishings: Contractor's option.

E. Equipment: Six adjustable band protective helmets for visitors, one 10 inch outdoor weather thermometer and _____.

2.05 OWNER AND ARCHITECT/ENGINEER OFFICE

A. Separate space for sole use of Owner and Architect, with separate entrance door with new lock and two keys.

B. Electrical Distribution Panel: Two circuits minimum, 110 volt, 60 hz service.

C. Minimum four 110 volt duplex convenience outlets, one on each wall.

D. Telephone: As specified in Section 01500.

E. Sanitary Facilities: As specified in Section 01500.

F. Drinking Fountain: Convenient access by workers.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install office spaces ready for occupancy 7 days after date fixed in Notice to Proceed.

B. Parking: Two hard surfaced parking spaces for use by Owner and Architect, connected to office by hard surfaced walk.

C. Employee Residential Occupancy: Not allowed on Owner's property.

3.02 MAINTENANCE AND CLEANING

A. Weekly janitorial services for offices; periodic cleaning and maintenance for offices.

B. Maintain approach walks free of mud, water, and snow.

3.03 REMOVAL

A. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

END OF SECTION

SECTION 01530

BARRIERS

GENERAL

1.01 SUMMARY

A. Section Includes: Suitable barriers required to prevent public entry and to protect Work, exist-ing facilities, and landscaping from construction operations, and barrier removals when no longer needed or at completion of Work.

B. QUALITY ASSURANCE
   1. Comply with applicable federal, state, and local codes and standards.

1.02 PRODUCTS

A. MATERIALS
   1. New or used, suitable for the intended purpose and complying with requirements of applicable codes and standards.
   2. Fencing: Open-mesh materials per Contractor's option and a minimum height of 6'-0". Construct open-mesh fences according to industry standards.
   3. Other Barriers: Materials per Contractor's option and as appropriate to serve the required purpose.

1.03 EXECUTION

A. INSTALLATION
   1. Install barriers in a neat and uniform appearance.
   2. Maintain barriers as needed during construction period.
   3. Relocate barriers as required by progress of construction.
   4. Fences:

1.04 Before starting work at the site, install enclosure fence with suitable locking entrance gates.

1.05 Locate fences to enclose construction areas and construction staging area.

1.06 Provide vehicular entrance gates in suitable locations to construction and existing facilities. Avoid interference with traffic patterns.

1.07 Locate pedestrian entrance gates as required to provide controlled personnel entry.

A. REMOVALS
   1. Remove barriers, including foundations, when con-struction has progressed to the point when barriers are no longer needed and when approved by A/E.
   2. Clean and repair damage caused by installation or removal of barriers.

END OF SECTION

SECTION 01565
SECURITY MEASURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security measures including formal security program, entry control, personnel identification, guard service, and miscellaneous restrictions.

1.02 RELATED REQUIREMENTS

A. Section 01100 - Summary: use of premises and occupancy.

B. Section 01500 - Temporary Facilities and Controls: Temporary lighting.

1.03 SECURITY PROGRAM

A. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

B. Initiate program in coordination with Owner's existing security system at project mobilization.

C. Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.

1.04 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities.

B. Allow entrance only to authorized persons with proper identification.

C. Maintain log of workers and visitors, make available to Owner on request.

D. Owner will control entrance of persons and vehicles related to Owner's operations.

E. Contractor shall control entrance of persons and vehicles related to Owner's operations.

F. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

1.05 PERSONNEL IDENTIFICATION

A. Provide identification badge to each person authorized to enter premises.

B. Badge To Include: Personal photograph, name, assigned number, expiration date and employer.

C. Maintain a list of accredited persons, submit copy to Owner on request.

D. Require return of badges at expiration of their employment on the Work.

1.06 RESTRICTIONS

A. Do not allow cameras on site or photographs taken except by written approval of Owner.

B. Do no work on Sundays.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01590
FIELD OFFICES AND SHEDS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Temporary field offices, storage sheds, or work sheds furnished, installed, and maintained during the entire construction period or as needed for construction.
   1. Before installation of offices and sheds, consult with the Board for location, access, and related facilities.

1.02 REQUIREMENTS

A. Construction of Field Offices and Sheds:
   1. Structurally sound, weather tight, with floor raised aboveground.
   2. Temperature Transmission Resistance: Compatible with human occupancy and storage requirements.
   3. At Contractor's option, portable or mobile buildings may be used. Mobile homes, when used, shall be modified for field office use.

B. Year Round Hurricane Precautions: Provide appropriate tie-downs for temporary trailers, field offices, and sheds to be capable of withstanding wind velocity pressures according to American Society of Civil Engineers (ASCE) 7-98.
   1. Provide calculations and connection details, signed and sealed by a Florida registered professional engineer, using wind velocity pressure values for the specific structure according to ASCE 7-98 based on a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.15.

1.03 FIELD OFFICE

A. Contractor's Field Office:
   1. Size as required for general use and to provide space for project meetings.
   2. Services:
      a. Lighting: 50 foot-candles at desktop height.
      b. Exterior lighting at entrance door.
      c. Automatic heating and mechanical cooling equipment to maintain human comfort conditions.
      d. Minimum of four 110-volt duplex electric convenience outlets, at least 1 on each wall of major spaces.
      e. Electric Distribution Panel: Two circuits minimum, 110 volt, 60-hertz service.
      f. Drinking water cooler and toilet facili-ties. Provide refrigerator w/ ice for use by both owner and AE as needed.
      g. Telephone: Direct line instrument. Refer to Section 01510 - Temporary Utilities for additional information.
      h. Photocopier available for use by the Board and A/E.
      i. Facsimile machine available for use by the Board and A/E.
      j. Two wireless 2-way communication devices for use by the Board.
   3. Meeting Area Furnishings:
      a. Conference table and chairs for at least 12 persons.
      b. Racks and files for Project Record Documents in or next to the meeting area.
      c. c. Provide 4’ x 4’ white board, and 4’ x 8’ tackboard

1.04 d. Other Furnishings: Contractor's Option.

A. Provide electrical, lighting, and telephone services as necessary.

1. One 10-inch (250 mm) outdoor-type thermometer.

B. A/E's Field Office: Maintain and provide a n air conditioned and heated field office equipped with lights, telephone, and plan desks large enough for the use by the A/E.

C. Provide workspace for two staff, one administrative and one full-time site representative. Provide a min of two (2) 3' x 6' desks and 36" deep x 8 ft. counter sufficient to hold full size plan set for review.

D. Provide a desktop computer equipped with scheduling software used by the contractor, Microsoft word, excel, Microsoft project, complete "Adobe" package including Adobe Photoshop and Autocad- 2002. Provide ample memory for programs indicated. Provide second jack location and electrical outlets to support notebook computer (provided by AE)

1.05 System should be equivalent to the following;

1.06 PP420UA#ABA HP d530 Convertible Minitower

A. Microsoft® Windows® XP Professional

B. Intel® Pentium® 4 3.00GHz/800 with HT Technology

C. Intel® 865G chipset

D. 1GB PC3200 400MHz DDR (2X512)

E. 40GB PATA/100 7200RPM

F. Integrated Intel® Extreme graphics2 (64MB equivalant)

G. 48X/32X/48X/16X DVD/CD-RW combo drive

H. 1.44MB Floppy disk drive

I. Integrated audio with internal speaker

J. Integrated Broadcom NetXtreme Gigabit Ethernet networking

K. HP PS/2 standard keyboard

L. USB optical scroll mouse

M. Norton Antivirus, latest edition

N. 3-3-3 (Parts/Labor/On-Site) Limited Worldwide Warranty

O. P9621D#ABA HP L1702 17-inch carbon/silver analog flat panel display

P. Provide an 11 X 17" copier/printer/fax machine that is wired/interfaced with the computer equal to HP Laser Jet 81150

Q. Provide DSL line form internet communication of the computer and access/license to MSN

R. Provide Fields representative with phone/walkie talkie that interfaces with contractors fields crew.

S. Provide independent locks, and provide individual keys to staff.

T. Provide two lockable four-drawer letter size file cabinets, and one lockable legal size four drawer cabinet. Provide vertical blueprint rack (s) and rack space for minimum 9 volumes of drawings.

U. Provide telephone number and independent fax numbers for each to the architect. Cost of telephone installation shall be paid by Contracto5r and long distance calls made by the AE will be paid by the AE.

V. Provide HD metal shelving unit(s) to provide 24 LF of shelving minimum, clear depth to be 12" min (must be able to hold notebooks)

W. 10. Provide 4' x 4' white board, w/ markers, and tack board surface equivalent to 4' x 8ft.

X. Board's Field Office: Provide an adjacent air-conditioned and heated field office space.

1. Arrange space to allow separation from AE area and privacy by means of a door.

2. A minimum area of 120 square feet of space, adequately lighted, with electrical service and receptacles for normal office aids.
3. Furnishings: Include one secretarial type desk and chair, one table approximately 3 feet by 6 feet, one lockable four-drawer letter size file cabinet, and a vertical blueprint rack(s) sized appropriately to hold this projects 9 volumes of documents.
4. Provide a desktop computer equal to unit specified for Architect above.
5. Provide a desk telephone in the Board's office for the Board's exclusive use.
6. Cost of telephone installation shall be paid by Contractor and long distance calls made by the Board will be paid by the Board.

1.07 STORAGE SHEDS

A. As required of various trades.

B. Dimensions: Adequate for storage and handling of products.

C. Ventilation: Comply with specified and code requirements for products stored.

1.08 USE OF PERMANENT FACILITIES

A. Permanent facilities, enclosed, habitable, and with operable mechanical and electrical facilities, may be used as offices located in the building.
   1. Consult with A/E and the Board regarding permis-sion for use of selected areas within the building.
   2. Provide specified furnishings, equipment, and services.

PART 2 PRODUCTS

2.01 MATERIALS, EQUIPMENT, AND FURNISHINGS

A. Serviceable, adequate for required purpose, and not violating applicable codes or regulations.

PART 3 EXECUTION

3.01 INSTALLATION

A. Fill and grade sites for temporary structures to provide surface drainage.

B. Construct temporary field offices and storage sheds on proper foundations. Provide connections for utility services.
   1. Secure portable or mobile buildings, when used, against break-ins and hurricane requirements per code.
   2. Provide slip-resistant steps and landings at entrance doors.

C. Mount thermometer at a convenient outside, continuously shaded location.

3.02 MAINTENANCE AND CLEANING

A. Provide periodic maintenance and cleaning for temporary struc-tures, furnishings, equipment, and services.

3.03 REMOVALS

A. Remove temporary field offices, contents, and services when no longer needed.

B. Remove storage sheds when no longer needed.

C. Remove foundations and debris, grade site to specified eleva-tions, and complete remaining site work indicated on Construction Documents.

END OF SECTION

SECTION 01600
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.
B. Re-use of existing products.
C. Transportation, handling, storage and protection.
D. Product option requirements.
E. Substitution limitations and procedures.
F. Procedures for Owner-supplied products.
G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01100 - Summary: Lists of products to be removed from existing building.
B. Section 01400 - Quality Requirements: Product quality monitoring.
C. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
D. Section 01732 - Waste Management: Waste disposal requirements potentially affecting packaging and substitutions.

1.03 REFERENCE STANDARDS

A. 16 CFR 260 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; current edition.
B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.
B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

D. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Do not use products having any of the following characteristics:
   1. Made outside the United States, its territories, Canada, or Mexico.
   2. Made using or containing CFC's or HCFC's.
   3. Made of wood from newly cut old growth timber.

C. Where all other criteria are met, Contractor shall give preference to products that:
   1. Are extracted, harvested, and/or manufactured closer to the location of the project.
   2. Have longer documented life span under normal use.
   3. Result in less construction waste.
   4. Are made of vegetable materials that are rapidly renewable.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Architect will consider requests for substitutions only within 15 days after date of Agreement.

C. Substitutions will not be considered when a product becomes unavailable through no fault of the Contractor.

D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

E. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

G. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 OWNER-SUPPLIED PRODUCTS

A. See Section 01100 - Summary for identification of Owner-supplied products.

B. Owner's Responsibilities:
   1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for product delivery to site.
   3. On delivery, inspect products jointly with Contractor.
   4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
   5. Arrange for manufacturers' warranties, inspections, and service.

C. Contractor's Responsibilities:
   1. Review Owner reviewed shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01610
MATERIALS AND EQUIPMENT

GENERAL

1.01 SUMMARY

A. Section Includes: General requirements for delivery, storage, handling, and installation of products and Contractor's options in selecting products and requesting substitutions.

B. SUBMITTALS

1. Products Listed: Within 45 days after contract award date, submit to A/E a complete list of specified products to be provided, with names of manufacturers and installing subcontractors.
2. Manufacturer's Instructions: Comply with manufacturer's printed installation instructions and manufacturer=s Materials Safety Data Sheets (MSDS). Obtain and distribute copies of such information to parties involved in installation, including 3 copies to A/E.

1.02 Maintain 1 set of complete instructions and 1 set of MSDS at the job site during installation and until project completion.

A. DELIVERY, STORAGE, AND HANDLING

1. Arrange deliveries of products according to construction schedules. Avoid conflicts with work, site conditions, and school operations, if applicable.

1.03 Schedule product delivery for minimum storage time at the site.

A. Products shall be delivered in undamaged condition, in manufacturer's original containers or packaging, and with identifying labels intact and legible.

B. Immediately upon delivery, inspect shipments to ensure compli-ance with Construction Documents and approved submittals. Verify products are undam-aged.

C. Handle products without soiling or damaging.

D. Storage and Protection:

1.04 Store products according to manufacturers printed instructions, with seals and labels intact and legible.

1.05 Store products prone to damage by elements in weather-tight enclosures.

1.06 Maintain temperature and humidity within range required by manufacturer's instructions.

1.07 Store products aboveground, on blocking, or skids to prevent soiling or staining.

1.08 Cover products prone to de-teriora-tion with waterproof covers and provide adequate ventilation to avoid condensation.

1.09 Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

1.10 Arrange storage to provide easy access for inspection. Inspect stored products periodically to ensure products are maintained under specified conditions and are free from damage or deterioration.

A. Protection After Installation: Protect installed products from damage. Remove coverings when protection is no longer needed.

B. BOARD'S INSTRUCTIONS
   1. Contractor's Options:

1.11 Where products are specified by reference standard only, select any product complying with the requirements of the standard.

1.12 Where products are specified by naming two or more products or manufacturers, select one of the products or manufac-turers named.

1.13 For products specified by naming two or more products or manufacturers without the words "or accepted equivalent" or similar language, a substitution option does not exist.

1.14 For products specified by naming only one product or one manufacturer, and the words "or accepted equivalent" or similar language, any product submitted as an equivalent shall be treated as a substitution to be submitted for consideration only after award of the contract.

1.15 For products specified by naming only one product and manufacturer without the words "or accepted equivalent" or similar language, a substitution option does not exist.

A. Product Substitutions: For a period of 45 days after contract award date, A/E will consider written requests from Contractor for substitution of products according to the General Conditions.

B. A request for substitution of a product may be submitted to the A/E after the Contractor:

1.16 Has investigated the proposed product and determined it is equal or superior to the specified product.

1.17 Agrees to provide same or better warranty for product substitution as for product specified.

1.18 Agrees to be responsible for coordinating and installing the substitution.

1.19 Agrees to pay for any necessary changes to other work required by the substitution selected by Contractor.

1.20 Agrees to pay costs, including A/E's services required to revise the Construction Documents to make the work complete.

1.21 Waives all claims for additional costs that may subsequently become apparent due to the substitution.

1.22 Is offering either a substantial credit to the Board for acceptance of the substitution or a convincing justifica-tion that the product to be provided as the substitution is substantially superior in quality, performance, compatibility with adjacent products, durability, vandal-resistance or other important factors.

A. After the period of 45 days has elapsed, the only substitution requests allowed are for the removal of the specified products from the marketplace or natural catastrophes and other similar acts of God.

1.23 Scheduling conflicts are not grounds for substitution requests.

1.24 PRODUCTS

A. MANUFACTURED AND FABRICATED UNITS
   1. Fabricate and assemble according to referenced standards and approved shop drawings.
   2. Manufactured related parts of duplicate units to standard sizes and gages shall be interchangeable.
   3. Match similar items by one manufacturer.
   4. Do not use material or equipment for other than designated or specified purpose.

1.25 EXECUTION

A. INSTALLATION
   1. Handle, install, connect, clean, and adjust products according to manufacturers' instructions and specifi-cations.

1.26 If job conditions or specified requirements conflict with manufacturer's instructions, notify A/E. Do not proceed with the work until A/E issues clarification.

A. FIELD QUALITY CONTROL
   1. Upon completion of work and tests, provide necessary skilled labor for operating systems and equipment for 8 continuous hours a day for 3 consecutive days.
   2. Notify major subcontractors to be present at inspections with necessary tools and equip-ment to facilitate easy and safe access to all parts of the buildings and equipment.

END OF SECTION

SECTION 01616
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."

B. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

A. Section 01300 - Administrative Requirements: Submittal procedures.

B. Section 01400 - Quality Requirements: Procedures for testing and certifications.

C. Section 01600 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
   1. Adhesives, sealants, and sealer coatings.
   2. Carpet.
   3. Carpet cushion.
   4. Carpet tile.
   5. Resilient floor coverings.
   6. Paints and coatings.
   7. Insulation.
   8. Gypsum board.
   9. Acoustical ceilings and panels.
   10. Cabinet work.
   11. Wall coverings.
   12. Composite wood and agrifiber products used either alone or as part of another product.
   13. Other products when specifically stated in the specifications.

B. Interior of Building: Anywhere inside the exterior weather barrier.

C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 REFERENCE STANDARDS

A. CAL (VOC) - Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers (including Addendum 2004-01); State of California Department of Health Services; 2004

B. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; Current Edition.

C. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; Current Edition.

D. GreenSeal GC-03 - Anti-Corrosive Paints; Green Seal, Inc.; 2007

E. GreenSeal GS-11 - Paints; Green Seal, Inc.; 1993.

F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.; 2011.

G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scscertified.com.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Evidence of Compliance: Submit for each different product in each applicable category.
   1. Identify evidence submittals with the words "LEED Report".

C. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.

D. Installer Certifications for Accessory Materials: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. All VOC-Restricted Products: Provide products having VOC content of types and volume not greater than those specified in State of California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current GREENGUARD Children & Schools certification; www.greenguard.org.
      b. Current Carpet and Rug Institute Green Label Plus certification; www.carpet-rug.org.
      c. Current SCS Floorscore certification; www.scscertified.com.
      d. Current SCS Indoor Advantage Gold certification; www.scscertified.com.
      e. Product listing in the CHPS Low-Emitting Materials Product List at www.chps.net/manual/lem_table.htm.
      f. Current certification by any other agencies acceptable to CHPS.
      g. Report of laboratory testing performed in accordance with CHPS requirements for getting a product listed in the Low-Emitting Materials Product List; report must include laboratory's statement that the product meets the specified criteria.
   2. Product data submittals showing VOC content are NOT acceptable forms of evidence.

B. Adhesives and Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
      b. Published product data showing compliance with requirements.
      c. Certification by manufacturer that product complies with requirements.

C. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current GreenSeal Certification.
      b. Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.

D. Paints and Coatings:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Architectural coatings VOC limits of state in which the project is located.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
   3. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
      b. Published product data showing compliance with requirements.
      c. Certification by manufacturer that product complies with requirements.

E. Carpet and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current Green Label Plus Certification.
      b. Report of laboratory testing performed in accordance with requirements.

F. Carpet, Carpet Cushion, and Adhesive: Provide products having VOC content as specified in Section 09680.

G. Carpet Cushion: Provide products having VOC content not greater than that required for CRI Green Label certification.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current Green Label Certification.
      b. Report of laboratory testing performed in accordance with requirements.

H. Carpet Tile and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current Green Label Plus Certification.
      b. Report of laboratory testing performed in accordance with requirements.

I. Carpet Tile and Adhesive: Provide products having VOC content as specified in Section 09685.

J. Composite Wood and Agrifiber Products and Adhesives Used for Laminating Them: Provide products having no added urea-formaldehyde resins.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current SCS "No Added Urea Formaldehyde" certification; www.scscertified.com.
      b. Published product data showing compliance with requirements.
      c. Certification by manufacturer that product complies with requirements.

K. Other Product Categories: Comply with limitations specified elsewhere.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. All additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01700
EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Pre-installation meetings.

D. Cutting and patching.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, except payment procedures.

I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01100 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01300 - Administrative Requirements: Submittals procedures.

C. Section 01400 - Quality Requirements: Testing and inspection procedures.

D. Section 01500 - Temporary Facilities and Controls: Temporary interior partitions.

E. Section 01510 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.

F. Section 01780 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

G. Section 02225 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.

5. Work of Owner or separate Contractor.
6. Include in request:
   a. Identification of Project.
   b. Location and description of affected work.
   c. Necessity for cutting or alteration.
   d. Description of proposed work and products to be used.
   e. Alternatives to cutting and patching.
   f. Effect on work of Owner or separate Contractor.
   g. Written permission of affected separate Contractor.
   h. Date and time work will be executed.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.
   1. Minimum of 5 years of documented experience.

B. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State of Florida.

1.06 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Temporary Lighting: As the building is enclosed, provide temporary lighting as required.

D. Temporary Power Outlets: Provide as required for execution of the Work.

E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
   1. Provide necessary temporary ventilation fans, power, temporary heat, or place air-conditioning systems in operation to provide proper humidity and temperature conditions for installation or application of flooring, paint, coatings, acoustical ceilings, and any other items requiring climate control at appropriate locations or any other means acceptable to A/E.

F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
   2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.
   2. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
   3. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.

H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
   1. Pest Control Service: Weekly treatments.

I. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. Coordination of Drawings and Specifications
   1. Where discrepancies occur between the Drawings and specifications, between large scale Drawings and small scale Drawings, or within a document itself, the use of the item or arrangement of better quality, greater quantity, or higher cost shall be decided by the A/E.
   2. If any such discrepancies occur in the Drawings or specifications, notify A/E and the Board for interpretations or decisions before proceeding with the Work. A/E interpretations or decisions shall be final.
   3. Drawings are diagrammatic and show general arrangement of systems and work included in the Contract.
      a. Coordinate Drawings and verify dimensions before laying out work and be responsible for conflicts.
      b. Comply with Drawings in laying out Work and coordinate drawings of various trades involved in the project to verify spaces receiving work.
      c. Notify A/E if space conditions appear inadequate before proceeding.
         1) If directed by A/E, make reasonable modifications in layout as needed to prevent conflict with work of various trades or for proper execution of Work without extra charge.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
   1. Notify the Board, by letter through the A/E, at least 2 weeks before required shut-off of any utilities, security, fire protection, or energy management systems or equipment.
      a. Letter shall state date, time, and duration of shut-off.
      b. Protection of water and heat-using equipment shall comply with the following:
         1) Immediately before water shut-off, coordinate with the Board's electrical shut-off to water heaters, boilers, and other equipment damaged by lack of water.
         2) Upon restoration of water supply, coordinate with the Board re-energizing water and heat-using equipment.
            (a) Make immediate shut-off without notice if life or property are endangered.
      c. Emergency Shut-Off: In case of a need for emergency cutoff during evenings, weekends, holidays, or other times when A/E or Board is not immediately available, contact M-DCPS Department of Energy and Recycling Management at (305)995-1550.

E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of work of separate sections.

H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01600.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within five days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Promptly notify Architect of any discrepancies discovered.

B. Utilize recognized engineering survey practices.

C. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

D. Periodically verify layouts by same means.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01500 in locations indicated on drawings.

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and _____): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.

b. See Section 01100 for other limitations on outages and required notifications.
c. Provide temporary connections as required to maintain existing systems in service.

4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

E. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.

F. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

H. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

I. Clean existing systems and equipment.

J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

K. Do not begin new construction in alterations areas before demolition is complete.

L. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-conforming work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07840, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Prohibit traffic from landscaped areas.

H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.10 SYSTEM STARTUP

A. Coordinate with requirements of Section 01800 - Commissioning.

B. Coordinate schedule for start-up of various equipment and systems.

C. Notify Architect and owner seven days prior to start-up of each item.

D. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

E. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

F. Verify that wiring and support components for equipment are complete and tested.

G. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

I. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See Section 15950.

3.13 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

J. Clean Owner-occupied areas of work.

3.14 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Substantial Completion.

D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

E. Owner will occupy all of the building as specified in Section 01100.

F. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.

G. Accompany Project Coordinator on preliminary final inspection.

H. Notify Architect when work is considered finally complete.

I. Complete items of work determined by Architect's final inspection.

3.15 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

GENERAL

1.01 SUMMARY

A. Section Includes: Fiscal provisions, legal submittals, and administrative require-ments.
   1. Closeout Submittals Required of Trades: In respective specification sections and as specified in this section.

B. RECORD DOCUMENTS
   1. Record Drawings:

1.02 Keep accurate notes on Record Drawings of Work as installed. Include dimensions of underground lines, their offsets, and valve locations.

1.03 Maintain the set of Record Drawings apart from those used for construction.

1.04 Mark each page of the Record Drawings with the words "RECORD DRAWINGS" in neat, large printed letters.

1.05 Record information concurrently as Work progresses.

1.06 Do not conceal any work until the required information is marked on Drawings.

1.07 Show locations of internal utilities and appurtenances concealed in the construction to visible and accessible features.

1.08 Show locations of field changes and details not on original Drawings.

A. Record Specifications and Addenda:

1.09 Mark each section to record manufac-turer, trade name, catalog number, supplier of each product, and item of equipment installed.

A. Update record drawings monthly for A/E review of compliance. Non-compliance will be grounds for A/E to note in the certification for payment of such fact. This will be grounds for not processing the Requisition for Payment as noted in Article 4.2.5 of the General Conditions.

B. CONTRACTOR'S CLOSEOUT SUBMITTALS TO A/E
   1. Evidence of compliance with requirements of governing authorities and construction documents as noted in various sections.

1.10 Project record documents.

1.11 Operating and maintenance data, instructions to Board's personnel.

1.12 Warranties and bonds.

1.13 Record list of various building finishes including tile, carpet, acoustical finish, wall covering, paints and coat-ings, giving manufacturers' brand names or types and colors used in various locations.

1.14 Keys: According to requirements of Section 08710 - Finish Hardware.

1.15 Spare parts and maintenance materials.

1.16 Evidence of payment and release of liens.

A. FINAL ADJUSTMENTS OF ACCOUNTS
   1. Submit a statement of accounting to A/E. Statement shall reflect all adjustments to contract sum and the follow-ing:

1.17 The original contract sum.

1.18 Additions and deductions resulting from:

1.19 Previous change orders.

1.20 Allowances.

1.21 Unit prices.

1.22 Deductions for uncorrected work.

1.23 Penalties and bonuses.

1.24 Deductions for liquidated damages.

1.25 Deductions for additional construction review payments.

1.26 Other adjustments.

1.27 Total contract sum, as adjusted.

1.28 Previous payments.

1.29 Sum remaining due.

A. FINAL CHANGE ORDER
   1. Prepare a Final Change Order, reflecting approved adjustments to contract sum not made by previous Change Orders.

B. FINAL APPLICATION FOR PAYMENT

1. Submit final Application.

1.30 NOT USED

1.31 NOT USED

END OF SECTION

SECTION 01730
OPERATION AND MAINTENANCE DATA

GENERAL

1.01 OPERATION MANUALS AND MAINTENANCE INSTRUCTIONS

A. Submit 2 draft copies of complete operating and maintenance manuals to A/E for review within 60 calendar days after acceptance of mechanical and electrical equipment shop drawings. Submit 6 copies of A/E accepted final operating and maintenance manuals for record documents, bound in durable 3 ring binders, acceptable to A/E, with tabs and index at least 5 days before scheduled acceptance inspection.

1.02 Properly identify and mark manufacturers' Standard literature to clearly define information applicable to installed equipment.

A. Before substantial completion, instruct the Board's authorized operating personnel, through qualified individuals, of operation, adjustment, and maintenance during demonstrations of properly operating systems and equipment.

1.03 Give the Board at least 5 working day notice of proposed instruction periods for the Board to schedule at its convenience.

1.04 Arrange with subcontractors and manufacturers for an instruc-tion-al period of not more than 3 days for each major item of mechanical and electrical equipment.

1.05 Prepare in reproducible form, detailed maintenance manuals, as needed for the Board's personnel, of installed mechanical and electrical equipment and systems. Include description and operation of systems, equipment, and parts replacement.

1.06 Furnish a separate manual or chapter for each of the following:

1.07 Plumbing systems.

1.08 Air-conditioning and ventilating systems.

1.09 Control systems.

1.10 Electrical systems.

1.11 Contents of each manual or chapter shall include, but not be limited to, the following:

1.12 Step-by-step procedure for system start-up, including a pre-start checklist. Refer to controls and indicators by nomenclature used on panels and in control diagrams.

1.13 Detailed instructions in proper sequence, for each mode of operation.

1.14 Emergency Operation: If some functions of equipment can be operated while other functions are disabled, give instructions for operations under such conditions. Include only those alternate methods of operations the operator can follow when there is a partial failure, malfunctioning of components, or other unusual condi-tions.

1.15 Shutdown Procedure: Include instructions for stopping and securing equipment after operation. If a specific sequence is required, give step-by-step instructions in order of sequence.

1.16 Maintenance Instructions and Requirements: Provide the following categories:

1.17 Preventive Maintenance: Provide a tabular form schedule for preventive maintenance listing recommended frequency of performance for each of the following preventive maintenance tasks:

1.18 Cleaning: Provide instructions and schedules for routine cleaning and inspection with recommended lubricants.

1.19 Inspection: If periodic inspection of equipment is required for operation, cleaning, or other reasons, show items requiring inspection and give inspection criteria for motors, controls, filters, and other maintenance items.

1.20 Provide instructions for minor repairs or adjustments required for preventive maintenance routines.

1.21 Identify test points and give values for each.

1.22 Corrective Maintenance: For a rapid replacement procedure to reduce equipment downtime, provide the following:

1.23 For troubleshooting tables, charts, or diagrams of specified procedures, use a 3-column chart entitled "Malfunction, Probable Cause, and Recommended Action."

1.24 Indicate repair and replace-ment procedures most likely to be required in mainte-nance of equipment.

1.25 List safety precautions and instructions to be followed before, during, and after making repairs, adjustments, or routine maintenance.

1.26 Manufacturer's literature covering equipment with illustrations, exploded views, and replacement part lists.

1.27 Notify the A/E of completion of instructional periods in writing. Include names of all personnel attending the instructional periods, for the Board's record.

1.28 NOT USED

1.29 NOT USED

END OF SECTION

SECTION 01740
WARRANTIES

GENERAL

1.01 SUMMARY

A. Work Includes: General administrative and procedural requirements for manufacturers' standard or special warranties on products as specified.

B. Related Sections:
   1. 01700 - Project Closeout.
   2. 01730 - Operation and Maintenance Data.

C. Disclaimers and Limitations: Manufacturers' disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work incorporating the products, nor does it relieve suppliers, manufacturers, or subcontractors required to countersign special warranties with the Contractor.
   1. DEFINITIONS

D. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Board.

E. Special Warranties are written warranties required by or incorporated in the Construction Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Board.
   1. WARRANTY REQUIREMENTS

F. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work damaged because of such failure or that must be removed and replaced to provide access for correction of warranted Work, at no cost to the Board.
   1. Correction of work shall include shipping, labor, supervision, and related work involved in replacing defective parts or materials provided by manufacturers under their warranties.

G. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

H. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Construction Documents.

I. The Board's Recourse: Written warranties made to the Board are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Board can enforce other duties, obligations, rights, or remedies.
   1. Rejection of Warranties: The Board reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Construction Documents.

J. Warranties made by subcontractors to the Contractor are a part of the Contractor's responsibility to the Board.

K. The Board reserves the right to refuse acceptance of Work where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments have done so.
   1. SUBMITTALS

L. Submit written warranties to the A/E before the date certified for Substantial Completion. If the A/E's Certificate of Substantial Completion designates a commencement date for warranties

other than the date of Substantial Completion for the Work or a designated portion of the Work, submit written warranties upon request of the A/E.

1. When a designated portion of the Work is completed and occupied or used by the Board by separate agreement with the Contractor during the construction period, submit properly executed warranties to the A/E within 15 days of completion for the designated portion of the Work.

M. When a special warranty is required to be executed by the Contractor or the Contractor and a subcontractor, supplier, or manufacturer, prepare a written document containing appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Board through the A/E for approval before final execution.

1. Refer to individual Sections of Divisions 2 through 16 for specific content requirements and requirements for submittal of special warranties.

N. Form of Submittal: At Final Completion, compile 2 copies of each required warranty properly executed by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the specifications.

O. Provide warranties in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders.

1. Use thicknesses as necessary to accommodate contents and sized to receive 8-1/2" by 11" paper.
2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES," the Project title or name, and the name of the Contractor.
3. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark tabs to identify products or installations.
4. Provide a typed description of the product or installation, including the name of the product.
5. Give reference to the applicable specification section, and the name, address, and telephone number of the installer.
6. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.
7. NOT USED
8. EXECUTION
    a. SCHEDULE OF WARRANTIES

P. Schedule: Provide warranties on products and installations as specified in the following Sections:

1.02 THERMAL AND MOISTURE PROTECTION

1.03 Division 7 Joint Sealers: 10 years from manufacturer for repair and replacement and 2 years for labor from applicator.

1.04 DOORS AND WINDOWS

1.05 Division 8 Wood Doors: Warranty for lifetime of installation.

1.06 Division 8 Aluminum Framed Storefronts: 3 years for aluminum window, 5 years for glazing.

1.07 FINISHES

1.08 Division 9 Carpet (Tufted): Warranty 2 years from Contractor, 10 years from carpet manufacturer against wear.

1.09 SPECIALTIES

1.10 Division 10 Metal Toilet Partitions: Warranty 10 years for product and installation.

1.11 Division 10 Operable Partitions: Warranty 3 years for defects in material or installation.

1.12 MECHANICAL

1.13 Division 15 General Provisions: Furnish the Board copies of all warranties extending beyond the period specified in General Conditions.

1.14 Division 15 Water Treatment: Require approval and acceptance from manufacturer's warranty for each component and the water treatment system.

1.15 ELECTRICAL

1.16 Division 16 Battery Powered Emergency Incandescent Lighting Units: 3 years unconditional, 5 years pro-rata.

END OF SECTION

SECTION 01780
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 00700 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.

B. Section 01300 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

C. Section 01700 - Execution Requirements: Contract closeout procedures.

D. Individual Product Sections: Specific requirements for operation and maintenance data.

E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.

2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
2. Field changes of dimension and detail.
3. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

O. Include test and balancing reports.

P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Product data, shop drawings, and other submittals.
      c. Operation and maintenance data.
      d. Field quality control data.
      e. Photocopies of warranties and bonds.
   4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

DIVISION 2

SECTION 02060
BUILDING DEMOLITION

PART 1 GENERAL

1.01 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.

1.02 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.03 RELATED REQUIREMENTS

A. Section 01100 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01100 - Summary: Sequencing and staging requirements.

C. Section 01100 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

D. Section 01500 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

E. Section 01600 - Product Requirements: Handling and storage of items removed for salvage and relocation.

F. Section 01700 - Execution Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

G. Section 01732 - Waste Management: Limitations on disposal of removed materials; requirements for recycling.

H. Division 1 for cutting and patching procedures for selective demolition operations.

I. Division 1 - Volatile Organic Compound (VOC) Content Restrictions.

J. Division 15 Sections for demolishing, cutting, patching, or relocating mechanical items.

K. Division 16 Sections for demolishing, cutting, patching, or relocating electrical items.

1.04 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Demolition Schedule: Include detailed schedule showing start and completion dates for each area of demolition and for completion of demolition work. Submit method of demolition and plan of removing work.

C. Site Plan: Showing:
   1. Areas for temporary construction and field offices.
   2. Areas for temporary and permanent placement of removed materials.

D. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.

2. Identify demolition firm and submit qualifications.
3. Include a summary of safety procedures.

E. Certification: Submit copy of demolition firm's current license to operate in Miami-Dade County, Florida.

F. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.06 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
1. Minimum of 5 years of documented experience.

B. Organize and perform demolition work to avoid damage to construction intended to remain.

C. Demolition and transportation of debris shall comply with applicable codes and regulations governing these operations. Fees shall be paid by the Contractor.

D. Demolition and removal operations shall be conducted in an expedient manner, with precautions taken to prevent demolition site from being an "attractive nuisance".

E. Notify the Board and A/E of any conditions capable of affecting the safety of occupants of adjacent buildings, the normal use of these facilities, or the physical condition of the structures.
1. In case of accidental disruption of utilities or the discovery of previously unknown utilities, stop work immediately and notify the Board and A/E.
2. Do not continue work until the Board, A/E, and Contractor agree on a plan to correct the situation or identify utility service line.

1.07 SEQUENCING AND SCHEDULING

A. Scheduling: Areas next to demolition and removal work may be occupied and their activities cannot be interrupted or disturbed during normal working hours. Demolition schedule shall be according to drawings and as accepted by the City and A/E.

B. Coordinate with applicable utility companies and the City for utility line removal, capping, and utility shutdowns required by removal work.

1.08 PROJECT CONDITIONS

A. Existing work not specified for removal that is temporarily removed, damaged, exposed, or in any way disturbed or altered by removal work shall be repaired, patched, or replaced to the City and A/E's satisfaction at no additional cost to the City.

B. Provide barriers and warning devices to protect the public and users of adjacent facilities.

C. Environmental Protection:
1. Control amount of dust resulting from construction or demolition to prevent spread of dust to other buildings and to avoid creation of a nuisance in surrounding areas. Use of water to control dust will not be allowed when it will result in flooding or other objectionable or hazardous or conditions.
2. Use of explosives is not allowed.
3. Disposition of demolished materials by burning is not allowed.

D. Traffic Maintenance:
1. Conduct removal operations to maintain traffic along existing streets and walks.
2. Keep paved streets and walkways free of debris.
3. Remove material and other matter tracked or fallen onto traffic surfaces.

E. Disposition of Materials:
1. Title and responsibility to materials and equipment to be removed, excepting salvageable equipment to be retained by the City, is vested in the Contractor upon receipt of Notice to Proceed.

2. The City will not be responsible for the condition, loss, or damage to such materials and equipment after the Notice to Proceed.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

A. Remove portions of existing building in the following sequence:
   1. existing Asst. Director/Literacy Area/Typewriters/Waiting area.
   2. existing Lobby/Exhibition Area/Circulation Desk Area.
   3. existing Multipurpose/Young Adults area.

B. Remove other items indicated, for salvage, relocation, and recycling.

C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 DEMOLITION

A. Structures:
   1. Demolish existing indicated structures according to accepted schedule and Demolition plan.

B. Perform removal and demolition according to Demolition Schedule and take necessary precautions to protect existing adjacent buildings, furnishings, and equipments.

C. Existing Utilities: Perform utility related work according to these specifications for the type of utility service involved.

D. Removal:
   1. Remove demolished construction materials and related debris from the site on a regular basis.
   2. Accumulation of debris on the site will not be allowed.
   3. Selling of salvageable building materials or equipment or furnishings is not allowed at the site.

3.03 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01700.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.

9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

H. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.

I. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Comply with requirements of Section 01732 - Waste Management.
2. Dismantle existing construction and separate materials.
3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.04 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.05 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
1. Verify that construction and utility arrangements are as shown.
2. Report discrepancies to Architect before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01500 in locations indicated on drawings.

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and _____): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. See Section 01100 for other limitations on outages and required notifications.
   4. Verify that abandoned services serve only abandoned facilities before removal.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.06 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove from site all materials not to be reused on site; comply with requirements of Section 01732 - Waste Management.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 02072
REMOVALS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Removal work as required on drawings and as specified in this section and repair of damage to existing facilities to remain.

1.02 Related Sections:

1.03 SUBMITTALS

A. Removal Procedure for Site Work: If requested by A/E, submit proposed procedure of removal work.

1.04 Procedure shall provide:

A. Means for safe conduct of work, careful removal, and disposition of materials specified to be salvaged for the City of North Miami.

B. Protection of property to remain undisturbed.

C. Timely disconnection of utility services.

D. Procedure shall include a detailed description of methods and equipment to be used for each operation, and sequence of each operation.

1.05 PROJECT/SITE CONDITIONS

A. Existing sidewalks, curbs, paving, landscaping, or other existing work not specified for removal that is temporarily removed, damaged, exposed, or disturbed or altered by removal work shall be repaired, patched, or replaced at no cost to the City of North Miami.

1.06 Existing Trees:

A. Do not damage trees within project site specified to be left in place.

B. Protect trees indicated to remain as required with acceptable barricades or temporary fencing during construction.

1.07 Environmental Protection:

A. Dust Control:
   1. Control dust resulting from demolition to prevent spread of dust to occupied portions of buildings and to avoid creation of a nuisance in surrounding areas.
   2. Do not use water to control dust when it will result in flooding or pollution or other hazardous or objectionable conditions.

B. Fire: Do not dispose of demolished materials or trees, etc., by burning.
   1. Explosives: The use of explosives is not allowed.
      a. Site Inspection: Inspect entire project area to determine extent of removal, salvage, and patching work.

1.08 SCHEDULING

A. Activities in areas next to removal areas cannot be interrupted or disturbed during normal facility hours.

B. Consult with the Owner and A/E to schedule work. See Section 01310 - Construction Schedule.

1.09 Utility Companies:

A. Coordinate with applicable utility companies and the Owner for utility line removal, if any, and related capping and utility shutdowns required by such removal work.

1.10 Removals:

A. Assign removals to appropriate trades under respective sections, best suited for this type of work to avoid unnecessary damage due to the efforts of unskilled workers.

PART 2 PRODUCTS

2.01 DISPOSITION OF MATERIALS NOT INDICATED OR SPECIFIED TO BE SALVAGED

2.02 Title to Materials:

A. Title to materials and equipment to be removed, except salvageable equipment to be retained by the City of North Miami, is vested in the Contractor upon receipt of Notice to Proceed.

B. The City of North Miami will not be responsible for condition, loss of, or damage to such materials and equipment after receipt by Contractor of Notice to Proceed.

C. Remove excess materials and equipment not specified to be salvaged from site and premises upon completion of removal operations.

PART 3 EXECUTION

3.01 REMOVAL WORK

A. Perform removal work indicated on drawings or as specified in an orderly manner according to accepted construction schedule.

B. Protect work specified to remain.

C. Protect adjacent areas from damage or undue dirt and dust.

D. Wet down debris or rubbish, if necessary, to minimize flying dust.

3.02 EXISTING UTILITIES

A. Utility work shall be performed according to these specifications for the particular type of utility service involved.

3.03 EXISTING WORK

A. Existing work may be cut, altered, removed, or temporarily removed and replaced as necessary for the performance of work required.

B. Exception: Unless otherwise indicated on drawings, do not cut or alter structural members without authorization by the A/E.

C. Restore damaged or defaced areas or items, remaining in place, of work performed under this Contract to comparable conditions existing before the work.

END OF SECTION

3

DIVISION

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes, but is not limited to, concrete reinforcement, and necessary accessories.

1.03 SUBMITTALS

A. Do not reproduce Structural Drawings for use as shop or placement drawings without prior approval of the Architect.

B. Product Data: Submit, for record only, not for approval, data for each type of product and material indicated including others as requested by Architect. Indicate manufacturing process used for steel reinforcing. Substitutions for specified items or manufacturers are to be submitted in accordance with Division 1 and will be subject to approval, rejection or other appropriate action.

C. Steel Reinforcement Shop Drawings: Complete details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement" and ACI SP-66 “Detailing Manual”. Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement.

D. Material Certificates: Signed by manufacturers and contractor certifying that the steel reinforcement and reinforcement accessories comply with requirements of the Contract Documents. Unidentifiable steel is prohibited.

E. Environmental Objective Documentation: Provide documentation of level of compliance with the following:

F. Provide data indicating post-consumer and post-industrial recycling percentages of steel reinforcing.

1.04 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. Codes and Standards: Comply with the following, unless more stringent provisions are indicated:
   1. Florida Building Code, 2010 Edition.
   2. ACI 301, "Specification for Structural Concrete for Buildings.”
   3. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
   4. ACI 315, “Details and Detailing of Concrete Reinforcement.”
   5. ACI-318, “Building Code Requirements for Reinforced Concrete.”
   6. “CRSI Manual of Standard Practice.”

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Deliver reinforcement to the job site bundled, tagged and marked. Use durable metal or embossed plastic tags indicating bar size, lengths, and reference information corresponding to markings shown on placement drawings.

1.06 ENVIRONMENTAL OBJECTIVES

1.07 Manufacturer/Fabricator to supply documentation of level of compliance or non-compliance with the following requirements before consideration as an "Acceptable Manufacturer".

1.08 All steel reinforcing shall use steel made in an electric arc furnace (EAF).

PART 2 PRODUCTS

2.01 STEEL REINFORCEMENT

A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

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

C. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets. Rolls are not acceptable.

2.02 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
   1. For concrete surfaces where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.
   2. For welded wire fabric in slabs on grade use precast slab bolsters, concrete brick or sand plate chairs spaced no farther than 3'-0" c/c.

B. Mechanical Splicers for Reinforcing Steel: Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, the following:
   1. Lenton threaded Couplers.
   2. Dayton Bar Grip or Dayton Grip Twist.
   3. Dywidag Extruded Coupler Splice.
   4. Bar-Lock Coupler System.

C. Reinforcing Dowel Replacement: Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, the following:
   1. Dayton Dowel Bar Replacement.
   2. Richmond Dowel Bar Substitution.
   3. Lenton Form Saver Plus.
   4. Williams Rebar Flange Coupler

2.03 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

B. Shop bend and fabricate reinforcing bars to conform with shapes and dimensions indicated on drawings. In case of errors, do not bend or straighten reinforcement without prior approval of Architect. Make all bends cold.

PART 3 EXECUTION

3.01 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover specified on the drawings. Tie bars and bar supports together with 16 gauge wire and set wire ties with ends directed into concrete, not toward exposed concrete surfaces. Do not tack weld crossing reinforcing bars.

D. Splices: Locate only where indicated on the drawings or approved shop drawings except with prior approval of Architect.
   1. For standard splices, lap ends, placing bars in contact, and tightly wire tie. See drawings for lap lengths.
   2. Do not weld splices.

E. Provide template for all column dowels.

F. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging (3’-0”o.c. max.). Lap edges and ends of adjoining sheets at least two mesh spacings. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with 16 gauge wire.

G. Do not bend bars embedded in hardened or partially hardened concrete without approval from the Architect.

H. Do not weld reinforcing bars unless specifically shown. Where shown comply with AWS D1.4. Bars to be welded shall conform to ASTM A706.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes, but is not necessarily limited to, concrete, concrete materials, mix design, placement procedures, curing and finishes.

B. Related Sections include, but are not necessarily limited to, the following:
   1. Division 2 Section "Earthwork" for drainage fill under slabs-on-grade, including grade beams and pile caps.
   2. Division 3 Section “Concrete Formwork”.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.04 SUBMITTALS

A. Environmental Objective Documentation: Provide documentation of level of compliance with the following:
   1. The products supplied are manufactured/fabricated within a radius of 500 miles from the project site and/or the manufactured products are extracted, or recovered within 500 miles of the project site.
   2. Provide data indicating compliance with cement substitution percentage by weight, specified in section 2.11, for each concrete design mix.
   3. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.
      a. Include statement indicating costs for each product having recycled content.
   4. Design Mixtures for Credit ID 1.1: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements and for equivalent concrete mixtures that do not contain portland cement replacements.

B. Product Data: Submit, for record only, not for approval, data for each type of product and material indicated including admixtures, patching compounds, waterstops, joint systems, curing compounds, and others as requested by Architect. Substitutions for specified items or manufacturers are to be submitted in accordance with Division 1 and will be subject to approval, rejection or other appropriate action.

C. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Substantiating data to be no older than one year from date of submittal for each mix design.
   1. Indicate amounts of mix water to be withheld for later addition at Project site.

D. Material Certificates: Signed by manufacturers and contractor certifying that each of the following items complies with requirements of the Contract Documents:
   1. Cementitious materials and aggregates.

2. Admixtures.
3. Floor and slab treatments.
4. Waterstops.
5. Curing materials.
6. Bonding agents.
7. Vapor retarders.
8. Joint filler strips.

1.05 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. Submit written evidence of at least ten such projects.
   1. Submit written evidence that flatwork placer/finisher has not less than (3) years continuous experience and a minimum of (5) projects in the successful placement and finishing of concrete slabs with flatness and levelness requirements equal to or higher than those specified for this project. Submit evidence that flat work finishers are ACI certified.

B. Manufacturer Qualifications: A firm experienced in the successful manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production and delivery, facilities and equipment.
   1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities. Submit certification.
   2. Manufacturer must be F.D.O.T. certified.

C. Source Limitations: For each placement, obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

D. Codes and Standards: Comply with the following, unless more stringent provisions are indicated:
   1. Florida Building Code, 2010 Edition.
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
   3. ACI 211.1 “Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.”
   4. ACI 211.2 “Standard Practice for Selecting Proportions for Structural Lightweight Concrete.”
   5. ACI 301, "Specification for Structural Concrete for Buildings.”
   6. ACI-304, “Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.”
   7. ACI-305, “Hot Weather Concreting.”
   8. ACI-308, “Recommended Practice for Curing Concrete.”
   9. ACI-309, “Recommended Practice for Consolidation.”
   10. ACI-311, “Guide for Concrete Inspection.”
   11. ACI-318, “Building Code Requirements for Reinforced Concrete.”

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Portland Cement:
   1. General: ASTM C 150, Type I.
   2. Slabs on Grade: Type I or Type II with a C3A content less than 8%.

B. Other Cementitious Materials: Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

C. Pozzolans:
   1. Fly Ash: ASTM C 618, Class C or F.

D. Blended Hydraulic Cement: ASTM C 595, Type I (PM), pozzolan-modified portland cement.

E. Blended Hydraulic Cement: ASTM C 595, Type I (SM), slag-modified portland cement.

F. Normal-Weight Aggregate:
   1. Fine Aggregate: Natural quartz sand or manufactured sand from local stone aggregates conforming to ASTM C33, produced from FDOT approved sources, with fineness modulus not less than 2.4, and having a proven service record.
   2. Coarse Aggregate: Clean, washed, sound, crushed natural stone products produced from FDOT approved sources. Free from salt, clay, mud, loam or other foreign matter. Conform to ASTM C33; sizes No. 67 (3/4 inch) or No. 57 (1 inch), No. 8 or No. 89 (3/8 inch), and No. 467 (1 1/2 inch). Use largest size practical for members being cast.
   3. Class: Negligible weathering region, class per ASTM C33.

G. Water: Potable and complying with ASTM C 94.

2.02 CONCRETE ADMIXTURES

A. General: Provide admixtures produced by acceptable manufacturers and used in compliance with the manufacturer's printed directions. Use only admixtures which have been incorporated and tested in the accepted mixes, unless otherwise authorized in writing by the Architect. Do not use admixtures which increase the shrinkage properties of concrete. Submit substantiating data, if requested.

B. Air-entraining admixture: Conform to ASTM C260. Use air-entraining admixture in all concrete except in concrete having a design strength greater than 4000 psi.

C. Water-reducing admixture: Conform to ASTM C494, Type A, D or E free of chlorides, fluorides, or nitrates, except for those attributable to the water used in manufacturing. Use in all structural concrete.

D. High Range Water Reducing Admixture: Conform to ASTM C494, Type F or Type G and ASTM C1017. Formulate HRWR from sulfonated melamine formaldehyde condensates or sulfonated naphthalene formaldehyde condensate or carboxylated polyether. The admixture is to be added to the concrete mix after initial mixing has taken place. If added at the batch plant HRWR to have an effective life without redosing (third generation HRWR) of at least 2 Hours. If added at the jobsite, the addition shall be by certified technicians employed by the concrete supplier or an authorized representative of the admixture manufacturer. This admixture is in addition to and not a substitute for any other admixtures specified elsewhere.

E. Calcium Chloride: Do not use calcium chloride in concrete. Do not use any admixtures which contribute free chloride ions to the concrete mix.
   1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
      a. Volclay Waterstop-RX; Colloid Environmental Technologies Co.

2.03 VAPOR RETARDERS

A. Vapor Retarder: Polyethylene sheet, ASTM E 1745, Class B, not less than 10 mils thick.

2.04 CURING MATERIALS

A. Liquid Membrane Curing Compound: A dissipating resin type compound, conforming to ASTM C309, Type 1 or 2. The film must chemically break down in a 4 to 6 week period after application.

B. Liquid Membrane-Forming Cure and Seal Compound: VOC Compliant, conforming to ASTM C309, Type 1, Class B and ASTM C1315, Type 1, Class A or B. The compound shall be a clear styrene acrylate type, 25% solids content minimum, and have test data from an independent testing laboratory indicating to a maximum moisture loss of .040 grams per square cm. When applied at a coverage rate of 200 sq. ft. per gallon.

C. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

E. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

F. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

G. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
   1. Liquid Membrane Curing Compounds Dissipating Type:
      a. Aqua Kure-Clear; Lambert Corp.
      b. Resin Cure-E; Nox-crete, Inc.
      c. Kurez D.R. V ox; Euclid Chemical Company
      d. Res X-Cure WB; Burke
      e. 1100 Clear; W.R. Meadows, Inc.
      f. Day Chem Rez Cure (J-11-W) ; Dayton Superior Corporation
      g. L&M Cure R ; L&M Construction Chemicals, Inc.
   2. Liquid Membrane-Forming Cure and Seal Compound:
      a. Kure 1315; Sonneborn Building Products
      b. Day-Chem Cure & Seal 1315; Dayton Superior Corporation
      c. Super Aqua-Cure VOX or Super Diamond Clear VOX; Euclid Chemical Company
      d. Crystal Gard 0800; Lambert Corp.
      e. Cure & Seal 250E; Nox-crete, Inc.
      f. Spartan Cote 30%; Burke
      g. Dress & Seal 25; L&M Construction Chemicals
      h. CS 309-25 or VOCOMP-25; W.R. Meadows, Inc.
   3. Clear, Solvent-Borne, Membrane-Forming Curing Compound:
      a. AH Clear Cure; Anti-Hydro International, Inc.
      b. Spartan-Cote; Burke Group, LLC (The).
      c. Conspec #1-15 percent solids; Conspec Marketing & Manufacturing Co., Inc.
      d. Diamond Clear; Euclid Chemical Co.
      e. Nitocure S; Fosroc.
      f. Lambco 120; Lambert Corporation.
      g. L&M Dress & Seal 18; L&M Construction Chemicals, Inc.
      h. Kure-N-Seal; Sonneborn, Div. of ChemRex, Inc.
   4. Clear, Waterborne, Membrane-Forming Curing Compound:
      a. AH Clear Cure WB; Anti-Hydro International, Inc.
      b. Klear Kote WB II Regular; Burke Chemicals.
      c. High Seal; Conspec Marketing & Manufacturing Co., Inc.
      d. Aqua Cure VOX; Euclid Chemical Co.
      e. Glazecote Sealer-20; Lambert Corporation.
      f. Dress & Seal WB; L&M Construction Chemicals, Inc.
      g. Kure-N-Seal WB; Sonneborn, Div. Of ChemRex, Inc.

2.05 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene. Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to the following:
   1. Acrylbond; Lambert Corp.
   2. J-40 Bonding Agent; Dayton Superior Corp.
   3. Admix 101; Larsen Products
   4. Acryl-60; Std. Drywall
   5. AcrylSet; Master Builders
   6. Sonocrete; Sonneborn-Contech
   7. SBR Latex; Euclid Chemical Co.
   8. Sika Latex; Sika Corp.

2.06 CEMENT GROUT AND DRYPACK

A. Prepackaged Non-Shrink Non-Metallic Non-Gaseous Grout: ASTM C 1107, Grade B or C at a fluid consistency (flow cone) of 20 to 30 seconds. Grout shall be bleed free and attain 7500 psi compressive strength in 28 days at fluid consistency. Use for structural repairs.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Masterflow 928; Master Builders
      b. Crystex; L & M Construction Chemicals
      c. Five Star Fluid Grout 100; U.S. Grout
      d. Euco N-S; Euclid Chemical Co.
      e. Sikagrout; Sika Corp.
      f. Conbextra HF; Fosroc
      g. Vibropruf #20; Lambert Corp.

B. Cement Grout: Mix one part Portland cement, 2-1/2 parts fine aggregate, and enough water and liquid bonding agent in a 50/50 mix for required consistency depending on use. Consistency may range from mortar consistency to a mixture that will flow under its own weight. Use for leveling, preparing setting pads of beds, for filling non-structural voids, and similar uses. Do not use for grouting under bearing plates or structural members in place.

C. Drypack: Mix one part Portland cement, 2 parts fine aggregate, and enough water and liquid bonding agent in a 50/50 mix to hydrate cement and provide a mixture that can be molded with hands into a stable ball (a stiff mix). Do not mix more than can be used in 30 minutes. Use for patching tie holes and large surface defects in concrete.

2.07 CONCRETE MIXES

A. Concrete for all parts of the concrete work shall be homogenous and, when hardened, possess the required strength, durability, watertightness, appearance, resistance to deterioration and abrasion, and other qualities as specified or required.

B. Mix proportioning: Proportion concrete according to ACI 211.1. Trial mixes shall be designed by the testing laboratory approved by Architect or designed by the producer and witnessed and tested by the testing laboratory, in accordance with ACI 318 Chapter 5.3. Proportioning on the basis of field experience with complete statistical data, not more than one year old from date of submittal, to confirm mixes is acceptable.

C. Provide concrete which will develop ultimate compressive strength at 28 days equal to that noted on drawings and listed below.

D. Concrete Grades:

	Mix No.	Strength	Air Yes/No	Max. Aggregate Size	W/C or W/C&P*
1.					
2.	3000	N	1”	0.64	

E. Concrete Use:

	Element	Mix No.
1.		
2.	1. All Concrete	1

F. Design Slump:
   1. General: 4 inches.
   2. Concrete Containing High Range Water Reducer: 2 to 3 inches before addition of HRWR, 8 inches after.
   3. Slump Tolerance: Plus/minus 1 inch.

G. Chloride Ion Content for Corrosion Protection: Determine the chloride content of the component concrete materials, excluding admixtures, and provide this information to the Architect when submitting mix design. Design mixes will not be approved when the sum of chloride content of component materials indicates that the concrete mix derived from those materials will have a water soluble chloride ion content exceeding 0.1% for concrete exposed to the elements and 0.2% for concrete protected from the elements, when percent is determined by weight of cement. When the source of any component material for the concrete is changed or when the design mix is altered, a chloride content determination test shall be made immediately. Resubmit the altered design mix for approval by the Architect.

H. Cementitious Materials: Minimum Portland cement content of any concrete mix containing Ground Granulated Blast-Furnace Slag is 280 lbs., for all other concrete mixes, minimum portland cement content is 423 lbs. Use ground granulated blast-furnace slag, as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

I. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 3 to 5 percent. Except for concrete exposed to freezing temperatures, do not use air-entraining admixture for interior slabs to receive a hard trowel finish, unless otherwise indicated.

J. Air Content: 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 percent, unless otherwise indicated:
   1. Air Content: 3 percent.

K. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in all structural concrete.
   2. Use water-reducing and retarding admixture when ambient temperature is 85 degrees F or higher and/or low humidity, or other adverse placement conditions exist.
   3. Use high range water-reducing admixture in pumped concrete, at areas of reinforcing steel congestion, and as required for placement and workability.

L. Adjustment to Concrete Mixes: Mix design adjustments may be requested by contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

2.08 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94.

B. Mixing and Delivery Time: When air temperature is between 95 and 100 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 100 degrees F, reduce mixing and delivery time to 60 minutes.

C. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type and number, batch time, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 EXECUTION

3.01 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor bolts, accurately located, to elevations required.
   2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
   3. Install dovetail anchor slots in concrete structures as indicated.
   4. Do not provide sleeves or openings in structural members unless shown on the structural drawings or approved by the Architect.

3.02 VAPOR RETARDERS

A. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to manufacturer's written instructions. Use below interior floor slabs only.

3.03 CONCRETE PLACEMENT

A. Complete the following before placing concrete:
   1. Excavate and compact subgrade, arrange for compaction testing, place vapor barrier and remove excess water.
   2. Secure all formwork. Verify that shoring and reshoring has been inspected and accepted by Delegated Engineer. Moisten wood forms except where form coatings are used.
   3. Accurately locate all steel reinforcement, conduits, outlet boxes, anchors, hangers, sleeves, bolts, expansion joint materials and other embedded items and secure against shifting during concrete placement or consolidation.
   4. Cooperate with other trades and verify that their work is installed.
   5. Notify testing agency to test concrete.
   6. Ensure that all required inspections are performed.

B. Comply with ACI 301, ACI 304, ACI 308 and ACI 318.

C. Jobsite Tempering: Place concrete within 1-1/2 hours after introduction of water to mix. Submit time stamped batching tickets upon delivery of concrete to job site.
   1. Do not add water to ready-mix concrete except as provided in ASTM C 94, Paragraph 11.7. When so allowed, limit addition of water to maximum of one (1) gallon per cubic yard. Addition of water may only be authorized by Architect, the concrete producer’s quality control representative, a preapproved representative of Contractor, or the Special Inspector.
   2. Concrete produced with high range water reducer may only be tempered with additional high range water reducer.

D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.
   1. Maximum height of concrete free fall is 4 feet. Columns up to 8 feet in height may be poured in one lift. Concrete in columns and walls over 8 feet may be poured full height with the use of drop chutes or tremies or up to a maximum of 16 feet if HRWR admix concrete is used.

E. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
   1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
   2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
   3. Concrete in columns and walls shall be cast at least twenty four (24) hours before horizontal members they support are cast.

F. Deposit and consolidate concrete for slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

G. Pumping: Slumps in excess of six (6) inches at the pump will not be permitted except for concrete produced with HRWR. If placing by means of pump, a specifically designed concrete mix shall be submitted to the Architect for review. No pumps smaller than 4 inches will be permitted. Exception: A 3” pump may be used for 8” wide beams and columns cast on top of or between masonry walls or for filling masonry cells.

3.04 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. Remove fins and other projections exceeding 1/4” rubbed down or chipped off. Use for concrete surfaces not exposed to view in the finished work.

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. Remove fins and other projections exceeding 1/8 inch in height.
   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, painting, or staining.

C. Rubbed Finish: Apply the following to smooth-formed finished concrete:

D. 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.

3.05 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces. Slope surfaces to drains.

3.06 CONCRETE PROTECTION AND CURING

A. General: Comply with ACI 308 “Recommended Practice for Curing Concrete” and ACI 301. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

B. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the methods listed under C. Unformed Surfaces:

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Curing Compound: Apply to all concrete surfaces that are not permanently exposed. Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Provide a second coat applied at 90 degrees to initial application within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
2. Curing and Sealing Compound: Apply to permanently exposed concrete surfaces. Apply uniformly in a 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. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.
3. 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 lap over adjacent absorptive covers.
4. 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, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
    a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.

3.07 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
    1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid epoxy joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.08 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. If reinforcing steel is exposed, remove concrete to provide a minimum of 3/4” clearance all around. Prior to patching allow the Architect and Threshold Inspector adequate time to review prepared areas. Clean, dampen with water, and brush-coat prepared surfaces with bonding agent or slurry coat. Fill and compact with dry pack grout or non-shrink non-metallic grout before bonding agent has dried. Fill form-tie voids with cement grout, dry pack grout or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

C. Repairing Unformed Surfaces: Test unformed surfaces, such as slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with dry pack grout or non-shrink non-metallic grout. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact

patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

D. Perform structural repairs of concrete, not covered herein, only with Architect's and Structural Engineer's approval, using repair procedures they recommend.

E. Other repair materials and installation not specified above may be used, subject to Architect's approval.

3.09 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting 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.

B. Testing Services: Sample concrete after all water and admixtures have been added. Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day. For slabs 6" or thinner, increase frequency to each 50 cu. yd. or fraction thereof of each concrete mix placed each day.
2. Slump: ASTM C 143; one test at point of placement for each composite sample. Perform additional tests when concrete consistency appears to change.
3. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of four standard cylinder specimens for each composite sample. For pumped concrete, take sample at point of placement.
4. Compressive-Strength Tests: ASTM C 39; test one specimen at 7 days for information and three at 28 days for acceptance. If one of the first two 28 day tests fall below specified strength, test the remaining specimen at 56 days.

C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests (3 sets of 2 cylinders each) equals or exceeds specified compressive strength and no compressive-strength test (1 set of 2 cylinders) value falls below specified compressive strength by 10% or 500 psi, whichever is less.

E. Strength tests that are not satisfactory indicate questionable concrete. The testing agency and Contractor shall submit to the Architect a report of the questionable concrete plus the two test reports immediately prior to and after (5 reports total) for evaluation.

1. If the questionable concrete is not accepted by the Architect, the testing agency shall take core tests per ACI 301 and ASTM C42 minimum diameter of cores -4 inches. Concrete will be considered structurally adequate if average of 3 cores is at least 85% f'c and no single core is less than 75% f'c.
2. Concrete not considered adequate by core testing shall be removed and replaced or load tested per ACI 318, Chapter 20.

F. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for each test.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

H. The contractor may be required to pay all costs of additional testing or evaluation of questionable concrete and provide a credit to the Owner for acceptance of questionable concrete.

END OF SECTION

5 DIVISION

SECTION 05120
STRUCTURAL STEEL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. The work specified in this section includes all labor, materials, equipment, permits, and services necessary for the fabrication and erection of structural steel and related work, complete, in accordance with the Drawings and as specified herein, including the detailing of all connections.

B. Structural steel is that work defined in AISC “Code of Standard Practice” and as otherwise shown on Drawings.

1.03 SUBMITTALS

A. Submit in accordance with conditions of Contract and Division 1 Specification Sections.

B. Qualifications: Include lists of 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.

C. Product Data for each type of product specified, including the following:
   1. Bolts, nuts, and washers, including mechanical properties.

D. Welder’s certification. Submit to Owner’s inspection agency.

E. The fabricator shall submit details and complete calculations that clearly identify proposed substitutions for Engineer’s review prior to preparation of detailed shop drawings.

1.04 CODES AND STANDARDS

A. Florida Building Code, 2010 Edition.

B. AISC “Code of Standard Practice for Steel Buildings and Bridges”.
   1. Paragraph 4.4. “Approval” is modified such that the Structural Engineer will return submittals to the Architect within ten working days from time of receipt.

C. AISC “Specifications for Structural Steel Buildings”, including Commentary and Supplements thereto as issued.

D. AISC “Specifications for Structural Joints using ASTM A 325 or A490 Bolts” approved by the Research Council on Structural Connections of the Engineering Foundation.

E. “Specification for Structural Joints using ASTM A325 or A490 Bolts”. Approved June 30, 2004.

F. AWS D1.1 “Structural Welding Code”.

G. ASTM A 6 “General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use”.

H. Occupational Safety and Health Act (OSHA), as amended to date.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site at such intervals to insure uninterrupted progress of work

B. Deliver anchor rods and anchorage devices which are to be embedded in cast-in-place concrete or masonry in ample time to not delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using plates, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

D. Store fasteners components in sealed containers until ready to use. Reseal open containers to prevent contamination by moisture or other deleterious substances. Store closed containers in a protective shelter to protect fasteners from dirt and moisture. Only as many fastener components as are anticipated to be installed during the work shift shall be taken from protective storage. Fastener components that are not incorporated into the work shall be returned to protective storage at the end of the work shift. Fasteners from open containers and fasteners that accumulate rust or dirt shall not be used and shall be immediately and permanently removed from the project site.

E. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural steel rolled W and WT shapes: ASTM A 992, Fy=50 ksi.

B. Structural steel rolled M, S, C and MC shapes and Angles: ASTM A 36, Fy=36 ksi.

C. Structural steel plates and bars: ASTM A 36, Fy=36 ksi.

D. Cold-formed hollow structural sections (HSS):
   1. Round sections: ASTM A500, Grade C, Fy=46 ksi.
   2. Square and Rectangular sections: ASTM A500, Grade B, Fy=46 ksi.

E. Steel pipe: ASTM A53, Type E or S, Grade B, Fy=35 ksi.

F. Anchor Rods: ASTM F1554, Grade 55 with Supplementary Requirement S1, hooked.

G. Unfinished threaded fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts.
   1. Provide square head and nuts.

H. High-strength threaded fasteners: Heavy-hex structural bolts, heavy-hex nuts, and hardened washers, as follows:
   1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A325 or A490.

I. Direct tension indicator washers: ASTM F959.

J. Bolt Lubrication: All bolts shall be well lubricated at time of installation, dry, rusty bolts will not be allowed. Bolts or nuts shall be wax dipped by the bolt supplier or “Johnson’s Stick Wax 140” shall be used with all bolts in the shop or field. Cleaning and lubrication of ASTM 1852 twist-off type tension-control bolts is not permitted.
   1. For complete-joint penetration groove welds, weld metal shall have a charpy V-notch impact strength of 20 ft./lbs. –20°F.

K. Structural steel primer paint: SSPC – Paint 11 lead and chromate free, V.O.C. complaint, minimum solids 55% by volume. Use for steel not receiving special coatings or fireproofing. Refer to Architectural Drawings and Division 9.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Steel spec Heavy Duty Primer; Sherwin Williams.
      b. Tnemec – Series 10; Tnemec.
      c. Primatite; Devoe.
   2. Provide shop primer and shop applied top coat paint in accordance with Division 9 Section “Special Coatings” where shown on the Architectural Drawings.

3. Steel permanently exposed to the elements that does not receive a coating, such as cooling tower supports, shall be hot dip galvanized.

L. Non-metallic shrinkage-resistant grout: Provide in accordance with Section 03300.

2.02 FABRICATION

A. Shop fabrication and assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

B. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.

C. Where finishing is required, complete the assembly, including welding before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

D. Connections:
   1. Weld shop connections, as indicated.
   2. Bolt field connections, except where welded connections are indicated.
   3. Provide high-strength, threaded fasteners except for temporary bracing to facilitate erection or otherwise indicated.

E. High-strength bolted construction: Install high-strength threaded fasteners in accordance with AISC “Specifications for Structural Joints using ASTM A 325 or A 490 Bolts” (RCSC June 30, 2004).

F. Welded construction: Comply with AWS D1.1 for procedures, appearance and quality of welds, and method used in correcting welding work.

G. Holes for other work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.

H. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.

I. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes, or enlarge holes by burning. Drill holes in bearing plates.

J. Provide weep hole in any confined steel surface capable of retaining water during erection or service. Seal weld as required to prevent migration of water into confined region.

2.03 SHOP PAINTING

A. Priming: Unless specified otherwise in Division 9 “Special Coatings” comply with the following: Immediately after surface preparation, apply VOC compliant structural steel primer paint in accordance with manufacturer’s instructions and at a rate to provide dry film thickness of not less than 2.5 mils. Use painting methods that result in full coverage of joints, corners, edges and exposed surfaces. Refer to Division 9 Section “Special Coatings” for priming and painting of members to receive coatings.

B. Shop prime structural steel, except do not prime:
   1. Members or portions of members to be embedded in concrete or mortar. Prime embedded steel that is partially exposed on exposed portions and initial 2” of embedded areas only.
   2. Surfaces that are scheduled to receive sprayed-on fireproofing.
   3. Members that are to be hot dip galvanized.
   4. Surfaces within 2” of welds.
   5. Mask off and do not prime a strip 2” wide on any surfaces to receive a row of puddle welds.

C. Steel members which cannot be readily painted after fabrication, such as back-to-back angles and tees, shall be primed and finish coated prior to fabrication.

PART 3 EXECUTION

3.01 ERECTION

A. Temporary shoring and bracing: Provide temporary shoring and bracing members and connections of sufficient strength to bear imposed loads from steel self weight and erection procedures or any other loads created by other contractors on a temporary basis. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guidelines to achieve proper alignment of structures as erection proceeds.

B. Temporary planking: Provide temporary planking and working platforms as necessary to effectively complete work.

C. Anchor rods and bolts: Furnish anchor rods, bolts and other connectors required for securing structural steel to foundations and other in-place work.
   1. Furnish templates and other devices as necessary for pre-setting rods, bolts and other anchors to accurate locations.
   2. Refer to Division 3 of these specifications for anchor rod installation requirements in concrete, and Division 4 for masonry installation.

D. Field assembly: Set structural members accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment. Comply with AISC Code of Standard Practice except where more stringent requirements are contained herein.
   1. Level and plumb individual members of structure within specified AISC tolerances.
   2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

E. Erection bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.

F. Comply with AISC Specification for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

G. Do not enlarge unfair holes in members by burning or by use of drift pins. Ream holes that must be enlarged to admit bolts as permitted by Architect.

H. Tighten bearing-type bolts A-325N to the snug tight condition as follows:
   1. Bolts shall be placed in all holes, with washers positioned as required and nuts threaded to complete the assembly.
   2. Compacting the joint to the snug-tight condition shall progress systematically from the most rigid part of the joint.
   3. The snug-tightened condition is the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench.
   4. More than one cycle through the bolt pattern may be required to achieve the snug-tightened joint.

I. Provide hardened washers conforming to ASTM F436 and place under the part being turned.

J. Do not reuse or retighten bolts which have been fully tightened. Use only non-galvanized nuts and bolts that are clean, rust-free, and well lubricated. Bolts and nuts shall be wax dipped by the bolt supplier or lubricated with Johnson's Stick Wax 140. Cleaning and lubrication of ASTM F1852 twist-off-type tension-control bolts is not permitted.

K. Where slotted holes are used to accommodate thermal movement, notify the Architect if bolt is expected to hit the end of slot, based on temperature at time of installation.

L. Store fastener components in sealed containers until ready for use. Reseal open containers to prevent contamination by moisture or other deleterious substances. Store closed containers from dirt and moisture in a protective shelter. Take from protective storage only as many fastener components as are anticipated to be installed during the work shift. Fastener components that are not incorporated into the work shall be returned to protective storage at the end of the work shift. Fasteners from open containers and fasteners that accumulate rust or dirt shall not be used and shall be immediately and permanently removed from the project site.

M. Headed shear studs: All welding ferrules for shear connectors shall be removed prior to placement of concrete.

N. Gas cutting: Do not use gas-cutting torches in field for correcting fabrication errors in primary structural framing. When permitted, finish gas-cut sections equal to a sheared appearance by grinding or reaming. Do not use gas cutting to fabricate bolt holes.

O. Touch-up painting: Immediately after erection, slag field welds and clean bolted connections and abraded areas of shop paint. Apply paint to exposed areas using original shop primer or cold galvanizing compound. For exposed steel having special coatings system, reapply both primer and top coat per Division 9 Section, “Special Coatings”. For galvanized steel, apply Zinc Clad Cold Galvanizing by Sherwin-Williams or Cold Galvanizing by ZRC Chemical by brush or spray to provide a minimum dry film thickness of 3 mils.

3.02 QUALITY CONTROL

A. Shop testing and inspection by the Owner is to evaluate the effectiveness of the Fabricator’s required Quality Control and Assurance Program.

B. Owner will engage a Structural Inspector to perform field inspections pursuant to the Structural Inspection Plan presented on the Drawings.

C. Owner will engage a testing agency to perform shop inspections, shop testing, field-testing, and to prepare test and inspection reports.

D. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

E. Provide access for testing agency to places where structural steel work is being fabricated or produced and unobstructed views to all members in nearby storage so that required inspection and testing can be accomplished.

F. Testing agency may inspect structural steel at plant before shipment; however, Architect reserves the right, at any time before final acceptance, to reject material not complying with specified requirement.

G. Correct deficiencies in structural steel work which inspections or laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor’s expense, as may be necessary to reconfirm any noncompliance of original work, and as may be necessary to show compliance of corrected work.

H. Field Inspection and Tests: Inspect and Test during the erection of structural steel assemblies as directed by the Engineer of Record, but not less than the following
   1. Verify field welding procedures and obtain welder certificates.
   2. Check joint preparation and fit up, backing strips, and runout plates.
   3. Check preheating to assure proper temperature, uniformity, and thoroughness through the full material thickness.
   4. Review welding sequence.
   5. Perform visual inspection of all welds for compliance with Contract Documents. Perform non-destructive tests of welds in conformance with Section 6 of AWS D1.1 as may be required by Architect, but not less than:

a. Splices: 100%.
b. Full Penetration Welds: 50% except 100% of cantilever members.
c. Partial Penetration Welds: 25%.
d. Fillet Welds: 10%.

6. Check 100% of bolted connections according to inspection procedures outlined in the "Specification for Structural Joints using ASTM A325 or A490 Bolts" and as required elsewhere in these specifications.
7. Production Stud Application Testing: Test the first two studs per welder per day for each set-up and size and type of stud. Test by bending studs 30 degrees using a 4 lb. hammer per AWS D1.1 Section 7.7. Use a 4 lb. hammer to sound 100% of studs. A pinging sound usually represents a sound weld. Studs that produce a "thud" should be bend tested. Passing studs may remain bent while failing studs must be replaced.
8. Interpret, record, and report all results of the non-destructive tests.
9. Mark for repair any area not meeting Specification requirements. Correction of rejected welds shall be made in accordance with Paragraph 3.7, "Corrections", AWS D1.1.
10. Re-examine all repair areas and interpret, record, and report the results of examinations of repair welds.

END OF SECTION

6

DIVISION

SECTION 06100
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-structural dimension lumber framing.
B. Plywood Backing panels, and sheathing.
C. Preservative treated wood materials.
D. Miscellaneous framing and sheathing.
E. Concealed wood blocking, nailers, and supports.
F. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 03300 - Cast-in-Place Concrete: Setting anchors in concrete.
C. Section 05120 - Structural Steel: Prefabricated beams and columns for support of wood framing.

1.03 REFERENCE STANDARDS

A. AFPA (NDS) - National Design Specification for Wood Construction; 2005.
B. AFPA-SFI - Sustainable Forestry Initiative
C. AFPA (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; American Forest and Paper Association; 2012.
D. ANSI A208.1 - American National Standard for Particleboard; 2009.
E. APA PRP-108 - Performance Standards and Qualification Policy for Structural-Use Panels (Form E445); 2001.
F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
G. ASTM D6007 - Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products Using a Small-Scale Chamber:2002
H. ASTM D6330 - Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined Test Conditions:1998
I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
J. ASTM E 1333 - Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber; 2010.
K. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2012.
L. FLA (FBC-B) - Florida Building Code: Building; 2010.
M. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
N. FSC- FOREST STEWARDSHIP COUNCIL: Sustainable Forestry Initiative.
O. PS 1 - Structural Plywood; 2009.
P. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology, Department of Commerce; 2010.

Q. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.

1.04 QUALITY ASSURANCE

A. Lumber Standard: Comply with PS 20, except as otherwise indicated.

B. Plywood Standard: Comply with PS 1, except as otherwise indicated.

C. Comply with AWPA (American Wood Preservers Association) Standards and FBC for Exterior use.

D. Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.

E. VOC emissions: Provide low VOC products.
   1. Engineered Wood Products: Provide products with no added urea formaldehyde.
   2. Determine formaldehyde concentrations in air from wood products under test conditions of temperature and relative humidity in accordance with ASTM D6007 or E1333.
   3. Determine Volatile Organic Compounds VOC), excluding formaldehyde, emitted from manufactured wood-based panels in accordance with ASTM D6330.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Samples: For rough carpentry members that will be exposed to view, submit two samples, 6x12 inch in size illustrating wood grain, color, and general appearance.

C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

D. Letter of Certification for Pressure Treatment: Submit Certification from treating plant stating chemicals and process used and net amount of preservatives retained are in conformance with specified standards.
   1. Submit two copies of chemical treatment manufacturer's instructions for proper use of each type of treated material

1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.07 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Southern Pine, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service

for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
5. Do not install any wood material into any concealed spaces unless shown on the drawings or approved by the Building Department, Owner and Architect.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Do not install any wood material into any concealed spaces unless shown on the drawings or approved by the Building Department, Owner and Architect.

B. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

C. Sizes: Nominal sizes as indicated on drawings, S4S.

D. Moisture Content: S-dry or MC19.

E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 EXPOSED DIMENSION LUMBER

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

C. Sizes: Nominal sizes as indicated on drawings.

D. Surfacing: S4S.

E. Moisture Content: S-dry or MC19.

2.04 STRUCTURAL COMPOSITE LUMBER

A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.

B. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer.
   1. Columns: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 1,800,000 psi, minimum.
   2. Beams: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 1,800,000 psi, minimum.
   3. Headers Not Longer Than 48 inches: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber.
   4. Manufacturers:
      a. Weyerhaeuser: www.weyerhaeuser.com.
      b. Boise Cascade: www.bc.com.
      c. Georgia-Pacific Corp.: www.gp.com.
      d. Substitutions: See Section 01600 - Product Requirements.

2.05 EXPOSED BOARDS

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Moisture Content: Kiln-dry (15 percent maximum).

C. Surfacing: S4S.

D. Species: Southern Pine.

E. Grade: No. 2, 2 Common, or Construction.

2.06 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-C plywood, 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E 84.

B. Other Applications:

1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
3. Other Locations: PS 1, C-D Plugged or better.

2.07 ACCESSORIES

A. Fasteners and Anchors:

1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
3. Anchors: Toggle bolt type for anchorage to hollow masonry.

B. Building Paper: Water-resistant Kraft paper. Asphalt saturated felt, non-perforated, ASTM D226.

2.08 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:

1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
   a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
   b. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Examine the substrates and supporting structure and the conditions before installing carpentry work. Do not install on unsatisfactory conditions.

B. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.

D. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

E. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

F. Specifically, provide the following non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Chalkboards and marker boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.

3.05 INSTALLATION

A. General:
   1. Discard units of material with defects that might impair the quality of the work, and units that are too small to fabricate the work with minimum joints or the optimum joint arrangement.

2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.
3. Securely attach carpentry work to substrate by anchoring and fastening as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will by exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

B. Wood Grounds, Nailers, Blocking and Sleepers:
1. Provide as shown and at all locations required for attachment of other work. Form shapes as shown or required. Coordinate location with other work involved.
2. Stagger joints at least 6 inches for individual members in built-up installations.
3. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

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

D. Do not expose wood products in attics, soffits, chases, or other spaces concealed within the building, clarify prior to installation.

E. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.
4. Size panel backboards 12" larger than the mounted equipment to the greatest extent practicable. Butt adjoining boards to form continuous backboard.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING

A. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

B. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06200
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood door frames, glazed frames.

C. Wood casings and moldings.
   1. Baseboards
   2. Trim

D. Wood treatments

E. Accessories including, but not limited to, fasteners.

F. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 06100 - Rough Carpentry: Support framing, grounds, and concealed blocking.

C. Section 06410 - Custom Cabinets: Shop fabricated custom cabinet work.

D. Section 08211 - Flush Wood Doors.

E. Section 09900 - Paints and Coatings: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.

C. ANSI A208.1 - American National Standard for Particleboard; 2009.

D. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

F. ASTM D6007 - Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products Using a Small-Scale Chamber:2002

G. ASTM D6330 - Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined Test Conditions:1998

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

I. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

J. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.

K. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood-Preservers' Association; 2012.

L. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).

M. FLA (FBC-B) - Florida Building Code: Building; Current Edition.

N. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.

O. FSC- FOREST STEWARDSHIP COUNCIL: Sustainable Forestry Initiative.

P. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association; 2009.

Q. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

R. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 2011.

S. PS 1 - Structural Plywood; 2009.

T. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2010.

U. UL (BMD) - Building Materials Directory; current edition.

V. WI (CCP) - Certified Compliance Program (CCP); current edition at www.woodworkinstitute.com/certification.

1.04 DEFINITIONS

A. Certified Wood: Independent third party (FSC) verified wood from forests complying with responsibly managed forest standards that meet broad social, economic and environmental goals.

B. Finish Carpentry: The last step of the carpentry process where the finish carpenter performs tasks such as installing baseboards, crown molding, and other millwork elements that are viewable as opposed to carpentry within walls, which will later be enclosed.

C. HAP. Hazardous Air Pollutant

D. HMA Hardwood Moldings Glossary

E. MDF. Medium Density Fiberboard

F. MDO Plywood: Plywood with a medium-density overlay on the face.

G. MIC. Methyl diisocyanate, an extremely toxic isocyanate chemical compound and HAP, used in making industrial adhesives and polyurethane.

H. SPIB: The Southern Pine Inspection Bureau

I. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

J. VOC. Volatile Organic Compounds are compounds that have a high vapor pressure and low water solubility.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: Convene a pre-installation conference after installation of required mock-up and prior to commencement of this work. Discuss any items that may alter fabrications or intended installation and determine acceptable conclusions.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Coordinate work with all other trades for rough-in work and installation of adjacent and associated components.

1.06 SUBMITTALS

A. See Section 01300 - Administrative Requirements for submittal procedures.

B. Product Data:

1. Provide instructions for attachment hardware, finish hardware, and all prefabricated items.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories. Show fabrication details and connections to adjacent Work. Submit Shop Drawings in accordance with Section 01300 (01 3000).
   1. Minimum Scale of Detail Drawings: 3" = 1'-0". Elevations at 1/4" = 1'-0"
   2. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.
   3. Indicate required field measurements beyond control of mill.
   4. Indicate the allowable uniformly distributed loads for shelving.
   5. Include certification program label.

D. Samples:
   1. Finish Samples: 24 inches long x full width, 12 inch width for panels; each type wood species and item to receive finish. Submit manufacturer's full range of sample finish, stains, grades, colors, textures and patterns of wood and trims for Architect's selection.
   2. Color Samples (Final finish): Manufacturer's standard colors, textures, patterns, and finish.

E. Quality Control Submittals:
   1. Dip Treatment Certificates: Certification by treating plant stating chemical solutions used, submersion period, and conformance with specified standards.
   2. Pressure Treatment Certificates: Certification by treating plant stating chemicals and process used, net amount of salts retained, and conformance with specified standards.
   3. Installation Instruction: Provide installation instructions and lists of replacement parts for all hardware and accessories.

F. Letter of Certification(s) for Sustainable Forestry:
   1. Forest Stewardship Council (FSC): Provide letter of certification signed by lumber supplier. Indicate compliance with FSC "Principles for Natural Forest Management" and identify certifying organization.
      a. Submit FSC certification numbers; identify each certified product on a line-item basis.
      b. Submit copies of invoices bearing the FSC certification numbers.
   2. Sustainable Forestry Board: Provide letter of certification signed by lumber supplier. Indicate compliance with the Sustainable Forestry Board’s "Sustainable Forestry Initiative" (SFI) and identify certifying organization.
      a. Submit SFI certification numbers; identify each certified product on a line-item basis.
      b. Submit copies of invoices bearing the SFI certification numbers.

G. Letter of Certification for Pressure Treatment: Submit Certification from treating plant stating chemicals and process used and net amount of preservatives retained are in conformance with specified standards.
   1. Submit two copies of chemical treatment manufacturer's instructions for proper use of each type of treated materia

1.07 QUALITY ASSURANCE

A. Mill and Producer's Label: Each lumber and panel item shall bear label indicating type, grade, mill, and grading agency on unfinished surface, or on end of material with finished surfaces.
   1. Panels shall bear APA or equivalent grade-mark; each panel.

B. Built-ins and casework shall be constructed and installed to carry intended loads, not have sharp corners, splinters, or any construction features or projections that would be hazardous to occupants and users. Casework and cabinets shall be constructed in conformance with applicable state and federal accessibility requirements.

C. Particle board is not allowed.

D. Cabinet work shall follow minimum requirements described in the latest edition of the Architectural Woodwork Institute (AWI) following "Custom Grade" standards.

E. Casework shall be "Custom Grade" overlay design with plastic laminate finish.

F. Only manufacturers with financial stability and 5 years experience in casework manufacture and installations of similar scope will be considered.
   1. The installer must be a company whose primary business is the manufacturing of plastic laminate casework.
   2. The installer shall have adequate physical facilities and personnel for this size project with a qualified engineering department to provide layout and shop drawings for review before fabrication.

G. Evidence of qualifications shall include product catalog, descriptive literature, and specifications for the proposed product. Submit a sample cabinet, complete with drawer, door hardware, and corner sample of counter top with the product literature.

H. Fire Hazard Classification: Comply with required NFPA, ANSI and UL surface burning characteristics for plastic laminates, lumber and plywood.

I. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
   2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
   3. Single Source Responsibility: Provide and install this work from single fabricator.

J. Field Measurements: Design and fabricate units based upon field conditions and measurements. Verify field measurements are included in shop drawings.

1.08 MOCK-UP

A. Prepare mock-up under provisions of Section 01 4000. Mock ups may be used as part of the finished work if accepted.

B. Provide full size sample installation for each condition of each type indicated, in specified finish. Contractor shall coordinate with Architect for all required locations.

C. Owner shall inspect units to ascertain quality and conformity to AWI Standards.

D. Units will establish a minimum standard of quality for this work for the remainder of the project

1.09 DELIVERY, STORAGE, AND HANDLING

A. Environmental Limitations: Do not deliver or install wood products until building is enclosed, wet work is complete, and HVAC system is operating and consistently maintaining temperature and relative humidity (RH) at occupancy levels, and in accordance with manufacturer's recommendations.

B. Protect work from moisture damage. Store materials and completed fabricated wood items in a dry, well ventilated area completely protected from the weather. Comply with temperature and humidity requirements for storage and installation as specified in the applicable quality standards.

C. Protect sanded and prefinished surfaces during handling and installation. Keep such surfaces covered with polyethylene film or other suitable protective covering.

D. Immediately prior to, during and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

E. Protect work from damage until final acceptance.

1.10 FIELD CONDITIONS

A. Ambient Conditions: Maintain constant minimum temperature of 60 degrees F and maximum relative humidity of 55 percent in spaces to receive the Work of this Section.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

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

1.11 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for Factory-Applied finish.

D. Special Warranty for Columns: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace columns that fail in materials or workmanship within specified warranty period.
   1. Warranty Period for Columns: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards for Custom Grade.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

C. Interior Woodwork Items:
   1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.
   2. Door, Glazed Light, and Pocket Door Frames: White birch; prepare for paint finish.
   3. Loose Shelving: Birch plywood; prepare for paint finish.AWI Premium Grade
      a. Unassembled shop fabricated units, oversize length for field fitting.
      b. Panel Products: Veneer core
         1) Plywood Face and Back Veneer Species: Any Group 1 species, A-D-INT APA, Exterior glue.
         2) Plywood Cut; Face and Back Veneer: Plain sliced.
      c. Exposed Edges: Solid lumber edge bands or plastic "T" spline edge banding unless noted otherwise.
   4. Cabinets:
      a. For Paint Finish: AWI Custom Grade, with exposed work of "Natural" Birch lumber and closed-grain hardwood face veneer.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Provide sustainably harvested wood, certified or labeled as specified in Section 01600.

C. Provide wood harvested within a 500 mile radius of the project site.

2.03 LUMBER MATERIALS

A. Lumber: Kiln-dried to 12 percent average moisture content for exterior Work; 8 percent for interior Work.

2.04 SHEET MATERIALS

A. Softwood Plywood Not Exposed to View: Any face species, veneer core; PS 1 Grade A-B; glue type as recommended for application.

B. Softwood Plywood Exposed to View: Face species as indicated, rotary cut, veneer core; PS 1 Grade A-B; glue type as recommended for application.

2.05 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Fasteners:
   1. Nails, Spikes, and Staples: Size and type to suit application; non-ferrous metal or galvanized steel for exterior locations, high humidity locations, treated wood, and wood to receive transparent finishes; plain finish for other interior locations.
   2. Bolts, Nuts, Washers, Lags, and Screws: Medium carbon steel; size and type to suit application; galvanized for exterior locations, high humidity locations, and treated wood; plain finish for other interior locations.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry; expansion shield and lag bolt type for anchorage to solid masonry or concrete; galvanized steel or stainless steel.

2.06 ACCESSORIES

A. Lumber for Shimming, Blocking, and miscellaneous use: Softwood lumber of white pine species.

B. Safety Glass: ASTM C1048, fully tempered; clear; 3 mm thick minimum.

C. Primer: as specified in Section 09900.

D. Wood Filler: Solvent base, tinted to match surface finish color.

2.07 WOOD TREATMENT

A. Factory-Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.

B. Shop pressure treat wood materials requiring fire rating to concealed wood blocking.

C. Provide identification on fire retardant treated material.

D. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

E. Redry wood after pressure treatment to maximum 15 percent moisture content.

2.08 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Shop prepare and identify components for book match grain matching during site erection.

C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.09 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

D. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
   1. Transparent:
      a. System - 10, UV Curable, Water-based.
      b. Stain: As selected by Architect.

c. Sheen: Satin.

2. Opaque:
   a. System - 10, UV Curable, Water-based.
   b. Color: As selected by Architect.
   c. Sheen: Semigloss.

E. Back prime woodwork items to be field finished, prior to installation.

F. Mill assemble items to largest sizes practicable, to minimize field cutting and jointing. Allow for cutting and fitting where necessary to fit at the Site.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

C. Verify that field measurements, surfaces, substrates, structural support, utility connections, tolerances, levelness, plumbness, humidity, moisture content level, cleanliness and other conditions are as required by the manufacturer, and ready to receive Work.

D. Do not proceed with finish Work until unsatisfactory substrate conditions are corrected.

3.02 PREPARATION

A. Condition the Work of this Section to average prevailing humidity conditions in installation areas prior to installing.

B. Layout installation by marking extents of each item, and anchoring / fastening locations coordinated with blocking or other structural support.
   1. Marks shall be covered up and hidden by installation.
   2. GC to locate areas out-of-level and correct.

C. Protect adjacent substrates, installed work and existing items from damage by construction operations with temporary but effective means.

D. Backprime lumber for painted finish exposed on the exterior or, where indicated, to moisture and high relative humidities on the interior. Comply with requirements of section on painting within Division 9 for primers and their application.

E. Surface Preparation for Coating System:
   1. Remove hardware and hardware accessories, plates, and similar items in places that are not to be coated, or provide surface-applied protection prior to surface preparation and painting.
      a. Remove items if necessary for complete sealing or finishing of items and adjacent surfaces.
      b. Clean surfaces, before applying paint or surface treatments, removing oil, grease and all other foreign substances.
      c. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly-coated surfaces.
      d. Following completion of coating operations in each space or area, items shall be reinstalled in the same manner that they were removed.
   2. Unfinished Wood Surfaces: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper. Sand smooth surfaces exposed to view 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 application of primer.
      b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood. After priming, fill holes and

imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

c. When transparent finish is required, backprime with spar varnish.

F. Product Preparation: Handle products in accordance with manufacturer's instructions and warranty requirement including, but not limited to:
   1. Remove shipping / storage protection
   2. Acclimatize product to installation location.
   3. Strictly adhering to manufacturer's handling and installation safety requirements.

G. Door and Window Openings
   1. Examine if rough openings are square, plumb and correctly sized.
      a. Correct rough openings more than 1/2 inch in. out of plumb and adjust sole plate.
      b. Shim rough opening to door frame as needed to make plumb and compensate for twist.

3.03 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

D. Cut wood items to fit unless specified to be shop-fabricated, or shop-cut to exact size. Scribe and cut for accurate fit where Work abuts other finish Work. Drill pilot holes at corners before making cutouts. Provide flush hairline joints.
   1. Allow for expansion and contraction movement of wood material joints due to moisture.
   2. Abut and align top and face edge surfaces in one true plane, with internal supports placed to prevent deflection. Plane solid wood when necessary to make top and face planes aligned and flush.
   3. Provide scarf joints at all end-to-end joints.
   4. Distribute defects to the greatest appearance advantage possible.
   5. Trim and Moulding: Install in single, unjointed lengths at openings and for runs less than the maximum lumber length available. For long runs, use only 1 piece less than the maximum length available in any straight run. Stagger joints in adjacent members. Cope moulding at returns. Miter at corners.
      a. Inside Corner: Butt one side-piece to wall, and cope second side piece to fit tight to profile of the first piece.
      b. Outside Corner: Miter both pieces.
   6. Attach the Work securely in place.
      a. Nailing: Blind nail where possible. Use finishing nails where exposed. Set nail heads for filling, except for exterior wood scheduled to receive natural finish (if any).
      b. Anchoring: Secure the Work to anchors or to blocking which is built-into or directly attached to substrates.
         1) Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Use fine finishing nails for exposed nailings, countersunk and filled flush with finished surface
      c. Fasteners: Fasten or anchor materials and units in a concealed manner with fasteners appropriate to use and anticipated durability.
         1) Do NOT use chromium-plated metal fasteners and anchors.
         2) Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
         3) Make tight connections between members.
         4) Install fasteners without splitting wood; pre-drill hardwood and countersink nail heads, fill flush and sand smooth, unless otherwise indicated.

5) Place fasteners, when exposed, aligned in straight rows parallel with edges of members for exposed work, with fasteners evenly spaced, and with adjacent rows staggered.

E. Treated Wood: Coat exposed surfaces of treated field-cut wood items with a heavy brush coating of the same preservative.

F. Casework (stained/painted): Install Work in a manner consistent with the AWI Quality Grade specified.
   1. Secure casework to grounds, stripping, or blocking with countersunk concealed fasteners and blind nailing, as required to provide a rigid installation. Scribe and cut for accurate fit to other finish Work.
   2. Adjust and lubricate casework hardware for proper operation.

G. Wood with Transparent Finish: Match color and grain pattern.
   1. Remove existing materials which do not conform with requirements. Resecure existing materials which are to remain but have inadequate attachment to substrates.
   2. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.
   3. Caulk any visible seams between carpentry and wall, ceiling or floor construction, that cannot be sealed by fastening. Finish caulking smooth and flush with adjacent surfaces, ready to paint. Improper caulking may cause the finish carpentry work to be rejected and reinstalled.

3.04 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09900.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.05 FIELD QUALITY CONTROL

A. Site Tests and Inspections: Provide per section 01400 (01 4000)and as follows:
   1. Allow and facilitate unscheduled inspections of timber source stands, complete forestry operations, and sawmill to meet FSC or other sustainability standards.

B. Non-Conforming Work per General Conditions and as follows:
   1. Remove, Repair and Reinstall or Restore in Place damaged items.
      a. Finish touch-up damaged surface finishes.
      b. Apply EPA registered treatment to water-damaged treated lumber.
   2. Replace damaged materials or items with New if repair not acceptable to Architect

3.06 CLEANING

A. Clean exposed surfaces of prefinished Work.
   1. Waste Management per Section 01 7419 and as follows:
      a. Disposal Requirements:
         1) Handle hazardous waste in strict accordance with manufacturers' recommendations and AHJ rules and regulations for materials regulated under RCRA (Resource Conservation and Recovery Act).
         2) On-site incineration not allowed.
      b. Coordinate take-back program with manufacturer, if applicable.
         1) Store and return pallets, containers and packaging to manufacturer or fabricator or recycler for reuse or recycling.

2) Store scrap materials to be returned to manufacturer for recycling into new product.

2. Provide Progress Cleaning per Section 01 7000 and as follows:
   a. Work Areas: Continuously clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
      1) Clean and maintain completed construction until Substantial Completion.
   b. Site: Continuously maintain Project site free of waste materials and debris.
3. Provide Final Cleaning immediately prior to Substantial Completion inspection per Section 01 7000.

3.07 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

3.08 PROTECTION

A. Protect installed Work from damage by Work of other trades. Maintain temperature and humidity requirements during the construction period in interior installation areas to ensure that work will be without damage or deterioration at time of acceptance.

B. Repair existing damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

END OF SECTION

SECTION 06410
CUSTOM CABINETS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Countertops.

C. Cabinet hardware.

D. Factory finishing.

E. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

A. 08710 - Finish Hardware.

B. 08210 - Wood Doors.

C. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.

D. Section 06100 - Rough Carpentry: Support framing, grounds, and concealed blocking.

E. Section 09900 - Paints and Coatings: Site finishing of cabinet exterior.

1.03 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition; (ADA Standards for Accessible Design).

B. ASTM D6007 - Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products Using a Small-Scale Chamber:2002

C. ASTM D6330 - Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined Test Conditions:1998

D. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010.

E. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.

G. AWI P-201 - Architectural Casework; 1989.

H. AWI P-205 - Fire Code Summary; 1986.

I. AWI P-206 - Guide to Wood Species; 1977.

J. AWI P-211 - Source Book; current edition.

K. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).

L. FLA (FBC-B) - Florida Building Code: Building; 2010.

M. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber; Federal Specifications and Standards; Revision A, 1996.

N. GS-36 - Commercial Adhesives; 2000.

O. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

P. PS 1 - Structural Plywood; 2009.

Q. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2010.

R. SCAQMD1113 - Architectural Coatings

S. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, quantities, locations and conditions of adjoining work, fastening methods, jointing details, and accessories.
   1. Minimum Scale of Detail Drawings: 3" =1'-0", including details, sections and elevations.
   2. Identify locations of each item.
   3. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.
   4. Indicate required field measurements beyond control of mill.
   5. Indicate the allowable uniformly distributed loads for shelving.
   6. Show plastic laminate colors, patterns, and inserts.

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

F. Samples: 7 inch (18 centimeter) by 9 inch (23 centimeter) samples of each type of tackable wallcovering material required.

G. Letter of Certification for Pressure Treatment: Submit Certification from treating plant stating chemicals and process used and net amount of preservatives retained are in conformance with specified standards.
   1. Submit two copies of chemical treatment manufacturer's instructions for proper use of each type of treated material

H. Key Schedule: Provide lock and key schedule for lockable cabinets. Coordinate key schedule with Section 08 7100. All cabinets shall be keyed the same (one key) per room. Coordinate with Owner for all keying requirements.

I. Certification: Submit certifications by treating plant that pressure treatment materials comply with governing ordinances.

1.06 QUALITY ASSURANCE

A. Built-ins and casework shall be constructed and installed to carry intended loads, not have sharp corners, splinters, or any construction features or projections that would be hazardous to occupants and users. Casework and cabinets shall be constructed in conformance with applicable state and federal accessibility requirements.

B. Particle board is not allowed.

C. Casework shall be "Custom Grade" overlay design with plastic laminate finish.

D. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
2. All Cabinets shall be manufactured in a climate-controlled environment, stored after fabrication in a climate controlled (temperature and humidity) storage area and shipped to the job site in an enclosed container (semi-tractor trailer).

E. Lumber Grading: Lumber Grading Rules and Wood Species in accordance with Voluntary Product Standards PS 20-70. Grading rules of Southern Pine Inspection Bureau (SPIB) apply to materials furnished.

F. Fire Hazard Classification: Comply with required NFPA, ANSI and UL surface burning characteristics for plastic laminates, lumber and plywood.

G. Field Measurements: Design and fabricate units based upon field conditions and measurements. Verify field measurements are included in shop drawings.

1.07 MOCK-UP

A. Provide mock-up of scheduled base cabinet, wall cabinet, and countertop of each type specified, including hardware, finishes, and plumbing accessories.

B. Locate where directed.Contractor to coordinate with Architect for all required locations.

C. Owner shall inspect units to ascertain quality and conformity to AWI Standards.

D. Units will establish a minimum standard of quality for this work.

E. Mock-up may remain as part of the Work, upon approval of the Architect and STOF Representative.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

B. Immediately prior to, during and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

C. Protect work from damage until final acceptance.

1.09 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

B. Coordinate work with plumbing, mechanical, electrical, and other trades for rough-in work and installation of adjacent and associated components.

1.10 WARRANTY

A. Manufacturer Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of manufactured wood casework that fail in materials or workmanship, and against manufacturing defects in material and fabrication within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Delamination of components or other failures of glue bond.
      b. Warping of components.
      c. Failure of operating hardware.
      d. Deterioration of finishes.
   2. Manufacturer shall warrant all casework products for a period of three (3) years.
   3. Manufacturer shall warrant against structural failure of the cabinet body for a period of ten (10) years.

B. Installers Warranty: The installer shall warrant the entire installation against defects in material and workmanship for a period of three (3) years.

C. Warranty periad shall begin on the date of Substantial Completion.

PART 2 PRODUCTS

2.01 CABINETS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI Architectural Woodwork Standards for Custom Grade.
   1. Materials and Fabrication: Premium grade construction and finishing in accordance with AWI "Quality Standards", conforming to Section 400B - Laminate Clad Cabinets. Cabinets at administrative areas (or as designated in drawings) to be painted shall be constructed with AWI “Quality Standards”, conforming to Section 400.
   2. Design Type: Flush Reveal overlay design in accordance with AWI Architectural Casework - General Details, except as otherwise specified and detailed.

B. Plastic Laminate Faced Cabinets: Custom grade.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Hardwood Plywood: HPVA HP-1, Formaldehyde –free Hardwood Plywood

C. Particleboard: Premium Industrial Grade, minimum 47 lb. density, formaldehyde-free, ANSI A208.1-M-3. (Cabinets and countertops)

D. Hardboard: ANSI A135 -4, Class 1 tempered, smooth, 2 sides equal to “Duron” by USG.

E. Hardwood Plywood: Formaldehyde free, concealed members, solid wood hardwood, kiln dried, select Poplar, Fir or mill option.

F. Case members, tops, bottoms, sides, dividers, shelves, doors, and door fronts shall be ¾” thick, 9-ply thick closed grained hardwood plywood, incorporating Type II water resistant glue.

2.03 LAMINATE MATERIALS

A. Manufacturers:
   1. Formica Corporation: www.formica.com. Basis of Design
   2. Panolam Industries International, Inc\Nevamar or Pionite.: www.nevamar.com.
   3. Wilsonart International, Inc: www.wilsonart.com.
   4. Substitutions: See Section 01600 - Product Requirements.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as scheduled.
   1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
   2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
   3. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
   4. Flame Retardant Surfaces: HGF, 0.048 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
   5. Cabinet Liner: CLS, 0.020 inch nominal thickness, through color, white unless otherwise noted on plans, textured, low gloss finish. All interior exposed faces to be lined.
   6. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.04 COUNTERTOPS

A. General: Refer to plans for schedule / location of specific countertops.

B. Plastic Laminate Countertops: Plywood substrate covered with HPDL. Marine grade plywood shall be used at all sink countertops.

C. Plastic Laminate Countertop (chemical resistant for science lab): Plywood substrate covered with HPDL chemical resistant. Basis of Design: Nevamar ChemArmour.

2.05 ACCESSORIES

A. Laminate Adhesive: Type recommended by fabricator to suit application, must be low emitting-water based product

B. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

C. Concealed Joint Fasteners: Threaded steel.

D. Miscellaneous: Provide shims, blocking, etc. as required for complete installation.

E. Grommets: Standard plastic, painted metal, or stainless steel grommets for cut-outs, in color to match adjacent surface. unless noted otherwise on drawings.
   1. All grommet location shall be shown in shop drawings for coordination.
   2. All grommets in solid surface or stone counters shall be stainless steel finish to be selected by architect.
   3. All sold brackets shall be provided with concealed cut-outs as needed to convey systems connections at all locations.

F. Sealer: multi-use, waterbased, low gloss sealer for highly porous surfaces such as particle board, plywood, processed wood and porous concrete. AMF Safecoat Safe Seal or equal to be applied on all exposed surfaces.

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome or satin chrome finish, for nominal 1 inch spacing adjustments.
   1. Manufacturers:
      a. Basis of Design -Knape & Vogt Mfg. Co, Product: No. 255 Standard and No. 256 Supports or approved equal
      b. Equal products by the following manufacturers are acceptable.
         1) Accuride International, Inc: www.accuride.com.
         2) Grant hardware Products by Hettich America, www.hettichamerica.com
         3) Julius Blum Inc.www.blum.com
      c. Substitutions: See Section 01 6000 - Product Requirements.

C. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers.
   1. Product: 345840 manufactured by Stanley products - Basis of Design: www.stanleyhardware.com
   2. Equal products by the following manufacturers are acceptable;
      a. Grant hardware Products by Hettich America, www.hettichamerica.com
      b. Stanley: www.stanleycommercialhardware.com
      c. Hafele America Co.: www.hafele.com/us

D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.
   1. Manufacturers:
      a. Basis of Design: Schlage CL 200 series cabinet /drawer lock, US26D, complete with strike plate
      b. Equal products by the following manufacturers are acceptable.
         1) Accuride International, Inc: www.accuride.com.

2) Grant hardware Products by Hettich America, www.hettichamerica.com
3) Julius Blum Inc.www.blum.com
4) Olympus Lock, Inc.: www.olympus-lock.com
5) Schlage by Ingersoll Rand: us.allegion.com
6) Yale; www.AssaAbloy.com www.yalelock.com
7) CorbinRusswin: www.corbinCorbin.com, www.Assaabloy.com

c. Substitutions: See Section 01 6000 - Product Requirements.

2. Master key: Master key doors and drawers of cabinetry in each room with each other and the main entrance room door.

E. Catches: Magnetic.
1. Basis of Design, Stanley 41 Series

F. Drawer Slides:
1. Static Load Capacity: Heavy Duty grade.
2. Mounting: Side mounted.
3. Stops: Integral type.
4. Features: Provide self closing/stay closed type.
5. Products:
a. Basis of Design: Knape & Vogt Manufacturing Company; Product NO. 8400 Extension Slides: www.knapeandvogt.com.
b. Equal products by the following manufacturers are acceptable.
1) Accuride International, Inc: www.accuride.com.
2) Grant hardware Products by Hettich America, www.hettichamerica.com
3) Julius Blum Inc.www.blum.com
c. Substitutions: See Section 01600 - Product Requirements.

G. Hinges: Concealed (fully mortised) self-closing type, aluminum with satin finish.
1. Basis of Design, Stanley Product: Stanley HT1592, US28 or approved equal.:
a. Equal products by the following manufacturers are acceptable;
1) Hafele America Co.: www.hafele.com/us
2) Hardware Resources: www.hardwareresources.com.
3) Stanley: www.stanleycommercialhardware.com
4) Julius Blum, Inc: www.blum.com.
5) Grant hardware Products by Hettich America, www.hettichamerica.com
6) Substitutions: See Section 01600 - Product Requirements.
2. Exposed hinges will not be accepted.

2.07 SHOP TREATMENT OF WOOD MATERIALS

A. Provide UL approved identification on fire retardant treated material.

B. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.08 SITE FINISHING MATERIALS

A. Finishing: Site finished as specified in Section 09900.

2.09 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Fabrication Workmanship:
1. Construct millwork items in accordance with specified quality grade of reference standards, except as otherwise specified or detailed.
2. Construct millwork items using materials specified for plastic laminate finish.

C. Milling: Fabricate and assemble work at mill as complete as practicable. Deliver ready to assemble and set in place. Machine sand work at mill and deliver free of machine or tool marks or defects that will show through finish.

D. Plastic Laminate Tops, Shelving, and Drawer fonts
   1. Use plywood substrate as specified. Particleboard permitted by OCPS standards)
   2. Glue tops and panels under pressure using Type II water- resistant(water based-Low emitting) adhesive. Glue plastic, core and backing sheet in one operation after applying edge bands.

E. Plastic Laminate Tops, Panels, Cabinet Shelving, and All Exposed Surfaces:
   1. Use plywood substrate as specified. (Particleboard, hardboard and flake-board are not acceptable -)
   2. Glue panels under pressure using Type II water- resistant(water based-Low emitting) adhesive. Glue plastic, core and backing sheet in one operation after applying edge bands.

F. Fabricate finished tops and edges from one continuous sheet of plastic laminate. Make corners and joints hairline. Slightly bevel arises.

G. Edges of millwork to be eased as required to eliminate sharp edges and sealed.

H. Backsplash and Aprons: Square edge, direct bond cover and full returns. Make corners and joints hairline.

I. Door and Drawer fronts shall be 3/4" thick plywood
   1. Front: High Pressure Laminate with balanced liner.
   2. Drawer Bottom: 1/2 inch ", fully bound (dadoed) into front, sides and back laminated with thermally fused melamine.
   3. Drawer Body to include sides, back and sub-front 1/2" laminated with thermally fused melamine.
   4. Drawer Sides (Alternative): White Blum Metabox drawer side system with integrated drawer slides including ancillary fastening accessories.

J. Open Shelving shall be 3/4" thick plywood
   1. Top : High Pressure Laminate with balanced liner.
   2. Bottom: Melamine

K. Shelving inside cabinet: 1" thick plywood
   1. Top and Bottom: Melamine.

L. Provide plastic laminate finish on all exposed surfaces of doors, drawers, countertops, splashes, etc. of cabinets, unless noted otherwise. Shelves shall be finished on all sides and edges.

M. Base: 4- inch high,3/4 inch CDX plywood.

N. Construction: Construct each unit or cabinet in one section where practical, or in largest practical sections to facilitate ease of handling and installation. Cabinet constructed in more than one section, ship trim and scribe strips loose at field joints. Locate counter butt joints minimum 2 foot from sink cutouts.

O. Finish Hardware: Fit drawer guides and cabinet-mounted shelf standards at mill. Ship other finish hardware items loose for installation at job site.

P. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
   2. Cap exposed plastic laminate finish edges with material of same finish and pattern.

Q. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:

1. Provide center matched panels at each elevation.
2. Provide sequence matching across each elevation.
3. Carry figure of cabinet fronts to toe kicks.

R. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches on center.

S. Mechanically fasten back splash to countertops with steel brackets at 16 inches on center.

T. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Seal cut edges.

2.10 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.

C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.

D. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces for conditions that would prevent quality installation of millwork.

B. Verify adequacy of backing and support framing.

C. Verify location and sizes of utility rough-in associated with work of this section.

D. Do not install on defective conditions, doing so shall indicate acceptance of site conditions and requires installer to correct any and all defects.

E. Contractor shall take accurate field measurements and adjust the shop drawings accordingly before fabrication. The A/E shall be informed in writing of any dimension changes resulting from such field measurement before fabrication.

F. The casework shall be set in place, leveled, and secured to walls and floors as normal and standard to the trade. Fillers shall be used between casework and walls and shall be accurately scribed to walls for a neat installation. Casework shall be caulked where meeting walls, floors and soffits. Seal all counter joints and where backsplash meets counter top.

G. The casework installer shall accurately cut openings required for sinks or other equipment as indicated on plans.

3.02 INSTALLATION

A. General:

1. Do not start installation until the building is enclosed and the HVAC system controls the temperature and humidity (75 degrees, 55 RH) in the room space.
2. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level (within 1/16" in 10'), in accordance with drawing details and shop drawings.
3. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
4. Do not install trim until backs and unexposed edges have been back primed.
5. Provide cutting, fitting, fabricating, erecting, wedging, bracing, blocking, nailing and securing of items of rough woodwork throughout, including miscellaneous furring, grounds, blocking, and nailers. Build-in items where indicated on Drawings or where required for attachment of finish and other work.

6. Provide 4" high backsplash and end splashes at all locations where countertops abut walls.
7. Fully bed backsplashes and end splashes to top and each other with Dow Corning #786 mildew resistant silicone sealant.

B. Cabinets:
1. Install cabinets plumb with countertops level to within 1/16" in 10'.
2. Level base cabinets to within allowable tolerances.
3. Accurately scribe and fit scribe strips, trim strips and filler panels to irregularities of adjacent surfaces: Maximum gap opening 0.025".
4. Secure cabinets permanently to floor using anchors spaced at maximum of 30" o.c., minimum of two for each unit.
5. Bolt adjoining cases together, maximum width of joints 1/32".
6. Fasten tops to bases with screws driven through base cabinet top frame into bottom of countertop.
7. Blocking, Bucks, and Nailers: Install plumb, level and true with joints flush, fastened securely in place.
8. Cuts, miters, joints, etc. shall be well sawn and joined. Nail heads or holes shall not be exposed in finish work. Drive nails and screws true and straight. Glue joints securely together. Sand all surfaces thoroughly, leaving clean and ready for finishing.
9. Furring and Stripping: Install plumb and level, shim to provide true finish surface.
10. Install color-matched sealant at unfinished joints with other materials.
11. Install wall-shelving standards on solid backing or with toggle bolts into steel studs or masonry or TEK screws into concrete. Do not install wall-shelving standards into gypsum wallboard only. Space standards as required to support indicated loading but not less than 5-plf based on shelf material provided.
12. Do not install cabinetry or millwork closer than 24" to ceilings in fully sprinklered buildings or such that installation obstructs any fire sprinkler head.

3.03 ADJUSTING

A. Install cabinet hardware according to requirements of the finish hardware as specified and in accurate positions as indicated on the drawings.

B. Test installed work for rigidity and ability to support loads.

C. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

B. Touch up marred or abraded finished surfaces and wipe down surfaces to remove fingerprints and markings, and leave in clean condition.

C. Provide protection for casework from miscellaneous adjacent work by other trades.

END OF SECTION

DIVISION 7

SECTION 07212
BOARD AND BATT INSULATION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09260 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.02 REFERENCE STANDARDS

A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

C. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2013.

D. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.04 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation in Metal Framed Walls: Batt insulation with integral vapor retarder.

2.02 BATT INSULATION MATERIALS

A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.

B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   2. Facing: Aluminum foil, flame spread 25 rated; one side.

C. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
   1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation .

3.02 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

C. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.03 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07920
JOINT SEALERS

PART 1 GENERAL

1.01 SYSTEM DESCRIPTION

A. Provide sealants and caulking for the joints between dissimilar materials and to close other joints.

1.02 REFERENCE STANDARDS

A. ASTM C510 - Standard Test Method For Staining And Color Change Of Single- Or Multicomponent Joint Sealants; 2011.

B. ASTM C790 - Use of Latex Sealants; 1990

C. ASTM C834 - Standard Specification for Latex Sealants; 2010.

D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2011.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

G. ASTM C1248 - Standard Test Method For Staining Of Porous Substrate By Joint Sealants; 2012.

H. ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2007.

I. ASTM D1667 - Standard Specification for Flexible Cellular Materials--Poly(Vinyl Chloride) Foam (Closed-Cell); 2005 (Reapproved 2011).

J. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).

K. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for concrete Pavements; 1991 (Reapproved 2011).

L. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.03 SUBMITTALS

A. Product Data: Indicate chemical characteristics, performance criteria, limitations and color chart for all materials.

B. Samples: Submit samples of each type of sealant and caulking.

C. Submit manufacturer’s installation instructions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

C. Single source responsibility: Obtain materials from a single manufacturer, as much as possible.

D. Comply with

1.05 WARRANTY

A. Replace sealants and caulking which fails because of loss of cohesion or adhesion, or does not cure.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sealant Type 1: Concrete-to-concrete (except tilt-up walls), stone-to-stone. ASTM C 920; low modulus, one component, non-sag, neutral cure silicone.
   1. Elongation Capability: Plus 100 percent to minus 50 percent; elongation, 1600%
   2. Service Temperature Range: Minus 20 to 160 degrees F.
   3. Shore A Hardness Range: 15 - 20; ASTM D 2240.
   4. Staining: None; ASTM C 1248.
   5. Color as selected by Architect.
   6. Manufacturers: Dow Corning Corp. 790, or equal.

B. Sealant Type 2: Structural glazing, perimeter windows, metal-to-metal. ASTM C 920; intermediate modulus, one component, non-sag, neutral cure silicone.
   1. Elongation Capability: Plus or minus 50 percent.
   2. Service Temperature Range: Minus 40 to 300 degrees F.
   3. Shore A Hardness Range: 30; ASTM D 2240.
   4. Staining: None; ASTM C 510.
   5. Color as selected by Architect.
   6. Manufacturers: Dow Corning Corp. 795, Dow Corning 995.

C. Sealant Type 3: Glass-to-glass (non-structural). ASTM C 920; high modulus. one component, non-sag, acetoxy cure silicone.
   1. Elongation Capability: Plus or minus 25 percent.
   2. Service Temperature Range: Minus 35 to 140 degrees F.
   3. Shore A Hardness Range: 23; ASTM D 2240.
   4. Non-staining and non-bleeding.
   5. Color as selected by Architect.
   6. Manufacturers: Dow Corning Corp. 999A; Pecora 863: GE 1200.

D. Sealant Type 4: Perimeter windows, aluminum-to-brick, metal-to-metal, metal-to-stucco, aluminum-to-concrete. ASTM C 920; medium modulus, one component, non-sag, neutral cure silicone.
   1. Elongation Capability: Plus or minus 50 percent
   2. Service Temperature Range: Minus 20 to 120 degrees F.
   3. Shore A Hardness Range: 25 - 30; ASTM D 2240.
   4. Staining: None; ASTM C 510
   5. Color as selected by Architect.
   6. Manufacturers: Dow Corning Corp. 791; GE Silpruf.

E. Sealant Type 5: Brick-to-brick. ASTM C 920, low modulus, two component, non-sag, polyurethane.
   1. Elongation Capability: Plus or minus 25 percent.
   2. Service Temperature Range: Minus 20 to 120 degrees F.
   3. Shore A Hardness Range: 20 - 25; ASTM D 2240.
   4. Non-staining and non-bleeding.
   5. Color as selected by Architect.
   6. Manufacturers: Mameco International, Vulkem 922; Sika Corporation, Sikaflex 2C; Tremco, Dymeric 511; Pecora, Dynatrol II.

F. Sealant Type 6: Wood-to-wood. ASTM C 920; medium modulus, one component, non-sag, polyurethane.
   1. Elongation Capability: Plus or minus 25 percent.
   2. Service Temperature Range: Minus 20 to 120 degrees F.
   3. Shore A Hardness Range: 25 - 40; ASTM D 2240.
   4. Non-staining and non-bleeding.
   5. Color as selected by Architect.
   6. Manufacturers: Mameco International, Vulkem 116; Sika Corporation, Sikaflex 1a.

G. Back-up Materials:
   1. As recommended by caulking or sealant manufacturer and compatible with each material.
   2. Preformed material sized to require 25 percent to 50 percent compression upon insertion in joint.
   3. Do not use materials impregnated with oil, bitumen or similar materials.

H. Bond Breakers: Where joints are not of sufficient depth to receive back-up material install polyethylene bond-breaking tape at back of joint.

2.02 Primer:

A. As recommended by manufacturers of caulking or sealant used.
   1. Type that will seal the surfaces and prevent absorption of the vehicle essential to the retention of elasticity by the caulking or sealant compound.

B. Accessories: Provide solvent, cleaning agents and other necessary materials as recommended by the caulking or sealant manufacturer essential for a complete installation.

PART 3 EXECUTION

3.01 PREPARATION

A. Verify joint dimensions, physical, and environmental conditions are acceptable to receive work of this Section.

B. Verify that substrate surfaces and joint openings are ready to receive work.

C. Verify that join backing and release tapes are compatible with sealant.

D. Remove loose materials and foreign matter which might impair adhesion of sealant.

E. Clean and prime joint under provisions of manufacturer’s instructions.

F. Perform preparation under provisions of manufacturer’s instructions.

G. Protect elements surrounding work of this section from damage or disfiguration.

3.02 INSTALLATION

A. Perform work under provisions of ASTM C804 for solvent release and ASTM C790 for latex base sealants.

B. Install sealant under provisions of manufacturer’s instruction.

C. Measure joint dimensions and size materials to achieve required width/depth rations.

D. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

E. Install sealant free of air pockets, foreign embedded matter, ridged and sags.

F. Apply sealant within recommended temperature range. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Apply generally with caulking gun of proper nozzle size to fit joints.

H. Apply with sufficient pressure to fill joint from backing to surface.

I. For joints in flat surfaces, neatly tool compound slightly concave with proper tools.

J. Execute finishing of caulking around frames with coving tool.

K. As work progresses, immediately remove compound that may accidentally flow onto adjoining surfaces using manufacturer's recommended solvent and cleaners. Remove excess material from joints immediately.

L. At completion, carefully check all joints for damage and repair damaged joints.

M. Clean adjoining surfaces.

N. Protect sealants and caulking until cured.

3.03 SCHEDULES

A. Exterior:
   1. Perimeters of exterior openings where frames meet exterior facade of building: Type 2.
   2. Expansion and control joints in exterior surfaces of poured-in-place concrete walls: Type 1.
   3. Expansion and control joints in exterior surfaces of pre-cast tilt-up wall panels: Type 8.
   4. Exterior joints in horizontal wearing surfaces: Type 4 in areas subject to foot and vehicular traffic; Type 3 at plazas, malls, patios etc.

B. Interior:
   1. Seal interior perimeters of exterior openings: Type 2.
   2. Expansion and control joints in interior surfaces of poured-in-place concrete walls: Type 1.
   3. Expansion and control joints in interior surfaces of pre-cast tilt-up wall panels: Type 8.
   4. Interior control and expansion joints in floor surfaces: Type 3.
   5. Perimeters of interior frames: Type 4.
   6. Perimeters of bath fixtures: Type 5.
   7. Exposed interior control joints in drywall: Type 5.
   8. Control joints in drywall, perimeter, and between metal framing and substrate in sound rated partitions: Type 6.

END OF SECTION

8

DIVISION

SECTION 08110
STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. Non-fire-rated steel doors and frames.
B. Steel frames for wood doors.
C. Fire-rated steel doors and frames.
D. Thermally insulated steel doors.
E. Sound-rated steel doors and frames.
F. Steel glazing frames.
G. Accessories, including glazing, louvers, and matching panels.

1.03 RELATED REQUIREMENTS

A. Section 04220 - Concrete Unit Masonry.
B. Section 06100 - Carpentry.
C. Section 08710 - Door Hardware.
D. Section 08800 - Glazing: Glass for doors and borrowed lites.
E. Section 09260 - Gypsum Board Systems
F. Section 09900 - Paints and Coatings: Field painting.

1.04 REFERENCE STANDARDS

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
B. ANSI A224.1 - American National Standard Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1990.
C. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames; 2007 (R2011).
D. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
E. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2011).
F. ASTM A366/A366M - Standard Specification for Commercial Steel (CS) Sheet, Carbon, (0.15 Maximum Percent) Cold-Rolled; 1997.
G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
H. ASTM A 924/A 924M - Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot Hot-Dip Process; 2009a.
I. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2007.
J. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.

K. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.

L. ASTM E413 - Classification for Rating Sound Insulation; 2010.

M. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.

N. FLA (FBC-B) - Florida Building Code: Building; 2010.

O. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.

P. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.

Q. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2012.

R. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

S. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

T. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate installation of Exterior Doors with Hardware and Glass Supplier, Exterior door assemblies (including hardware specified in Section 08 7100) shall be tested and labeled as conforming to AAMA/WDMA/CSA101/I.S.2/A440 or ASTM E330 and ASCE-7 criteria.
   1. Product Approval: Door / Frame Assemblies shall meet current Florida Building Code Product Approval System requirements.

1.06 DEFINITIONS

A. Steel Sheet Thicknesses: Thickness dimensions, including those referenced in ANSI A250.8, are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic-coated steel sheets.

B. Areas subject to Mopping: Include the following areas: Kitchens, dining rooms, toilets, locker/showers, custodial, and other similar spaces with hard or resilient flooring.

1.07 SUBMITTALS

A. See Section 01300 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
   1. Label Construction Certification: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for each door and frame assembly constructed to conform to design, materials, and construction equivalent to requirements for labeled construction

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
   1. Door Schedule: Use same reference designations indicated on Drawings in preparing schedule for doors and frames.
   2. Elevations of each door design.
   3. Details of doors, including vertical and horizontal edge details and metal thicknesses.
   4. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   5. Locations of reinforcement and preparations for hardware.
   6. Details of anchorages, joints, field splices, and connections.
   7. Details of accessories.
   8. Details of moldings, removable stops, and glazing.

9. Details of conduit and preparations for power, signal, and control systems.

D. Installation Instructions:
   1. Manufacturer's printed installation instructions, if other than as specified in ANSI/SDI A250.11, HMMA 840, or NFPA 80.
   2. Jobsite paint protection requirements: Manufacturer's printed storage instructions, if other than as specified in ANSI/SDI A250.8, HMMA 861, or HMMA 840-TN01.

E. Exterior Door Certificates:
   1. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.
      a. Hurricane Resistant Openings (State of Florida): Within the State of Florida, provide copy of current State of Florida Product Approval as proof of compliance that doors, frames and hardware for exterior opening assemblies have been tested and approved for use at the wind load and design pressure level requirements specified for the Project.
      b. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to American Society of Civil Engineers (ASCE) 7-98 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.15.
      c. Hurricane Resistant Components (State of Florida): Within the State of Florida, provide copy of independent, third party certified listing conforming to ANSI A250.13.

F. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section

1.08 QUALITY ASSURANCE

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

B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience. Installers shall be state-certified or licensed Contractor, or locally registered Contractor in Miami Dade County, FL.

C. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

D. Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.

E. Structural Performance: Engineering calculations shall be required for all exterior door and frame assemblies indicating compliance with requirements, that bear the seal and signature of a Structural Engineer registered in Florida. Include summary of forces and loads on walls and jambs. Provide door and frame assemblies capable of withstanding wind pressures calculated according to the following:
   1. Wind Loads: In accordance with Florida Building Code (current edition) and loads shown on structural drawings.
   2. Basic Wind Speed: Ultimate Wind Speed = 146 mph
   3. Importance Factor: III.
   4. Exposure Category: C .
   5. Wind Factor: 1.15.
   6. Provide Florida Product Approval for all Exterior Door and Frames, in compliance with Rule 9N-3015, Florida Administrative Code (FAC).

F. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.
   1. Provide applied labels to doors and frames. Embossed labels will not be acceptable.
   2. Smoke Control Door Assemblies: Comply with NFPA 105.

a. Smoke "S" Label: Doors to bear “S” label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

G. Knock-down frames are not permitted.

H. City of North Miami reserves the right to cut open, at no cost to the board, a random door to verify construction and reinforcements for compliance with the City of North Miami previously accepted manufacturer's shop drawings. Non-Compliance will be grounds for removal and replacement of installed door at no expense to the city of North Miami.

I. Maintain at the project site a copy of all reference standards dealing with installation.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors, frames, and accessories undamaged and with protective wrappings or packaging. Provide temporary steel spreaders securely fastened to the bottom of each welded frame. Do not use non-vented plastic.
   1. Deliver all doors and frames to the jobsite in a timely manner to not delay progress of other trades.
   2. Ship and store frames with temporary stiffeners and spacers in place to prevent distortion

B. Store in accordance with NAAMM HMMA 840, and the following;
   1. Store doors protected at corners to prevent damage or marring of finish. Store doors in upright position under cover on building site on wood sills or on floors in a manner to prevent rust and damage.
   2. Store frames in upright position under cover on building site on wood sills or on floors in a manner to prevent rust and damage.
   3. Provide minimum 1/4-inch space between each stacked door to permit air circulation.
   4. Do not store in non-vented plastic or canvas shelters

C. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

1.10 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.11 WARRANTY:

A. Hollow metal doors and frames shall be supplied with a l year warranty against defects in materials and construction.

B. Warranty shall begin on date of substantial completion of the project.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Doors and Frames:
   1. Amweld International Inc Firedoor.; www.amweld.com
   2. Assa Abloy Ceco or Curries: www.assaabloydss.com.
   3. De La Fontaine Inc; Hollow Metal Frame ____ Profile: www.delafontaine.com.
   4. Benchmark Commercial Doors; a division of General Products Co.Inc.; http://www.benchmarkdoors.com/
   5. Pioneer Industries, Inc.; www.pioneerindustries.com
   6. Republic Doors: www.republicdoor.com.
   7. Steelcraft, an Allegion brand; Product ____: www.allegion.com/us.
   8. Technical Glass Products; SteelBuilt Window & Door Systems: www.tgpamerica.com.

9. Substitutions: Must be approved during bidding process - See Section 01600 - Product Requirements.

2.02 DOORS AND FRAMES

A. Requirements for All Doors and Frames:
   1. Accessibility: Comply with ANSI/ICC A117.1.
   2. Door Top Closures: Flush with top of faces and edges.
   3. Door Edge Profile: Beveled on both edges.
   4. Door Texture: Smooth faces.
   5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
   6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
   7. Galvanizing for all frames: All components hot-dipped zinc-iron alloy-coated (galvannealed), A60/ZF180 at interior and A90 at exterior.
   8. Core: 20-gauge cold rolled sheet steel vertical stiffeners in a "Z" configuration, spaced not more than 6" o.c. and spot welded to the face sheet. Vertical stiffeners extend the full length of door cavity, except in areas of reinforcement. Core between stiffeners filled with mineral wool batting.
   9. Finish: Factory primed, for field finishing.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

C. Materials;
   1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
   2. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
   3. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF180) zinc-iron-alloy (galvannealed) coating designation.
   4. Supports and Anchors: After fabricating, galvanize units to be built into exterior walls according to ASTM A 153/A 153M, Class B.
   5. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153/A 153M.

2.03 STEEL DOORS

A. General:
   1. Doors shall be reinforced, stiffened, sound deadened and insulated with impregnated kraft honeycomb core filling inside of door and laminated at inside face of door panels with contact adhesive.
      a. Door shall have continuous vertical mechanically interlocking joints at lock and hinge edges. Internal portion of stiles to be sealed with epoxy.
      b. Doors shall have 1/8” bevel along hinge and lock edges.
      c. Top and bottom channels of steel doors shall be galvannealed 14 ga.
      d. Hinge reinforcement shall be 7 ga. For 1 ¾” doors.
      e. Lock reinforcement shall be 16 ga.
      f. Closer reinforcement shall be 14 ga. Box minimum of 6” wide x 20” long.

B. Exterior Doors :
   1. Grade: ANSI A250.8 Full Flush Level 3, physical performance Level A, Model 2, seamless.

2. Thickness: 1-3/4 inches.
3. Core: Vertical steel stiffeners.
4. Core Fill: Provide fiberglass or mineral standard to manufacturer.
5. Top Closures : Flush with top of faces and edges.
6. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A 653/A 653M, with A60/ZF180 coating.
7. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C 1363 .
8. Weatherstripping: Separate, see Section 08 7100.
9. Finish: Factory primed, for field finishing.

C. Exterior Security Doors :
1. Grade: ANSI A250.8 Full Flush Level 4, physical performance Level A, Model 2, seamless.
2. Thickness: 1-3/4 inches.
3. Core: Vertical steel stiffeners.
4. Top Closures : Flush with top of faces and edges.
5. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
6. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C1363 .
7. Weatherstripping: Separate, see Section 08710.
8. Peephole:
9. Finish: Factory primed, for field finishing.

D. Stile and Rail Door Construction:
1. Doors shall meet requirements of ANSI A250.8 Level 3,physical performance Level A, Model 3, style and rail.
   a. All exterior doors to be galvannealed with A60 zinc-iron alloy coating.
   b. Top and bottom channels of steel doors shall be galvannealed 14 ga.
   c. Stiles:
      1) 16 ga tubular construction.
      2) 5 ¼” minimum face dimension
   d. Rails:
      1) 16 ga tubular construction.
      2) 5” minimum face dimension, 10” minimum face dimension at bottom rail.
   e. Interior rails:
      1) 16 ga tubular construction.
      2) 5” minimum face dimension

E. Interior Doors, Non-Fire-Rated:
1. Grade: ANSI A250.8 Level 2, physical performance Level B, Model 1, full flush. under 4'-0" width.
2. Grade: ANSI A250.8 Level 3, physical performance Level B, Model 2, seemless. larger than 3'-0" width.
3. Core: Vertical steel stiffeners.
4. Thickness: 1-3/4 inches.
5. Texture: Smooth faces.
6. Finish: Factory primed, for field finishing, unless noted otherwise in schedule.

F. Interior Doors, Fire-Rated:
1. Grade: ANSI A250.8 Level 2, physical performance Level B, Model 2, seamless.
2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10B or NFPA 252 ("neutral pressure").
   a. Provide units listed and labeled by UL.
   b. Attach fire rating label to each fire rated unit.
3. Core: Mineral fiberboard.

4. Texture: Smooth faces.
5. Finish: Factory primed, for field finishing.

G. Interior Smoke and Draft Control Doors (Indicated as "S" on Drawings): Same construction as fire-rated doors with indicated fire rating, plus:
1. Maximum Air Leakage: 3.0 cfm per sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
2. Gasketing: No added gasketing or seals allowed.
3. Label: UL "S" label.

H. Interior Doors, Sound-Rated:
1. Grade: ANSI A250.8 Level 2, physical performance Level B, Model 2, seamless.
2. STC Rating of Assembled Door, Frame, and Seals: 35, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
3. Core: Vertical steel stiffeners.
4. Sound Seals: Integral, concealed in door or frame.
5. Force to Open and Close and Latch: Not more than 5 pounds.

I. Panels: Same construction, performance, and finish as doors.

2.04 STEEL FRAMES

A. General:
1. Comply with the requirements of grade specified for corresponding door, except:
a. ANSI A250.8 Level 2 Doors: 16 gage frames.
b. ANSI A250.8 Level 3 Doors: 14 gage frames.
c. ANSI A250.8 Level 4 Doors: 12 gage frames.
d. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 16 gage
e. Frames for Sound-Rated Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 3, 14 gage
2. All frames to have 2” face.
3. All joints shall have welded mitered corners ground smooth, without dishing.
4. Sanitary or hospital type stops shall have 6 inch high cutoffs with 45 degree caps.
5. Frames shall be factory prepared for field installed silencers.
6. Frames for 1 ¾” doors shall have 7 ga. universal hinge reinforcement and prepared for 4 ½” x 4 ½” standard or heavyweight hinges.
7. Strike reinforcement shall be 16 ga. and prepared for ANSI A115.1-2 strike.
8. Strike jambs shall have 14 ga. reinforcement
9. Finish: Factory primed, for field finishing.
10. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
11. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
12. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
13. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.

B. Exterior and Door Frames: Fully welded.
1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating minimum.
2. Weatherstripping: Separate, see Section 08710.

C. Interior Door Frames, Non-Fire-Rated: Fully welded type.

1. Terminated Stops: Provide at all interior doors; closed end stop terminated 6 inches above floor at 45 degree angle.

D. Interior Door Frames, Fire-Rated: Fully welded type.
   1. Fire Rating: Same as door, labeled.

E. Sound-Rated Door Frames: Fully welded type.

F. Mullions for Pairs of Doors: Fixed, of profile similar to jambs.

G. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.

H. Transom Bars: Fixed, of profile same as jamb and head.

2.05 ACCESSORY MATERIALS

A. Glazing: As specified in Section 08800, factory installed.

B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered corners; prepared for countersink style tamper proof screws.

C. Glazing Stops:
   1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
   2. Provide screw-applied, removable, glazing stops on inside of glass, louvers, and other panels in doors.

D. Astragals for Double Doors: Specified in Section 08710.
   1. Exterior Doors: Steel, T-shaped.
   2. Fire-Rated Doors: Steel, shape as required to accomplish fire rating.

E. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.

F. Grout for Frames:
   1. All Exterior frames to be installed shall be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.
   2. Coating: Provide full coverage at frame interior before grouting with corrosion inhibiting bituminous coating
   3. Grout fill-in-place doorframes at masonry and concrete walls after installation.
   4. Grout shall be a mortar mix complying with ASTM C270, Type S-1800 psi minimum.
   5. Grout shall be installed prior to gypsum wallboard installation.

G. Jamb Anchors: Provide according to frame manufacturer's recommendations for attachment to masonry walls, concrete columns, and metal stud system as shown on drawings to allow grout fill.

H. Floor Anchors: Provide 14 gage galvanized sheet steel angle shaped anchors for each jamb extending to the floor, punched for not less than two 1/4" diameter bolts.

I. Spreaders: Provide frames with temporary steel spreader bars tack welded to jambs to maintain full rigidity and proper alignment during installation.

J. Glazing: All rated doors shall be provided with rated glazing in compliance with current project specifications, Florida Building Code, Florida Fire Protection Code and UL requirements. All fire rated exterior applications shall have NOA product approval per FAC 9N-3 in compliance with Florida Building Code and tested assembly requirements. Refer to Section 08 8000.

K. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.

L. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

2.06 FINISH MATERIALS

A. Frame Primer: Full immersion, Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standardcompatible with substrate and field-applied finish paint system indicated.
   1. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils (0.018 mm) on all sides..
   2. Repair damaged zinc-coated surfaces by the application of zinc dust paint.
   3. Thoroughly clean and chemically treat to insure maximum paint adhesion.

B. Door Primer: Provide full coverage electrostatic spray coat of rust-inhibitive metal primer.

C. Dry all frames and doors in a baking oven process.

D. Factory Priming for Field-High Performance Coating Finish: Where field coating after installation is indicated, apply primer recommended or provided by coating manufacturer immediately after cleaning and pretreatment. Comply with coating manufacturer's instructions for applying.
   1. Provide factory prime finish for field high performance coating of exterior doors and frames.
      a. Color: As shown on drawings.

E. Field Finish: Refer to section 09 9000.

2.07 HARDWARE PREPARATION

A. Provide minimum hardware reinforcing gages as specified in ANSI A250.6. Drill and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of ANSI A250.8/SDI 100 and ANSI A250.6.

B. For additional requirements refer to BHMA A156.115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory.

C. Punch door frames, with the exception of frames that will have weatherstripping, to receive a minimum of three rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

D. Corrosion Resistant Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Start of work will signify acceptance of all existing conditions.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with protective coating, prior to installation.

3.03 INSTALLATION

A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.and SDI 105, approved shop drawings and manufacturers written instructions unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced

securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

B. Install fire rated units in accordance with NFPA 80.and Smoke-Control Doors: Install to comply with NFPA 105.

C. Coordinate with masonry the frame anchor placement/
   1. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners.
   2. Build in or secure wall anchors to adjoining construction. Backfill frames with mortar.
   3. Place frames before construction of enclosing walls and ceilings.

D. Grout all frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
   1. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.
   2. In masonry construction, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.

E. In metal-stud partitions, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Attach wall anchors to studs with screws.

F. Install roll-formed-steel reinforcement channels between two abutting frames. Anchor to structure and floor.

G. Door Installation: Comply with ANSI A250.8. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.

H. Coordinate installation of hardware.

I. All frames shall be coordinated by contractor to receive finish, casing and trim.

J. Install fire-rated frames according to NFPA 80.

K. Coordinate installation of glazing.

3.04 TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.2.
   1. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

B. Maximum Diagonal Distortion: 1/8 in measured with straight edge, corner to corner.

C. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.

D. Between Bottom of Door and Top of Threshold: Maximum 1/4 inch.

E. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 1/2 inch

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Adjust sound control doors so that seals are fully engaged when door is closed.

C. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition. Provide final adjustment as follows:
   1. Door Contact With Silencers: Doors shall strike a minimum of two silencers without binding lock or latch bolts in the strike plate.
   2. Head, Strike, and Hinge Jamb Margin: 1/8".
   3. Meeting Edge Clearance, Pairs of Doors: + 1/16".
   4. Bolts and Screws: Leave tight and firmly seated.

5. Soundseal gasketing.
6. Vermin Protection:
    a. Drop Seal: Full contact with no gaps.
    b. Brush weatherstripping.

D. Test sound control doors for force to close, latch, and unlatch; adjust as required to comply.

E. After erection and glazing, clean and adjust hardware.

3.06 PROTECTION

A. Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed by Contracting Officer.

3.07 CLEANING

A. Prime-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of compatible air-drying primer.

B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

C. Fill all dents, holes, etc. with metal filler and sand smooth flush with adjacent surfaces-paint to match.

D. Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks

END OF SECTION

SECTION 08210
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. Solid-core doors with wood-veneer, faces.

B. Factory finishing flush wood doors.

C. Factory fitting flush wood doors to frames and factory machining for hardware.

D. Louvers for flush wood doors.

1.03 RELATED REQUIREMENTS

A. Section 06200 - Finish Carpentry.

B. Section 08110 - Steel Doors and Frames.

C. Section 08710 - Door Hardware.

D. Section 08800 - Glazing.

E. Section 09260 - Gypsum Board Assemblies

F. Section 09900 - Paints and Coatings: Site finishing of doors.

1.04 REFERENCE STANDARDS

A. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.

B. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.

C. ASTM D 6007 -Standard Test Method for Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber -02 (reapproved 2008)

D. ASTM D6330 - 98(2008) Standard Practice for Determination of Volatile Organic Compounds (Excluding Formaldehyde) Emissions from Wood-Based Panels Using Small Environmental Chambers Under Defined Test Conditions

E. ASTM E 152 - Standard Methods of Fire Tests of Door Assemblies; 1981a.

F. ASTM E413 - Classification for Rating Sound Insulation; 2010.

G. ASTM E 1333 - Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber; 2010.

H. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).

I. ASTM E2129 Standard Practice for Data Collection for Sustainability Assessment of Building Products; 2010

J. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

K. FBC - Florida Building Code, Current Edition.

L. FSC-STD-01-001 (version 4-0) EN - Principals and Criteria for Forest Stewardship

M. GreenSeal GS-11 - Architectural Paints; 1993.

N. GreenSeal GS-36 - Commercial Adhesives; 2000.

O. GreenSeal GS-11 - Architectural Paints; 1993.

P. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2010.

R. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2008.

S. SCAQMD Rule 1113 - Architectural Coatings: current edition; www.aqmd.gov.

T. SCAQMD Rule 1168 - Adhesive and Sealant Application -; current edition; www.aqmd.gov.

U. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

V. WDMA I.S.1-A - Architectural Wood Flush Doors; Window and Door Manufacturers Association; 2004.

W. WDMA I.S.6-A - Architectural Wood Stile and Rail Doors; 2001. (ANSI/WDMA I.S.6-A)

X. NWWDA T.M. 7-90, Cycle-Slam Test Method

Y. NWWDA T.M. 8-90, Hinge-Loading Test Method

Z. NWWDA T.M. 10-90, Screwholding Test Method

1.05 SUBMITTALS

A. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, and trim for openings. 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; location and extent of hardware blocking; and other pertinent data.
   1. Indicate location, size, type, rating, and hand of each door.
   2. Indicate dimensions and locations of mortises and holes for hardware, additional blocking, cutouts, face veneers types and finishing requirements.
   3. Indicate fire-protection ratings for fire-rated doors.
   4. Utilize same designation as Architect’s door mark.

C. Samples for Verification:
   1. Face Veneers.
   2. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish.
   3. Corner sections of doors, approximately 8 by 10 inches, with door faces and edging representing typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.
   4. Samples shall be specifically required for non-specified manufacturer’s products submitted as a Substitution.

D. Product Certificates shall be required by manufacturers of non-named products certifying that each product furnished meets the Specifications and with individual project requirements for the purpose intended. Certificates and sample finishes shall be submitted with Shop Drawings.

E. Warranty: Sample of special warranty.

1.06 QUALITY ASSURANCE

A. Contractor Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five years. Installers shall be state-certified or licensed Sub-Contractors, or locally registered Sub-Contractors in Orange County, Florida.

B. Manufacturer(s) Qualifications: Employ only manufacturers making the specified materials as a regular production item.

C. Source Limitations: Obtain flush wood doors from single manufacturer.

D. Comply with NWWDA I.S. 1-A Architectural Wood Flush Doors unless more stringent requirements are indicated.

E. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

F. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing according to NFPA 252.

G. Doors shall not be delivered or installed until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.

H. Condition doors to project temperature and humidity for not less than 48 hours prior to installation.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

D. Doors shall not be delivered or installed until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.

E. Condition doors to project temperature and humidity for not less than 48 hours prior to installation.

F. Wood doors shall be protected at all times during construction. After installation, take appropriate measures to protect doors from abuse.

G. Do not partially cover transparent door finishes with paper, cardboard or any other opaque covering that will create uneven aging of veneer.

H. Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

I. Store and handle doors in accordance with NWWDA I.S.1-A Care and Installation at Job Site.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Condition doors to protect temperature and humidity for not less than 48 hours prior to installation.

1.09 WARRANTY

A. Project Warranty shall be as stated in Division 1 of the Specifications.

B. Special Warranty: Manufacturer's standard form, signed by the Manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

C. Unless otherwise stated, duration of all warranties shall begin on the date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Algoma Hardwoods, Inc.
2. Ampco, Inc.
3. Buell Doors, Dallas, TX.
4. Eggers Industries.
5. Graham; an Assa Abloy Group company.
6. Marshfield Entry Systems, Inc.
7. Mohawk Flush Doors, Inc.; a Masonite company.

2.02 DOOR CONSTRUCTION, GENERAL

A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.

B. All doors shall be 1 ¾ inch finished thickness constructed.

C. Doors shall be furnished ready for paint finish.

D. NWWDA I.S.1-A Performance Grade: Premium

E. Structural-Composite-Lumber-Core Doors:
1. Structural Composite Lumber: WDMA I.S.10.
a. Screw Withdrawal, Face: 700 lbf .
b. Screw Withdrawal, Edge: 400 lbf .

F. Non-Fire Rated Doors: Provide either glued block or structural composite lumber (SCL) core.
1. Furnish 5-ply construction with stiles and rails bonded to core, then entire unit abrasive planed and sized prior to veneering.
2. Stiles shall be mill option hardwood glued to core. Veneer applied to hardwood edge is not acceptable.
3. Rails shall be mill option hardwood or SCL.
4. Glue shall be equivalent to Type I.

G. Fire-Rated Doors: Provide non-asbestos mineral core that complies with applicable rating and label requirements.
1. Furnish 5-ply construction with stiles and rails bonded to core, then entire unit abrasive planed and sized prior to veneering.
2. Stiles shall be manufacturer’s standard mill option hardwood glued to core and shall comply with applicable rating and label requirements. Veneered hardwood edges are not acceptable.
3. Rails shall be manufacturer’s standard glued to core and shall comply with applicable rating and label requirements.
4. Glue shall be equivalent to Type I.

5. Provide manufacturer's standard lock blocks and other required blocking for improved screw-holding capability approved for use in doors with fire ratings indicated and as needed to eliminate through-bolting hardware. Through-bolting hardware is not acceptable.
6. All doors requiring fire ratings shall carry UL label certification.

H. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252, UBC 7-2 1997 or UL 10C.
1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
2. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
3. Pairs: Provide formed-steel edges and astragals with intumescent seals.
   a. Finish steel edges and astragals with baked enamel finish, match hardware finish.

2.03 VENEERED-FACED DOORS FOR PAINT FINISH

A. Interior Solid-Core Doors:
1. Grade: Standard, with Grade A faces.
2. Species: To match existing wood doors, unless noted otherwise on finish schedule.
3. Cut: Quarter Sliced
4. Match between Veneer Leaves: Book match.
5. Assembly of Veneer Leaves on Door Faces: Running match.
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Pair match: Center match.
8. Core: Either glued wood stave or structural composite lumber.
9. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.

2.04 VISION PANELS

A. Provide manufacturer's standard metal frame for light openings in flush wood doors.

B. Provide manufacturer's standard metal frame approved for use in door vision panels of fire rating indicated in rated doors. Include concealed metal glazing clips where required for opening size and fire rating.

2.05 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated with uniform clearances and bevels. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
1. Comply with requirements in NFPA 80 for fire-rated doors.

B. 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 with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
2. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

C. Coordinate with hardware mortises in metal door frames.

D. Bevel lock and hinge edges of single acting doors 3 degrees.

E. Openings: Cut and trim openings through doors in factory to comply with applicable requirements of referenced standards. Seal around openings prior to installation of trim, stops and louvers.
   1. Light Openings: Trim openings with moldings of material and profile indicated.
   2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 08 Section "Glazing."
   3. Louvers: Factory install louvers in prepared openings.

2.06 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   1. Finish faces, all four edges, edges of cutouts, and mortises. Primer and fillers may be omitted on bottom edges, edges of cutouts, and mortises.

B. Primer finish doors at factory.

C. Doors receiving opaque finish shall be factory primed and finished on the job.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine doors and installed door frames before hanging doors.
   1. Verify door frames are in proper location and have proper anchorage.
   2. Verify that frames comply with indicated requirements for type, size, location and swing characteristics. Verify that frames have been installed with plumb jambs and level heads.
   3. Verify HVAC system is in routine, continuous operation.
   4. Verify that Shop Drawings have been successfully submitted, reviewed and returned.
   5. Verify that the correct door hardware has been delivered and doors have been prepped correctly.
   6. Reject doors with defects.

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

3.02 PREPARATION

A. Condition doors to average prevailing humidity in installation area before hanging

3.03 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware."

B. Install doors in accordance with manufacturer's instructions, approved shop drawings and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements

C. Prehung doors: Install doors in accordance with the manufacturer's instructions and details. Provide fasteners for stops and casing trim within 75 mm/ 3 inch of each end and spaced 279 mm/ 11 inch on center maximum. Provide side and head jambs joined together with a dado or notch of 5 mm 3/16 inch minimum depth.

D. Use machine tools to cut or drill for hardware.

E. Coordinate installation of glazing.

F. Install door louvers plumb and level.

G. Job-Fit Doors:

1. Align and fit doors in frames with uniform clearances and bevels as indicated.
2. Do not trim stiles and rails more than limits set by manufacturer or allowed with fire-rated doors.
3. Machine doors for hardware.
4. Seal cut surfaces after fitting and machining.

H. Fitting Clearances:
1. Non-Rated Doors:
a. 1/8" at jambs and heads.
b. 1/16" per leaf at meeting stiles for pairs of doors.
c. 1/8" from bottom of door to top of decorative floor finish or covering.
2. Threshold: 1/4" clearance from bottom of door to top of threshold.
3. Bevel non-rated doors 1/8" to 2 inches at lock and hinge edges.

I. Refer to Section 09900 for finishing of job site finished doors.

3.04 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Leave installation clean and free from finger marks, dirt, and other substances and ready for painting.

C. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 08310
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall access door and frame units.

B. Ceiling access door and frame units.

1.02 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

B. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of all access door units.

D. Samples: Submit two access units, 12 x 12 inch in size illustrating frame configuration.

E. Manufacturer's Installation Instructions: Indicate installation requirements.

F. Project Record Documents: Record actual locations of all access units.

PART 2 PRODUCTS

2.01 ACCESS DOOR AND PANEL APPLICATIONS

A. Walls, Unless Otherwise Indicated:
   1. Size: 12 x 12 inches, unless otherwise indicated.

B. Walls in Wet Areas:
   1. Size: 12 x 12 inches, unless otherwise indicated.
   2. Tool-operated spring or cam lock; no handle.
   3. In All Wall Types: Surface mounted face frame and door surface flush with frame surface.

C. Fire Rated Walls: See drawings for wall fire ratings.
   1. Size: 12 x 12 inches, unless otherwise indicated.
   2. Tool-operated spring or cam lock; no handle.

D. Ceilings, Unless Otherwise Indicated: Same type as for walls.
   1. Size in Lay-in Grid Ceilings: To match grid module.
   2. Size in Other Ceilings: 12 x 12 inches, unless otherwise indicated.
   3. Tool-operated spring or cam lock; no handle.

2.02 WALL AND CEILING UNITS

A. Access Doors: Factory fabricated door and frame units, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.
   1. Material: Steel.
   2. Door Style: Single thickness with rolled or turned in edges.

3. Units in Fire Rated Assemblies: Fire rating as required by applicable code for the fire rated assembly in which they are to be installed.
4. Steel Finish: Primed.
5. Primed Finish: Polyester powder coat; manufacturer's standard color.
6. Hardware:
   a. Hardware for Fire Rated Units: As required for listing.
   b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings. Secure rigidly in place.

C. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION

SECTION 08410
METAL-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.
B. Infill panels of metal and glass.
C. Aluminum doors and frames.
D. Door hardware.
E. Perimeter sealant.

1.02 RELATED REQUIREMENTS

A. Section 01 4000 - Quality Requirements: Procedures for testing and certifications.
B. Section 05120 - Structural Steel: Steel attachment members.
C. Section 05500 - Metal Fabrications: Steel attachment devices.
D. Section 07260 - Weather Barriers: Perimeter air and vapor seal between glazing system and adjacent construction.
E. Section 07840 - Firestopping: Firestop at system junction with structure.
F. Section 07900 - Joint Sealers: Perimeter sealant and back-up materials.
G. Section 08520 - Aluminum Windows: Operable sash within glazing system.
H. Section 08710 - Door Hardware: Hardware items other than specified in this section.
I. Section 08800 - Glazing: Glass and glazing accessories.
J. Section 09900 - Paints and Coatings: Field painting of interior surface of infill panels.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.
B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2009 (part of AAMA 501).
C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
D. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.
E. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; 2003
F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

J. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

L. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

M. FLA (FBC-B) - Florida Building Code: Building; 2010.

N. FLA (PAD) - Florida Building Code Online - Product Approval Directory; database at www.floridabuilding.org.

O. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

P. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting a minimum one week before starting work of this section; require attendance by all affected installers.
   1. Agenda to include but not be limited to:
      a. Review all submittals/NOAs.
      b. Review of surface preparation and window installation procedures.
      c. Review of submittals shop drawings, product approval, etc.
      d. Review of special details and situations.
      e. Discuss sequence of construction, responsibilities and schedule for subsequent operations.

C. Inspections: Provide on-site weekly inspections by Owner’s representative during and after installation of window system.

D. The Owner may request random water test after installation of storefront units.
   1. Contractor shall cooperate with the Owner, Architect, or Owner's Representative in conducting the water test.

E. Contractor shall correct any defective installation without any additional cost to the Owner

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
   1. Include wind load and deflection calculations, summary of forces and loads on walls and jambs.signed and sealed by an Engineer registered in the State of Florida.

D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, dimensional limitations.

E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

F. Samples: Submit two samples 12 x 4 inches in size illustrating finished aluminum surface, glass, infill panels, glazing materials.

G. Samples: Glazing gasket, sealant and weatherstriping 6 inches sample each.

H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type, grade, and size of aluminum window. Test results based on use of down-sized test units will not be accepted.
   1. Report of field testing for water leakage.

J. Maintenance Data: For windows, including finishes to include in maintenance manuals.

K. Report of field testing for water leakage.

L. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Florida.

B. Manufacturer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum five years of documented experience.
   1. Engineering Responsibility: Preparation of data for glazed aluminum storefront systems including the following:
      a. Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer’s standard assemblies

C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience. Installers shall be state-certified or licensed Contractor, or locally registered Contractor in Orange County, FL.

D. General: Provide glazed aluminum storefront systems, including anchorage, capable of withstanding, without failure, the effects of the following:
   1. Structural loads.
   2. Thermal movements.
   3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
   4. Dimensional tolerances of building frame and other adjacent construction.
   5. Failure includes the following:
      a. Deflection exceeding specified limits.
      b. Thermal stresses transferred to building structure.
      c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
      d. Noise or vibration created by wind and thermal and structural movements.
      e. Loosening or weakening of fasteners, attachments, and other components
      f. Sealant failure.
   6. All exterior assemblies shall be compliant with Florida Administrative Code rule 9N-3 for statewide product approval and require a Florida Product approval number.

E. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

F. Wind Resistance: Execute the installation of the Storefront system to comply with wind resistance requirements of applicable building codes for specific negative wind pressures at various building elevations (heights) as indicated on the Drawings.

1. Calculations: Wind load calculations shall be prepared by a licensed structural engineer registered in the State of Florida in accordance with ASCE 7.
2. Basic Wind Speed: Ultimate Wind Speed = 140 mph
   Nominal Wind Speed = 108 mph
3. Importance Factor: III
4. Exposure Category : Contact OCPS BCCO for determination.
5. WInd Factor 1.15

G. Testing: Provide certified copy of test results from an approved testing laboratory or agency per the FBC Product Approval System.
   1. Testing certification must accompany requests for substitutions and approvals.
   2. Exterior windows: Air, water, and structural test unit shall conform to requirements set forth in ASTM E 283, ASTM E 331, and ASTM E 330 with manufacturer's standard locking/operating hardware and insulated glazing configuration, and as follows;
      a. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
      b. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
      c. Test Duration: As required by design wind velocity but not less than 60 seconds.

H. Deflection of Framing Members:
   1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span or 3/4 inch (19 mm), whichever is smaller.
   2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
   3. Cantilever Deflection: Where framing members overhang an anchor point, limited to 2 times the length of cantilevered member, divided by 175.

I. Fenestration Standard: Comply with AAMA/WDMA 101/I.S.2/NAFS, "North American Fenestration Standard Voluntary Performance Specification for Windows, Skylights and Glass Doors," for definitions and minimum standards of performance, materials, components, accessories, and fabrication. Comply with more stringent requirements if indicated.
   1. Provide AAMA-certified aluminum windows with an attached label.

J. Glazing Publications: Comply with published recommendations of glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated.

K. Thermal Movements: Provide glazed aluminum curtain-wall systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
   2. Provide documentation the window assembly complies with the thermal requirements indicated on the plans and in the approved energy code calculations.

L. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code--Aluminum."

1.07 DELIVERY, STORAGE, AND HANDLING

A. to the project with the manufacturer’s UL Listed Labels intact and legible. Handle the materials with care to prevent damage.

B. Handle products of this section in accordance with AAMA CW-10.

C. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Assembly Warranty Requirements: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that fail, or do not comply with requirements or that deteriorate as defined in this Section within specified
   1. Correct defective Work within a one year period after Date of Substantial Completion.Failures include, but are not limited to, the following:
      a. Structural failures including, but not limited to, excessive deflection.
      b. Noise or vibration caused by thermal movements.
      c. Water leakage through fixed glazing and framing areas
      d. Failure of operating components to function properly.
   2. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
   3. Provide five year manufacturer warranty against excessive degradation of finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

C. Installer agrees to repair or replace any window component that fails as a result of the installation for a period of three (3) years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR MONOLITHIC GLAZING

A. Center-Set Style:
   1. Basis of Design: YKK AP America Inc; YES 45 FS.
   2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

B. Front/Outside-Set Style:
   1. Basis of Design: YKK AP America Inc; YWW 45 FS.
   2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

C. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
   1. CRL Aluminum/United States Aluminum Commercial Products Group; www.usalum.com
   2. EFCO, a Pella Company: www.efcocorp.com.
   3. Kawneer Company, Inc/TRACO; www.kawneer.com
   4. Trulite Glass and Aluminum Solutions, LLC: www.trulite.com.
   5. Substitutions: See Section 01600 - Product Requirements.
      a. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.02 BASIS OF DESIGN -- DOORS

A. Wide Stile, Monolithic Glazing:
   1. Basis of Design: YKK AP America Inc; Model 50D.
   2. Thickness: 1-3/4 inches.

B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
   1. Trulite Glass and Aluminum Solutions, LLC: www.trulite.com.

2. YKK AP America Inc: www.ykkap.com.
3. ES Windows, LLC.
4. Substitutions: See Section 01600 - Product Requirements.
   a. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Finish: Class I color anodized to be selected by architect;
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
      d. Factory finish all surfaces that will be exposed in completed assemblies.
      e. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
      f. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   3. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   4. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   6. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
   8. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
   9. Preparation for Window Treatments: Provide reinforced interior horizontal head rail.

B. Performance Requirements:
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Design Wind Loads: Comply with requirements of FBC code. 146 mph minimum.
      b. Importance Factor : III
      c. Exposure C
      d. Wind Factor 1.15
      e. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8.00 lbf/sq ft.

3. Air Leakage: Maximum of 0.06 cu ft/min/sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 pounds per square foot pressure differential across assembly.
4. Water Leakage: None, when measured in accordance with ASTM E331 at specified pressure differential.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
   1. Shapes and thicknesses of framing members shall be sufficient to meet the following criteria as measured in accordance with ANSI/ASTM E330: Provide glazing beads, moldings, and trim of not less than 0.050 inch nominal thickness.
   2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Infill Panels: Insulated, aluminum sheet face and back, with edges formed to fit glazing channel and sealed.
   1. Finish: Same as storefront.

C. Beam and Column Covers: Provide 0.09 inch thick extruded or brake formed aluminum trim and filler moldings to close off aluminum door frames and aluminum storefront construction to building exterior and interior surfaces. Trim shall be of proper alloy to receive finish, finish to match storefront.

D. Swing Doors: Glazed aluminum.
   1. Thickness: 1-3/4 inches.
   2. Top Rail: 3 1/2 inches wide.
   3. Vertical Stiles: 3 1/2 inches wide.
   4. Bottom Rail: 10 inches wide.
   5. Glazing Stops: Square.
   6. Finish: Same as storefront.

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209 (ASTM B209M).

C. Flasing: Aluminum sheet. Provide sill pan fashing at all locations and conditions.

D. Fasteners: Stainless steel.

E. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.

F. Concealed Flashings: 0.018 inch thick stainless steel.

G. Perimeter Sealant: Type Silicone specified in Section 07900.

H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

I. Glazing Accessories: As specified in Section 08800.

J. Shop and Touch-Up Primer for Steel Components: SSPC-Paint 25, zinc oxide, alkyd, linseed oil primer.

K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.06 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating or AAMA 612 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.

B. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.07 HARDWARE

A. Other Door Hardware: Storefront manufacturer's standard type to suit application.
   1. Finish on Hand-Contacted Items: Polished stainless steel.
   2. For each door, include butt hinges, pivots, push handle, pull handle, exit device, narrow stile handle latch, and closer.
   3. Refer to Section 08 7100 for coordination with saddle threshold, actuator and lockset core requirements.

2.08 FABRICATION

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

C. Verify that anchorage devices have been properly installed and located.

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

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Install entrance system in accordance with manufacturer’s written Instructions and AAMA storefront and entrance guide specifications manual.

F. Provide thermal isolation where components penetrate or disrupt building insulation.

G. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

H. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

I. Coordinate attachment and seal of perimeter air and vapor barrier materials.Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

J. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

K. Set thresholds in bed of mastic and secure.

L. Install hardware using templates provided. Adjust operating hardware for smooth operation
   1. See Section 08 7100 for hardware installation, operator and actuator installation requirements.

M. Install perimeter sealant in accordance with Section 07900.

N. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

C. Sealant Space Between Storefront Mullions and Adjacent Construction: Maximum of 1/2" inch and minimum of 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.

B. Test installed storefront for water leakage in accordance with AAMA 501.2.

3.05 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION

A. Protect installed products from damage during subsequent construction.

B. Protect aluminum entrances from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants. Remove and replace damaged aluminum entrances at no extra cost.

END OF SECTION

SECTION 08710
FINISH HARDWARE

PART 1 GENERAL

1.01 SUMMARY

A. Provide finish hardware including necessary accessories.

1.02 Related Sections:

A. 06100 - Carpentry.
B. 08110 - Steel Doors and Frames.
C. 08210 - Wood Doors.
D. 16721 - Fire Alarm and Detection System.
E. Division 16 - Electrical.

1.03 SYSTEM DESCRIPTION

A. Furnish labor and material to complete hardware work indicated, as specified, or as may be required by actual conditions at building.
B. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier assumes all responsibility for correct quantities.
C. Ensure all hardware meets or exceeds the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications. This includes all ADA and Owner's requirements.
D. Exterior Doors: open outwards 180 degrees (except when against wall).
E. Copies of the hardware schedule, templates and keying schedules: submitted and approved before ordering.
F. Fire-Rated Openings:
    1. Provide hardware for fire-rated openings in compliance with A.I.A. (NBFU) Pamphlet No. 80 and NFPA Standards No. 101. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and door frame labels.
    2. Where panic exit devices are required on fir-rated doors, provide supplementary marking on door UL label indicating Fire Door to be equipped with fire exit hardware and provide UL label on exit device indicating "Fire Exit Hardware".
G. Fasteners:
    1. Ensure hardware conforms to published templates generally prepared for machine screw installation.
    2. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.
    3. Concealed Type Fasteners: Furnish hardware units which have exposed screws with Phillips flat heads screws. Finished to match adjacent hardware.
    4. Install door closers and exit devices with closed head through bolts (sex bolts).
H. Coordinate work with requirements of other sections.

1.04 SUBMITTALS

A. Exterior Door Certification: Miami-Dade County or FBC product approval single listing with specified door, doorframe, and hardware, demonstrating compliance with Florida Building Code missile impact criteria.

B. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to American Society of Civil Engineers (ASCE) 7-05 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.15.

C. Submit initial draft of hardware schedule at earliest possible date in order to facilitate the fabrication of other work, particularly hollow metal frames, which are critical in the project construction schedule. Include with schedule product data or other shop drawings and information essential to coordinated review of hardware schedule. Include in schedule installation dimensions for the benefit of the installer.
   1. Approval of Hardware Schedule shall not relieve the A/E or Contractor of the cost and responsibility to furnish all necessary and required hardware for this project.
   2. Three weeks before ordering hardware, submit 2 copies of Hardware Schedule covering all items required for entire project to City of North Miami (CoNM) Central Lock Department.
   3. Identify manufacturer of each item with type, numbers, and finish symbols.
   4. Indicate door numbers at individual hardware set numbers.
   5. Indicate doors with card readers.
   6. Include a separate index, listing all doors in the project sorted numerically and with appropriate hardware set number next to each door number with building numbers.
   7. Horizontal type schedules are not acceptable.

D. Catalog Cuts: Submit 6 sets of catalog cuts for each piece of hardware furnished.

E. Templates: Furnish suitable templates, with approved Hardware Schedule, to respective trades and suppliers as required to insure accurate setting, reinforcing, and fitting of finish hardware specified.

F. Bitting:
   1. Before ordering the cylinders and locksets, the Hardware Supplier, through the City of North Miami Project Manager, shall request Keying Schedule and Bitting List from City of North Miami Central Lock Department.

G. Keying requirements for this project shall be handled by the Board and the Hardware Supplier.

H. Keying information, including Keying Schedules, door index, and Bitting Lists, shall never be in the possession of the Contractor.
   1. The keyway for the lock cylinders to be used on this project shall be selected by City of North Miami Central Lock Department. Refer to paragraph 2.02 A.1.a.

I. Keying:
   1. Lock cylinders shall be keyed and registered by the factory for all Master Key (MK) and Construction Master Key (CMK) systems to maintain security and identification. Keying information, including Keying Schedules and Bitting Lists, shall never be in the possession of the Contractor.

J. Provide Great Grand Master Keys (GGMK), Grand Master Keys (GMK), Master Keys, Section Master Keys (SMK) and Change Keys (CK) according to the keying schedule provided by CoNM Central Lock Department:

K. Provide individual lock cylinder keying according to CoNM Central Lock Department furnished keying schedule.

L. Construction Master Keying:
   1. Cylinders shall be Construction Master Keyed (CMK).

2. Identify quantity of Construction Master Keys (CMK) furnished for project on Hardware Schedule.
3. The project shall remain on Construction Master Keys (CMK) system until accepted by the Board. Following acceptance, CoNM Central Lock Department shall "knock-out" CMK system upon notification by City of North Miami Project Manager.

M. Master Keys, Change Keys, and CMK Plug Extractors:
1. Supply all cylinder locks with a minimum of 5 cut change keys (CK).
2. Furnish each keyed alike (KA) lock group with a maximum of 12 cut keys, furnish all remaining required keys uncut.
3. Furnish 10 CMK Plug Extractors.
4. Furnish 5 each Master Keys (MK).
5. Provide keys and plug extractors in enveloped sets and identify with keyset numbers and factory file or folio number.
6. Do not pack keys with locksets.
   a. The permanent keys shall at no time be in the possession of the Contractor or his representatives. If this security measure is violated and rekeying is required, then the cost of rekeying this entire project shall be the sole responsibility of the Contractor. If rekeying is required, it shall be accomplished by City of North Miami to maintain security for the project or facility.
   b. Coordinate delivery and pickup of the following items with CoNM Central Lock Department:
7. Cut keys, blank keys, and CMK Plug Extractors.
8. Each CMK used on the project (whole keys or pieces of keys) in the Contractor's possession at the time of project acceptance.
9. Account for lost or destroyed CMK.
10. Obtain a receipt upon delivery.
    a. Key Stamping:
11. Stamp cut keys with the words "Do Not Duplicate" and City of North Miami post number on opposite sides.
12. Verify with CoNM Central Lock Department for specific post numbers provided on keying schedule.
13. Do not stamp bitting numbers or any factory nomenclature on the keys.
    a. Key Bows: Standard and unembossed.

N. Cylinder Location Verification:
1. CoNM Central Lock will determine if key cylinders are properly located within the project according to approved Hardware and Keying Schedule.
   a. As CMK is "knocked-out", cylinders found incorrectly or improperly keyed, in wrong location or otherwise malfunctioning shall be corrected at no cost to the Board.

O. Miscellaneous Keys:
1. Mark and tag keys to electric panels, access panels, built-in cabinets, and any other miscellaneous keys with description and room number or location.
2. Turn all keys over to CoNM Central Lock Department representative upon acceptance of project and obtain a receipt. Do not leave the facility without obtaining receipt.

1.05 QUALITY ASSURANCE

A. Florida Building Code (FBC), 2010.

B. Americans with Disabilities Act and Accessibility Guidelines (ADA).

C. National Fire Protection Association:
1. NFPA 80 - Standard for Fire Doors and Windows.
2. NFPA 101 - Life Safety Code.

D. State and local fire safety codes.

E. Provide written guarantee that all materials furnished under this Section will be free from defects in materials and workmanship for a period of one year from date of final Certificate of Acceptance.

F. Ensure the provision, proper coordination and functioning of finish hardware required for all openings, whether or not hereinafter listed in the detailed schedule, including proper type of strike plates, length of spindle, hand, backset and bevel of locks, hand and degree opening for closers, length of kickplates, length of rods and flush bolts, type of door stop and other functions or mechanism to meet the requirements of the project.

1.06 DELIVERY, STORAGE, AND HANDLING:

A. Properly package and mark hardware according to the Hardware Schedule, complete with necessary screws, special tools, instructions, and installations templates.

B. Keys: Do not package keys with the individual hardware sets.

C. Store hardware in a secured area.

D. Deliver hardware only after detailed schedule, keying diagrams and samples have been approved.

E. Provide secure lock-up for hardware delivered to the project. Control handling and installation of hardware items which are not immediately replaceable so that the completion of the work will not be delayed by hardware losses.

1.07 WARRANTY

A. Ensure material furnished is warranted for one (1) year after installation or longer as the individual manufacturer's warranty permits.

B. Mechanical Locks and Electronic Access Locks: Warranted in writing by the manufacturer against failure due to defective materials and workmanship, for a period of five (5) years commencing from the Date of Purchase.

C. Other Electronic Hardware (Power supplies, EL/RX/LX switches, etc.): Warranted for one (1) year from Date of Purchase.

D. Overhead Door Closers: Warranted in writing by the manufacturer against failure due to defective materials and workmanship, for a period of ten (10) years commencing on the Date of Final Completion and Acceptance, and in the event of failure, the manufacturer is to promptly repair or replace the defective with no additional cost to the Owner.

1.08 PRODUCTS

A. MANUFACTURERS
   1. Referenced Manufacturers:
   2. ABH
   3. Baldwin
   4. Brookline
   5. Cipco
   6. Corbin
   7. Firemark
   8. Glynn Johnson
   9. Hager
   10. Hager
   11. Ives
   12. LCN
   13. Locknetics
   14. Marks

15. McKinney
16. National Guard Products
17. Pemko
18. Precision
19. Quality
20. Reese
21. Rockwood,
22. Russwin
23. Schlage
24. Tel-Kee
25. Trimco
26. Wonder Lock
27. Zero

1.09 COMPONENTS

A. Substitutions will not be considered for any of the following listed manufacturers of hinges, locksets, door closers, or exit devices.
   1. Lock Cylinders: Six pin and single ring only. Restricted keyway will be selected by CoNM Central Lock Department.

B. Special restricted keyways shall be required by the Board and may be of different manufacturer than the lock hardware manufacturer.

C. A letter of authorization shall be required from the Board, before ordering restricted materials for this project. Contact CoNM Central Lock Department for this authorization.
   1. Locksets: Locksets shall be furnished and assembled with cylinder and labeled with door tag number and key symbol from hardware supplier, as specified and meeting ADA requirements.

D. Schlage D Series Rhodes - Heavy-duty lever handle locksets (Vandlgard) x 26D x thru-bolts. Thru-bolts required for wood and steel doors, regardless of manufacturers recommendations.

E. Marks 195 Survivor Series: Heavy-duty lever handle locksets (American Design) x 26D.

F. Example:
   1. Function Description Part Number
   2. Schlage Marks
   3. Classroom Student occupied Spaces D94 195S
   4. Office Individual Admin. Offices D92 195AB
   5. Exit Lock Exit Only D25 195NB
   6. Storeroom* Mechanical, Electrical, D96 195F
      a. Custodial, Storerooms
         1) Hotel/Motel Individual Staff Toilets D85 195H
            (a) Privacy Individual Classroom D40S 195L
                (1) Toilets
            (b) Passage Passage Only D10 195N
            (c) Communicate Communicating (Restricted D66 195DC
            (d) Usage)
            (e) *Knurled outside levers required for Mechanical, Electrical, Custodial, and Hazardous areas.
         2) Hinges: By Hager, McKinney, or M-DCPS Central Lock Department accepted equivalent.

G. Interior hollow metal doors:
   1. Hager BB1168 x ss pin 4-1/2 x 4-1/2 USP.

H. Interior wood doors:
   1. Hager BB1279 4-1/2 x 4-1/2 USP.
I. Exterior doors:
   1. Hager AB933 4-1/2 x 4-1/2 US32D.
J. Accepted equivalent with stainless steel oil-impregnated bearings and stainless steel hinge pins.
K. Interior High Security Doors:
   1. Hager AB930 4-1/2 x 4-1/2 USP.
L. Accepted equivalent with stainless steel oil-impregnated bearings and stainless steel hinge pins.
   1. Exit Devices:
M. Comply with ADA requirements and shall be by the same manufacturer.
N. Precision 1100 Series or North Miami Central Lock Department accepted equivalent.
O. Non-labeled: Pairs of doors shall have outside door pull on RHR door only. Provide "exit only" device on LHR door.
P. Labeled: Interior labeled doors requiring exit devices shall have outside lever trim on RHR door. Provide "exit only" device on LHR door.

1.10 Mount manufacturer's cylinders to the door and not through the body of the exit device.

A. Vertical Rod Exit Devices: Vertical Rod Exit Devices are not acceptable.
B. Bore-In Deadbolt Locks:

1.11 Used at non-labeled exterior group toilets, custodian rooms, and mechanical rooms: Marks or Schlage.

1.12 Other than exterior group toilets, deadbolt locks shall not be used on labeled doors or any student occupied area.

1.13 Marks 13OK/26D with door pull Hager H4G for non-labeled doors.

A. Surface Mounted Head/Foot Bolts.
B. Use at labeled and non-labeled doors on telephone closets, mechanical rooms, electrical rooms, flammable storage, and interior storage rooms at the LHR door of a pair of doors without a center mullion. Comply with NFPA-80 2.8-2.5.

1.14 Do not use at student occupied areas.

1.15 Left Hand Reverse (LHR) leaf.

1.16 Exterior Labeled: Hager 275D (UL).

1.17 Right Hand Reverse (RHR) leaf.

1.18 Exterior Labeled: Exit device x door pull and cylinder.

1.19 Exterior Non Labeled: Deadbolt x door pull and cylinder.

1.20 Interior: Storage function cylindrical lever lock, knurled outside.

A. Removable Hardware Mullion:

1.21 For exterior pair of doors except at non-occupied spaces.

1.22 Labeled openings: Precision FL822.

1.23 Non-labeled openings: Precision 822.

A. Weather Stripping, Thresholds, Door Bottoms, and Astragals.

1.24 Accepted Manufacturers: Baldwin, Brookline, Cipco, Corbin, Glynn Johnson, Hager, Ives, National Guard Products, Quality, Pemko, Reese, Russwin, Trimco, Rockwood, or Zero.

1.25 Stop applied sound seals or weather stripping shall not exceed more than 5/16" thickness.

1.26 Kitchen receiving doors require brush weather stripping, applied at the bottom, exterior surface of door. Do not specify a threshold for this door. Other doors entering into food service areas, that do not require thresholds for weather protection, shall have automatic door bottoms to provide vermin protection.

1.27 Provide rain drips for all exterior doors not having overhead roof protection.

1.28 Provide door weatherstripping for head and jamb legs at building perimeter doors to air-conditioned spaces, exterior classroom entrance and exit doors, kitchen receiving areas, exterior electric rooms, food service areas, home economics classrooms, and exterior doors to media centers.

1.29 Soundseals and automatic door bottoms shall be used at perimeter doors to band rooms, media centers, music suites and at interior doors of music rooms, CCTV rooms, mechanical rooms, and other sound sensitive rooms. Use bumper type thresholds for exterior doors and saddle type thresholds for interior doors.

1.30 Thresholds:

1.31 Panic Type Thresholds (For exterior and sound control use):

1.32 Hager 520SAS: 5" wide x 1/2" high.

1.33 Saddle Type Thresholds (Only for interior use at change of floor finishes and sound control use):

1.34 Hager 418SA: 3" wide x 1/4" high.

1.35 Hager 413SA: 5" wide x 1/4" high.

1.36 Marble Thresholds: For toilet rooms, wet mop areas adjacent to other spaces and sink or mop receptor equipped custodial closets.

1.37 Thresholds shall comply with ADA requirements.

1.38 Door Bottoms.

1.39 Automatic Door Bottoms: Hager 747S.

1.40 Weatherstrip/Soundseals:

1.41 Rigid Weatherstrip: Hager 891SAS.

1.42 Press on Weatherstrip: Hager 736.

1.43 Brush Weatherstrip: Hager 801S.

1.44 Soundproofing: Hager 862SXN or SDN.

1.45 Silencers: Hager 307D.

1.46 Overhead Rain Drip: Hager 810S.

1.47 Astragals:

1.48 Hager 837SAV.

1.49 Use only at a pair of doors with head and foot bolts.

A. Auxiliary Hardware: Push Plates, Kick Plates, Doorstops and Holds, and Doorstops.

1.50 Accepted Manufacturers: Architectural Builders Hardware (ABH), Baldwin, Brookline, Cipco, Corbin, Glynn Johnson, Hager, Ives, National Guard Products, Quality, Pemko, Reese, Rockwood, Russwin, Trimco, or Zero.

1.51 Push-Plates: Hager 60S PK, hard black plastic with beveled edges.

1.52 Provide push plates at non-labeled doors with exit devices or deadbolts, and at toilet room doors without locksets.

1.53 Omit push plates at doors with lever handle cylindrical locksets.

1.54 Provide 2 push plates and 2 kick plates on double acting doors.

1.55 Do not use push-plates on fire labeled doors.

1.56 16 inches x 16 inches x 1/8", hard black plastic.

1.57 4 inches x 16 inches x 1/8" on doors with vision panels.

1.58 Clear plastic, push-plates are not acceptable.

1.59 Kick Plates: Hager 214SBL.

1.60 Provide at all doors except to individual offices at administration areas.

1.61 16 inches x 1/8" thick x less 2 inches the width of door, hard black plastic with beveled edges. At louvered doors, provide 16 inch height maximum or to bottom of louver.

1.62 Clear plastic kick plates are not acceptable.

1.63 Kick plates for labeled doors shall be UL labeled.

1.64 Doorstops and Holds:

1.65 Wall mounted doorstop and holds: Hager 254W x US26D.

1.66 At custodial, electrical, and mechanical non-labeled spaces and exterior non-labeled access to corridors.

1.67 Floor mounted door holders: Hager 258F x US26D.

1.68 At non-labeled doors only if doorstop and holds cannot be used and cush-n-stop closers at labeled doors.

1.69 Door holds at labeled doors with closers shall be magnetic hold open devices connected to the fire alarm system.

1.70 Doorstops:

1.71 Wall mounted doorstops: At non-labeled wood doors to administrative individual offices, conference rooms, storage rooms, and work rooms and at all labeled doors. Install on solid concrete or masonry walls or at drywall or plaster applications with adequate backing reinforcement.

1.72 Convex type for doors not having push button locksets: Hager 230W.

1.73 Concave type for doors having office function or push-button locksets, locate on button side of door: Hager 234W.

1.74 Floor mounted doorstops: At labeled doors only if wall mounted stops cannot be used.

1.75 Provide doorstops or other door control devices at doors if stop and holds are not specified.

1.76 Door Pulls, Cast aluminum: Hager H4G.

A. Fasteners:

1.77 Hollow Metal Doors: Accepted machine.

1.78 Kick Plates: O.H. Phillips recess Type A SMS.

1.79 Thresholds: Hager FHSL 25-1/4 x 1/4-20 x 2" cadmium plated expansion screw in one unit or accepted equivalent.

1.80 Brush Weatherstripping: As recommended by manufacturer.

1.81 Finish: Match finish of surfaces to which they are applied.

A. Door Closers:

1.82 For hollow metal doors, doors exposed to wind conditions, labeled doors, and doors to student occupied spaces.

1.83 Pairs of doors shall require closers.

1.84 Do not provide a closer on a leaf with head and foot bolts.

1.85 LCN Series 4111-N AVB x EDA x TB, parallel arm only.

1.86 4111-N DEL x AVB x AL x EDA x TB (Special delay action closer, do not provide at doors opening 180 degrees or greater).

1.87 4111-N Spring Cush AVB x AL x EDA x TB.

1.88 4116-N AVB x AL x EDA x TB (oversize doors only, verify with manufacturer).

1.89 4111-N Cush-n-stop x AVB x EDA x TB. Provide where 180-degree swing is obstructed or where a wall stop is not practical.

A. Overhead Stop and Hold:

1.90 3324-US26D, surface mounted, by ABH.

A. Electromagnetic Holder/Release:

1.91 Hold open devices specified for fire rated doors shall be electromagnetic type. Holder shall be wired to fire alarm system and shall release in the event of fire. Coordinate with Section 16721 - Fire Alarm and Detection System.

1.92 900 Series by Firemark or 2210-US28 Mag Holder Recessed Wall Mount by ABH.

1.93 M-DCPS Central Lock Department will not consider other manufacturers as "accepted equivalent" unless the mounting and the mounting hole patterns are identical to Firemark. This alone will not be the sole basis of being equivalent.

A. Electromagnetic Lock: Locknetics or accepted equivalent.

1.94 Labeled and non-labeled doors:

1.95 Locknetics Series 390 x MBS x L1 x ATD x FSE x US28. Minimum holding force shall be 1500 pounds.

1.96 Signal Switch (SS): Internally mounted switch to monitor the use of the touch bar.

1.97 Exit Device, labled: SS FL1108 x 39LA

1.98 Exit Device, non-labeled: SS 1103 x door pull.

1.99 Hinge: AB850 x 4.5" x4/5" x US32D x ETW-4.

1.100 Motion Detector: Scan II B.

A. Viewfinder (peephole).

1.101 1755 x 26D Hager.

1.102 EXECUTION

1.103 EXAMINATION

1.104 Do not proceed with the work of this section until conditions detrimental to the proper installation and protection of hardware have been performed.

1.105 INSTALLATION

1.106 Door hardware locations shall be as follows:

A. Pushplates: 1 inch above pushpad and 1 inch from exit device head.

B. Pushplates with a Vision Panel: 1 inch above exit device between vision panel and edge of door.

C. Exit Device: 40-5/16" from door bottom or 34 inches as required for children's accessibility.

D. Lever Lockset: 38 inches from door bottom or 34 inches as required for children's accessibility.

E. Deadbolt: 48 inches from door bottom.

F. Kickplate: 1 inch from door bottom or 1/2" from top of surface mounted automatic door bottom.

G. Viewport: 60 inches from door bottom.

1.107 Finish Hardware:

A. Lockset and cylinders: Permanent restricted cylinders shall be installed with lockset.

B. Do not install finish hardware until operations causing dampness have been completed.

1.108 Door Closers:

A. Install with closer manufacturer's thru bolts and adjust for proper operation.

B. Location: Locate closer on door as if door were to swing 180 degrees, regardless of the actual swing of the door. When using Cush-n-stop, mount for maximum opening swing. Verify 90, 100, or 110 degree template mounting.

C. Do not allow closer to act as a stop.

D. Closer Foot: Install with 5 screws for wood jambs or 5 stove bolts for metal jambs. Provide an accepted spacer (if required by the width of stop) for fifth fastener.

1.109 Use of screw type fasteners are not allowed for metal frames.

1.110 Exit Devices: Install with thru bolts.

1.111 Door Pulls: Top hole of door pull shall be 2 inches above bottom of exit device casing at casing centerline.

1.112 Stop and Hold, Wall Mounted: Install at top outside corner of door, with thru bolts or grommet nuts.

A. Install wall portion according to manufacturer's recommendations and based on field conditions to withstand 100 lbs. shear pressure.

1.113 Stop and Hold, Floor Mounted: Install at bottom outside corner of door, with thru bolts or grommet nuts.

A. Install floor portion according to manufacturer's recommendations, after finish floor covering has been installed. Secure to subfloor using full size spacer if necessary to keep bottom flush with finish flooring, i.e. carpet.

1.114 Surface Bolts (Head and Foot): Install with thru bolts or grommet nuts.

1.115 Thresholds at Exterior Doors Exposed to Weather:

A. Set in full bed of sealant.

B. If threshold is saddle type, then door bottom shall seat against threshold. Threshold shall not exceed 1/4" in height.

1.116 Brush Weatherstripping: Install according to manufacturer's recommendations and after final finish has been applied to door and frame.

1.117 Push Plate:

A. 1 inch above push pad and 1 inch from exit device head

B. With vision panel, 1inch above exit device head between vision panel and edge of door.

1.118 FIELD QUALITY CONTROL

1.119 At final acceptance, hardware shall be clean and free from disfigurement, paint, and other foreign matter.

1.120 HARDWARE SCHEDULE

A. Hardware Group No. 1 - Exterior – Café (ADD ALTERNATE)

Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
EA	MORTISE CYLINDER	20-002 Adams Rite Cam	626	SCH

Balance of hardware by storefront manufacturer.

B. Hardware Group No. 2 - Existing

Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
EA	EXIT DEVICE	ED6400 X N355	626	C-R
EA	RIM CYLINDER	20-057	626	SCH

C. Hardware Group No. 3 - Meeting Rooms

Provide each SGL door(s) with the following:

Quantity	Description	Model Number		Finish	Mfr
EA	HINGE	5BB1 4.5 X 4.5	652		IVE
EA	ROLLER LATCH	RL32	626		IVE
SET	90 DEG OFFSET PULL	PR 8190HD 10" N		630	IVE
EA	FLOOR STOP	FS438	626	IVE	

Balance of hardware by storefront manufacturer.

D. Hardware Group No. 4 - Waiting Room

Provide each SGL door(s) with the following:

Quantity	Description	Model Number		Finish	Mfr
EA	HINGE	5BB1 4.5 X 4.5	652	IVE	
EA	PASSAGE SET	ND10S RHO		626	SCH
EA	SURFACE CLOSER	1461 REG OR PA AS REQ			689
LCN					
EA	KICK PLATE	8400 10" X 2" LDW B4E		630	IVE
EA	WALL STOP	WS406/407CVX		630	IVE
EA	SILENCER SR64	GRY	IVE		

Operational Description

Both levers always unlocked. Inside lever is always free for immediate egress. Self-Closing.

E. Hardware Group No. 5 - Children's Area

Provide each SGL door(s) with the following:

Quantity	Description	Model Number		Finish	Mfr
EA	HINGE	5BB1 4.5 X 4.5	652	IVE	
EA	PASSAGE SET	ND10S RHO		626	SCH

EA	SURFACE CLOSER	1461 REG OR PA AS REQ			689 LCN
EA	KICK PLATE	8400 10" X 2" LDW B4E		630	IVE
EA	WALL STOP	WS406/407CVX		630	IVE
EA	THRESHOLD	613 36"	AL	NGP	
EA	SILENCER SR64	GRY	IVE		

Operational Description

Both levers always unlocked. Inside lever is always free for immediate egress.

Self-Closing.

F. Hardware Group No. 6 - Toilet Room

Provide each SGL door(s) with the following:

Quantity	Description	Model Number		Finish	Mfr
EA	HINGE	5BB1 4.5 X 4.5	652	IVE	
EA	HOSPITAL PRIVACY	ND44S RHO		626	SCH
EA	SURFACE CLOSER	1461 REG OR PA AS REQ			689 LCN
EA	KICK PLATE	8400 10" X 2" LDW B4E		630	IVE
EA	WALL STOP	WS406/407CVX		630	IVE
EA	SILENCER SR64	GRY	IVE		

Marble threshold by others.

Operational Description

Self-Closing.

G. Hardware Group No. 7 - Electrical Room

Provide each PR door(s) with the following:

Quantity	Description	Model Number		Finish	Mfr
EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE	
SET	AUTO FLUSH BOLT	FB31P	630	IVE	
EA	STOREROOM LOCK	ND80PD RHO		626	SCH
EA	COORDINATOR	COR X FL	628	IVE	
EA	SURFACE CLOSER	1461 REG OR PA AS REQ			689 LCN
SET	SEALS	5050CL 20'	CLR	NGP	
EA	THRESHOLD	613 72"	AL	NGP	

Metal Z Astragal by door manufacturer.

Operational Description

Self-Closing.

END OF SECTION

SECTION 08800
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Plastic Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07900 - Joint Sealers: Sealant and back-up material.

B. Section 08110 - Steel Doors and Frames: Glazed doors and borrowed lites.

C. Section 08211 - Flush Wood Doors: Glazed lites in doors.

D. Section 08410 - Metal-Framed Storefronts: Glazing furnished by storefront manufacturer.

E. Section 08 5113 - Aluminum Windows: Glazed windows.

F. Section 08830 - Mirrors.

G. Section 10800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.

C. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.

D. ASCE 7 - Minimum Design Loads for Buildings and Other Structures, 2005 .

E. ASTM C 162 - Standard Terminology of Glass and Glass Products; 2005.

F. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).

G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

H. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

I. ASTM C 1349 - Standard Specification for Architectural Flat Glass Clad Polycarbonate; 2010

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

K. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2009c.

L. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

M. FLA (FBC-B) - Florida Building Code: Building; Current Edition.

N. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2010.

P. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2008.

Q. UL9 - Standard for Safety Fire Tests of Window Assemblies-Eighth Edition; 2009.

R. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

S. UL 263 - UL Standard for Safety Fire Tests of Building Construction and Materials-Fourteenth Edition; 2011

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting a minimum of one week before starting work of this section; require attendance by all affected installers.

B. Review glazing requirements with Storefront Manufacturer, and the Miami-Dade County NOA requirements.

1.05 DEFINITIONS

A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

B. Interspaced: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.

C. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard

D. Laminated Glass Unit Surfaces:
   1. Side 1 - Exterior surface of outer pane.
   2. Side 2 - Interior surface of outer pane.
   3. Side 3 - Interior surface of inner pane.
   4. Side 4 - Exterior surface of inner pane

E. Delegated (Specialty) Engineer: All submitted drawings and calculations shall be prepared by or under the supervision of and shall bear the signature and seal of the Delegated (Specialty) Engineer. The Delegated (specialty) Engineer shall be a Florida Registered Professional Engineer, not the Engineer of Record, who specializes in and undertakes the design of structural components or structural systems as described herein for this Project. Refer to the Plans "Structural Notes" for additional information and requirements of a Delegated (Specialty) Engineer

1.06 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
   1. Submit two-copies of manufacturer's specifications, and installation instruction for each type of glass, glazing sealant and compound, gasket and associated miscellaneous material required.
   2. Include manufacturer's published data, or letter of certification, or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the applications shown.
   3. Include product data for exterior glazing indicating glass and glazing Solar Heat Gain Coefficient (SHGC) and Visible Light Transmittance (VT) in accordance with the National Fenestration Rating Council (NFRC) methodology.
   4. Show by transmittal that the Glazer distributed one copy of each recommendation and instruction.
   5. If Safety glass, provide two copies of manufacturer certification

C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

D. Samples: Submit two samples 12 x 12 inch in size of glass units, showing coloration and design, including information on SHGC and U-value. Provide sample with full insulating glass composite for Architect review and approval of final coloring and light transmission.

E. Samples: Submit 23 inch long bead of glazing sealant, color as selected.- if not selected prepare strips of material representative in color of the adjoining framing system.

F. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

G. Certificates: Certify that products meet or exceed specified requirements.

H. Compatibility and Adhesion Test Report: Submit statement from sealant manufacturer indicating that glass and glazing materials have been tested for compatibility and adhesion with glazing sealants and interpreting test results relative to material performance, including recommendations for primers and substrate preparation needed to obtain adhesion.

I. Complete current Florida Building Code (FBC) High Velocity Hurricane Zones (HVHZ) Protocols and required product Notice of Acceptance (NOA).

J. Manufacturer's Certificate: Certify that Exterior glazing meets or exceeds specified requirements, including STC rating and Hurricane impact criteria.

K. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Insulating Glass Units: One of each glass size and each glass type.

L. Warranties: Special warranties specified in this Section.

1.07 QUALITY ASSURANCE

A. Design Requirements: Design exterior glazing systems to conform to the Florida Building Code and meet the design pressures shown on Contract Documents and meet the Impact Standards, in compliance with Florida Building Code (FBC) High Velocity Hurricane Zones (HVHZ) Protocols and required product Notice of Acceptance (NOA).

B. Perform Work in accordance with GANA Glazing Manual, FGMA Sealant Manual, SIGMA TM-3000 Glazing Guidelines, and GANA Laminated Glazing Reference Manual for glazing installation methods.

C. Comply with applicable codes and regulations and with the Consumer Product Safety Commission CPSC 16 CFR 1201 and with applicable recommendations of Flat Glass

D. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

E. Labels: Glass shall bear labels indicating the manufacturer, type and thickness. Do not remove labels until inspected and approved.
   1. All safety glass shall at least a temporary (permanent is preferred) label indicating manufacturer, type, thickness, and compliance with CPSC 16 CFR 1201 or ANSI Z97.1.
   2. Each pane of tempered glass, except tempered spandrel glass, shall be permanently identified by the manufacturer and each pane of laminated glass shall be permanently identified with the laminators, overall glass thickness and trade name of interlayer. The identification mark shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed. Tempered or laminated spandrel glass shall be provided with a removable paper marking by the manufacturer
   3. If temporary label, label is to remain on glass until Owner Building Inspection is complete, then removed and turned into the Owner Building Department.

F. Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

G. Source Limitations for Glass Sputter-Coated with Solar-Control Low-E Coatings: Where solar-control low-e coatings of a primary glass manufacturer that has established a certified fabricator program is specified, obtain sputter-coated solar-control low-e-coated glass in fabricated units from a manufacturer that is certified by coated-glass manufacturer.

H. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

I. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257

J. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
   1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

K. Interior glazed areas. Where interior glazing is installed adjacent to a walking surface, the differential deflection of two adjacent unsupported edges shall not be greater than the thickness of the panels when a force of 50 pounds per linear foot (plf) (730 N/m) is applied horizontally to one panel at any point up to 42 inches (1067 mm) above the walking surface.

L. Safety glazing: Panels and storefronts. In addition to the requirements of FBC Section 2406.3, the following is considered a hazardous location and requires safety glazing: Glazed panels within 48 inches (1219 mm) of a door, excluding transoms or vertical panels above 6 feet 8 inches (2031 mm).
   1. All glazing in hazardous locations shall be safety glazing meeting the requirements of the Florida Building Code, Building, Section 2406.
   2. Large glass panels shall be subdivided by a built-in horizontal member or a permanent chair rail not less than 11/2 inches (38 mm) in width, located between 24 and 36 inches (610 and 914 mm) above the floor.

M. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."

N. Wall mirrors shall provide distortion-free reflected images and be optically matched for distortion-free reflected images from panel to adjacent panel, guaranteed for 1 year.

O. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by an approved independent agency maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.

1.08 MOCK-UP

A. Provide mockup of storefront and windows including glass and air barrier and vapor retarder seal. Coordinate with Storefront Section.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.09 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

C. Glazing breakage:The glazing subcontractor shall be responsible for all broken, scratched, damaged or defective materials and shall replace same at his expense

1.10 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Sealed Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

C. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.01 GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated

B. Windborne-Debris-Impact Resistance: Provide exterior glazing that passes enhanced-protection testing requirements in ASTM E 1996 for Wind Zone indicated on strutural drawings when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on the Project and shall be installed in same manner as glazing indicated for use on the Project.
   1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
   2. Small-Missile Test: For glazing located more than 30 feet (9.1 m) above grade.

C. Tempered Glass: Glass to be heat-strengthened by Manufacturer's standard process (after cutting to final size), to achieve a flexural strength of four times normal glass strength; provide temp glass where required by code, generally 4’ horizontally from doors and within 18" of floor to comply with Federal Specification DD-6-1403, or as scheduled.

D. All exterior and interior glazing shall be supplied by single manufacturer. All exterior glazing shall be same color as selected by Architect.

E. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

F. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.

2.02 MANUFACTURERS:

A. AGC Flat Glass North America, Inc: www.afgglass.com.

B. Cardinal Glass Industries: www.cardinalcorp.com.

C. Oldcastle Glass, Inc: www.oldcastleglass.com.

D. Technical Glass Products

E. Traco - Cranberry Twp, PA – 800-837-7001.

F. PPG Industries, Inc: www.ppgglazing.com. - BASIS of DESIGN

G. SCHOTT North America Inc; Pyran Platinum L (laminated) Fire Rated Ceramic Glass.

H. Vetrotech Saint-Gobain North America; .www.vetrotechusa.com

I. Viracon, Apogee Enterprises, Inc: www.viracon.com.

2.03 GLAZING TYPES

A. Type E-1 - Exterior Impact Glazing: Typical throughout building,
   1. Applications: All exterior glazing unless otherwise indicated as insulating glass
   2. Type: Laminated Heat strengthened glass.

3. Product: PPG [6MMSB70XL (2)] Solarbronze spectrally selective tinted glass by PPG
4. Tint: Bronze or as selected by Architect.
5. Thickness: 9/16 inch.(6mm) minimum or other width as required to comply with Florida Building Code (FBC) High Velocity Hurricane Zones (HVHZ) Protocols and required product Notice of Acceptance (NOA) of window and storefront manufacturer(s).
6. Impact rated as required by Florida Building Code Product Approval System with colored tint to match insulated laminated storefront units.
7. Light Transmittance: _____ percent, nominal.
8. Solar Heat Gain Coefficient:.24 percent, nominal.
9. Coating: Low-e
10. U- value: 0.84 Summer, 0.93 Winter.
11. Glazing Method: Exterior wet method, sealant and sealant.

B. Type E-2 - Exterior Vision Safety Glazing:
1. Applications: Door lites, windows, other locations within 4 ft. of means of egress, and as noted on plans .
2. Type: Laminated safety glass.
3. Impact rated as required by Florida Building Code Product Approval System
4. All exterior glazing shall be from single source to match color, finish and thickness.
5. Thickness: 9/16 inch.(6mm) minimum or other width as required to meet NOA of Storefront and Window Manufacturer.
6. Impact rated as required by Florida Building Code Product Approval System with colored tint to match laminated storefront products,
7. Solar Heat Gain Coefficient:.24 percent, maximum.
8. Glazing Method: Exterior wet method, sealant and sealant.

C. Type S-1 - Single Vision Glazing:
1. Applications: All interior glazing unless otherwise indicated.
2. Type: Fully tempered float glass.
3. Tint: Clear.
4. Thickness: 1/4 inch minimum, 3/8" thick for glass storefront/ partitions.

D. Type S-2 - Single Safety Glazing: Non-fire-rated, conforming to ANSI Z97.1 and ASTM C1048
1. Applications: Provide this type of glazing in the following locations:
   a. Glazed lites in Interior doors, except fire doors.
   b. Sliding glass doors.
   c. Glazed sidelights to doors, except in fire-rated walls and partitions.
   d. Glazed view windows and panels in partitions enclosing student activity rooms, except in fire-rated walls and partitions.
   e. Other locations required by applicable federal, state, and local codes and regulations.
   f. Other locations indicated on the drawings.
2. Type: Fully tempered float glass as specified.
3. Tint: Clear.
4. Thickness: 1/4 inch typical, 3/8" when glass is over 9 SF - minimum thicknesses.

E. Type S-3 - Fire-Rated Safety Glazing:
1. Applications: Provide this type of glazing in the following locations:
   a. Glazed lites in fire door: Complying with UL10C.
   b. Fire windows.
      1) Window Certification: Window assemblies with ratings of less than 60 minutes shall be tested in accordance with ASTM E163, NFPA 257, UBC 7-4, UL 9, Standard Tests Methods.
   c. Sidelights, borrow lites, and other glazed openings in partitions indicated as having an hourly fire rating.

1) Wall Certification: Window/wall assemblies with ratings of 60 minutes, 90 minutes or 120 minutes shall be tested in accordance with ASTM E119, NFPA 251, UBC 7-1, UL 263 Standard Test Methods for Fire Tests of Building Construction and Materials
2) Door Certification: Door Assemblies shall be tested in accordance with ASTM E-152, NFPA 252, UBC 7-2, and UL 10C.

d. Other locations indicated on the drawings.

2. Fire Rating: 20, 45 or 60 minutes, as specified, or is indicated on the drawings.
   a. Type: Glass-ceramic safety glazing.
   b. Thickness: 1/4 inch typical, 3/8" when glass is over 9 SF - minimum thicknesses.
3. Provide a fire rated glazing manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage, or failure
4. Manufacturer: SaftiFirst -Basis of Design www.safti.com
   a. SuperLite I - 20 minute rated, ¼" thick - doors.
   b. Superlite I-XL - 45 minute rated, ¼" thick - where not required to pass hose stream test.
   c. SuperLite C/SP - 45, 60 and 90 minute rated ceramic glazing - all rated door locations.
   d. SuperLite II-XL - 45 minute rated, ¾" thick - for all rated steel frame window, transom and sidelight conditions.

F. Type S-4 - One-Way Reflected Glass
1. Application: Locations indicated on the drawings, confirmed by Architect and Owner.
2. Laminated from 2 pieces of Type I, Class 1, Quality q3, laminated together with a clear 0.030" thick polyvinyl butyl interlayer, total 3/8" thick, coated on the No. 2 face with a hard, adherent film of chromium or other approved coating of equal durability.
3. Glass shall transmit not more than 14% of total incident visible light and shall reflect from the front surface of the coating not less than 33% of the total incident visible light.
4. Thickness: 1/4 inch.
5. Glazing Method: Gasket glazing.

2.04 EXTERIOR GLAZING ASSEMBLIES

A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with Florida Building(High Velocity Hurricane Zone) code.
1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
3. Thicknesses listed are minimum.

B. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
1. In conjunction with vapor retarder and joint sealer materials described in other sections.
2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.05 GLASS MATERIALS

A. Float Glass: All glazing is to be float glass unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
2. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
3. Tinted Types: Color and performance characteristics as indicated.

4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.

B. Glass-Ceramic Safety Glazing: UL- or WH-listed as fire-protection-rated glazing and complying with 16 CFR 1201 test requirements for Category II without the use of a surface-applied film.
   1. 20-Minute Fire Doors: Hose stream test is not required.
      a. Vetrotech Saint-Gobain North America; : www.vetrotech.com.
   2. Fire Rating: As indicated; tested as a wall, not as opening protection.

C. Two-Way Mirror Glass: Mirror quality float glass (Q2) with factory coating.

2.06 GLAZING COMPOUNDS

A. General: Provide materials as recommended by the manufacturer for the required application and condition of installation in each case. Provide only compounds that are proven to be fully compatible with surfaces contacted.

B. Manufacturers:
   1. Bostik Inc: www.bostik-us.com.
   2. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
   3. Pecora Corporation: www.pecora.com.
   4. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   5. Substitutions: Refer to Section 01600 - Product Requirements.

C. Silicone Sealant : Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected.

2.07 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

D. Interlayer: Product as approved by NOA for specific use indicated
   1. Basis of Design: DuPont™ SentryGlas® , as manufactured by DuPont™ Glass www.sentryglas.com
   2. Thickness: 0.060 inch minimum on vertical surfaces and minimum .090 inch at canopy, additional thickness as required at bulletproof assemblies.
   3. Color: Clear
   4. Interlayer Physical Properties:
   5. Young's Modulus: 43 kpsi, when tested in accordance with ASTM D5026
   6. Tensile Strength: 5.0 kpsi, when tested in accordance with ASTM D638.
   7. Elongation: 400%, when tested in accordance with ASTM D638
   8. Flex Modulus: 50 kpsi, when tested in accordance with D790.
   9. Heat Deflection Temperature at 0.46 MPa: 110 deg F, when tested in accordance with D648.

E. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.

F. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I; white color.

G. Glazing Clips: Manufacturer's standard type.

H. Other Materials: Provide other materials not specifically described but required for a complete and proper installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that framing for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.
   1. Center in glazing rabbet to maintain specified clearances at perimeter on all four sides. Maintain centered position of glass in rabbet and provide the required sealer thickness (⅛" maximum) on both sides of glass.
   2. Whenever glass dimensions are larger than 50 united inches, provide setting blocks at the sill and spacer shims on all four sides; locate setting blocks one-quarter way in from each end of glass.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealant in accordance with manufacturer's instructions.

3.03 GENERAL INSTALLATION

A. Comply with combined printed recommendations of glass manufacturers, of manufacturer of sealants, gaskets and glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

B. Where a combination of sealing materials is required for glazing in the same frame, the manufacturer must certify that all glazing materials furnished are compatible with each other.

C. Where setting blocks and spacer shims are required to be set into a glazing compound or sealant, they may be buttered with the compound or sealant, placed in position and allowed to set firmly prior to installation of glass.

D. Frame Preparation and Acceptance
   1. Inspect all frames and surrounds to be glazed under this section and notify the Contractor of any defects, improper materials or workmanship of other conditions that will affect the satisfactory installation of glass. Do not proceed with glazing until such conditions have been corrected. Absence of notification, or the beginning of glazing, will indicate acceptance of all previously placed related work executed by other trades.
   2. Other trades will execute the following work; but before starting glazing work, the glazier shall verify compliance with the requirements listed.
      a. That frames are firmly anchored in proper position, plumb and square within 1/8" nominal dimensions on approved shop drawings.
      b. That the rivet, screw, bolt or nail heads, welding fillets and other projections are removed from glazing rabbets to provide the specified clearances.
      c. That all corners and fabrication intersections are sealed and sash and frames are weather-tight.
      d. That rabbets at seals weep to outside and all rabbets are of sufficient depth and width to receive the glass and provide the required overlap of the glass.
      e. That all sealing surfaces of steel sash and frames are primer painted.

E. Stop Bead Glazing - Using Putty and/or Elastic Glazing Compound: Except where other materials or methods are specified hereinafter, use putty for bedding glass in hollow metal frames.
   1. Apply ample back putty or compound to rabbet so that it will ooze out when pressing glass into position and completely cover glass in rabbet. Place setting blocks and spacer shims as required. Press glazing into position.
   2. Secure glazing in place by the application of stop beads. Bed stop beads against glass and bottom of rabbet with compound and/or putty, leaving proper thickness between glass and stop beads. Secure stop beads in place with suitable fastenings. Strip surplus compound or putty from both sides of glass and tool to provide clean sight lines.

F. Glass Cutting: Make cuts clean, only moderately convoluted, with flare or bevel not exceeding 1/8 of glass thickness.
   1. Unacceptable defects:
      a. Impact chips, spalls, or nipped edges.
      b. Flake chips or shark teeth deeper than 1/4 of glass thickness.
      c. Serration hackle deeper than 1/8 of glass thickness.
   2. Comply with recommendations of FGMA Glazing Manual, glass manufacturer, manufacturer of sealant, and other glazing accessories.
   3. Do not attempt to cut, seam, nip, or abrade glass tempered or heat strengthened.
   4. Remove and replace glass broken, chipped, cracked, abraded, or damaged during construction.

G. Glazing - Using Glazing Gaskets
   1. Glass stops with glazing gaskets shall be used for securing glass in frames of all storefront type entrance doors and in such other locations as indicated on the drawings.
   2. Glazing gaskets without stops shall be used for glazing glass in all storefront type sash and frames, except where otherwise indicated on the drawings. Glazing of storefront type sash and frames using glazing gaskets without stops shall be done in strict accordance with the manufacturer's directions. Provide and place setting blocks as required. Gaskets shall be of the proper size for the thickness of glass being used. After glazing, seal gaskets to glass Continuously with a clear elastic and watertight sealant similar to G.E. Silicon Sealant. Seal gaskets to glass on exterior face only.

H. Install wall mirrors and fasten with non-corrosive, theftproof, concealed hangers and plywood backing according to standard practices. Fasten with mirror adhesive according to manufacturer's instructions.

I. Manufacturer's label showing strength, grade, thickness, type, and quality of glass shall remain on each piece of glass until it has been set and inspected.

J. Guarantee work to be waterproof.

3.04 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - EXTERIOR WET METHOD (SEALANT AND SEALANT)

A. Place setting blocks at 1/4 points and install glazing pane or unit.

B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.

C. Fill gaps between glazing and stops with silicone type sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.

D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.

C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

D. Place glazing tape on free perimeter of glazing in same manner described above.

E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

F. Knife trim protruding tape.

3.07 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND)

A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.

B. Locate and secure glazing pane using glazers' clips.

C. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.08 MANUFACTURER'S FIELD SERVICES

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

C. Upon completion of work all glass shall be free from cracks and other defects. Any defective or broken glass that may appear before acceptance or within the one-year warranty period shall be removed and replaced with new glass without additional cost to the Owner; excepting glass which is broken by a specific cause relating to building occupancy not relating to this contract.

3.09 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.10 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Upon completion of the work and just prior to occupancy of the building, all glass shall be thoroughly washed and cleaned.

END OF SECTION

9

DIVISION

SECTION 09051
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:
   1. Broadloom carpet.
   2. Carpet tile.
   3. Thin-set ceramic tile and stone tile.

B. Removal of existing floor coverings.

C. Preparation of new and existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and pH.

1.02 RELATED REQUIREMENTS

A. Section 01230 - Alternatives: Bid pricing for remediation treatments if required.

B. Section 01400 - Quality Requirements: Additional requirements relating to testing agencies and testing.

C. Section 01732 - Waste Management: Handling of existing floor coverings removed.

1.03 REFERENCES

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2009).

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.

E. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

1.04 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and pH limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Adhesive Bond and Compatibility Test Report.

D. Copy of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.

1.05 QUALITY ASSURANCE

A. Contractor may perform adhesive and bond test with his own personnel or hire a testing agency.

B. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.

2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.

B. Deliver materials in manufacturer's packaging; include installation instructions.

C. Keep materials from freezing.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
   3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of pH found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: 1/8 inch, maximum.
   2. If testing agency recommends any particular products, use one of those.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering.
   2. Preliminary cleaning.
   3. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
   4. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. pH tests; in same locations as moisture vapor emission tests, unless otherwise indicated.

6. Specified remediation, if required.
7. Patching, smoothing, and leveling, as required.
8. Other preparation specified.
9. Adhesive bond and compatibility test.
10. Protection.

C. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating over entire suspect floor area.
3. Excessive pH: If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.05 pH TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Note: This procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

C. Use a wide range pH paper, its associated chart, and distilled or deionized water.

D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the pH paper into the water, remove it, and compare immediately to chart to determine pH reading.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value is over 10.

3.06 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.09 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09220
PORTLAND CEMENT PLASTER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Portland cement plaster for installation over metal lath, masonry, concrete, and solid surfaces.

B. Metal Lath

1.02 RELATED REQUIREMENTS

A. Section 05400 - Cold Formed Metal Framing: Structural metal framing for Exterior plaster ceilings.

B. Section 09111 - Non-Loadbearing Metal Framing: Metal stud framing and furring for plaster.

C. Section 09260 - Gypsum Board Assemblies: Metal stud framing and furring for plaster.

1.03 REFERENCE STANDARDS

A. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

B. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

C. ASTM C206 - Standard Specification for Finishing Hydrated Lime; 2003 (Reapproved 2009).

D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.

E. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2012a.

F. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering; 2006.

G. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2010.

H. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2012a.

I. FLA (FBC-B) - Florida Building Code: Building; 2010.

J. NAAMM ML/SFA 920 - Guide Specifications for Metal Lathing and Furring; 2009.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide data on plaster materials, characteristics and limitations of products specified.

C. Shop Drawings; Provide shop drawing of elevations, showing all locations of score joints, expansion joints, trim pieces and details.

D. Samples: Submit two samples, 12 x 12 inch in size illustrating each finish color and texture.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience, for the application of work specified in this section.

C. Unless otherwise specified, comply with applicable requirements of governing codes and authorities and ASTM C754 and C840.

D. Comply with fire-resistance ratings as required by governing authorities and codes. Materials must be listed by Underwriters' Laboratories or tested in accord with ASTM E119.

E. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

F. For Interior locations comply with latest specification of Metal Lath Manufacturer's Association and ANSI Standards, ANSI A42.3, and ANSI A42.4 except where more stringent or more detailed requirements are indicated.

G. Comply with Metal Lath and Steel Framing Association (MLSFA) "Guidelines for Metal lathing and Furring" and "Technical Bulletin 10" for selection of metal lath for each application indicated.

H. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.06 MOCK-UP

A. Construct mock-up of interior wall, ten feet long by ten feet wide, illustrating surface finish(s).

B. Locate where directed by Architect.

C. Mock-up may remain as part of the Work. upon approval of Architect.

1.07 FIELD CONDITIONS

A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F or over 80 degrees F.

B. Maintain minimum ambient temperature of 50 degrees F during installation of plaster and until cured.

PART 2 PRODUCTS

2.01 PORTLAND CEMENT PLASTER ASSEMBLIES

A. Interior Partitions Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

B. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.
   1. Coordinate components of fire rated assemblies with materials specified for support of plaster in other sections.

2.02 PLASTER MATERIALS

A. Portland Cement, Aggregates, and Other Materials: In accordance with ASTM C 926.

B. Portland Cement: ASTM C150, Type I.
   1. For finish coat: White color.

C. Masonry Cement: ASTM C91 Type N.

D. Lime: ASTM C 206, Type S.

E. Aggregate: Natural sand, within the following sieve sizes and percentage retained limits:
   1. No. 4: 0.
   2. No. 8: 0 to 5.
   3. No. 16: 5 to 30.

F. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.

2.03 METAL LATH

A. General: Contractor shall select the required metal lath to meet the support spacing and performance creteria. Metal and wire lath and metal accessories embedded in the plaster shall be galvanized or otherwise rust-resitant. Weight tags shall be left on all metal or wire lath until approved by the building official. Refer to FBC Table 2514.3.2 for minimum spacing of supports.

B. Flat Rib Metal Lath: ASTM C847, galvanized; 1/8 inch thick.
   1. Weight: To suit application, comply with deflection criteria, and as specified in ASTM C841 for framing spacing.
   2. Weight: 2.75 lb/sq yd. minimum .
   3. Backed with treated paper.

C. Ribbed Metal Lath: ASTM C847, galvanized; 3/8 inch thick.
   1. Weight: To suit application, comply with deflection criteria, and as specified in ASTM C841 for framing spacing.
   2. Weight: 3.4 lb/sq yd.
   3. Backed with treated paper.

D. Welded Wire Lath: ASTM C933; galvanized; with 2 inch square openings, paper or felt backing, of weight to suit application- 2.48 lb/sq yd. minimum, comply with deflection criteria, and as specified in ASTM C841 for framing spacing.

E. All metal lath shall be lapped 1 inch minimum.

F. Corner Mesh: Formed sheet steel, minimum 0.018 inch thick, perforated flanges shaped to permit complete embedding in plaster, minimum 2 inch size; same finish as lath.

G. Strip Mesh: Expanded metal lath, same weight as lath, 2 inch wide x 24 inch long; same finish as lath.

H. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, maximum possible lengths.
   1. Casing Beads: No.10 as manufactured by Plastic Components, Inc., with ground depth matching the specified stucco or Portland cement plaster thickness.
   2. W-Type Control Joints: No.20 M Joint as manufactured by Plastic Components, Inc., ground depth to match specified Portland cement plaster thickness.

2.04 PLASTER MIXES

A. Over Solid Bases: Two-coat application, mixed and proportioned in accordance with manufacturer's instructions.

B. Over Metal Lath: Three-coat application, mixed and proportioned in accordance with manufacturer's instructions.

C. Premixed Plaster Materials: Mix in accordance with manufacturer's instructions.

D. Mix only as much plaster as can be used prior to initial set.

E. Mix materials dry, to uniform color and consistency, before adding water.

F. Protect mixtures from freezing, frost, contamination, and excessive evaporation.

G. Do not retemper mixes after initial set has occurred.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify the suitability of existing conditions before starting work.

B. Masonry: Verify joints are cut flush and surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.

C. Concrete: Verify surfaces are flat, honeycomb are filled flush, and surfaces are ready to receive work of this section. Verify no bituminous, water repellent, or form release agents exist on concrete surface that are detrimental to plaster bond.

D. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

3.02 PREPARATION

A. Dampen masonry surfaces to reduce excessive suction.

B. Clean concrete surfaces of foreign matter. Clean surfaces using acid solutions, solvents, or detergents. Wash surfaces with clean water.

C. Roughen smooth concrete surfaces and apply bonding agent in accordance with manufacturer's instructions.

3.03 PLASTERING

A. Apply plaster in accordance with ASTM C926.

B. Two-Coat Application(interior only)
   1. Apply first coat to nominal thickness of 3/8 inch.
   2. Apply finish coat to nominal thickness of 1/8 inch.

C. Three-Coat Application Over Metal Lath:
   1. Apply first coat to a nominal thickness of 3/8 inch.
   2. Apply second coat to a nominal thickness of 3/8 inch.
   3. Apply finish coat to a nominal thickness of 1/8 inch.

D. Three-Coat Application Over Solid Bases:
   1. Apply first coat to a nominal thickness of 1/4 inch.
   2. Apply second coat to a nominal thickness of 1/4 inch.
   3. Apply finish coat to a nominal thickness of 1/8 inch.

E. In exterior work, scribe contraction joints through entire plaster application atmax 20 feet on center each way, unless noted otherwise on plans. (scoring shall match approved shop drawings)

F. Moist cure base coats.

G. Apply second coat immediately following initial set of first coat.

H. After curing, dampen previous coat prior to applying finish coat.

I. Accessories for Portland Cement Plaster: Install accessories of type indicated at following locations:
   1. External corners: Install corner beads at external corners.
   2. Casing Beads: Install at terminations of plaster work.

J. Control Joints: Install control joints at locations indicated, or if not indicated, at locations complying with the following criteria and approved by Project Consultant.
   1. Where an expansion or control joint occurs in surface of construction directly behind plaster membrane.

2. Where, in plastered surfaces of ceilings and walls, distances between, and areas within, control joints exceed, respectively, the following measurements:
   a. 10’ in either direction and 100 square feet.
   b. Where length to width ration exceeds 2-1/2 to 1.
3. Extend joints full width or height of plaster membrane where portland cement plaster panel sizes or dimensions change.

K. Install pre-fabricated expansion joints of 2-piece design where shown as “Expansion Joint”, 3/8” joint width for exterior.

L. Install channel screeds (reveals) where indicated. Where ends of channel sections meet, set in bead of sealant; set all splice plates in mastic.

M. Finish Texture: Float to a consistent and smooth finish.(Other finishes, per approved mock up, and as noted on shop drawings.

N. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess fines to surface.

O. Moist cure finish coat for minimum period of 48 hours.

3.04 REPAIRING

A. Sounding Surfaces:
   1. Sound out all stucco on masonry and poured concrete by dragging a small hammer (4 oz ball peen) over the surface.
   2. Mark all hollow sounding surfaces that indicate a non-bonding of substrate.

B. Cutting and patching:
   1. Cut, patch, point-up, and repair removed plaster as necessary to accommodate other Work and to restore cracks, dents, and imperfections.
   2. Remove plaster to eliminate blisters, buckles, excessive crazing, and check cracking, dry out, efflorescence, sweat-out and similar defects, and where bond to substrate has failed, Replace plaster matching adjacent surfaces.

3.05 PAINTING

A. Prior to painting plaster, ensure the moisture content of the plaster is less than that recommended by the paint manufacturer and the pH of the plaster is less than 10. Verify the moisture content using an electronic moisture meter and the ph using a ph pencil. Test every 1,000 square feet.

3.06 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

3.07 CLEANING

A. Remove temporary protection and enclosure of other Work.

B. Promptly remove plaster from doorframes, windows, and other surfaces, which are not to be plastered.

C. Repair floors, walls and other surfaces, which have been stained, marred, or otherwise damaged during plastering Work.

D. When plastering Work is completed, remove unused materials, containers and equipment, and clean floors of plaster debris.

3.08 PROTECTION

A. Provide final protection and maintain conditions, which ensures plaster Work being without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09260
GYPSUM BOARD SYSTEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SECTION INCLUDES

A. Metal Components for non-load bearing partition walls and Interior suspended ceilings and soffits.

B. Gypsum wallboard:
   1. Fire rated.
   2. Fiberglass reinforced board.

C. Gypsum base coat plaster for filling hollow metal interior door frames.

D. Gypsum sheathing.
   1. Glass-Mat faced
   2. Unfaced mat
   3. Exterior Soffit board
   4. Exterior Fiberglass Mat faced Gypsum Roof Board.

E. Cementitious backing board.

F. Accessories, including exterior soffit vents and Access panels

G. Sound attenuation blanket.

H. Acoustical tape, sealant.

I. Laminating adhesive.

J. Security Mesh.

1.03 RELATED SECTIONS

A. Division 1 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 05400 - Cold - Formed Metal Framing: Exterior and Interior Loadbearing walls and Exterior suspended ceilings and soffits.

C. Section 06100 - Rough Carpentry

D. Section 07270 - Firestopping

E. Section 07920 - Joint Sealants

F. Section 08110 - Steel doors and Frames

G. Section 09240 - Portland Cement Plaster

H. Section 09900 - Painting

I. Section 10522 - Fire Extinguishers Cabinets and Accessories

1.04 REFERENCE STANDARDS

A. ANSI A108 Series/A118 Series/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2012.1.

B. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2012.1.

C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002 (Reapproved 2007).
D. ASTM C630/C630M - Standard Specification for Water-Resistant Gypsum Backing Board; 2000.
E. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2011a.
F. ASTM C656 - Standard Specification for Structural Insulating Board, Calcium Silicate; 2007.
G. ASTM C840 – Standard Specification for the Application and Finishing of Gypsum Board.
H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
I. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2010.
J. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.
K. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2011.
L. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2007a (Reapproved 2011).
M. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing Board; 2012.
N. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2011.
O. ASTM D5420 – Standard Test Method for Impact Resistance of Flat Rigid Plastic By Means of a Striker Impacted by Falling Weight.
P. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
Q. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.
R. ASTM E695 – Standard method for Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact loading.
S. ASTM E 2129 - Standard Practice for Data Collection for Sustainability Assessment of Building Products.
T. FLA (FBC-B) - Florida Building Code: Building; 2010.
U. GA-216 – Recommended Specifications for the Application and Finishing of Gypsum Board.
V. GA-600 – Fire Resistance Design Manual.
W. GreenSeal GS-36 - Commercial Adhesives
X. NAAMM ML/SFA 540 - Lightweight Steel Framing Systems Manual; 1987, Third Edition.
Y. NAAMM ML/SFA 920 - Guide Specifications for Metal Lathing and Furring; 2009.
Z. SCAQMD Rule 1168 - Adhesive and Sealant Application www.aqmd.gov.
AA. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.

1.05 SUBMITTALS

A. Product Data: Submit properly identified product data including material specifications and printed installation directions for system.
   1. Where fire rated partitions and ceilings are indicated, submit manufacturer's U.L. design for each item of construction.
   2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

C. Provide calculations for loadings and stresses of specially fabricated framing and soffitts, stamped by a Professional Structural Engineer.

D. Test Reports: For all stud framing products that do not comply with ASTM C645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections

1.06 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience, written certification by the manufacture for the application of work specified in this section.

C. Unless otherwise specified, comply with applicable requirements of governing codes and authorities and ASTM C754 and C840.

D. Comply with fire-resistance ratings as required by governing authorities and codes. Materials must be listed by Underwriters' Laboratories or tested in accord with ASTM E119.

E. All gypsum board products shall have minimum mold growth ASTM D3273 rating of 10.

F. All components of gypsum board systems shall be by one manufacturer or compatible.

G. Coordination:
   1. Prior to and during installation, coordinate with work of other trades to facilities required openings and finishes.
   2. After Shop Drawing process conduct pre-construction meeting with drywall contractor, architect, owner, project coordinator, and others involved with process.
   3. Prior to pre-construction meeting and installation, contractor to provide manufacturer’s tested assemblies for both fire and STC ratings in conformance with designated ratings noted on plans. Contractor to notify architect of any discrepancies and make proposals of alternate systems prior to bid.

1.07 DELIVERY, STORAGE AND HANDLING:

A. Store material off floor in dry area to prevent damage from moisture or excessive handling.

B. Follow manufacturer’s requirements for on-site storage and handling of materials.

C. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.08 FIELD CONDITIONS

A. Proceed with installation of gypsum board materials only after building is weathertight. Maintain temperature in areas receiving gypsum board materials between 55 degrees and 90 degrees F. during and subsequent to installation and provide adequate ventilation.

1.09 WARRANTY

A. Furnish Owner warranty for a period of five (5) years from date of final acceptance. Warranty shall provide for prompt repair of imperfections at no additional cost to Owner.

B. Warranty shall be signed by Contractor and installer.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Gypsum Board: U.S. Gypsum Co products listed as a standard of quality/ Basis of Design.

1. Use products manufactured by United States based companies only, do not use drywall manufactured in China. The following manufacturers are also approved for use;
   a. National Gypsum Corp; www.nationalgypsum.com
   b. U.S. Gypsum Corp; www.usg.com
   c. Georgia-Pacific Corp; ww.gp.com
   d. Lafarge North America Inc; www.lafarge.com

B. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC; www.clarkdietrich.com
   2. Dietrich Metal Framing; www.dietrichindustries.com
   3. Consolidated Systems, Inc; http://www.csisteel.com
   4. National Gypsum Company; www.nationalgypsum.com

2.02 MATERIALS

A. Metal Framing materials:
   1. Non-Load bearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (240 Pa).
      a. Studs: "C" shaped with flat or formed webs with knurled faces. Minimum Base Metal Thickness: 20 gauge minimums 0.036 inch (0.91 mm).
      b. Runners: U shaped, sized to match studs.
      c. Ceiling Channels: C shaped.
   2. Non-Load bearing Framing System Components behind wall panel systems: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/800 , or 1/8" in 8'-0" maximum allowable tolerance at 5 psf (240 Pa).
      a. Studs: "C" shaped with flat or formed webs with knurled faces. Minimum Base Metal Thickness: 20 gauge minimums 0.036 inch (0.91 mm).
      b. Runners: U shaped, sized to match studs.
      c. Ceiling Channels: C shaped.
   3. Furring Brackets: Serrated-arm-type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C645, min 0.0312 in.(20 gauge) thick base (uncoated) metal, designed for screw-attachment to steel studs and steel rigid furring channels used for furring.
   4. Z-Furring Members: Manufacturer's standard zee-shaped furring members with slotted or non slotted web, fabricated from hot-dip galvanized steel sheet complying with ASTM A525, Coating Designation G60; with min. 0.0312 in. thick (20 gauge)base (uncoated) metal, 1-1/4 in. face flange, 7/8 in. wall-attachment flange, of depth required to fit insulation thickness indicated.
   5. Steel Furring Channel: Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22.2 mm) deep. Minimum Base Metal Thickness: 0.0312 inch (0.79 mm).
   6. Fasteners: Provide fasteners of type, material, size, corrosion-resistance, holding power, and other properties required to securely fasten steel framing and furring members to substrates involved; comply with recommendations of gypsum drywall manufacturer for applications indicated.
   7. Thermal Insulation for Furred Assemblies: Refer to requirements of Section 07210.
   8. Interior Partitions Indicated as Acoustic: Provide completed assemblies with the following characteristics:
      a. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
   9. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
      a. Fire Rated Partitions: 1-HR hour rating typical.
      b. Head of Fire Rated Partitions: 1-HR hour rating.

c. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.

2.03 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

B. Impact-Rated Wallboard: Tested to Level 3 soft-body and hard-body impact in accordance with ASTM C1629.
   1. Application: High-traffic (all extended learning areas, corridors, dining and stairs) areas indicated, and all ramp level spaces.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
   4. Unfaced Type: Interior fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M.
   5. Type: Fire-resistance rated Type X, UL or WH listed, where indicated on plans.
   6. Thickness: 5/8 inch.
   7. Edges: Tapered.
   8. Products:
      a. National Gypsum Company; Gold Bond Hi-Impact Brand XP Wallboard.
      b. Temple-Inland Building Product by Georgia-Pacific, LLC; ComfortGuard IR Impact Resistant.
      c. USG Corporation; Fiberock Brand Panels--VHI Abuse-Resistant.

C. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings, unless otherwise indicated.
   2. Thickness: 5/8 inch (15.8 mm).
   3. Edges: Tapered.

D. Type X: ASTM C36, 5/8 in. thick, tapered long edges.

E. Cementitious Backer Board: Conform to ANSI A118.9
   1. Size: 1/2 in. thick.
   2. Product: Custom Building Products Model Wonderboard, United States Gypsum Co.

F. Gypsum Board Joint Treatment Materials: Comply with ASTM C475.
   1. Acoustical Sealant:
      a. Nondrying, nonhardening, nonskinning, nonstaining gunnable, synthetic rubber.
      b. Product: Ohio Sealants Inc. Model Pro Series SC-170, Pecora Corp. Model BA-98, Tremco Inc. Model Tremco Acoustical Sealant.

2.04 MISCELLANEOUS MATERIALS:

A. General: Provide auxiliary materials for gypsum work of type and grade recommended by gypsum board manufacturer.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum boards.

C. Metal Lath Diamond Mesh Metal Lath: ASTM C847, galvanized; self-furring for gypsum plaster only.
   1. Refer to Section 092400 for Metal Lath for Portland Cement Plaster.

D. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners , except as otherwise indicated.

2. Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners , except as otherwise indicated.
3. Ready-mixed vinyl-based joint compound.
4. Chemical hardening type compound.
   a. USG Durabond Joint Compound 90 as Basis of Design.

E. Sound Attenuation Blankets: Unfaced mineral fiber blanket insulation produced by combining mineral fibers manufactured from glass slag with thermosetting resins to comply with ASTM C665 for Type I (blankets without membrane facing).

F. Thermal Insulation: As specified in Division 7 Section "Building Insulation."

G. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
1. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by a qualified independent testing agency.
2. Hangers: Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.

H. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire

I. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
4. Deflection and Firestop Track: Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.

J. Metal Accessories:
1. Corner Beads; USG Dur-A-Bead No. 101, galvanized or plastic.
2. Metal Trim (Casing Bead): No. 200-A or 200-B metal trim, galvanized or plastic.
3. Aluminum Trim: Extruded accessories of profiles and dimensions indicated
   a. Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), alloy 6063-T5.
   b. Factory-painted, baked-enamel finish.
   c. W shape 2" x 2" reveal -DRWT-200-200 by Fry Reglet - Basis of Design
4. Exterior Soffit Vents: One piece, perforated, ASTM B 221 6063 T5 alloy aluminum, with edge suitable for direct application to gypsum board and manufactured especially for soffit application. Provide continuous vent.
5. Access panels in Gypsum Wallbard
   a. Interior are made of glass fiber reinforced gypsum (GRFG) for interior use --Hinged rounded corner (1 3/4" radius) Basis of Design IntexForms, Inc; www. intextforms-com.
   b. Exterior use shall be glass fiber reinforced cement panels (GRFC)--Hinged rounded corner (1 3/4" radius) Basis of Design IntexForms, Inc; www.intextforms.com.
   c. Coordinate locations with MEP damper locations.
   d. Acceptable Alternate Manufacturers:
      1) Milcor DW.
      2) Nystrom Flush WB.

3) Willaims Bros. WB-DW.

PART 3 – EXECUTION

3.01 GENERAL

A. Install gypsum board systems in strict accord with manufacturer's published installation directions, and as specified herein.

3.02 INSTALLATION OF STEEL FRAMING FOR GYPSUM BOARD PARTITIONS

A. Metal Framing: Install in accordance with ASTM C754 & C840 and manufacturer's instructions.

B. Install floor and ceiling runners as required; do not miter at corners.

C. Install steel framing members 16 inches o.c., plumb, level, true to line, and secured with proper fasteners.

D. Terminate partitions at heights indicated on the drawings.
   1. Where partitions terminate at underside of structural deck, install long leg type ceiling runners leaving 1/2" space between top of stud and web of ceiling runner.
      a. Secure ceiling runners to concrete structure with hardened stub nails or power driven fasteners at 24 inches o.c.
      b. Secure ceiling runners to underside of metal floor or roof decking with concrete topping using power driven fasteners at 24 inches o.c.
      c. Where electrical cellular type metal floor decking is indicated, secure ceiling runners only to concrete filled deck flutes using power driven fasteners at 16" o.c. Do not place fasteners in electrical cells.
   2. Where ceiling runners are located parallel to and directly under electrified metal deck cells or under trench headers, secure partitions ceiling runners to overhead using sections of ceiling runner spanning across electrified deck cell or trench header at 16" o.c. Fasten short runner sections to top of ceiling runners before erection.
      a. Secure each end of short runner sections (with ceiling runner attached) to underside of floor decking on each side of electrified deck cell or trench header. Do not place fastenings in electrical cells.
      b. Secure ceiling runners to underside of metal roof decking without concrete topping using drilled in or self-drilling sheet metal screws at 16" o.c.
   3. Where partitions terminate at suspended acoustical ceilings provide twist clips 16 inches o.c. maximum for attachment of ceiling runner to suspended tees. Attach casing beads to ceiling runner. Prior to attachment, seal gap between partition top and acoustical ceiling with two continuous strips of foam tape applied to top of ceiling runners.

E. Provide additional studs to support inside corners at partition intersections and corners, and to support outside corners, terminations of partitions and both sides of control joints. Provide not less than 3 studs at partition external corners and intersections.

F. Provide 20 gage metal studs at door jambs and at partitions supporting heavy loads such as shelving, wall cabinets, and plumbing fixtures.

G. Coordinate frame openings with hollow metal frames. Provide 20 gage metal studs on each side of door frame openings extended to overhead structure. Framing across top of door frames shall be made of standard floor and ceiling runner with flanges cut and bent 90 degrees at each end.
   1. Install short lengths of studs vertically 16 inches o.c., above door frames, with each flange of each stud secured to top and bottom runners. Provide diagonal stud braces in stud panels over openings over 4 feet wide. Fit diagonal stud braces between top and bottom runners and secure each flange at each end to runners.

H. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

I. Provide all holes, cut outs and notches in framing members for proper installation of electrical and mechanical items. Provide stud framing fastened in partitions as required for support of electrical boxes, telephone boxes, lights, access doors, and other attached or recessed equipment. Provide all stud and ceiling runner reinforcing or additional studs as required to provide straight, plumb and safe partitions, free from weakness. Where studs are cut for pipe, conduit, and other work, reinforce partitions in accord with manufacturer's directions and details.

J. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

K. Where chase walls are indicated thicker than nominal stud depth, provide two rows of metal studs. Studs to be spaced 16 inches o.c. to provide chase wall width desired or as required to accommodate pipes and recessed accessories indicated.
   1. Brace each row of studs together with horizontal metal stud sections spaced 24 inches o.c. maximum, attached to each vertical stud. Form metal stud furred pilasters as required to conceal ducts, pipes, and conduits in finished areas.

L. Provide additional horizontal stiffeners: 4'-0" OC at the following applications;
   1. At single layer partitions over 8'-0" high with studs spaced 16 inches o.c.
   2. At double layer partitions over 10'-0" high with studs spaced 16 inches o.c.

3.03 INSTALLATION OF SUSPENSION SYSTEM COMPONENTS FOR CEILINGS AND SOFFITS

A. General:
   1. Install metal framing in accordance with ASTM C754 except as otherwise specified.
   2. Install the members true to line and level to provide surface flatness with maximum variation of 1/8" in 10' in any direction.
   3. Install metal studs at 16" o.c. unless noted otherwise.

B. Metal Furring Channels
   1. Secure to masonry walls and around door and window openings, intersections, and corners with low velocity power driven anchors.
   2. Install metal furring at 16" o.c. vertically.
   3. Extend furring on exterior walls full height of wall.

C. Hangers:
   1. Secure hangers to concrete construction by attaching to inserts or by drilled-in or power driven attachment devices; by inserting through cast-in-holes in concrete joists; or by looping over joists before slabs are formed. Secure top ends of hanger wires, not hooked in concrete, by inserting through anchor eye and twisting free end three times around wire.
   2. Secure hangers to concrete filled metal deck by inserting "pigtail" hangers thru slots in deck before concrete is poured or by drilling accepted anchor devices through non-electrified sections of metal deck before sprayed fireproofing application, and secure by twisting free ends three times around wire. Do not hang from hanger tabs in deck.
   3. Location and Spacing: Locate hangers plumb in relation to main runners and avoid contact with insulation covering ducts and pipes. Do not pass hangers through ducts. Space hangers in as required to meet design loads. Alter spacing of hangers or provide double hangers splayed to avoid ducts and other obstructions but do not exceed maximum allowable ceiling area to be supported by each hanger. Offset horizontal forces of splayed hangers by counter-splaying bracing or other suitable means.
   4. Provide extra hangers within 6 inches of ends of main runners, to support light fixtures and as required to support diffusers, grilles, access panels and other items resting in or on the ceilings. At control and expansion joints, provide extra hangers as required to support discontinuous runners.
   5. Where overhead structural supporting members are at such spacing that above requirements cannot be complied with, adequate intermediate supports shall be provided,

or main runners shall be made deeper, or heavier, or closer spaced main runners shall be provided as required.

6. Install hanger tabs on metal decking as per manufacturer's recommendations.

D. Main Runners: Suspend main runners on hanger wires, level and true. Size and spacing of main runners as required to meet design loads. Saddle tie main runners to hanger wires. Locate main runners within 6 inches of parallel walls to provide support for cross furring. Splice main runners by lapping 12 inches and wire tying each end of splice with two double strands of 16 gage wire.

E. Furring: Provide standard metal furring or metal screw stud type furring channels of sizes and spacing as required to meet design loads. Attach furring to main runners by saddle tying to main runners with two strands of No. 16 gage wire, or by suitable wire clips. Splice screw stud type furring channels by lapping 8 inches and secure with pan head sheet metal screws.

F. Do not abut runners or furring into masonry or concrete construction; allow one (1) inch clearance, minimum between such construction and ends of runners or furring.

G. Install suspension system to required plane within + 1/8 inch in 12 feet.

H. Grillage Reinforcing: At light fixtures, access doors, and other ceiling openings that interrupt furring, provide additional furring reinforcing to restore grillage strength. Provide furring members at perimeters of ceiling openings.

I. Access Doors: Install access doors furnished under other trades. Provide hanger wire supports at corners of access doors sized 16 inches or larger.

J. Strut Bracing: For ceilings over 100 square feet, in addition to wire hangers, provide l-l/2 inch runner channel or screw stud type struts for each 64 square feet of ceiling, secured to overhead and with bottom ends secured to main runner channels. For ceiling grids not braced by partitions on all sides, provide furring channel "X" braces 8 feet o.c. as required to maintain horizontal stability of ceiling.

3.04 INSTALLATION OF GYPSUM BOARD

A. General: Cut and fit gypsum board by scoring and breaking, or by sawing, working from face side. Smooth cut edges and ends of gypsum board to achieve neat joining. Where gypsum board meets projecting surfaces, scribe and cut. Remove cracked, broken or otherwise damaged boards and replace with new materials.

B. **Wallboard assemblies shall provide full coverage for all installed insulation board/batt. Board shall be extended to and closed at underside of deck at all locations. Insulation may not be left exposed.**

C. Walls and Columns: Apply gypsum board with long dimension parallel to metal stud framing members or metal furring channels. Except for column edges, lay out gypsum board ends and edges to occur over studs or channels, horizontally and vertically. Use gypsum board of maximum practical length to minimize joints. Joints to be neatly fitted and staggered on opposite sides of studs. Cut gypsum board to fit tight to penetrations and abutting items. Allow l/4 inch clear space at floor to prevent wicking. Reduce wicking gap to 1/8 inch at sound-rated partitions. Extend gypsum board upward to structural soffit unless lower extent is indicated, but in no case less than 6 inches above level of suspended ceiling. Cover gypsum board end joints at masonry walls with metal trim strip against a continuous bead of calking.

1. Provide Level 5 finish at all wall areas to recieve wall coverings, custom digital prints wall coverings and any specialty finishes.

D. Ceilings: Apply gypsum board to the ceiling with long dimension at right angles to the furring members. Gypsum board may be applied with long dimension parallel to furring members that are spaced 12 inches o.c. when attachment members are provided at end joints.

E. Double Layer 2 Hour Fire Rated Construction:

1. Screw apply first ply of fire rated gypsum backing board as herein before specified and in accord with manufacturer's directions.

2. Laminate face layer of fire rated gypsum board over first ply using Durabond Joint Compound 210 or 90 applied to entire back surface of face panels and to extreme edges of panels. Apply adhesive in beads approximately 3/8 inch wide at base and ½ inch high spaced 4-1/2 inches o.c. maximum. Stagger joints in face layer with joints in first ply. Laminate face layer to base layer using moderate pressure, temporary supports and suitable screws in accord with manufacturer's directions.

F. Sound Rated Construction: Where sound rated construction is indicated, it shall be in accordance with approved manufacturer's published installation directions.

G. Fire Rated Construction: Where fire rated construction is indicated, it shall be in accord with approved manufacturer's U.L. or F.M. fire rated installation directions.

H. Accessories and Trim: Install accessories and trim as follows:
1. Corner Beads: Install specified corner beads from floor to ceiling line on all external gypsum board surfaces.
2. Casing Beads: Where gypsum board is indicated to be inserted in hollow metal door frames, sidelight frames, casing beads will not be required. Install specified casing beads in all other locations where gypsum board abuts another material and to exposed gypsum board edges.
3. Control Joints: Install control joints in all partitions, ceilings and soffits, spaced not more than 30 feet o.c. Locate control joints in partitions at internal corners or at door frame edges, extending from top of door frame to top of partition. Where no door occurs and control joints are required, install control joints from floor to top of partitions. Where control joints are required on one side of a partition, provide a matching control joint on opposite side of partition. Where a space has a gypsum board ceiling and partition requires a control joint, extend partition control joint through ceiling at same location. After removal of tape joint covers, seal control joints with sealant as specified in Section 07920 "Joint Sealants".
4. Fasten above accessories and trim with staples or crimps in accord with manufacturer's recommendations. Cut end joints square and align for tight neat fit.
5. Flanges of corner beads and control joints shall be coated with not less than two coats of taping compound sanded smooth.
6. Where sound rated partitions are indicated, sound and fire seal behind control joints as recommended by gypsum board manufacturer.

3.05 SUSPENDED GYPSUM BOARD FIRE/DRAFT STOP PARTITIONS IN CEILING PLENUMS

A. Locate suspended fire/draft stop partitions as indicated on the RCP drawings and so that bottom runners are located over acoustical ceiling grid members as indicated and to limit ceiling areas to 10,000 s. f..

B. Fasten top runner to underside of concrete slab with sufficient l/4 inch diameter machine screws in concrete expansion anchors to safely suspend barrier and with screws not more than 12 inch centers, screws staggered. Provide extra fasteners each side each stud as required. Do not mechanically fasten studs or runners to acoustical ceiling system.

C. Attach each metal stud to top runner with sufficient sheet metal screws or bolts to safely suspend partition, and with not less than one screw in each flange of each stud. Provide continuous bottom runners attached to each stud flange with sheet metal screws.

D. Set stud braces every second stud.
1. Use same material as studs.
2. Set braces at 30 degrees minimum. Screw fasten to studs and to underside of concrete slabs with 1/4 inch diameter machine screws in concrete expansion anchors.

E. Provide additional fasteners as required to assure rigid and secure support and bracing of entire system.

F. Gypsum Board joints to be sealed with compound, tape and topping compound. Sanding will not be required.

G. Close gap between bottom of fire draft stop and top of acoustical panel ceiling with properly sized gypsum board strips screwed to studs; coordinate work with Acoustical Panel Ceiling Work.

H. Seal perimeter of partitions and perimeters of partition penetrations air tight with the specified acoustical sealant.

3.06 SOUNDPROOF PARTITIONS

A. Joints on opposite sides of partitions shall not occur on same stud member.

B. Electrical boxes, telephone boxes and other openings shall not be placed back to back.

C. Provide acoustical tape sealing of electrical and telephone boxes after conduits and boxes are installed and before gypsum board is in place. Cover backs and sides of boxes with 1/16 inch thick acoustical tape or acoustical sealant so as to provide air tight soundproofing of all holes in outlet boxes. Close unused knockout openings with metal caps prior to application of tape or sealant.

D. Sound Attenuation Blankets: After installation of electrical and phone conduits and outlet boxes, and after installation of gypsum board on one side of studs, install specified sound attenuation blankets or batts in sound rated partitions tightly packed in partitions to fill voids. Secure blankets or batts by staples or panel adhesive to back of gypsum board.

E. Sealing Gypsum Board Openings: After gypsum board is in place, seal gypsum board openings around outlet boxes and other similar penetrations to gypsum board with acoustical sealant or joint compound and joint reinforcing tape.

F. Perimeter Sealing: Entire perimeter of partitions shall be sealed both sides with specified acoustical sealant, using a minimum of one bead of sealant each side. Cut gypsum boards on loose fit around partition perimeter. Leave a groove no more than 1/8 inch wide.
   1. "Gun" apply solid 1/4 inch minimum round continuous beads of sealant under gypsum board at floor line, at vertical edges of gypsum board abutting cement plaster, masonry or other materials, and at tops of gypsum board partition abutting overhead structure including edges above ceilings.
   2. Coordinate acoustical sealing of mechanical and electrical items such as television outlets, telephone outlets, electrical outlets, medicine cabinets, pipes, conduits and ducts penetrating partitions. Provide acoustical sealing around penetrations not having sealing specified in other sections.
   3. Conceal beads of sealant with floor base, trim or use above ceilings.
   4. At control joints and where gypsum board abuts another material and joints will be exposed, apply acoustical sealant and wipe smooth with a moist rag.

3.07 GYPSUM BOARD ATTACHMENT

A. Space fasteners not less than 3/8 inch nor more than ½ inch from edges and ends of gypsum board. While fasteners are being driven, hold the gypsum board in firm contact with underlying support. Proceed from the central portion of the gypsum board to the ends and edges. If the paper surfaces are broken by fastener in attachment, drive another fastener approximately 2 inches from the faulty fastener.

B. Drive screws with a mechanical tool, using a special bit to provide screwhead penetration just below gypsum board surface, without breaking surface paper or stripping the framing member around the screw.

C. Spacing of Fasteners - Screw Method:
   1. Walls: Space screws 12 inches o.c., maximum.
   2. Ceilings: Space screws 12 inches o.c., maximum.
   3. Fire rated construction: Space screws 12 inches o.c., maximum in field and 8 inches o.c. at edges.

4. Fasten corner beads and trim with fasteners spaced 6 inches o.c., driven through gypsum board into framing members.

3.08 INSTALLATION OF TRIM AND ACCESSORIES

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

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect

C. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
   2. At exterior soffits, not more than 30 feet (10 meters) apart in both directions.

D. Corner Beads: Install at external corners, using longest practical lengths.

E. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

F. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations shown on the drawings. Provide vent area specified.

3.09 JOINT AND FASTENER TREATMENT

A. Mix and use joint finishing materials in accord with manufacturer's published directions. Allow a minimum drying time of 24 hours between coats. Sand as necessary after each application without scuffing paper surface of gypsum board.

B. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

C. Reinforce wall and ceiling angles and inside vertical corner angles with tape folded to conform to the adjoining surfaces and to form a straight, true angle.

D. Embedment Coat: Apply a thin, uniform layer of joint compound (embedding type) approximately 3 inches wide over the joint to be reinforced. Center tape over the joint and seat into the compound, leaving sufficient compound under the tape to provide proper bond. Apply a skim coat of compound immediately after embedding tape.

E. Fill Coat: After drying, apply fill coat over embedding coat by evenly spreading compound over and slightly beyond the tapered edge area of the gypsum board; feather at the edges.

F. Topping: Cover fill coat with topping compound, spread evenly over and slightly beyond the edge of the proceeding coat; feather to a smooth, uniform finish.

G. Fastener Concealment: Treat fastener dimples and holes as described for joint treatment.

H. Conceal flanges of corners beads, casing beads, trim members and control joints by a minimum of two coats of compound applied in accord with manufacturer's published directions.

I. Joints at Penetrations: Where pipes, conduits, ducts, electrical devices, and other items penetrate gypsum board, calk as described in the Joint Sealers Section.

J. Finishes shall comply with ASTM C840 for Gypsum Board Finish levels.
   1. All areas exposed to the public shall have level 5 finish.
      a. Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface where semigloss and eggshell enamels and surfaces subject to severe lighting are indicated (see Section 09900 Painting).
   2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
      a. Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges where panels are substrate for tile.

3. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
   a. Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
4. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.

3.10 GROUTING OF HOLLOW METAL FRAMES

A. Comply with ANSI/NAAMM HMMA 862, “Guide Specifications for Commercial Security Hollow Metal Doors and Frames,” and ANSI/NAAMM HMMA 863, “Guide Specifications for Detention Security Hollow Metal Doors and Frames,” the standards require that “frame jambs shall be fully grouted to provide added security protection against battering, wedging, spreading, and other means of forcing open the door”.

B. Grout Mix: Mortar grout or gypsum –based plaster shall be used.
   1. Corrosion Resistant Coating: Coat frame prior to troweling grout. Asphalt emulsion or other high-build, water-resistant, resilient coating.
   2. Grout shall be installed prior to gypsum wallboard installation.

C. Grouting: After door frames are set up and braced in place, grout frame jambs solid up to jamb anchor clips and before grout sets, rake out grooves to receive gypsum board. After metal studs are in place, including runners and studs over door frame heads, pour grout in runners and before grout sets, rake out grooves to receive gypsum board.

3.11 FIELD QUALITY CONTROL

A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, Architect will conduct an above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

B. Notify Architect seven days in advance of date and time when Project, or part of Project, will be ready for above-ceiling observation.

C. Before notifying Architect, complete the following in areas to receive gypsum board ceilings:
   1. Installation of 80 percent of lighting fixtures, powered for operation
   2. Installation, insulation, and leak and pressure testing of water piping systems.
   3. Installation of air-duct systems.
   4. Installation of air devices
   5. Installation of mechanical system control-air tubing
   6. Installation of ceiling support framing

3.12 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION

SECTION 09300
TILE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications
B. Tile for wall applications.
C. Cementitious backer board as tile substrate.
D. Coated glass mat backer board as tile substrate.
E. Stone/Marble thresholds.

1.02 RELATED REQUIREMENTS

A. Section 07900 - Joint Sealers.
B. Section 09260 - Gypsum Board Assemblies: Installation of tile backer board.
C. Section 15410 - Plumbing Fixtures: Shower receptor.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile - Version; 2013.1.
B. ANSI A108.1A - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2013.1.
C. ANSI A108.1B - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
D. ANSI A108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.
F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2013.1.
G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 2013.1.
H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 2013.1.
I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2013.1.
J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2013.1.
K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2013.1.
L. ANSI A118.1 - American National Standard Specifications for Dry-Set Cement Mortar; 2013.1.
M. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.

N. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2013.1.

O. ANSI A118.5 - American National Standard Specifications for Chemical Resistant Furan Mortars and Grouts for Tile Installation; 2013.1.

P. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2013.1.

Q. ANSI A118.8 - American National Standard Specifications for Modified Epoxy Emulsion Mortar/Grout; 2012.1.

R. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2013.1.

S. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2013.1.

T. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2013.1.

U. ANSI A136.1 - American National Standard Specifications for Organic Adhesives for Installation of Ceramic Tile; 2013.1.

V. ANSI A137.1 - American National Standard Specifications for Ceramic Tile - Version; 2013.1.

W. ASTM C33 - Standard Specification for Concrete Aggregates; 2011.

X. ASTM C627 - Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester

Y. ASTM C847 - Standard Specification for Metal Lath; 2012.

Z. ASTM C1028 - Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method; 2007e1.

AA. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2010.

AB. ASTM D4068 - Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane; 2009.

AC. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.

AD. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

AE. NTMA (SPECS) - [NTMA Terrazzo Specifications]; current edition located at www.ntma.com.

AF. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2013.1.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting a minimum of one week before starting work of this section; require attendance by all affected installers.

B. This Contractor shall inspect the job conditions before starting, and his starting work constitutes approval of conditions. All flooring variations less than 1/8” in 10 ft., chips and cracks are the responsibility of the flooring subcontractor to feather/patch prior to the installation of tile.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.

D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements and ANSI A137.1.

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Tile: 5 percent of each size, color, and surface finish combination, but not less than 10 of each type.

1.06 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.

C. Installer Qualifications: Company specializing in performing tile installation, with minimum of 5 years of documented experience.

D. Flooring shall have slip resistance coefficients of at least the following values :
   1. 0.6 at level floors and walks.
   2. 0.8 at ramps and inclined floors and walks.

E. Slope floors down uniformly 1/8 inch per foot to floor drains located at low points. Ponding is not allowed.

F. Provide material with maximum amount of regional (within 500 miles) material feasible that achieves performance requirements of this Section,

1.07 MOCK-UP

A. See Section 01400 - Quality Requirements, for general requirements for mock-up.

B. Construct tile mock-up where indicated on the drawings, incorporating all components specified for the location.
   1. Minimum size of mock-up is indicated on the drawings.
   2. Approved mock-up may remain as part of the Work, upon approval of Architect and North Miami Library representative.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Packaging and Shipping: Tile to be delivered in original unopened packagingwith legible manufacturer identification, including size, quantity, manufacture date, and inspectorinitials.

B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials, and for a minimum of 7 days after completion.

1.10 WARRANTY:

A. This Contractor shall fully guarantee all materials and labor under this section for a period of one-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

PART 2 PRODUCTS

2.01 TILE

A. General: Provide tile that complies with ANSI A137.1 for types, compositions and other characteristics indicated. Provide tile in the locations and of the types colors and pattern indicated on the Drawings. Tile shall also be provided in accordance with the following:
   1. Factory Blending: For tile exhibiting color variations within the ranges selected under Submittal of samples, blend tile in the factory and package so tile taken from one package shows the same range of colors as those taken from other packages.
   2. Mounting: For factory mounted tile, provide back or edge mounted tile assemblies as standard with the manufacturer, unless otherwise specified.
   3. Factory Applied Temporary Protective Coatings: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with a continuous film of petroleum paraffin wax applied hot. Do not coat unexposed tile surfaces.
   4. Tile shall meet or exceed the ADAAG slip resistance coefficient of 0.6 on static surfaces .75 at wet areas and 0.8 on ramps, and submit documentation to Architect.
   5. Refer to finish plans for size and pattern of tiles if not indicated below, listing below if preliminary list, refer to finish schedule on plans.

B. Concrete Wall Tile Type CN: ANSI A137.1, and as follows:
   1. Flexible Concrete Tile manufactured by Betona Tile .
   2. Size and Shape: As scheduled.
   3. Color(s): As scheduled.
   4. Pattern: See drawings. Final finish color layouts to be provided after award.
   5. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.
   6. Wear Warranty: 10 year limited

C. Porcelain Wall Tile Base Type PB: ANSI A137.1, and as follows:
   1. Time 2.0 manufactured by Florida Tile .
   2. Size and Shape: 4"x24".
   3. Colors: As scheduled.

D. Porcelain Floor Tile Type PT: ANSI A137.1, and as follows:
   1. Time 2.0 manufactured by Florida Tile .
   2. Size and Shape: 12 x12 inch.
   3. Surface Finish: non-slip.
   4. Colors: As shown on the drawings.
   5. Pattern: Refer to plans for sizes and patterns..
   6. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.

E. **SOURCE QUALITY CONTROL**
   1. Tests: Manufacturer to supply independent laboratory for test results on:
      a. Flexural strength ASTM C-293
      b. Water absorption ASTM C-140
      c. Compressive strength ASTM C-140

2. Inspections:
   a. Documented inspection of terrazzo tile quality control tests

2.02 TRIM AND ACCESSORIES

A. Thresholds: Marble, white, honed finish; 2 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.

B. Transition strip: Schluter-Systems, www.schluter.com.

2.03 SETTING MATERIALS

A. Provide setting materials made by the same manufacturer as grout.

B. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
   1. Products:
      a. ProSpec, an Oldcastle brand; B-7000 Epoxy Mortar and Grout: www.prospec.com.

C. Furan Mortar Bond Coat: ANSI A118.5.
   1. Applications: Locker rooms, showers, concessions.

2.04 ADHESIVE MATERIALS

A. Manufacturers:
   1. Bonsal American, an Oldcastle brand: www.bonsal.com
   2. ProSpec, an Oldcastle brand: www.prospec.com.
   3. Bostik Inc: www.bostik-us.com.
   4. LATICRETE International, Inc: www.laticrete.com.
   5. Mapei Corporation; Product ____: www.mapei.com.

B. Organic Adhesive: ANSI A136.1, thinset bond type; use Type I in areas subject to prolonged moisture exposure.

C. Epoxy Adhesive: ANSI A118.3, thinset bond type.

2.05 MORTAR MATERIALS

A. Manufacturers:
   1. Bonsal American, an Oldcastle brand: www.bonsal.com
   2. ProSpec, an Oldcastle brand: www.prospec.com.
   3. Bostik Inc: www.bostik-us.com.
   4. LATICRETE International, Inc: www.laticrete.com.

B. Latex Portland Cement Mortar: ANSI A118.4, composed as follows:
   1. Mixture of Dry-Mortar Mix and Latex Additive: Mixture of pre-packaged dry-mortar mix and liquid-latex additive complying with the following requirements:
      a. Latex Additive: Acrylic Resin
   2. Mortar Bond Coat Materials:
      a. Dry-Set Portland Cement type: ANSI A118.1.
      b. Latex-Portland Cement type: ANSI A118.4.

2.06 GROUTS

A. Manufacturers:
   1. Bonsal American, an Oldcastle brand: www.bonsal.com
   2. ProSpec, an Oldcastle brand; ____: www.prospec.com.
   3. Bostik Inc: www.bostik-us.com.

4. LATICRETE International, Inc; LATICRETE SpectraLOCK PRO Premium Grout: www.laticrete.com.
5. LATICRETE International, Inc: www.laticrete.com.
6. Substitutions: See Section 01600 - Product Requirements.

B. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
1. Applications: All tile locations.
2. Color(s): As selected by Architect from manufacturer's full line.
3. Products:
a. Bostik Inc: www.bostik-us.com.
b. Custom Building Products; CEG-Lite: www.custombuildingproducts.com.
c. LATICRETE International, Inc; LATICRETE SpectraLOCK PRO Premium Grout: www.laticrete.com.

C. General: Provide epoxy grout where noted in plans for exterior locations, group toilet floors and concession areas.

D. Chemical-Resistant, Water-Cleanable, Ceramic Tile-Setting and Grouting Epoxy: ANSI A118.3.
1. Provide product capable of resisting continuous and intermittent exposure to temperatures of up to 140°F and 212°F, respectively as certified by mortar manufacturer for intended use.

E. Standard Grout: Standard cement grout, sanded or unsanded, as specified in ANSI A118.6.
1. Colors: To be selected by Architect from manufacturer's full range.
2. Toxicity/IEQ: Cement based, petroleum-free and plastic-free grout; ANSI A118.4.

2.07 THICK-BED MATERIALS

A. Mortar Bed Materials: Portland cement, sand, latex additive, and water.
1. Products:
a. LATICRETE International, Inc; LATICRETE 3701 Fortified Mortar Bed: www.laticrete.com.
b. Merkrete, by Parex USA, Inc.; Merkrete Underlay C: www.merkrete.com.
c. Substitutions: See Section 01600 - Product Requirements.

B. Cleavage Membrane: 4 mil thick polyethylene film,

C. Waterproofing Membrane Under Mortar Bed at shower pans, tiled tubs and at all second (or elevated) floor restroom areas: Use the following or any material specified for thin-set waterproofing applications.

2.08 THIN-SET ACCESSORY MATERIALS

A. Latex Underlayment: Quick set type, as recommended by membrane manufacturer, as required to provide positive drainage to floor drains.

B. Cleavage Membrane: 4 mil thick polyethylene film.

C. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Type: Fluid-applied.
2. Material: Trowel-applied water-based acrylic membrane, 25 mils thick, minimum, with continuous polyester fabric reinforcement.
3. Products:
a. LATICRETE International, Inc; LATICRETE Hydro Ban: www.laticrete.com.
b. Noble company; NobleSeal TS Thin-set waterproofing membrane; www.noblecompany.com.

D. Waterproofing Membrane at Showers and Tiled Tubs: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.

1. Type: Fluid-applied.
2. Material; Chlorinated Polyethylene (CPD) with a minimum thickness of 1.0 mm (40 mils) meeting ASTM D4068
3. Products:
   a. LATICRETE International, Inc; LATICRETE Hydro Ban: www.laticrete.com.
   b. Noble Company; Chloraloy Shower Pan Liner: www.noblecompany.com.
   c. Substitutions: See Section 01600 - Product Requirements.

E. Underlayment at Floors: Specifically designed for bonding to thin-set setting mortar; not primarily a waterproofing material and having the following characteristics:
1. Crack Isolation: Comply with ANSI A118.12.
2. Do Not Use: Gypsum or cementitious based self-leveling underlayment.

F. Membrane at Walls: 4 mil thick polyethylene film or Noble Company: Wall Seal sheet membrane for shower walls..

G. Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

H. Coated Glass Mat Backer Board: ASTM C1178/C1178M, with coated inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.

I. Mesh Tape: 2-inch wide self-adhesive fiberglass mesh tape.

J. Silicone Sealant: Silicone sealant, moisture and mildew resistant type, white; use for shower floors and shower walls.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

F. All joint design essentials to comply with TCNA EJ171-09. Perimeter controls are mandatory for all installations. All soft joints and expansion joints are to be located directly over cold joints or any substrate expansions. Provide joints as shown on Architectural drawings, if not shown provide at spacing recommended by TCNA.
1. Column lines
2. Cold joints in the substrate concrete
3. Intersections of hallways (in all directions)
4. Door recesses where structural walls are located
5. Over saw-cut concrete control joints

G. Crack Isolation Membrane to be used on non-directional cracks, shrinkage cracks, and all areas where crack transfer is suspected.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Provide anti-fracture and waterproofing memebrane for all elevated (second floor and above) restroom floors at tfull area.

B. Install tile, thresholds, and stair treads and grout, sloping to drains, in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and The Tile Council of North America Handbook recommendations.

C. Request tile pattern. Do not interrupt tile pattern through openings.

D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout. Tile shall be spaced on surfaces to be covered to a minimum width of one-half tile.

F. Accent wall tile shall be installed level and true to line and flush with adjaacent plaster/stucco surface.

G. Form internal angles square and external angles bullnosed.

H. Install thresholds where indicated.Thresholds shall be installed at all wall openings where quarry tile abuts other floor finishes. Maximum threshold height ½" for HDCP requirements.

I. Sound tile after setting. Replace hollow sounding units.

J. Keep expansion joints free of adhesive or grout. Apply sealant to joints.

K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

L. Grout tile joints. Use standard grout unless otherwise indicated.

M. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F102, with standard grout.

B. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
   1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.
   2. Where epoxy bond coat and grout are indicated, install in accordance with TCNA (HB) Method F131.

3.05 INSTALLATION - FLOORS - MORTAR BED METHODS

A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F101, bonded, with standard grout.

B. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated.
   1. Where waterproofing membrane is indicated, with standard grout or no mention of grout type, install in accordance with TCNA (HB) Method F121.

2. Where epoxy bond coat and grout are indicated, install in accordance with TCNA (HB) Method F132, bonded.
3. Where epoxy or furan grout is indicated, but not epoxy or furan bond coat, install in accordance with TCNA (HB) Method F114, with cleavage membrane.

C. All floor slabs to receive tile shall be recessed the depth of the tile and setting bed to provide a level plane at access points. Slabs shall have steel trowel and find broom finishes with no curing compounds used.

D. Slope floors down uniformly 1/8 inch per foot to floor drains located at low points. Ponding is not allowed.

E. Cleavage Membrane: Lap edges and ends.

F. Mortar Bed Thickness: Minimum 1-1/4 inch, unless otherwise indicated.

3.06 INSTALLATION - WALL TILE

A. Over cementitious backer units install in accordance with TCNA (HB) Method W223, organic adhesive.

B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

C. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

D. Where tile abuts doorframes or other items of dissimilar material, a maxiumum 1/4" joint shall be provided. The joints shall be caulked with caulking compound that matches grout.

3.07 CLEANING

A. Clean tile and grout surfaces.

B. Upon completion of the building, all finishes shall be free of all mars, dents, or other visible imperfections.

3.08 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

B. Cover floors with kraft paper and protect from dirt and residue from other trades.

C. Where floor will be exposed for prolonged periods cover with plywood or other similar type walkways

END OF SECTION

SECTION 09511
SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.
B. Perimeter Trim.
C. Acoustical units.
D. Supplementary acoustical insulation above ceiling.

1.02 RELATED REQUIREMENTS

A. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 03300 - Cast-in-Place Concrete: Placement of special anchors or inserts for suspension system.
C. Section 07212 - Board and Batt Insulation: Acoustical insulation.
D. Section 13851 - Fire Alarm System: Fire alarm components in ceiling system.
E. Section 13925 - Fire Suppression Sprinklers: Sprinkler heads in ceiling system.
F. Section 15850 - Air Outlets and Inlets: Air diffusion devices in ceiling.
G. Section 16510 - Interior Luminaires: Light fixtures in ceiling system.

1.03 REFERENCE STANDARDS

A. AA H35.1/H35.1M - Alloy and Temper Designation Systems for Aluminum; 2009
B. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2011
C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a.
D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2010.
E. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
F. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2008.
G. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
H. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2000 (Reapproved 2005).
I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010b.
J. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2011.
K. ASTM E1111 - Standard Test Method for Measuring the Interzone Attenuation of Open Office Components; 2007.
L. ASTM E1414 - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum; 2011.

M. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.

N. ASTM E1477 - Standard Test Method for Luminance Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers; 1998a (Reapproved 2008).

O. CISCA (AC) - Acoustical Ceilings: Use and Practice; 1999.

P. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

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

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling and details. Show locations of items which are to be coordinated with, or supported by the ceilings.

C. Product Data: Provide data on suspension system components and acoustical units.

D. Samples for verification purposes of each type of exposed finish required, prepared on samples of size indicated below and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.
   1. 150 mm (6") square samples of each acoustical panel type, pattern, and color (6 each).
   2. Set of 300 mm (12") long samples of exposed suspension system members, including moldings, for each color and system type required (6 each).

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed, for each type of tile.
   3. Extra Suspension System Components: Furnish quantity of each exposed component equal to 5% of amount installed.

1.06 QUALITY ASSURANCE

A. Single Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work

B. Single Source Responsibility for Suspension System: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

C. Fire-Resistive Assemblies: Complete assembly listed and classified by UL for the fire resistance indicated.
   1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
   2. Flame Spread: 25 or less

3. Smoke Developed: 50 or less

D. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

E. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

F. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

G. Operational Service: Provide manufacturer's maintenance agreement or take-back program service for acoustical ceiling tile installed in project. Service shall reclaim materials for recycling and/or reuse. Service shall not landfill or burn reclaimed materials.

H. Steel Suspension System:
   1. Recycled Content: Provide post-consumer recycled or pre-consumer recycled content.

I. Mineral Base:
   1. Recycled Content: Provide post-consumer recycled or pre-consumer recycled content.
   2. Toxicity/IEQ: Coating or Panel based anti-microbial treatment to inhibit growth of mold and mildew:
      a. Coating-Based Antimicrobial Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment; and showing no mold or mildew growth when tested in accordance with ASTM D3273.
      b. Panel-Based Antimicrobial Treatment: Provide acoustical panels manufactured with antimicrobial treatment in the panels.
   3. Toxicity/IEQ: Mold and mildew resistant:
      a. Perlite Acoustical Panels: Provide volcanic perlite, clay, and inorganic binders.
   4. Toxicity/IEQ: Products shall contain no added formaldehyde.

J. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.08 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

B. Environmental Limitations: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

C. Operational Service: Provide manufacturer's maintenance agreement or take-back program service for acoustical ceiling tile installed in project. Service shall reclaim materials for recycling and/or reuse. Service shall not landfill or burn reclaimed materials

1.09 MOCK-UP

A. Provide ceiling tile system mock-up, 10 feet long by 10 feet wide, illustrating edge conditions all transitions between tile and adjacent surfaces.

B. Locate where directed by Architects.

C. Mock-up may remain as part of the Work, upon approval of Architects.

1.10 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
   1. Acoustical Panels: Sagging and warping.
   2. Grid System: Rusting and manufacturer's defects

C. Warranty Period:
   1. Acoustical technical and field panels: Ten (10) years from date of substantial completion.
   2. Grid: Ten (10) years from date of substantial completion.
   3. Armstrong (basis of Design) commercial transition components, suspension systems and ceiling products have a thirty (30) year warranty when installed together and used under normal conditions.

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

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Manufacturers:
   1. Ceiling Tile: Armstrong World Industries, Inc; Product Optima Series with HumiGuardPlus Square lay-in: www.armstrong.com - Basis of Design
   2. Perimeter Trim: Armstrong World Industries, Inc; Axiom-Classic Custom Perimeter Trim;www.armstrong.com - Basis of Design.
   3. Comparable Products of the following manufacturers are acceptable providing their products equal or exceed the quality specified;
      a. CertainTeed Corporation: www.certainteed.com.
      b. Hunter Douglas Contract: www.hunterdouglascontract.com.
      c. USG: www.usg.com.
      d. Substitutions: See Section 01600 - Product Requirements.

B. Acoustical Units - General:
   1. Standard for Acoustical Ceiling Units: Provide manufacturers' standard units of configuration indicated that comply with ASTM E 1264 classifications as designated by reference to types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.
      a. Mounting Method for Measuring NRC: Type E 400 (plenum mounting in which face of test specimen is 400 mm (15-3/4") away from the test surface) per ASTM E 795.
   2. Units for Installation in Fire-Rated Suspension System: Listed and classified for the fire-resistive assembly the suspension system is a part of.

C. Acoustical Tile Type ACT-2: Plastic faced mineral fiber, ASTM E 1264 Type IV, with the following characteristics:
   1. Size: 24 x 24 inches
   2. Thickness: 3/4" inches.
   3. Composition: Water felted.
   4. NRC Range: 0.60 to 0.95, determined as specified in ASTM E1264.
   5. Edge: Square.

6. Surface Pattern: Smooth, wipeable texture.

D. Acoustical Panels Type ACT-1: Ultima Series with Humiguard Plus, Square Edge by Armstong - Basis of Design, typical unless noted otherwise.
   1. Size: 24 x 24 inches x 3/4", refer to ceiling plans for size
   2. NRC Range: 0.70 to 0.95, determined as specified in ASTM E1264.
   3. Panel Edge: Square.
   4. Surface Color: White.

2.02 SUSPENSION SYSTEM(S)

A. Manufacturers:
   1. Same as for acoustical units.
   2. Basis of Design: Armstrong World Industries, Inc: www.armstrong.com, or approved equal.
   3. Substitutions: See Section 01600 - Product Requirements.

B. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

C. Wide-Face Capped Double-Web Steel Suspension System: Main and cross-runners roll-formed from pre-painted or electrolytic zinc-coated cold-rolled steel sheet, with pre-finished 23 mm (15/16") wide metal caps on flanges; other characteristics as follows:
   1. Structural Classification: Intermediate Duty System.
   2. End Condition of Cross-Runners: Override (stepped) or butt-edge type, as standard with manufacturer.
   3. Cap Material and Finish: Steel sheet painted white.

2.03 CUSTOM PERIMETER TRIM

A. Components: Edge trim system for suspended ceiling system, extruded
   1. Aluminum alloy 6063 trim channel, 10 foot straight or curved profiles to minimum 24 inches inside and outside radii for acoustical and for drywall applications.
   2. Trim Channel: wide face with 3/4 inch horizontal legs, straight or curved sections with special bosses formed for attachment to the tee-bar connection clip or hanging clip; commercial quality, extruded aluminum, factory-finished in factory-applied baked polyester paint (white to match Architect's Sample.
   3. Outside Corner Posts (Straight Only): Commercial quality extruded aluminum sections formed to match the Axiom trim channel profile; pre-assembled with built-in splice plates that connect to straight Axiom sections; 7/8 inch x 7/8 inch x 6”; factory-finished to match trim.
      a. Basis of Design: AX6OSCP - 6” Axiom Classic Outside Corner Post.
   4. Inside Corners (Straight Only): Commercial quality extruded aluminum sections formed to match the Axiom trim channel profile that connect to straight Axiom sections, 12 inch x 3/4 inch x 6" factory-finished in (factory-applied baked polyester paint to match trim.
      a. Basis of Design: AX6QSIS - 6” Axiom inside corner.
   5. Accessories as required for complete installation, Armstrong Axiom Trim pieces -Basis of Design, including but not limited to the following :
      a. AXHGC - Hanging clip, commercial quality aluminum, unfinished, used to align grid members that extend beyond the lower edge of the trim.
      b. AX2HGC - Hanging clip, commercial quality aluminum, unfinished, used when suspension wires must be attached directly to the trim sections.
      c. AXSPLICE - Splice with set screws, galvanized steel, unfinished, used to attached factory-mitered inside corners
      d. AX4SPLICE - Splice with set screws, galvanized steel, unfinished, used to attach joints between sections of trim.

e. AXTBC - T-bar Connector Clip, galvanized steel, unfinished, used to attach channel trim to supporting suspension members.
f. AXSPTHDC - Perimeter Trim Hold Down Clip used to secure cut edges of metal panels at the Axiom trim.
g. AXBTSTR - Drywall Bottom Trim Straight, extruded aluminum, 120 inches x 1-9/64 inch x 27/32 inch, used to finish edges of 5/8 inch drywall that is applied to the bottom surface of the Axiom.
h. AXBTCUR - Drywall Bottom Trim Curved, extruded aluminum, 120 inches x 1-9/64 inch x 27/32 inch, used to finish edges of 5/8 inch drywall that is applied to the bottom surface of the Axiom.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
   1. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
   2. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated as Axiom edge molding, manufacturer's standard moldings for edges and penetrations that fit type of edge detail and suspension system indicated. Provide column surround trim at round columns

C. Retention Clips: Armstrong #414 or similar by other acoustical panel manufacturers.

D. Gypsum Board: Fire rated type; 5/8 inch thick, ends and edges square, paper faced.

E. Tile Adhesive: Type recommended by tile manufacturer, bearing UL label for Class 0-25 flame spread

F. Acoustical Sealant For Perimeter Moldings: Specified in Section 07900.

G. Wire Hangers, Braces, and Ties: ASTM A 641M/ASTM A 641, Class 1 zinc coating, soft temper.
   1. Gage: Provide wire sized so that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct-Hung), will be less than yield stress of wire, but provide not less than 2.69 mm (0.106") diameter wire

H. Gasket For Perimeter Moldings: Closed cell rubber sponge tape.

I. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

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

C. Do not proceed with installation until unsatisfactory conditions have been corrected. Start of work constitutes acceptance of all conditions.

3.02 PREPARATION

A. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
   1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C 636/C 636M, ASTM E 580/E 580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

E. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
   1. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interferes with the location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
   2. Secure wire hangers by looping and wire tying, either directly to structures or to inserts, eye-screws, or other devices that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
   3. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye-screws, or other devices that are secure and appropriate for structure to which hangers are attached as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
   4. Space hangers not more than 1200 mm (48") along each member supported directly from hangers, unless otherwise shown, and provide hangers not more than 200 mm (8") from ends of each member.

G. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

J. Do not eccentrically load system or induce rotation of runners.

K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

3. Install edge moldings of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical units.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.
   2. Double cut and field paint exposed reveal edges.

G. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.

H. Install hold-down clips on panels within 20 ft of an exterior door.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

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

3.06 CLEANING

A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.07 SITE ENVIRONMENTAL PROCEDURES

A. Waste Management: As specified in Section 01 7419 - Construction Waste Management and as follows:
   1. Coordinate with manufacturer for maintenance agreement or take-back program. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION

SECTION 09650
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient base.

B. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03300 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS

A. ASTM D 5603 - 01 Standard Classification for Rubber Compounding Materials—Recycled Vulcanizate Particulate Rubber (2008)

B. ASTM E 2129-10-Standard Practice for Data Collection for Sustainability Assessment of Building Products

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

D. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).

E. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; 2002.

F. CA/DHS/EHLB/R-174Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers

G. GreenSeal GS-36 - Commercial Adhesives; 2000.

H. NSF 332 - Sustainability Assessment Standard for Resilient Floor Coverings

I. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

J. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. See Section 01 3300 - Submittal Procedures.

C. Product Data: Provide data on specified products, describing physical and performance characteristics; Material Safety Data Sheets (MSDS) including sizes, patterns and colors available; and installation instructions.

D. Verification Samples: Submit three samples, 2" x 2" inch in size illustrating color for each accessory product specified.

E. Concrete Testing Standard: Submit a copy of ASTM F710.

F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

H. Finish Flooring Systems: Submit verification that all interior flooring products, including adhesives and floor finish materials, comply with California Department of Health Services Standard Practice for the Testing of Volatile Organic emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda].

I. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Wall Base: 5% linear feet of each type and color.

1.05 QUALITY ASSURANCE

A. VOC emissions: Provide low VOC products. [Comply with California Department of Health Services Standard Practice for the Testing of Volatile Organic emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda] or
   1. Adhesives and sealants: Comply with California's South Coast Air Quality Management District (SCAQMD) #1168
   2. Aerosol adhesives: Comply with Green Seal GS-36
   3. Hard surface flooring: Comply with FloorScore Criteria

B. Provide resilient flooring compliant with NSF 332 Silver level unless noted otherwise.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be delivered to the building site in original unopened containers bearing the manufacturer's name, style name, pattern color name and number, production run, project identification, and handling instructions.

B. Protect roll materials from damage by storing on end.

1.07 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 RESILIENT BASE

A. Resilient Base: RB-1 ASTM F 1861, Type TS rubber, vulcanized thermoset; top set Style Traditional for use with carpet, and as follows:
   1. Height: 4 inch and 6 inch.
   2. Thickness: 0.125 inch thick.
   3. Finish: Satin.
   4. Length: Roll.
   5. Color: as scheduled.
   6. Manufacturers:
      a. Johnsonite, Inc; www.johnsonite.com- Basis of Design
      b. Burke Flooring: www.burkemercer.com.
      c. Roppe Corp: www.roppe.com.
      d. Substitutions: See Section 01600 - Product Requirements.

2.02 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
   1. Primer Toxicity/IEQ: Water-based; clear; of types as approved by resilient flooring manufacturer for specific material and substrates encountered
   2. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.

C. Moldings, Transition and Edge Strips: Metal.

D. Sealer and Wax: Types recommended by flooring manufacturer. Coordiante with Owner for final product requirements. Provide minimum of 4 coats finish at full area.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Test in accordance with ASTM F710.
   2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

C. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

D. Prohibit traffic until filler is cured.

E. Clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.05 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's instructions.

3.06 PROTECTION

END OF SECTION

SECTION 09685
CARPET TILE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

B. Removal of existing carpet tile.

1.02 RELATED REQUIREMENTS

A. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01732 - Waste Management: Reclamation/Recycling of new carpet tile scrap.

C. Section 03300 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2006 (Reapproved 2011).

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2010e1.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

D. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.

E. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute; Current Edition.

F. CRI (GLC) - Green Label Testing Program - Approved Product Categories for Carpet; Carpet and Rug Institute; Current Edition.

G. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; Current Edition.

H. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2011.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate layout of joints.

C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

E. Submit two, 12 inch long samples of edge strip.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01600 - Product Requirements, for additional provisions.
2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet with minimum 5 years experience.

1.06 WARRANTY:

A. Lifetime Limited Warranty , Including Face Wear, Moisture Barrier, Delamination, Tuft Bind, Unraveling and Static Protection.

PART 2 PRODUCTS

2.01 MATERIALS

A. Carpet Tile : Refer to ID sheet,
   1. Product: Infinity Modular manufactured by Mannington Commercial.
   2. Tile Size: 24" x 24" inch, nominal.
   3. Color: See Drawings.
   4. Pattern: See Drawings.
   5. Construction: Graphic Loop
   6. Gage: 1/10 inch.
   7. Stitches: 9 per inch.
   8. Pile Weight: 14 oz/sq yd.
   9. Primary Backing Material: 100% Woven Synthenic.
   10. Secondary Backing Material: Infinity Modular reinforced Composite Closed Cell Polymer.

2.02 ACCESSORIES

A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Edge Strips: Embossed aluminum, To be selected by architect color.

C. Adhesives: Acceptable to carpet tile manufacturer, compatible with materials being adhered; maximum VOC content as specified in Section 01616.

D. Adhesives: Acceptable to carpet tile manufacturer, compatible with materials being adhered; maximum VOC of 50 g/L; CRI Green Label certified; in lieu of labeled product, independent test report showing compliance is acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

D. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Test in accordance with Section 09051.
   2. Test in accordance with ASTM F710.

3. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove existing carpet tile.

B. Prepare floor substrates for installation of flooring in accordance with Section 09051.

C. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

D. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

E. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

F. Vacuum clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet tile in accordance with manufacturer's instructions and CRI Carpet Installation Standard.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.

F. Fully adhere carpet tile to substrate.

G. Trim carpet tile neatly at walls and around interruptions.

H. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09720
WALL COVERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation and prime painting.

B. Wall covering and borders.

1.02 RELATED REQUIREMENTS

A. Section 01616 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09900 - Paints and Coatings: Preparation and priming of substrate surfaces.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

B. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes; 2002 (Reapproved 2007).

C. ASTM F793 - Standard Classification of Wallcovering by Use Characteristics; 2010a.

D. FS L-P-1040 - Plastic Sheets and Strips (Polyvinyl Fluoride); Federal Specifications and Standards; Revision B, 1977.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on wall covering and adhesive.

C. Shop Drawings: Indicate wall elevations with seaming layout.

D. Samples: Submit six samples of wall covering, 12 x 12 inch in size illustrating color, finish, and texture.

E. Manufacturer's Installation Instructions: Indicate special procedures.

F. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01600 - Product Requirements, for additional provisions.
2. Extra Wall Covering Materials: 25 linear feet of each color and pattern of wall covering; store where directed.
3. Package and label each roll by manufacturer, color and pattern, and destination room number.

1.05 QUALITY ASSURANCE

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

1.06 MOCK-UP

A. Provide panel, ___ panel drops wide, full height, illustrating installed wall covering and joint seaming technique.

B. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cycling and cold temperatures.

C. Do not store roll goods on end.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Basis of Design: Maharam Wallcovering .

2.02 MATERIALS

A. Requirements for All Wall Coverings:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

B. Wall Covering - Recycle Stripes (in Young Adult's Area)
   1. Content: 48% Cellulose, 35% Latex, 17% Nylon
   2. Finish: Washable
   3. Backing: None
   4. Reference Dimension: 10'H x 13'4" W
   5. Maintenance: W-Clean with water-based cleanser

C. Wall Covering - Alphabet (in Children's Area)
   1. Color: 004 Turquoise on White
   2. Content: 63% Post-Consumer Recycled Cellulose, 22% Latex, 15% Cellulose
   3. Finish: None
   4. Backing: Polyester/Cotton Osnaburg
   5. Weight: 10.2 oz/ly
   6. Width: 54"
   7. Bolt Size: 50 yards
   8. Maintenance: W-Clean with water-based cleanser

D. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.

E. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

F. Substrate Primer and Sealer: Alkyd enamel type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the wall covering manufacturer.

B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.

C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.

E. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.

F. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tightly.

C. Horizontal seams are not acceptable.

D. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

E. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.

F. Apply wall covering to electrical wall plates prior to replacing.

G. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

B. Reinstall wall plates and accessories removed prior to work of this section.

3.05 PROTECTION

A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

SECTION 09900
PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.
   3. Prime surfaces to receive wall coverings.
   4. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.
      c. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
      d. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Floors, unless specifically so indicated.
   7. Ceramic and other tiles.
   8. Glass.
   9. Acoustical materials, unless specifically so indicated.
   10. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 1100 - Summary of Work

B. Section 01 3214.01 LEED NC 2009 Credit Summary

C. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

D. Section 01 4000 - Quality Requirements: Procedures for testing and certifications.

E. Section 01 6000 - Product Requirements

F. Section 01 7320 - Cleaning & Waste Management

G. Section 01 7700 - Closeout Procedures

H. Section 03 3000 - Cast-in Place Concrete: Preparation of substrates.

I. Section 04 3000 - Unit masonry: Preparation of substrates.

J. Section 05500 - Metal Fabrications: Shop-primed items.

K. Section 05510 - Metal Stairs: Shop-primed items.

L. Section 09 2116 Gypsum Board Assemblies: Preparation of substrates.

M. Section 09960 - High-Performance Coatings.

N. Section 15075 - Mechanical Identification: Painted identification.

O. Section 15075 - Mechanical Identification: Color coding scheme for items to be painted under this section.

P. Section 15076 - Identification for HVAC Piping and Equipment: Color coding scheme for items to be painted under this section.

1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

B. Flat: Lusterless or matte finish with a gloss range below 05 when measured at a 60-degree angle according to ASTM D 523.

C. Eggshell: Low-sheen finish with a gloss range between 05 and 20 when measured at a 60-degree angle according to ASTM D 523.

D. Satin: Low/medium-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree angle according to ASTM D 523.

E. Semigloss: Medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree angle according to ASTM D 523.

F. Full gloss: High-sheen finish with a gloss range more than 65 when measured at a 60-degree angle according to ASTM D 523.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASME A13.1 - Scheme for the Identification of Piping Systems; 2007

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2011.

D. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2012.

E. ASTM D 235 - (Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent); 2002; R 2007

F. ASTM D 523 - Standard Test Method for Specular Gloss; 2008

G. ASTM D2486 - Standard Test Methods for Scrub Resistance of Wall Paints; 2006.

H. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

I. ASTM D 4214 - Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films; 2007

J. ASTM D 4263 - Indicating Moisture in Concrete by the Plastic Sheet MethoD; 1983; R 2005

K. ASTM D 4444 - Use and Calibration of Hand-Held Moisture Meters; 2008

L. ASTM D6386 - Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting; 2010.

M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010b.

N. ASTM E 2129 - Standard Practice for Data Collection for sustainability Assessment of Building Products; 2005

O. ASTM F 1869 - Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2010.

P. GA-214 - Recommended Levels of Gypsum Board Finish; 2007.

Q. GreenSeal GS-11 - Paints; 1993.

R. GS-36 - Commercial Adhesives; 2000.

S. GS-47 - Stains and Finishes.

T. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; 2009, www.paintinfo.com

U. NACE RP0297 - Maintenance Painting of Electrical Substation Apparatus Including Flow Coating of Transformer Radiators;2004

V. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Fourth Edition.

W. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

X. SSPC-SP 1 - Solvent Cleaning; 1982 (Ed. 2004).

Y. SSPC-SP 6 - Commercial Blast Cleaning; 2006.

Z. SSPC-SP 7 - Brush-Off Blast Cleaning; 2006.

AA. USGBC LEED-NC - LEED Green Building Rating System for New Construction and Major Renovations; U.S. Green Building Council; 2009.

AB. SCAQMD Rule 1113 - Architectural Coatings: current edition; www.aqmd.gov.

AC. SCAQMD Rule 1168 - Adhesive and Sealant Application -; current edition; www.aqmd.gov.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. See Section 01340 -Submittal Procedures.

C. Product Data: Provide data on all finishing products, including VOC content.

D. Samples: Submit two painted samples, illustrating selected colors and textures for each color and system selected with specified coats cascaded. Submit on aluminum sheet, 4" x 6" inch in size.

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 Samples on the following substrates for Owner's Representative's review of color and texture only:
   a. Concrete: 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) Samples of masonry, with mortar joint in the center, for each finish and color.
   c. Ferrous Metal: 4-inch- (100-mm-) square Samples of flat metal and 8-inch- (200-mm-) long Samples of solid metal for each color and finish.

E. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

F. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.

G. Certification: By Manufacturer of applicator qualifications.

H. Submit the name, address, telephone number, FAX number, and e-mail address of the contractor that will be performing all surface preparation and coating application. Submit

evidence that key personnel have successfully performed surface preparation and application of coatings on a minimum of three similar projects within the past three years. List information by individual and include the following:

1. Name of individual and proposed position for this work.
2. Information about each previous assignment including:
   a. Position or responsibility
   b. Employer (if other than the Contractor)
   c. Name of facility owner
   d. Mailing address, telephone number
3. Location, size and description of structure
4. Dates work was carried out
5. Description of work carried out on structure

I. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

J. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

K. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

L. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 gallon of each color; store where directed.
   3. Label each container with color, type, texture, and room locations in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum five years documented experience.

B. VOC Content: Determine VOC (Volatile Organic Compound) content of solvent borne and waterborne paints and related coatings in accordance with EPA Method 24 or ASTM D3960. Provide low VOC products. Comply with:
   1. Interior architectural paints: Comply with Green Seal GS-11
   2. Anti-corrosive paints: Comply with Green Seal GS-11
   3. Clear wood finishes: Comply with SCAQMD #1113

C. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience.
   1. Submit the name, address, telephone number, FAX number, and e-mail address of the contractor that will be performing all surface preparation and coating application. Submit evidence that key personnel have successfully performed surface preparation and application of coatings on a minimum of three similar projects within the past three years. List information by individual and include the following:
   2. Name of individual and proposed position for this work.
   3. Information about each previous assignment including:
      a. Position or responsibility
      b. Employer (if other than the Contractor)
      c. Name of facility owner
      d. Mailing address, telephone number, and telex number (if non-US) of facility owner
      e. Name of individual in facility owner's organization who can be contacted as a reference
      f. Location, size and description of structure
      g. Dates work was carried out
      h. Description of work carried out on structure

D. Regulatory Requirements: Conform to applicable code for flame and smoke rating requirements for finishes.

E. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

F. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

G. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
   1. 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, Owner's Representative will select from standard colors and finishes available.

H. 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.
   1. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
   2. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.07 MOCK-UP

A. See Section 01400 - Quality Requirements, for general requirements for mock-up.

B. Provide exterior (Tilt-wall) and masonry field sample at an outside corner condition with finish extending minimum 10' both directions and selected height.

C. Provide a full-coat benchmark (mockups) finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
   1. Owner's Representative 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.
      b. Provide door and frame assembly illustrating paint coating color, texture, and finish.
      c. Small Areas and Items: Owner's Representative 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, Owner's Representative will use the room or surface to evaluate coating systems of a similar nature.

D. Locate where directed.

E. Mock-up may remain as part of the work, upon approval of Owner's Representative and Owner's Representative.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability, comply with provisions of Section 01600.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing, VOC content.

C. Maintain storage containers in a clean condition, free of foreign materials and residue, per manufacturer's instructions.

D. Paint Materials: Store tightly covered containers at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

E. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
   1. Minimum Application Temperature for Varnish and Stain Finishes: 65° F for interior or exterior, unless required otherwise by manufacturer's instructions.
   2. Minimum Application Temperatures for Latex Paints: 45° F for interiors 50° F for exterior unless required otherwise by manufacturer's instructions.
   3. 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).
   4. 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).
   5. Do not apply paint in 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 or is outside the humidity ranges required by the paint product manufacturer..
      a. 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.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

D. Dispose of waste in accordance with applicable regulations.

E. VOC Content: Determine VOC (Volatile Organic Compound) content of solvent borne and waterborne paints and related coatings in accordance with EPA Method 24 or ASTM D3960.

PART 2 PRODUCTS

2.01 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. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOC numbers used in this document need to be confirmed by using the products MSDS sheets.

C. Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions:
   1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
   2. Non-Flat Paints and Coatings: VOC content of not more than 150 g/L.

3. Anticorrosive Paints: VOC content of not more than 250 g/L.
4. Varnishes and Sanding Sealers: VOC content of not more than 350 g/L.
5. Stains: VOC content of not more than 250 g/L.
6. Aromatic Compounds: Paints and coating shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing on or more benzene rings).
7. Restricted Components: Paints and coatings shall not contain any of the following: Acrolein.,Acrylonitrile, Antimony. Benzene, Butyl benzyl phthalate,Cadmium. ? Di (2-ethylhexyl) phthalate, Di-n-butyl phthalate ,Di-n-octyl phthalate,.1,2-dichlorobenzene, Diethyl phthalate, Dimethyl phthalate, Ethylbenzene, Formaldehyde., Hexavalent chromium, Isophorone, Lead, Mercury, Methyl ethyl ketone, Methyl isobutyl ketone, Methylene chloride, Naphthalene, Toluene (methylbenzene), 1,1,1-trichloroethane, Vinyl chloride.

D. Colors: Match colors on Owner's Representative's approved samples. Aproximately 30 percent of surface area will be painted with deep tones.

2.02 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

C. Paints, Transparent Fishes, Stains:
1. Benjamin Moore & Co: Product: Eco Spec: www.benjaminmoore.com. - Basis of Design -Colors noted on drawings as "Owner's Representative's (Owner) approved sample "
2. PPG Architectural Finishes, Inc: Product: no VOC Paint.: www.ppgaf.com.
3. Sherwin-Williams Company: Product Harmony; www.sherwin-williams.com.

D. Substitutions: See Section 01600 - Product Requirements.

2.03 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
1. Toxicity/IEQ: Comply with applicable regulations regarding toxic and hazardous materials, and as specified. Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements.
   a. Interior paint: Comply with GS-11.
   b. Exterior paint: Comply with GS-11.
2. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
4. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
5. Supply each coating material in quantity required to complete entire project's work from a single production run.
6. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content: Comply with Section 01616.

D. Wood and Concrete Sealers

1. Biobased content:
   a. Membrane Concrete Sealers: Products that are penetrating liquids formulated to protect wood and/or concrete, including masonry and fiber cement siding, from damage caused by insects, moisture, and decaying fungi and to make surfaces water resistant. Concrete sealers that are formulated to form a protective layer on the surface of the substrate. Provide minimum 11% biobased content.
   b. Penetrating Liquids: Products that are penetrating liquids formulated to protect wood and/or concrete, including masonry and fiber cement siding, from damage caused by insects, moisture, and decaying fungi and to make surfaces water resistant. Wood and concrete sealers that are formulated to penetrate the outer surface of the substrate. Provide minimum 79% biobased content.

E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

F. Colors: As indicated on drawings
   1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
   2. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

2.04 CONCRETE UNIT MASONRY BLOCK FILLERS

A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.

B. 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).

C. Glidden Professional 3010 Concrete Coatings Block Filler Interior/Exterior Applied at DFT 9.0-13.6

D. PPG Pittsburgh Paints; 6-15 SpeedHide Interior/Exterior Masonry Latex Block Filler: Applied at a dry film thickness of not less than 7.0 mils.

E. Sherwin-Williams; PrepRite Interior/Exterior Block Filler B25W25: Applied at a dry film thickness of not less than 8.0 mils (0.203 mm).

F. Sherwin-Williams; Heavy Duty Block Filler B42W46: Applied at a dry film thickness of not less than 10.0 mils (0.254 mm).

2.05 PAINT SYSTEMS - INTERIOR

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. Glidden Professional 1000 High Hide Interior Primer Sealer. Applied DFT 1.2-1.3
   3. PPG Pittsburgh Paints; 4-503 Perma Crete Acrylic Concrete and Stucco primer: Applied at a dry film thickness of not less than 1.3 mil (0.033 mm).
   4. Sherwin-Williams; Loxon Exterior Masonry Acrylic Primer A24W8300: Applied at a dry film thickness of not less than 3.0 mils (0.076 mm). (For Masonry surfaces) (<100 g/l voc)
   5. Sherwin-Williams; PrepRite Interior/Exterior Block Filler B25W25: Applied at a dry film thickness of not less than 8.0 mils (0.203 mm). (for CMU) (<50 g/l voc)

B. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application
   1. Benjamin Moore; Eco Spec Interior Latex Primer Sealer No. 231: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
   2. GLidden Professional 9116 Lifemaster NO VOC Interior Primer. Applied DFT 1.4-1.6
   3. PPG_Pittsburgh Paints; 6-4900 SpeedHide Zero Interior Quick-Drying Latex Sealer: Applied at a dry film thickness of not less than 1.0 mil (0.025 mm).

4. Sherwin-Williams; ProGreen 200 Interior Latex Wall Primer, B28W600 Applied at a dry film thickness of not less than 1.0 mil (0.0275 mm). (43 g/l voc)

C. 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. Glidden Professional Devflex 4020PF Direct To Metal Primer. Applied DFT 2.2-3.5
   3. PPG Pittsburgh Paints; 90-912 Pitt-Tech Plus Interior/Exterior Primer/Finish DTM Industrial Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
   4. Sherwin-Williams; Pro Industrial Pro-Cryl® Universal Acrylic Primer B66-310 Series: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm). (<100 g/l voc)

D. 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. Glidden Professional Devflex 4020PF Direct To Metal Primer. Applied DFT 2.2-3.5
   3. PPG Pittsburgh Paints; 90-912 Pitt-Tech Plus Interior/Exterior Primer/Finish DTM Industrial Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
   4. Sherwin-Williams; Pro Industrial Pro-Cryl® Universal Acrylic Primer B66-310 Series: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm). (<100 g/l voc)

E. FL, Interior Flat Acrylic Paint: Factory-formulated flat acrylic-emulsion latex paint for interior application
   1. Benjamin Moore; Eco Spec Interior Latex Flat No. 219: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
   2. Glidden Professional 1210V Ultra Hide 150 NO VOC Interior Flat Paint. Applied DFT 1.3-1.5
   3. Glidden Professional 9100 Lifemaster NO VOC Interior Flat Paint. Applied DFT 1.4-1.6
   4. Pittsburgh Paints; 6-4900 Line SpeedHide Zero Interior Wall Flat-Latex Paint: Applied at a dry film thickness of not less than 1.0 mil (0.025 mm).
   5. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Flat Wall Paint B30-2600 Series: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm). (0 g/l voc)
   6. Sherwin-Williams; Harmony Interior Latex Flat Wall Paint B5 Series: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm)

F. Interior Flat Latex-Emulsion Size: Factory-formulated flat latex-based interior paint.
   1. Benjamin Moore; Eco Spec Interior Latex Flat No. 219: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
   2. Glidden Professional 9100 Lifemaster NO VOC Interior Flat Paint. Applied DFT 1.4-1.6
   3. PPG Pittsburgh Paints; 6-4110Line SpeedHide Zero Interior Wall Flat-Latex Paint: Applied at a dry film thickness of not less than 1.3 mil (0.033 mm).
   4. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Flat Wall Paint B30-2600 Series: Applied at a dry film thickness of not less than 1.6 mils (0.036 mm). (0 g/l voc)
   5. Sherwin-Williams; ProMar 200 Interior Latex Flat Wall Paint B30W200 Series: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).

G. LES, Interior Low-Luster Acrylic Enamel: Factory-formulated eggshell acrylic-latex interior enamel
   1. Benjamin Moore; Eco Super Spec Interior Latex Eggshell Enamel No. 223: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).
   2. Glidden Professional 1412V Ultra Hide 150 NO VOC Interior Flat Paint. Applied DFT 1.3-1.5
   3. Glidden Professional 9300 Lifemaster NO VOC Interior Flat Paint. Applied DFT 1.4-1.6
   4. PPG Pittsburgh Paints; 6-4310 SpeedHide Zero Interior Eggshell Acrylic Latex Enamel: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).

5. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Eg-Shell Enamel B20-2600 Series: Applied at a dry film thickness of not less than 1.6 mils(0.041 mm). (0 g/l voc)
6. Sherwin-Williams; Harmony Interior Latex Eg-Shell Enamel B9 Series: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

H. LSG, Interior Semigloss Acrylic Enamel: Factory-formulated semigloss acrylic-latex enamel for interior application.
1. Benjamin Moore; Eco Spec Latex Semi-Gloss Enamel No. 224: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
2. Glidden Professional 1416V Ultra Hide 150 NO VOC Interior Flat Paint. Applied DFT 1.3-1.5
3. Glidden Professional 9200 Lifemaster NO VOC Interior Flat Paint. Applied DFT 1.4-1.6
4. PPG Pittsburgh Paints; 6-4510 Series SpeedHide Zero Interior Semi-Gloss Latex: Applied at a dry film thickness of not less than 1.4 mil (0.036 mm).
5. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel B31-2600 Series: Applied at a dry film thickness of not less than 1.7 mils(0.033 mm). (0 g/l voc)
6. Sherwin-Williams; Harmony Latex Semi-Gloss Enamel B10 Series: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

I. IDF, Interior Dry Fog Finish for metal surfaces: Eggshell, alkyd or acrylic-latex¬based interior paint. (inside of Mechanical ducts)
1. Duron; 93-834 Dura-Clad Eggshell: Applied at a dry film thickness of not less than 2.5 mils (0.064 mm).
2. Glidden Professional 1482 Waterborne Interior Eggshell Dry Fall. Applied DFT 1.5-2.0
3. PPG Porter; 6-724XI Speedhide Super Tech WB Semi Gloss Acrylic Dry Fog: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
4. Sherwin-Williams; Pro Industrial Waterborne Dryfall Eg-Shel, B42W82 Series: Applied at a dry film thickness of not less than 2.5 mils (0.064 mm). (34 g/l voc).

J. P-12 and P14 , Interior Decorative Finish as noted on Schedule.
1. Pre-Base: Provide primer recommended by manufacturer for substrate.
   a. Concrete and Masonry: Suitable heavy-bodied latex vinyl acrylic block filler (if filling pores is desired).
   b. Primed Metals: Bonding pre-base.
   c. Unprimed Metals: In accordance with the manufacturer's recommendations.
   d. New Gypsum Board:
      1) Basis of Design: "EnviroMetal Pre-Base Primer/Sealer," Master Coating Technologies.
   e. Ceramic Tile and Glazed Block:
      1) Basis of Design: "EnviroMetal Pre-Base Bonding Primer," Master Coating Technologies.
2. Metallic Finish System Components:
   a. Base Coat: Water-based polyurethane/acrylic base coat and cross-linker.
      1) Basis of Design: "EnviroMetal EM200," Master Coating Technologies.
   b. Miscellaneous Materials: Surface patching compounds and other materials necessary for application of finish system shall be of high quality and compatible with coating system.

2.06 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler, per manufacturer's recommendation.

C. Fastener Head Cover Material: Latex filler per manufacturer's recommendation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.
   1. Remove items which are not to be coated from surfaces that are to be coated. Tag and protect removed items and store until re-installation. Re-install items after completion of coating application. Items which are not to be coated include, but shall not be limited to, operating hardware, electrical device plates, and factory-finished Items.
   2. Patch and repair substrates as specified in applicable specifications sections. Clean substrates. Remove dirt, grit, loose materials, grease, oil, temporary protective coatings, contamination, other foreign materials, etc. Sand with 100 grit or finer sand paper, spackle, putty, and caulk existing surfaces to produce smooth and uniform substrates. Spot-prime existing water-soluble stains with alcohol or oil-based stain killing primer. Touch-up painted or primed surfaces with compatible paint or specified primer.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
   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.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

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

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Plaster and Stucco: 12 percent.
   3. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
   6. Concrete Floors and Traffic Surfaces: 8 percent.

G. 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 Owner's Representative about anticipated problems when using the materials specified over substrates primed by others.

3.02 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Clean surfaces thoroughly and correct defects prior to coating application.

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

D. Remove or repair existing coatings that exhibit surface defects.

E. 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.

F. Provide barrier coats over incompatible primers or remove and reprime

G. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

H. Seal surfaces that might cause bleed through or staining of topcoat.

I. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

J. 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
   1. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
   2. 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.
   3. 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.
   4. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

K. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
   1. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
   2. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

L. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment and passivator treatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

M. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

N. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

O. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.

P. Concrete Floors and Traffic Surfaces to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

Q. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

R. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

S. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

T. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

U. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

V. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

W. 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.

X. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
   1. 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.

3.03 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. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
   9. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
   10. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

F. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

G. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

H. Sand wood and metal surfaces lightly between coats to achieve required finish.

I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 APPLICATION OF DECORATIVE SURFACES

A. Applicator shall apply finishes in accordance with manufacturer's written instructions and using manufacturer-approved equipment. Finishes may be applied using a standard roller in conjunction with a high-nap roller such as Wooster Polar Bear (rolled finish) or nylon bristle brush (brushed finish).
   1. Closets and storage areas shall be finished inside in the same manner as adjoining rooms.
   2. Finish HVAC registers and grilles and other items located in surfaces to receive coatings.

B. Apply as many under coats as necessary to produce a uniform substrate appearance. Do not exceed manufacturer’s recommended coverage rate. Allow to dry prior to application of subsequent coats.

C. Re-prime suction and hot spots on substrate prior to applying base coatings.

D. Over wood and gypsum board, sand primer with 100 grit or finer sand paper. Thoroughly remove dust from sanding with a clean, wet rag.

E. Apply each coat to a natural break point such as an edge or corner without stopping.

F. Finishes shall match approved benchmark samples and shall be free of runs, sags, holidays, and excessive irregularity/unevenness of pattern coat. Transitions between colors and/or other materials shall be sharp, clean and without overlaps

3.05 FIELD QUALITY CONTROL

A. See Section 01400 - Quality Requirements, for general requirements for field inspection.

B. 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:

C. Owner will engage a qualified independent testing agency to sample paint material being used, or to inspect and test paint for dry film thickness. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.

D. 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.

E. Owner will provide field inspection.

3.06 SITE ENVIRONMENTAL PROCEDURES

A. Indoor Air Quality: Provide temporary ventilation as specified in Section 01 5721- Indoor Air Quality (IAQ) Management.

B. Waste Management: As specified in Section 01 7439 - Construction Waste Management and as follows:

1. Coordinate with manufacturer for take-back program. Set aside scrap to be returned to manufacturer for recycling into new product. Close and seal all partially used containers of paint to maintain quality as necessary for reuse.

3.07 CLEANING

A. Collect waste material ,cans, rags, rubbish, and other discarded paint materials that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.08 PROTECTION

A. Protect finished coatings until completion of project.
   1. Protect work of other trades, whether being painted or not, against damage from painting.
   2. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Owner's Representative.

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.

C. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

D. Touch-up damaged coatings after Substantial Completion.

3.09 SCHEDULE - PAINT SYSTEMS

A. 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.

B. 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.

C. 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.

D. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

E. 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.

F. 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.

G. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements

3.10 INTERIOR PAINT SCHEDULE

A. Concrete and Masonry (Other Than Concrete Unit Masonry): Provide the following Low-Odor/VOC Latex Systems over interior concrete and brick masonry substrates:
   1. LES, Low-Luster Acrylic-Enamel Finish: Two finish coats over a primer
      a. Interior concrete and masonry primer
      b. Finish Coats: Interior low-luster acrylic enamel.

B. Concrete Unit Masonry: Provide the following finish systems over interior concrete masonry:
   1. LES, Low-Luster Acrylic-Enamel Finish: Two finish coats over a block filler
      a. Primer: Interior concrete and masonry primer
      b. Finish Coats: Interior flat acrylic paint.

C. Gypsum Board: Provide the following Low-Odor/VOC Latex Systems over interior gypsum board surfaces:
   1. LES, 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.
   2. LSG, Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.
      a. Interior concrete and masonry primer
      b. Finish Coats: Interior semigloss acrylic enamel.

D. Gypsum Board under visual display surfaces or wallcovering: Provide the following Low-Odor/VOC Latex Systems over interior gypsum board surfaces to receive visual display surfaces or wallcovering:
   1. Interior Flat Latex-Emulsion Size: One finish coat over a primer
      a. Primer: Interior gypsum board primer
      b. Finish Coats: Interior Flat Latex-Emulsion Size.

E. Ferrous Metal: Provide the following Low-Odor/VOC Latex Systems over ferrous metal:
   1. OSG, Semigloss Alkyd-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior ferrous-metal primer.
      b. Finish Coats: Interior semigloss alkyd enamel.
   2. IDF; Interior Dry Fog Finish: Two finish coats over a primer.
      a. Primer: Interior ferrous-metal primer.
      b. First and Second Coats: Eggshell, alkyd or acrylic-latex-based, interior paint.

F. Zinc-Coated Metal: Provide the following Low-Odor/VOC Latex Systems over interior zinc-coated metal surfaces:
   1. OSG, Semigloss Alkyd-Enamel Finish: Two finish coats over a primer.
      a. Primer: Interior zinc-coated metal primer.
      b. Finish Coats: Interior semigloss alkyd enamel.
   2. IDF; Interior Dry Fog Finish: Two finish coats over a primer.
      a. Primer: Interior zinc-coated metal primer.
      b. First and Second Coats: Eggshell, alkyd or acrylic-latex-based, interiorpaint.

3.11 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Division 15 and Division 16 for schedule of color-coding and identification banding of equipment, ductwork, piping, and conduit.

B. Paint the following work where exposed to view at exterior:
   1. Equipment, including panelboards and switch gear.
   2. Uninsulated metal piping.
   3. Uninsulated plastic piping.
   4. Pipe hangers and supports.
   5. Metal conduit.
   6. Plastic conduit.

C. Paint the following work where exposed in equipment rooms:
   1. Equipment, including panelboards and switch gear.
   2. Uninsulated metal piping.
   3. Uninsulated plastic piping.
   4. Pipe hangers and supports.
   5. Metal conduit.
   6. Plastic conduit.
   7. Tanks that do not have factory-applied final finishes.
   8. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

D. Paint the following work where exposed in occupied spaces:
   1. Equipment, including panelboards.
   2. Uninsulated metal piping.
   3. Uninsulated plastic piping.
   4. Pipe hangers and supports.
   5. Metal conduit.
   6. Plastic conduit.
   7. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
   8. Other items as directed by Owner's Representative.

E. Paint shop primed equipment.

F. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

G. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, in finished areas, except where items are pre-finished.

H. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles and to match face panels.

I. Paint exposed conduit and electrical equipment occurring in finished areas.

J. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

K. Color code equipment, piping, conduit, and exposed ductwork in accordance with requirements indicated. Color band and identify with flow arrows, names, and numbering.

3.12 SCHEDULE - COLORS:

A. Refer to plans for all colors scheduled.

END OF SECTION

10 DIVISION

SECTION 10160
METAL TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal toilet compartments.

B. Urinal and Vestibule screens.

1.02 RELATED REQUIREMENTS

A. Section 05120 - Structural Steel: Concealed steel support members.

B. Section 06100 - Rough Carpentry: Blocking and supports.

C. Section 10800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. ASTM A424 - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

C. Product Data: Provide data on panel construction, hardware, and accessories.

D. Samples: Submit two samples of partition panels, ____x____ inch in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Toilet Compartments:

1. Hadrian; Product Elite Series: www.hadrian-inc.com - basis of design
2. Global Steel Products Corp; Product ____: www.globalpartitions.com.
3. Metpar Corp; Product _____: www.metpar.com.
4. Substitutions: Section 01600 - Product Requirements.

2.02 MATERIALS

A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

B. Steel Sheet for Porcelain Enameling: ASTM A424, Type I, Commercial Steel.

C. Stainless Steel Sheet: ASTM A666, Type 304.

2.03 COMPONENTS

A. Toilet Compartments: Powder coated steel, floor-mounted headrail-braced.

B. Doors, Panels, and Pilasters: Sheet steel faces, laminated under pressure to a honeycomb core for sound deadening and rigidity, formed and closed edges to be welded together and inter-locked under tension with a roll-formed oval crown locking bar, mitred and ground smooth at corners. Honeycomb to have a maximum 25mm (1") cell size.

C. Door and Panel Dimensions:
   1. Thickness: 1 inch with cover sheet not less than 0.8mm (.030").
   2. Door Width: 24 inch.
   3. Door Width for Handicapped Use: 36 inch, out-swinging.
   4. Height: 64 inch.

D. Pilasters: 1-1/4 inch thick wth cover sheets not less than 0.9m (.036"), of sizes required to suit compartment width and spacing.

E. Urinal Screens: Wall mounted with two panel brackets, and floor-to-ceiling vertical upright consisting of pilaster anchored to floor and ceiling.

2.04 ACCESSORIES

A. Pilaster Shoes: Formed chromed steel with polished finish, 4" inch high, concealing floor fastenings.

B. Head Rails: Hollow anodized aluminum tube, 1 x 1-5/8 inch size, with anti-grip strips and cast socket wall brackets.

C. Brackets: Polished chrome-plated non-ferrous cast metal.

D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

E. Hardware: Polished chrome plated non-ferrous cast metal:
   1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
   2. Thumb turn or sliding door latch with exterior emergency access feature.
   3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
   4. Coat hook with rubber bumper; one per compartment, mounted on door.
   5. Provide door pull for outswinging doors.

2.05 FINISHING

A. Powder Coated Steel Compartments: Clean, degrease, and neutralize. Follow immediately with a phosphatizing treatment, prime coat and two finish coats powder coat enamel.

B. Color: 621 Slate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that field measurements are as indicated.

C. Verify correct spacing of and between plumbing fixtures.

D. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

END OF SECTION

SECTION 10400
IDENTIFICATION DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Room and door signs.

B. Interior directional and informational signs.

C. Emergency evacuation maps.

D. Interior signs

1.02 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition; (ADA Standards for Accessible Design).

B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

C. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; 2002.

D. FLA (FBC-B) - Florida Building Code: Building; 2010.

1. FBC-B High Velocity Hurricane Zones (HVHZ) Protocols and required product Notice of Acceptance (NOA).

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of signs and letters with size, location and installation of service utilities and lighting systems.

B. Preinstallation Meeting: Conduct a preinstallation meeting a minimum two weeks prior to the start of the work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
3. Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

F. Verification Samples: Submit samples showing colors specified.

G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01600 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

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

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for signage and letters.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ASI Sign Systems, Inc; www.asisignage.com - Basis of Design

B. Best Sign Systems, Inc: www.bestsigns.com.

C. Mohawk Sign Systems, Inc: www.mohawksign.com.

D. Seton Identification Products: www.seton.com/aec.

E. Substitutions: See Section 01600 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: All signs are required to comply with ADA Standards for Accessible Design and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign as indicated on plan.
   1. Sign Type: Flat signs with _____ panel media as specified.
   2. 1/8" thick minimum plastic laminated material with .008" thick minimum plastic face layer. Tape applied or glued raised text, Braille, or symbols are not allowed.
   3. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
   4. Character Height: 1 inch.White 1/32" raised upper case sans serif or simple serif type letters for room names and room numbers, raised symbols or pictograms,
   5. Sign Height: 3 inches, unless otherwise indicated on plans.
   6. Office Doors: Identify with room numbers to be determined later, not the numbers shown on the drawings; in addition, provide "window" section for replaceable occupant name.
   7. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers shown on the drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
   8. Service Rooms: Identify with room names and numbers to be determined later, not those shown on the drawings.
   9. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

C. Interior Directional and Informational Signs:

1. Sign Type: Same as room and door signs.
2. Allow for 20 signs 4 inches high by 16 inches long.
3. Wording of signs is scheduled on the drawings, and to be confirmed with Owner prior to shop drawings.
4. Where suspended, ceiling mounted, or projecting from wall signs are indicated, provide two-sided signs with same information on both sides.

D. Life-Safety Signage:
1. Sign Type: Similar to room and door signs.
2. Provide red background signage at the following locations and where required by code:
3. "FIRE EXTINGUISHER INSIDE" at the main entry door of a room containing a fire extinguisher.
4. “STORAGE NOT PERMITTED” at mechanical, electrical, and kiln rooms.
5. Maximum capacity of instructional or assembly spaces. Locate in the space, next to the main entry door

E. Emergency Evacuation Maps:
1. Allow for one map adjacent to interior door at all occupied spaces.
2. Map content to be coordinated with the Owner, building inspector and architect. All graphics and designs to developed by contractor for owner review.
3. Use clear plastic panel silk-screened on reverse, in finished aluminum frame, screw-mounted.

F. Interior Letter Signs:
1. Metal letters:
   a. Use individual letters
   b. Letter Cap Height:12"
   c. Letter Depth: 1/4"
   d. Color: brushed aluminum
   e. Font: Arial
   f. Mounting Method: Projected Stud Mount and/or flush mount, to be coordinated with Architect prior to installation.
2. Decal letters:
   a. Use indivual vinyl letters
   b. 6"H and 12" H, location shown on drawings.
   c. Font: Arial
   d. Color: to be selected by architect from manufacturer's standard options
   e. Mouting Method: Presure sensitive adhesive.

G. Obstruction Warnings:
1. Comply with FBC life safety potential hazards.
2. Provide padding with colored striping for TV brackets below 6'8":
   a. Apply padding to exposed lower edges and corners of bracket with screws at 6 inches on center and double stick tape

2.03 SIGN TYPES

A. Flat Signs: Signage media without frame.
1. Edges: Square.thickness of at least 1/8”. Tape applied or glued raised text, Braille, or symbols are not allowed.
2. Corners: Square.
3. Wall Mounting of One-Sided Signs: Concealed tamperproof screwsand double stick tape or adhesives at mounting heights of 42 or 60 inches above finish floor to sign centerline at locations according to FBC and accessibility requirements.

4. Wall and Ceiling Mounting of Two-Sided Signs: Aluminum wall bracket, powder coated, color selected from manufacturer's standard colors, attached with screws in predrilled mounting holes, set in clear silicone sealant.
5. Suspended Mounting: Stainless steel suspension cables, cable clamps, and ceiling fastener suitable for attachment to ceiling construction indicated.

B. Room adn Door Color and Font: Unless otherwise indicated:
1. Character Font: Helvetica, Arial, or other sans serif font.
2. Character Case: Upper case only.
3. Background Color: As selected by Architect .
4. Character Color: Contrasting color as selected by Architect.

2.04 TACTILE SIGNAGE MEDIA

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
1. Total Thickness: 1/16 inch.

2.05 ACCESSORIES

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

B. Exposed Screws: Chrome plated.

C. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Scheduling of installation by Owner or it's representative implies that substrate and conditions are prepared and ready for product installation. Proceeding with installation implies installer's acceptance of substrate and conditions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install product at heights to conform to Americans with Disabilities Act Accessibility Guidelines (ADAAG) and applicable local amendments and regulations.

C. Install signs within the following tolerances and in accordance with manufacturer's recommendations:
1. Interior Signs: Within 1/4 inch vertically and horizontally of intended location.
2. Exterior Signs: Within 1 inch vertically and horizontally of intended location.

D. Install neatly, with horizontal edges level.

E. Plaque
1. Casting shall be free of pits and gas holes and all letters shall be sharp and hand tooled.
2. Plaque shall be cleaned and etched and treated with Aldine.
3. Two coats of clear acrylic lacquer shall be sprayed on completed plaque.

F. Locate signs where indicated:
1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
2. If no location is indicated obtain Owner's instructions.

3.03 CLEANING, PROTECTION, AND REPAIR

A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 10 feet.

B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project in accordance with provisions in Division 1.

3.04 SIGN SCHEDULE

A. Schedule: Refer to signage schedule and Drawings for sizes, locations, and layout of signage types, sign text copy, and graphics.

END OF SECTION

SECTION 10650
OPERABLE PANEL PARTITIONS

PART 1 - GENERAL

1.01 1.01 DESCRIPTION

A. General

B. Furnish and install operable partitions and suspension system. Provide all labor, materials, tools, equipment, and services for operable walls in accordance with provisions of contract documents.

1.02 1.02 RELATED WORK BY OTHERS

A. Preparation of opening will be by General Contractor. Any deviation of site conditions contrary to approved shop drawings must be called to the attention of the architect.

B. All header, blocking, support structures, jambs, track enclosures, surrounding insulation, and sound baffles as required in 1.04 Quality Assurance.

C. Prepunching of support structure in accordance with approved shop drawings.

D. Paint or otherwise finishing all trim and other materials adjoining head and jamb of operable partitions.

1.03 1.03 SUBMITTALS

A. Complete shop drawings are to be provided prior to fabrication indicating construction and installation details. Shop drawings must be submitted within 60 days after receipt of signed contract.

1.04 1.04 QUALITY ASSURANCE

A. Preparation of the opening shall conform to the criteria set forth per ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions

B. The partition STC (Sound Transmission Classification) shall be achieved per the standard test methods ASTM E90.

C. Noise isolation classifications shall be achieved per the standard test methods ASTM E336 and ASTM E413.

D. Noise Reduction Coefficient (NRC) ratings shall be per ASTM C423.

E. Rack testing for 10 years. (tensional strength stress test)

F. The manufacturer shall have a quality system that is registered to the ISO 9001 standards.

1.05 1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Proper storage of partitions before installation and continued protection during and after installation will be the responsibility of the General Contractor.

1.06 1.06 WARRANTY

A. Partition system shall be guaranteed for a period of two years against defects in material and workmanship, excluding abuse.

PART 2 - PRODUCTS

2.01 2.01 ACCEPTABLE MANUFACTURERS

A. Upon compliance with all of the criteria specified in this section, Manufacturers wishing to bid products equal to the product specified must submit to the architect 10 days prior to bidding complete data in support of compliance and a list of three past installations of products similar to those listed. The submitting manufacturer guarantees the proposed substituted product complies with the performance items specified and as detailed on the drawings.

B. CONTACT: HUFCOR, IAIN PATERSON, 1-800-548-3267

2.02 2.02 MATERIALS

A. Product to be top supported Series 632 paired panels as manufactured by Hufcor Inc.
   1. Panels shall be nominally 3” thick, to 48” in width, and hinged in pairs.
   2. Panel faces shall be laminated to appropriate substrate to meet the STC requirement in 2.04 Acoustical Performance.
      a. Steel Face Construction.
   3. Frames shall be of 16 gauge painted steel with integral factory applied aluminum vertical edge and face protection. Optional: Face finish shall wrap around the vertical panel edges and provide no protective vertical face trim.
   4. Vertical sound seals shall be of tongue and groove configuration, ensure panel-to-panel alignment and prevent sound leaks between panels.
   5. Horizontal top seals shall be fixed continuous contact dual 4-finger vinyl.
   6. Horizontal bottom seals shall be retractable, provide up to 2” nominal operating clearance, and exert downward force when extended.
   7. Horizontal trim shall be of aluminum.
   8. Low profile hinges on basic panels shall be of steel and project no more than 1/4” beyond panel faces. Each pair of panels to have a minimum of three hinges.

B. Weight of the panels shall be7.8 lbs. per sq. ft. based on options selected.
   1. Suspension system:
   2. Reuse of existing track.
   3. Finishes
      a. Face finish shall be: (select as required):
      b. Factory applied reinforced vinyl fabric with woven backing, weighing not less than 15 oz. per lineal yard. Color shall be selected from manufacturer’s standard color selectors.
   4. Exposed metal trim and seal color shall be:
      a. Lamb’s Wool
      b. Brown
      c. Gray
   5. Available Accessories/Options
   6. (2) ADA compliant pass door of the same thickness and construction as the basic panels. Pass door panel legs require bottom seals that provide downward force to maintain stability during door operation. Pass door leaf has perimeter trim to protect face finish and to provide visual identification as required by International Building Code. Pass door leaf incorporates a self-adjusting retractable bottom seal providing sound control when door is closed.
      a. Recessed self illumination, exit sign (consult your local code)
      b. Panic hardware
      c. Pass doors to swing in opposite directions
      d. Existing Pocket Door to remain. Extra vinyl fabric to be provided for recover in the field to match new panels.

2.03 2.03 OPERATION

A. Panels shall be manually moved from the storage area, positioned in the opening, and seals set.
   1. Retractable Horizontal Seals
   2. Retractable horizontal seals shall be activated by a removable quick-set operating handle located approximately 42” from the floor in the panel edge.
   3. All retractable seals in each hinged pair shall be operated simultaneously.
   4. Seal activation requires approximately 15 lbs. of force per panel and approximately a 190 degree turn of the removable handle.
   5. Final partition closure to be by:
   6. Lever closure panel with expanding jamb which compensates for minor wall irregularities and provides a minimum of 250 lbs. seal force against the adjacent wall for optimum sound control. The jamb activator shall be located approximately 45” from the floor in the panel face and be accessed from either side of the panel. The jamb is equipped with a mechanical rack and pinion gear drive mechanism and shall extend 4”-6” by turning the removable operating handle.
   7. Stack/Store Panels
   8. Retract seals and move to storage area. Panels may be stored at either or both ends of the track or in a pocket.

2.04 2.04 ACOUSTICAL PERFORMANCE

A. Acoustical performance shall be tested at a laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) and in accordance with ASTM E90 Test Standards. Standard panel construction shall have obtained an STC rating of: 47
   1. Complete, unaltered written test report is to be made available upon request.

PART 3 - EXECUTION

3.01 Installation. The complete installation of the operable wall system shall be by an authorized factory-trained installer and be in strict accordance with the approved shop drawings and manufacturer’s standard printed specifications, instructions, and recommendations.

3.02 Cleaning

A. All track and panel surfaces shall be wiped clean and free of handprints, grease, and soil.

B. Cartoning and other installation debris shall be removed to onsite waste collection area, provided by others.

C. Training

D. Installer shall demonstrate proper operation and maintenance procedures to owner’s representative.

E. Operating handle and owners manuals shall be provided to owner’s representative.

END OF SECTION

SECTION 10660

INTERIOR SINGLE GLAZED OFFICE GLASS FRONTS

PART 1 GENERAL

1.01 SCOPE

A. Provide and install a clean, high-performance wall product, factory-engineered, yet flexible, to allow future relocation.

B. Work included: Provide full-height, interior, unitized, single-glazed, movable glass walls as shown and specified. Work includes:
   1. Manufacturer's standard aluminum horizontal and vertical framing members for type system specified.
   2. Insert can be material ½", 3/8", ¼" tempered glass in clear, or type as specified herein, or solid material. Laminated safety glass in .530", .405" & .280" thickness
   3. can also be used but it is not as robust or durable as tempered glass and we recommend the thicker versions.
   4. Manufacturer's standard anchors, seals and miscellaneous trim necessary to complete all work and, if noted, achieve the specified acoustical performance.
   5. ½" tempered frameless doors, aluminum framed glass doors, or wood doors for wall system.

1.02 RELATED WORK SPECIFIED ELSEWHERE BUT PROVIDED WITH THE MOVABLE WALLS:

A. A. Door hardware for the doors in the system - See section 08.70.00.

B. B. Wood Doors – for the doors in the system - See section 08.14.00.

1.03 WORK NOT INCLUDED

A. Glass and glazing used elsewhere on the project and not part of these full-height glass walls.

B. Doors and hardware not an integral part of this wall system.

C. Mirrors.

D. Drywall and other wall constructions.

E. Final Masterkeying of Lock Cores or Lock Cylinders

1.04 PERFORMANCE REQUIREMENTS

A. General: Provide and install wall systems from one manufacturer, such that it is capable of withstanding normal impact loads including loss or glass breakage attributable to the following: defective manufacture, fabrication, installation or other defects.

B. Glass design: Thickness of for double-glazed system. Provide glass lites of various sizes for specific layout of vertical and horizontal framing members and as necessary to accommodate project conditions as shown on drawings. Provide independent test data that the glass specified meets the indicate compliance.

C. All glass is to bear CPSC certified safety glazing labels indicating compliance with safety codes.

D. Installer qualifications: An experienced and manufacturer- trained installer shall be selected by the manufacturer and work under its guidance. Installer shall provide the appropriate certificates of insurance required by Owner and General Contractor.

E. Adjustability: Wall system shall have leveling tolerance of +/- 5/8" at head & +/- 5/8" at floor to accommodate building tolerances for an overall height range of 2-1/2". Height of doors shall be adjusted to verified field dimension to reasonable undercuts (nominally ½" to 1").

1. Manufacturer shall provide a variety of adjustable wall interface details that can adjust to building tolerances (Plumb +/- 1/8” at frames to +/- 3/8” at panels).

1.05 SUBMITTALS

A. Shop drawings: Submit shop drawings in PDF form and, if requested, AutoCAD form showing all layout, elevations and details sufficient to clearly define work with this project.

B. Test data: Submit independent acoustical data that the glass meets the results meets the desired acoustical performance specified herein.

C. Samples: Submit samples of panel and door frame members with specified finish, sample of glass of each type and size specified.

D. Surface burning characteristic: Identify solid surface materials surface burning characteristics per ASTM E-84 and provide the appropriate testing.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle materials in accordance with manufacturer’s recommendations to prevent damage and deterioration.

B. All glass and solid panels to be factory glazed in manufacturer’s aluminum trim components to achieve full unitized configuration of wall panels and delivered to project in unopened, shrink-wrapped, labeled, and palletized packaging.

1.07 PROJECT CONDITIONS

A. Prior to order release, manufacturer shall examine site egress, freight elevator opening dimensions, cab size and all applicable site conditions. Manufacturer shall field measure site to ensure wall panels will fit properly. Prior to delivery, manufacturer shall examine progress of project to ensure site will be ready to receive prefinished glass panels and is ready for installation (finished floor is installed, drywall painted and ceiling installed).

B. Manufacturer will not perform work under adverse job-site conditions.

C. Manufacturer shall report all unsatisfactory conditions to General Contractor and await correction of faulty conditions before proceeding with Work.

1.08 WARRANTY

A. Manufacturer to guarantee all materials and workmanship against defects of materials fabrication and installation for a period of one year from date of the completed installation.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Basis of design shall be Refine double-glazed system by Infinium Wall Systems, Strongsville, Ohio.

1. Equal products by other manufacturers will be considered provided they meet the type, color, pattern, profile, adjustability, etc. of the basis of design, provided they submit all data necessary for full evaluation to the Architect and receive approval three (3) days prior to bid date. Submittal of data does not guarantee acceptance of manufacturer or system.

B. To ensure consistent quality of appearance and performance, all materials must come from a single manufacturer.

2.02 PANELS AND FRAMING

A. The movable wall panels shall be 4" thick by 6" to 80"wide by 84" to 136" high, as shown on project drawings.

B. Panel weight shall be approximately 4 to 7 pounds per SF (depending on the type of glass).

C. Aluminum framing members shall be #6063-T6 aluminum, modular in size and factory assembled and glazed.

D. Panels shall have 2" horizontal top & bottom rails, with ¾" reveal at base and continuous ceiling channel. Base channel shall be unitized and spring loaded with locking set screws necessary to level each panel.

E. Horizontal muntin rails, where required, are 1-1/16" high. See drawings for requirements.

F. All vertical reveal mullions at glass-to-glass and glass-to-door frame locations shall be a maximum of 1-1/16" wide.

G. Mullions shall be comprised of two aluminum panel verticals connected with a continuous black or gray 5/16"-wide PVC connector strip.

H. Finish of all framing shall be clear anodized aluminum finish or other as specified.

I. Optional painted PPG Duracron S-600 enamel finish to match architects sample as shown on the drawings (for instance, samples by Benjamin Moore) , or other premium finishes such as: bronze anodized, powder coat finishes (smooth or textured), imaged powder coat, or the "decoral" process in wood grain, granite, marble, etc. Other optional specialty finishes are available upon request).

2.03 GLASS INSERTS –

A. Inserts of ½", 3/8" or ¼" thick tempered glass compositions are available and recommended - as tempered glass is robust & durable - such as low-iron glass, acid-etched or velour-etched glass, standard embossed or patterned glass, or tinted glass in gray, blue, azure, green, rose or bronze are available. See drawings for requirements and specifications.

B. Optional ¼" or 6mm premium tempered silkscreened, patterned or etched glasses by AGC, Bendheim, Coastal, GGI, Goldray, McGrory, Skyline Design, Trulite, etc. may also used. See drawings for requirements and specifications

C. Optional .530", .405" and .280" laminated glass with .030" PVB can be used subject to size restrictions with a clear interlayer, or combinations of .015" cool white, .015" arctic snow, or .015" polar white interlayers for ranges of translucency, with color interlayers by Vanceva (a division of Solutia), and standard clear glass, acid-etched or pattern glasses can be utilized. Note - there are minimum volume requirements involving the color interlayers – contact Infinium if desired.

D. Optional and premium laminated glass with printed plastic and .015" interlayers can also be provided such as those provided by TruDeco, Skyline Glass, McGrory etc. can be accommodated as well – contact these suppliers and select a specific sample # and in a thickness acceptable to Infinium framing - contact Infinium if desired.

E. Optional ¼" back-painted glass by US Color Glass in white can be used as a Dryerase marker surface. Other colors, such as Benjamin Moore's colors, can be matched.

F. ½" PETG resins glazing inserts with back-routed edge (by 3Form, Lumicor, Veritas, etc.) can be accommodated.

2.04 SOLID PANEL INSERTS

A. Solid panel inserts options:

1. Particle board core with back edge routed 1/2" thick in solid color or wood grain Thermo-Fused Melamine (TFM) Class B (premium for FRPB core Class A).
2. Wood veneer on particle board core (premium on FRPB core Class A).

3. Fabric-wrapped medium-density fiberboard inserts.
4. 5/8" Tackable acoustic panel made from high-impact fiberglass glued to ½" perforated micore (Class A rating).

B. All solid panels come with Guardian Greenguard CG-7 fiberglass insulation 3.5" thick with a flame spread of 25 & a smoke density of 50.

2.05 Power, Voice & Data Services

A. A. 4" x 4" vertical aluminum posts between door frame and glass panels or between two glass panels can accommodate factory-installed options:
1. Option 1: Cutouts and electrical boxes for industry-standard switches or standard power outlets with connector, and ½" trade-size flex conduit 48" higher than post and pull string (balance of electrical work by others).
2. Option 2: Cutouts and quick-connect Byrne UL183 8-wire 20 amp power devices mounted vertically (flex conduit in a 3SN configuration is also available with transition plate), quick-disconnect feed with flex connector and factory-installed 20 amp outlets. Factory-installed power feed available up to 360" long. Feed can be hardwired to junction box by others, or a transition plated can be provided and prewired on 4" x 4" junction box with a quick-connect end on the feed will be supplied.
3. Option 3: Cutouts for voice and data. Cutout with temporary bezel and pull string can be provided.

2.06 DOORS – SELECT FROM OPTIONS BELOW

A. Select doors from options below:
1. Types: Butt-hinged, center-pivot, or sliding.
2. Full height or with transom: Size as indicated on the drawings.

B. Specify type as required and as shown on the drawings:
1. ½" Tempered frameless glass doors. Options include:
   a. a. Frameless barn-style glass slider doors with Infinium carriage, guide, full-height receiver with sound seal package and choice of pull: locking or non-locking.
   b. b. Infinium # SH371BS proprietary patch block hinged glass doors
   c. c. Frameless patch block center pivot doors using CRL PH20 and PH10, with Jackson #20104M20 90-degree hold-open concealed overhead closer or Jackson #20104M19 non-hold-open closer with 1NT403 flush floor pivot (weight limit of 196 lbs)
   d. d. Top & Bottom rail Center Pivot Doors using CRL # DR2S__12S 2-5/16"h Rails; DR4S__12S 4" Rails,
   e. or DR10S__12S 10" Rails and Jackson #20104M20 90 Degree HO concealed overhead closer or Jackson #20104M19 NHO closer with 1NT402 flush floor pivot (weight limit of 440 lbs).
   f. 1-3/4" Thick solid-core wood doors with painted MDO faces and edges with a high-solids catalyzed lacquer (OP4) finish in a gloss __ (specify from 10 to 40) with finish to match sample. See related section 08.14.00.
   g. 1-3/4" Thick solid-core, plain-sliced veneer doors with book, center and balanced matched veneer. See related Section 08.14.00.
   h. 1-3/4" Thick solid-core, quarter-sliced veneer doors with slip, center and balanced matched veneer. See related Section 08.14.00.
   i. 1-3/4" Thick solid-core wood doors with high pressure laminated faces and edges. See related section 08.14.00.
   j. 1-3/4" Thick solid core full-lite wood doors with 6" stiles, 6" top rail and 8" or 10" bottom rail. Finish as indicated above and in section 08.14.00.
   k. 1-3/4" Thick aluminum-framed swinging glass doors. Standard locks shall have 5.5" stiles and 2" top and bottom rails (able to accept an optional automatic door bottom

or drop seal). An optional 2-5/8" stile shall be available, but this will limit the hardware available.

l. Aluminum-framed sliding doors shall have a 5.5" (with straight pulls) or 4-1/4" or 2-5/8" stile (with offset pulls) and a 2" bottom rail for concealed guide on panel side.

m. Double-glazed hinged aluminum-framed doors with ¼" tempered glass and proprietary 5"x5" Hager I182 BB1279RBRC hinges.

2.07 DOOR HARDWARE

A. See Hardware Section # 08.70.00 and Hardware Schedule by door on drawings to be included here (or furnished by hardware supplier in Section # 08.70.00 if excluded – change 1.02 & 1.03 accordingly). For guidance on hardware by door type, see Infinium Hardware Options by Door Type, available upon request.

PART 3 PROJECT EXECUTION

3.01 INSPECTION

A. Prior to delivery, review site progress and installation conditions to ensure site readiness. Do not proceed with Work until unsatisfactory conditions have been corrected.

B. If possible, recheck to verify sizes of openings, ceiling type, opening height, anchorage method, floor finish type, and gripper required.

C. Verify schedule to ensure installation as late as possible in the project schedule. Plan installation such that ceiling and flooring will be substantially complete prior to delivery.

3.02 3.02 RECEIVING, PROTECTION AND PREPARATION

A. Unload trim, panels and hardware, and stage on carpet in location(s) agreed upon.

B. Protect panels from edge damage during handling and installation. Remove and replace or touch-up freight damage, if any.

3.03 INSTALLATION

A. Install ceiling clips to acoustical ceiling grid or anchor to blocking under drywall at ceiling or soffit. Install ceiling channel to anchors. Use correct seal for ceiling type to ensure proper acoustical performance. Partition installs on finished floor and connects to finished walls and ceilings.

B. Express layout on floor directly below ceiling channel with chalk lines.

C. Install aluminum wall-starts with correct seal to ensure proper acoustical performance.

D. Locate and position correct factory glazed or solid unitized panel at wall start. Lift up around ceiling channel, pivot vertical and lower down on expressed floor layout.

E. Check for plumb and release set screws. Raise panel to correct height to allow for consistant reveal at top and reset the set screws to lock in place.

F. Bring in next panel and repeat process. Repeat process until end condition or door position is reached.

G. Cut and fit frame to height at floor and assemble, stand and set jamb next to adjacent panel.

H. Engage PVC connector to fasten panels together, and frames to panels and end conditions.

I. Install pre-mortised doors and hardware according to templates provided.

J. Check and adjust for proper working order and swing or slide of door units.

3.04 COMPLETION

A. Insure entire project is complete. Correct any unsatisfactory installation.

B. Participate in punch list review, and correct by touch-up or replace items as necessary.

C. Meet with furniture installer representative to discuss potential subsequent damage and review wall installation with them prior to their start.

END OF SECTION

SECTION 10800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Accessories for toilet rooms.

B. Grab bars.

1.02 RELATED REQUIREMENTS

A. Section 09300 - Tile: Ceramic washroom accessories.

B. Section 10160 - Metal Toilet Compartments.

1.03 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition; (ADA Standards for Accessible Design).

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.

C. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2013.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

F. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011e1.

G. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

H. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008.

I. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004 (Reapproved 2010).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.

C. Samples: Submit two samples of each accessory, illustrating color and finish.

D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Products listed are made by Bobrick Corporation.

B. Other Acceptable Manufacturers:
   1. American Specialties, Inc: www.americanspecialties.com.
   2. Bradley Corporation: www.bradleycorp.com.
   3. Substitutions: Section 01600 - Product Requirements.

C. All items of each type to be made by the same manufacturer.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

B. Keys: Provide _____ keys for each accessory to Owner; master key all lockable accessories.

C. Stainless Steel Sheet: ASTM A666, Type 304.

D. Stainless Steel Tubing: ASTM A269, Type 304 or 316.

E. Mirror Glass: Float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

F. Adhesive: Two component epoxy type, waterproof.

G. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.

B. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 TOILET ROOM ACCESSORIES

A. Toilet Paper Dispenser: Double roll, surface mounted bracket type, stainless steel .
   1. Product: B-4288 manufactured by Bobrick.

B. Paper Towel Dispenser: Folded paper type, stainless steel, surface-mounted, with viewing slots on sides as refill indicator and tumbler lock.
   1. Capacity: 400 multifold minimum.
   2. Product: B-4262 manufactured by Bobrick.

C. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface, with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gage refill indicator, tumbler lock.
   1. Minimum Capacity: 40 ounces.
   2. Product: B-2112 manufactured by Bobrick.

D. Mirrors: Stainless steel framed, 6 mm thick tempered glass mirror.
   1. Size: See drawings.
   2. Frame: 3/4 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.

E. Grab Bars: Stainless steel, nonslip grasping surface finish.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force, minimum.
      b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.

c. Length and Configuration: As indicated on drawings.
d. Products:
1) B-5806,Bobrick.

F. Sanitary Napkin Disposal Unit: Stainless steel, recessed, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
1. Product: B-353 manufactured by Bobrick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. For electrically-operated existing accessories, verify that electrical power connections are ready and in the correct locations.

D. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on the drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
1. Grab Bars: As indicated on the drawings.
2. Mirrors: As indicated on drawings inch, measured to bottom of mirrored surface.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

B. Existing restrooms: All toilet accessories to be removed (protect as needed) and re-installed post-installations of finishes.

END OF SECTION

15
DIVISION

SECTION 15010
GENERAL PROVISIONS

PART 1 FIELD SUPERVISION

1.01 Prior to commencement of work, verify measurements at building site. Submit discrepancies and differences to Architect/Engineer for consideration and decision before proceeding.

1.02 Obtain full information regarding peculiarities and limitations of space available for installation of the equipment and materials, and provide ready accessibility to dampers, valves and other apparatus, including any part of system required to be reached for maintenance or operations.

1.03 Provide accurate layout, grades and elevations; set sleeves and openings in ample time; take proper precautions to protect work and equipment from damage. All sleeves and openings shall be fireproofed by filling voids with U.L. approved fire sealant. All fire rated assemblies shall be a classified U.L. system for particular pipe material and penetration

1.04 Cut all openings and chases required to accommodate the work under this Division, and repair all floors, walls, etc., damaged by such cuttings. All work done under this heading must conform in every respect to finish and quality of materials and workmanship specified under appropriate sections.

1.05 Do all trenching, excavating and backfilling necessary to accommodate the work under this Division. Trench widths to be adequate to permit installation, allowing a minimum of 8" clearance on each side of pipe. Bottom of trench to be tamped firm and evenly graded to provide specified pitch. Sheath and brace trenches and excavations. After testing and inspection, backfilling with clean earth, carefully tamp each 9" layer. Backfilling and removal of any sheathing and bracing to be done without disturbing installed piping.

1.06 Perform all required tests in presence of representative of Architect/Engineer and any authority having jurisdiction. Give 48 hours notice prior to tests.

1.07 Insure compliance at all times of all employees with requirements of safety codes and all local codes and

1.08 ordinances applicable to performance of work under this Division.

PART 2 COORDINATION OF OTHER TRADES

2.01 General: The design drawings are generally diagrammatic. They do not show every bend, offset, elbow or other fitting which may be required in the piping and/or ductwork for installation in the spaces allotted. Careful coordination of the work of this Section with that of Division 2 and 16 is necessary to avoid conflicts.

2.02 Paint exposed piping, ducts, hangers and supports as specified in Section entitled PAINTING. Clean all surfaces free of grease, scale, rust and other foreign matter, and leave ready for painting. Touch up all factory finishes marred in construction with factory touch-up kits.

2.03 Provide starters for all motors specified under this Division unless otherwise indicated on plans or herein.

2.04 Provide all control items required and furnish wiring diagrams for all such equipment.

2.05 All electrical items furnished must conform to the requirements of Division 16.

2.06 Louvers for ventilation, air intake or exhaust in exterior walls of buildings are specified elsewhere in these Specifications.

PART 3 SPECIFIED

3.01 Equipment scheduled, on the drawings, was used to arrive at space, service and power requirements. If other acceptable equipment is used, contractor must verify that the space, service and power requirements are met or make modifications, to accept equipment used, at his expense which shall include any redesign costs.

3.02 PART 4 MATERIALS

3.03 Provide all new materials free from defects. All materials to be of American manufacture unless specifically noted otherwise.

3.04 PART 5 SHOP DRAWINGS AND SUBMITTALS

3.05 GENERAL: In order to expedite the project and avoid delivery delays only shop drawings listed below are required to be submitted and procedure outlined below must be followed:

3.06 All shop drawings must be submitted, at one time, within 45 days after notice to proceed. If contractor does not meet time schedule he shall install material or equipment as instructed by Architect/Engineer.

3.07 Submit, at one time, Shop and Detail Drawings, factory certified prints, brochures and materials lists for items specified in accordance with the requirements of the General Conditions of these Specifications.

3.08 Submittals for scheduled equipment shall include a summary sheet listing all scheduled information and all data for equipment to be supplied in exactly the form scheduled on the drawings.

3.09 All submittals must be identified by Specification Section and Paragraph Number and/or Drawing Number and Schedule Number and name.

3.10 Shop Drawing review does not imply or warrant acceptance of any count list or of any capacity, construction or operating characteristics different from equipment specified and scheduled.

3.11 Provide as a part of Shop Drawing submittals complete fabrication Shop Drawings of piping, valves, ductwork, all equipment location and connections, etc., completely coordinated with other trades at a scale not less than 1/4" equals 1'. Drawings shall include dimensioned location and elevation data.

3.12 PART 6 MANUALS AND CHARTS

3.13 Furnish, indexed and bound in loose leaf binders, 3 complete sets of all operating and maintenance instructions, literature and information pertaining to all equipment under this Division.

3.14 Mount complete operating instructions, laminated under plastic on solid mounting boards, as directed by Architect/Engineer.

3.15 Mount lubrication and recommend periodic maintenance, i.e., filter replacement, etc. schedule for each item of equipment, laminated under plastic on solid mounting boards, located as directed by Architect/Engineer.

3.16 Mount valve charts showing location and identification of all valves, laminated under plastic on solid mounting boards, as directed by Architect/Engineer.

3.17 PART 7 GUARANTEES

3.18 Furnish copies of all guarantees for equipment or materials extending beyond the guarantee period specified in the General Conditions of these Specifications.

3.19 PART 8 INSPECTIONS PART 8 INSPECTIONS

3.20 The work will be inspected by the Architect/Engineer during course of construction. Provide for all inspections by others having jurisdiction during the proper phase. Furnish certificate or certificates of final approval by other having jurisdiction at time of final inspection.

3.21 PART 9 PERMITS

3.22 Provide all special permits required for work under the various Sections of this Division.

PART 10 WORKMANSHIP

4.01 All work shall be performed by workers skilled in their respective trades and all materials and equipment shall be installed in accordance with manufacturer's recommendations.

4.02 Execute all work in a neat and workmanlike manner.

4.03 Where special qualifications are required, i.e., for welders, brazers, etc., a currently active certificate of qualification from a recognized testing laboratory and dated within the twelve months period to performance of the work will be required. If the workmanship of any such specially qualified worker creates reasonable doubt as to skill, the Architect/Engineer may require the worker to be recertified.

END OF SECTION

SECTION 15023
CODES AND STANDARDS

PART 1 GENERAL

1.01 Latest editions with current revisions and amendments of the following codes and standards are considered minimum requirements for materials, workmanship and safety where not covered elsewhere in these Specifications.

PART 2 CODES AND STANDARDS

2.01 Florida Building Code.

2.02 NFPA 90A Air Conditioning and Ventilating.

2.03 NFPA No. 91 Blower and Exhaust System

2.04 UL 555-Fire Dampers.

2.05 ASHRAE- Guide-Equipment, System and Applications.

2.06 SMACNA - Fibrous Glass Duct Construction Standards

2.07 SMACNA-HVAC Metal Duct Standards, Metal and Flexible

END OF SECTION

SECTION 15045

GENERAL COMPLETION

PART 1 GENERAL

1.01 As a prerequisite to final inspection, all construc-tion, testing, adjustments, balancing, start-up and any required instruction periods will have been completed on all mechanical systems and equipment.

1.02 Calibrate and adjust control systems and automatic alarm systems as required.

PART 2 AIR CONDITIONING

2.01 Complete ductwork installation, including all required dampers, deflectors, hangers, insulation, etc.

2.02 Level air conditioning units.

2.03 Install and test all control system components for function.

2.04 Coordinate following items with Test and Balance Con-tractor prior to and during the test and balance proce-dure.

2.05 Remove all disposable filters installed during start-up and install new filters prior to test and balance procedures.

2.06 Make all changes in pulleys, belts, motors or dampers and add any air control devices not specifically shown in contract documents re-quired to effect correct air balance, all at no additional cost to the Owner.

2.07 Remove and clean all pipe strainers.

PART 3 PLUMBING

3.01 Complete all plumbing systems and tests.

3.02 Test all plumbing fixtures for proper operation and adjust flush valves.

3.03 Complete leak tests and correction of defects. Install piping identification markers as required and post in place all valve charts, operating instructions and other data required.

END OF SECTION

SECTION 15051
MECHANICAL SUPPORT DEVICES

PART 1 GENERAL

1.01 Submit manufacturer's data on all equipment for review, if required by General Provisions, before commencing work.

1.02 Unless otherwise shown, provide motor starters and control items for all motors provided under this Division of the Specifications. Electrical items furnished must conform in all respects to the requirements of Division 16.

1.03 Verify and coordinate with electrical trades the sizes and characteristics of all electric motors furnished for mechanical equipment under this Division to insure proper service prior to ordering.

PART 2 PRODUCTS

2.01 Motors:

A. Application, construction and testing in accordance with NEMA Standards MG-1 and MG-2, latest edition. Construct all motor windings of copper insulated with minimum Class F insulation (Leads may be rated Class B). Frames shall be cast iron or steel. No aluminum windings or frames are acceptable.

B. Maximum temperature rise above 40 degrees C ambient to be as defined for Class B insulation.

C. At full load, motor running current not to exceed nameplate full load amperes at unity service factor.

D. Unless otherwise indicated, motors to be induction Super (E) premium efficiency type, rated, 60 cycles. Motor voltages to be as shown on the drawings.

E. Unless otherwise specified, enclosures to be drip-proof with fittings for pressure gun lubrication.

F. Provide slide rails for drives which require adjustment.

G. Must meet (EPAct) Energy Policy Act.

H. Furnished with 2 year warranty.

PART 3 EXECUTION

3.01 Install all equipment in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 15060
PIPE AND PIPE FITTINGS

PART 1 GENERAL

1.01 Submit manufacturer's data for review, if required by General Provisions, before any work is commenced.

1.02 Field tests required on complete systems are as described under the particular System Section.

PART 2 PRODUCTS

2.01 Pipe: Refer to specific Section for piping material.

2.02 Fittings (pressure pipe): Make joints and connections permanent and watertight.

A. Copper Pipe Domestic Water: Wrought copper, solder-joint type, ANSI B 16.22 95/5 solder, tin antimony type.

2.03 Fittings (non-pressure): Make joints and connections permanent and watertight.

A. PVC Pipe: Schedule 40 DWV/PW, pressure rated. Use molded preformed fittings and approved solvent. PVC piping shall be used only where specifically noted on drawings or within these specifications.

PART 3 EXECUTION

3.01 General: The design drawings are generally diagrammatic. They do not show every bend, offset, elbow or other fitting which may be required in the piping for installation in the space allotted. Careful coordination of the work of this Section with that of Division 2 and 16 is necessary to avoid conflicts.

3.02 Line and Grade:

A. Install gravity lines at uniform grade to low point after field verification of low point invert.

3.03 Jointing Pipe:

A. Threaded Pipe: Ream all pipe after cutting and before threading. Use non-hardening pipe compound "Tite-Seal" on male threads only.

B. Copper Tube: Ream all pipe after cutting, clean and tin end to be soldered.
   1. Provide nipples of same material and weight as pipe used. Provide extra strong nipples when length of unthreaded part of standard weight nipple is less than 1-1/2".

C. Provide reducing fittings where changes in pipe sizes occur.
   1. Provide dielectric unions or flanges between copper and steel piping and between brassware and steel. Do not use steel and copper piping in the same system without such isolation.
   2. PVC - Clean pipe with approved cleaner and join with approved solvent per manufacturer's instructions.

3.04 Unions: Provide unions in all domestic water service lines at each piece of equipment, specialty valves or at other locations required for ready disconnect.

3.05 Pipe Protections:

A. Paint all uninsulated metallic piping underground with two coats of asphaltic paint or wrap with 2 layers of 6 mil polyethylene film.

B. Wrap all pipes that touch metal or is exposed to masonry with two layers of 15 lbs. roofing felt.

C. Spirally wrap all pipe lines embedded in concrete with two layers of 30 lb. felt.

1. Coat all exposed threads on galvanized steel pipe after assembly with two coats of zinc chromate.

3.06 Tests: Complete all field testing prior to insulation, wrapping and/or backfilling.

END OF SECTION

SECTION 15080
PIPING SPECIALTIES

PART 1 GENERAL

1.01 Submit manufacturer's data for review, if required by General Provisions, before any work is commenced.

PART 2 PRODUCTS

2.01 Hangers: Malleable or wrought iron split ring with adjusters. Support steel service pipe larger than 1-1/2 inches at 10 feet and 1-1/2 inches and smaller at 8 feet; horizontal soil pipe at 5 feet and copper tube at 6 feet. When exposed to weather all hangers shall be galvanized.

A. For Steel or Cast Iron: Grinnel No. 115 or Fee and Mason No. 215.

B. For Copper Pipe: Copper plated, Grinnel CT-95 or Fee and Mason No. 365.

C. For larger pipe use Clevis type or trapeze.

D. Spring Hangers: Provide for all piping in mechanical room and a minimum of 50 pipe diameters horizontal distance from any piece of equipment. Provide compression springs with guides. Hanger rods to remain concentric at all times and not be subject to bending. Use calibrated springs that are adjustable.

E. Provide and set pipe inserts in concrete slabs between joists for pipe hangers. Use inserts similar to Fee and Mason Fig. 186 heavy duty.

F. Install sheet metal saddles under all insulated piping, in accordance with insulation manufacturer's recommendations.

G. All hangers threaded rods shall be galvanized.

PART 3 EXECUTION

3.01 Install all specialties as recommended by the manufacturer and in a neat workmanlike manner.

3.02 Install specialties so that they are accessible for operation, visual inspection and preventive maintenance.

3.03 Provide necessary layout and installation of inserts, sleeves and anchor bolts.

END OF SECTION

SECTION 15100

VALVES

PART 1 GENERAL

1.01 Provide valves that have the manufacturer's name and valve rating cast in body.

1.02 Submit manufacturer's data for review, if required by General Provisions, before any work is commenced.

1.03 General Valve Types: Provide sweat type end valve bodies for copper piping systems 2" in diameter and smaller and flanged valve bodies for piping systems 2-1/2" in diameter and larger.

PART 2 PRODUCTS

2.01 Valves-General Purposes:

A. Acceptable Manufacturers: Crane, Powell, Jenkins, Walworth, Stockham, Nibco.

B. Minimum Working Pressure: 150 psig steam.

C. Valves 2 Inches and Smaller: All bronze, sweat type ends for copper.

D. Valve 2-1/2 Inches and Larger: Iron body, brass trimmed, flanged ends.

E. Provide valves equal to following Stockham figure numbers:

		2" & Smaller	2-1/2" & Larger
1.	2" & Smaller	2" & Smaller	2-1/2" & Larger
2.	SCREWED	SOLDERED F	LANGED
3.	Gate B-122	B-124	F-661
4.	Globe B-22T	B-24T	G-512
5.	Check B-321	B-321	G-947

F. Check: Mission Duo-Check Series 150 for 2-1/2" and larger. Alternate Manufacturer: Mueller.

G. Strainers: Armstrong cast bronze, Series F4SC or F2SR. Armstrong cast iron, Series A1FL or A8FL for 2-1/2" and larger.

PART 3 EXECUTION

3.01 Install valves as recommended by manufacturer.

3.02 Install valves so that they are easily accessible for operation, visual inspection and preventive maintenance.

END OF SECTION

SECTION 15180

MECHANICAL SYSTEM INSULATION

PART 1 GENERAL

1.01 Submit manufacturer's data for review, if required by General Provisions, before any work is commenced.

1.02 Protect all materials from the weather during storage and installation.

PART 2 PRODUCTS

2.01 Ductwork Insulation:

A. Insulate all non-lined air conditioning supply, return and outside air ductwork with minimum R=6.0 blanket type of not less than 1 pcf density with fire retardant foil facing. Material shall be Underwriters' Laboratories labeled to comply with NFPA 90A. Fasten with flare type staples on 1" centers along overlaps. Seal all staple heads, laps and breaks in insulation with fire resistant mastic.

B. Insulate exposed to outdoors air conditioning ductwork as follows: cover with 2" thick ductboard with foil face R=8.0. Cover with mastic “Foster 4500". Embed glassfab into mastic, covering the entire ductboard. Cover glassfab with Foster 4500 mastic.

C. Insulate neck, throats and collars of supply outlet runouts above ceilings.

2.02 Piping Insulation:

A. Refrigerant suction lines: 3/4" closed cell flexible elastomeric thermal insulation. Flame spread rating of 25 or less and smoke developed rating of 50 or less. Provide protective coating as recommended by manufacturer when used outdoors.

2.03 Miscellaneous: Cap valves, drain and vent lines and miscellaneous appurtenances subject to sweating with foam plastic caps with approved flame spread 25 or less and smoke developed rating of 50 or less.

PART 3 EXECUTION

3.01 Install insulation in accordance with manufacturer's recommendations.

3.02 No insulation shall be installed until the system has been checked and free of all leaks.

3.03 Install all materials in a neat and workmanlike manner.

3.04 Protect all pipe insulation at hangers with galvanized sheet metal shields.

3.05 Provide all strainers in insulated lines with removable insulation caps to provide periodic maintenance without damage to the pipe insulation.

END OF SECTION

SECTION 15401
WATER SUPPLY PIPING SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 Submit manufacturer's data for review, if required by General Provisions, before any work is commenced.

PART 2 PRODUCTS

2.01 Provide fittings, specialties and valves as specified under other Sections in this division.

2.02 Pipe Material: Interior domestic water piping 6" and smaller, copper tube type "L" hard drawn, ANSI H 23.1. Copper type "M" or CPVC Flowguard gold pipe and fittings will be allowed for water distribution inside apartment after apartment shut-off valve and PRV.

A. Provide isolation on bushings between copper and steel pipe.

B. All piping and fittings shall be domestic manufactured.

PART 3 EXECUTION

3.01 Run water supply main to point indicated on plans and provide water tap and meter.

3.02 Provide water hammer arrestor at each fixture, riser and end of supply lines.

A. Diameter: Full size of supply pipe, 3/4" minimum.

B. Height: 20 pipes diameter, no less than 12".

C. Provide water hammer arrestors on dishwashers, clothes washer and any equipment requiring fast closing solenoid actuated valves or where shown on drawings. Provide access panel.

D. Manufacturers: P.P.P. Inc., Josam, Absorboton.

3.03 Valves:

A. Provide valves to isolate each cold water riser and branch line.

B. Provide pressure reducing valves as required to limit water pressure to individual plumbing fixtures from exceeding 75 psig. Pressure reducing valve shall be watts U5B or approved equal from Spence unless otherwise noted.

C. Provide stops at each plumbing fixture and equipment.

3.04 Run all water lines parallel or perpendicular to building lines.

3.05 Equipment Connections:

A. Make connections between any piece of equipment and any piping system in this Section of the Specifications by means of unions, flange joints or other fittings which permit equipment to be disconnected and removed for maintenance.

B. Install valves in supply lines to each piece of equipment on supply side of union connections.

3.06 Tests:

A. Test all parts of the water supply system before the piping is concealed and before the fixtures and equipment are connected. Use a hydrostatic pressure of not less than 100 psig and no less than 30 psi above system design pressure but never to exceed system components maximum working pressure, applied to the system for a period of four hours. Repair any leaks in the system and retest.

B. Leave concealed work uncovered until required tests have been completed, but if necessary, make tests on portions of the work and those portions of the work may be concealed after being inspected and approved. Make repairs of defects that are discovered as a result of inspection or tests with new materials. Caulking of screwed joints, cracks or holes will not be accepted. Repeat tests after defects have been eliminated.

END OF SECTION

SECTION 15404
SOIL AND WASTE PIPING

PART 1 GENERAL

1.01 Submit manufacturer's data for review, if required by General Provisions, before any work is commenced.

PART 2 PRODUCTS

2.01 Piping

A. PVC Schedule 40 soil pipe
   1. Safe waste from air conditioning equipment copper type "M" or PVC Schedule 40, when allowed by code.

B. All piping and fittings shall be domestic manufactured.

2.02 Provide piping, valves and specialties as specified under other Sections of this Division.

2.03 Floor Drains:

A. Toilets: Josam 30000-A series with "Nikaloy" tops.

2.04 Traps: Self Cleaning: Trap each fixture separately, unless otherwise specifically detailed.

2.05 Cleanouts: Standard pipe size bodies, with caulking ferrules conforming to thickness to that required for pipe and fittings of same metal. Provide removable cleanout plugs of brass with screw threads extending not less than 1/4" above pipe hub. Provide plugs with raised nuts where concealed or exposed on stacks in mechanical rooms and recess sockets where exposed flush with wall or floor in other areas.

A. Cleanout Cover in Finished Areas:

B. Walls: Josam 58790 Stainless Steel Finish.

C. Resilient Floors: Josam 58360 with Nikaloy Top.

D. Tile Floors: Josam 58480 ferrule with 58640 Nikaloy Cover.

E. Concrete Floors: Josam 58360 with Nikaloy Top.

2.06 Manufacturers: Josam, Zurn, Wade or J.R. Smith.

2.07 Trap Primer: Reseal all floor drain traps by means of a 1/2" copper line connected to a trap primer valve. Valve shall be connected the nearest plumbing fixture cold water supply. Priming valves, Josam 88250, Sloan F-72-A1, or P.P.P. Inc. All exposed pipes to be chrome plated.

2.08 Vent Flashing: Furnish lead flashing or copper pitch pans for all vents through the roof. Installation is specified in another section of these specifications.

PART 3 EXECUTION

3.01 Run piping to sewer connection point outside of building as indicated on drawings.

3.02 Install horizontal soil and waste piping to 1/8" per foot grade. Run horizontal vent lines to a minimum grade back to stacks and vertical vent lines as direct and free from bends as possible.

3.03 Run piping at ceiling as high as building construction permits, except where otherwise indicated.

3.04 Provide cleanouts at foot of each stack, at each change of direction of horizontal lines, and in horizontal runs at 50 foot intervals.

A. Cleanouts which may be rodded both ways shall be used whenever possible. Cleanouts shall be brought up to grade or finish surface, or accessible through panels with adequate clearances for rodding.

3.05 Make connections between equipment furnished by others under other divisions of these specifications to the piping systems provided under this division of the specification.

3.06 Test: Apply a water test to all parts of the drainage system before the pipes are concealed. These tests may be applied in sections. Close all openings of each system to be tested, except the highest opening above the roof, and fill the system with water up to the overflow points of this highest opening. Subject all parts of the system to not less than 10 feet of hydrostatic head except the uppermost 10 feet of the piping directly below the opening. Leave the water in the system for not less than 30 minutes, after which time no leaks at any point or lowering of the water level at the overflow shall be visible.

END OF SECTION 15404

SECTION 15450

PLUMBING FIXTURES AND TRIM

PART 1 GENERAL

1.01 Submit manufacturer's data and outline drawings for review, if required by General Provisions, before any work is commenced.

1.02 Take adequate precautions to insure that installed fixtures are protected from damage during construction.

PART 2 PRODUCTS

2.01 Fixtures:

2.02 Locate fixtures as shown on the drawings.

2.03 Provide fixture types, manufacture and model as shown in the schedule on the drawings.

A. All trim to be chrome plated brass unless otherwise specified.

2.04 Provide chrome plated escutcheon plates on wall penetrations. Finish shall be chrome plated brass unless otherwise specified.

2.05 All exposed branches of plumbing fixtures shall be brass pipe or tube, chrome plated, unless otherwise specified.

A. Approved Manufacturers: American Standard, Kohler, Crane, Eljer.

B. Approved Faucets: American Standard, Kohler, Chicago Faucet, Moen.

2.06 Supports: Wall mounted fixture supports to be steel plates with thru bolts, unless otherwise indicated.

PART 3 EXECUTION

3.01 Fixture designations at fixture locations shown on the drawings are the same as those shown in the fixture schedule.

3.02 Equipment, appliances and Fixture Connections: Provide all necessary material and labor to connect to plumbing system all fixtures appliances and equipment having plumbing connections, and which are furnished by Owner or specified in other sections or divisions of these specifications. Supply pipes to each item of equipment, appliance or fixture, shall be equipped with a cutoff valve to enable isolation of item for repair and maintenance without interfering with operation of other equipment or fixtures. All supply piping shall be anchored to prevent movement.

3.03 Install fixtures as recommended by the manufacturer.

3.04 At completion of work clean all fixtures and chrome trim.

END OF SECTION

SECTION 15907

TESTING AND BALANCING

PART 1 GENERAL

1.01 Complete all construction, testing, adjustments, balancing, starting and instruction as a prerequisite to final inspection.

1.02 The control manufacturer, after adjustment and calibration of controls, will attest in writing that the system is operating as intended.

1.03 Furnish three certified copies of test report to the Architect/Engineer. Provide a representative, tools and instruments so that all submitted data may be verified at final inspection.

1.04 Procure the services of an independent balance and testing agency, to be approved by the Engineer, which specializes solely in the balancing and testing of heating, ventilating and air conditioning systems.

PART 2 AIR BALANCE

2.01 Procedure: Do not begin test and balance until the system has been completed and is in full working order. Put all heating, ventilating, air conditioning and exhaust systems into full operation and continue their operation each day of testing and balancing.

2.02 Test Data Report: Upon completion of the balancing of the air systems, submit 3 copies of the complete test data to the Engineer for approval. Furnish a copy of the completed and verified test data to the Physical Facilities Director concurrently with the final submission to the Engineer.

2.03 Tests Required: Perform the following tests and balance each system in accordance with the following requirements:

A. Inspect and certify that all throw away dust and construction filters have been removed and final sets of operating filters have been installed before proceeding with test and balance.

B. Test and adjust blower rpm to deliver design cfm.

C. Measure air quantities in main and branch ducts by traversing entire cross sectional area of duct with pitot tube. Measure ducts having velocities of 1000 feet per minute or more, with inclined manometers (draft gauge) or magnehelic, measure ducts having velocities of less than 1000 feet per minute with micro-manometers, hook gauges or similar low pressure instruments. Seal openings in ducts for pitot tube insertion with snap-in plugs and cover with duct tape after air balance is complete. Determine diffuser, grille and register air quantities by direct reading velocity meters in accordance with the manufacturer's recommendations.

D. Obtain design air quantities in main ducts by adjusting fan speeds. Adjust branch duct air quantities by volume or splitter dampers. Mark dampers permanently after air balance is complete to enable them to be restored to their correct position if disturbed at anytime. This includes set position for multizone damper operators.

E. Opposed blade dampers at diffusers and registers may be used to balance air quantities, providing final adjustments do not produce objectionable drafts or sound levels. Final air quantities to be within 5% of design requirements. Air quantity adjustments by outlet deflectors, grids or air scoops will not be permitted.

F. Coordinate with the temperature control manufacturers representative to set adjustment of automatically operated dampers to operate as specified, indicated and/or noted.

2.04 Fan and air handling unit test data to include the following where applicable.

A. Installed Fan Data: Unit designation and location, manufacturer and model, size, arrangement, discharge, class, motor HP, volts, phase cycles, maximum F.L. amps.

B. Design Condition: Supply cfm, static pressure, minimum outside air cfm, fan rpm, fan bhp and dry bulb and wet bulb temperatures at return, supply and outside air.

C. Field Test Results: Supply cfm, suction and discharge static pressure, fan rpm, fan operating F.L. amps.

2.05 Perform velocity and pressure tests at main supply, return and fresh air ducts. Submit data with test and balance to include: duct location and size, number of readings, duct average velocity and pressure, total cfm.

2.06 Balance Diffusers, Grilles and Registers: Submit with the test report the following: location, size, identification, type, EFA factor, design and final test velocities and cfm

END OF SECTION

16
DIVISION

SECTION 16010
BASIC ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 This section is supported by the requirements of all other Contract Documents.

1.02 SUMMARY

A. This Section governs general procedures and work applicable to Divisions 15 and 16 and to certain equipment and work in Divisions 2, 8, 10, 11, 14, 15 and 16.
   1. Furnish labor, supervision, energy, materials, tools, transportation, equipment, permits (if required), insurance, taxes, temporary protection and correction necessary to provide work shown and specified.
   2. Provide apparatus, appliances, material or work not shown on drawings but mentioned in specifications, or vice versa, and any incidental accessories necessary to make work complete and ready for operation or inspection by inspecting authorities, even if not specified, without additional expense to Owner.
   3. Include minor details not usually shown or specified, but necessary for proper installation and operation, the same as if specified. In cases where apparatus is referred to in singular numbers, it is intended that such reference include as many such items as are required to complete work.
   4. Provide conduit, wiring, and miscellaneous accessories necessary for complete installation of and final connections to equipment furnished by Owner, if any, and by other trades.

1.03 RELATED SECTIONS

A. Cutting and Patching.
B. Contract Closeout.
C. Flashing (except cap flashing for roof equipment and ducts).
D. Painting of exposed surfaces including color code painting of piping and conduit.
E. Access panels.
F. Motor power and control wiring.

1.04 WORK NOT INCLUDED

A. Equipment and wiring provided by local Telephone utility and local Power and Light utility.

1.05 DRAWINGS

A. Drawings are diagrammatic and indicate general arrangement of systems and work.
   1. Do not scale drawings.
   2. Consult architectural drawings, shop drawings and details for exact locations of fixtures, thermostats and equipment.
      a. Where these are not definitely located, obtain this information from Project Architect/Engineer in writing prior to any rough-in.
   3. Follow drawings in laying out work.
      a. Check drawings of other trades to verify spaces in which work will be installed.
      b. Maintain maximum headroom clearances and space conditions at all points as required by local codes and regulations.
      c. Where headroom or space conditions appear inadequate, obtain instructions from Project Architect/Engineer before proceeding with installation.

4. Make reasonable modifications, without extra charge to Owner, in layout as needed to prevent conflict with work of other trades or for proper execution of work.
5. Engineering drawings are schematic for special equipment since exact dimensions and roughing-in requirements may vary with different manufacturers.

1.06 COOPERATION WITH OTHER TRADES

A. Schedule work and provide temporary service and connections for other trades.

B. Schedule work and provide temporary service and connections so existing systems will not be interrupted when they are required for usage of the existing building(s). Obtain written approval from the Owner at least 14 days prior to any interruption or connection.

C. Perform work at such time and in such manner as to cause minimum inconvenience to the Owner and as approved by the Architect. No allowance will be made for lack of knowledge of existing conditions.

D. Make all arrangements with the utility company for connecting the new services and providing all temporary services.

E. Field painting of exposed conduit and hangers is specified in the Section entitled PAINTING. Clean all surfaces and hanger rods free of grease, scale, rust and other foreign matter ready for painting. Touch up all factory finished, marred in construction, with factory touch-up kits.

F. Correct, without extra charge, electrical work installed in such a manner to cause interference with work of other trades, or to cause unacceptable clearance problems.

1.07 SHOP DRAWINGS AND PRODUCT DATA

A. Shop drawing requirements are specified in the General Conditions of the Contract for Construction.
   1. Do not ship apparatus or equipment from stock or fabricate until shop drawings have been accepted by Project Engineer.
   2. Submit shop drawings with pertinent data and with identification mark numbers specified or scheduled.
   3. Shop drawings without identifications mark numbers or with incomplete performance information will not be reviewed until submission is complete.
   4. Submit shop drawings, or product data where permitted, for the following:
      a. Shop drawings of switchgear, switchboards, panelboards, transformers, lighting fixtures, wiring and cable, raceways and wireways, outlet, pull and junction boxes, wiring devices, disconnect switches, fuses and circuit breakers, lightning protection, generator set, day-tank, automatic transfer switch(s) and fire alarm system.
      b. Catalog cuts without shop drawings are not acceptable.
      c. Submit 1/2" scale layout drawings for main electrical equipment spaces such as closets, switchgear rooms, major conduit bank runs and vaults. Submit layout drawings for review prior to installation of the work.

1.08 RECORD DRAWINGS

A. Keep accurate notes on record drawings of work as actually installed from work as originally indicated, paying particular attention to dimensioning of outside underground lines, their offsets and box locations.

1.09 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Upon completion of work and of tests, provide necessary skilled labor and helpers for operating systems and equipment for a period of 3 days of 8 hours each. Instruct Owner's authorized representative(s) in operation, adjustment and maintenance of systems and equipment. Give Owner at least 48 hours notice of proposed instruction period.

B. Before date of Acceptance Inspection, prepare in reproducible form, detailed operating and maintenance manuals for installed equipment and systems.
   1. Operating and maintenance manuals shall be used for training of and use by Owner's operating personnel in operation and maintenance of equipment and Electrical systems.
   2. Manuals shall address equipment, operation of systems and equipment and parts replacement.
   3. Furnish separate manual or chapter for each class of system:

1.10 SUPERVISION

A. Each subcontract trade shall provide services of an experienced superintendent, who shall be constantly in charge of installation of the work.

1.11 INSPECTIONS PRIOR TO OWNER'S ACCEPTANCE INSPECTION

A. Arrange and schedule as many inspections of work as may be necessary and, when appropriate, notify Project Architect/ Engineer, in writing, that safety-to-life systems are functioning in accordance with specifications.

1.12 CERTIFICATES

A. On completion of work, obtain certificates, if required, of compliance, approval or acceptance from authorities having jurisdiction over work and deliver these certificates to Project Architect.

1.13 MANUFACTURER'S NAMEPLATES

A. Each major component of equipment shall have manufacturer's name, address, model number and rating on a plate securely affixed in a conspicuous place.

B. Nameplate of a distributing agent will not be acceptable.

1.14 ACCEPTANCE

A. Operation of mechanical and electrical work by Contractor does not constitute acceptance of work. Acceptance will occur after Contractor has adjusted equipment, demonstrated that it fulfills requirements of specifications and drawings, corrected defects, and has furnished all of required certificates, if any.

1.15 SPECIAL WARRANTIES

A. Manufacturer's Equipment and System Warranties: Provide manufacturer's written warranties which become a part of Contractor's responsibility to Owner in accordance with General Conditions of the Contract for Construction.

B. Manufacturer's Service: Provide manufacturer's service agreements, where required elsewhere in Sections of these specifications.

C. Contractor's Corrections of Work:
   1. In addition to foregoing special warranties, any warranties made by Subcontractors to the Contractor are a part of the Contractor's responsibility to the Owner in accordance with General Conditions of the Contract.
   2. Correction of work shall include shipping, labor, supervision and related work involved in replacing defective parts or materials provide by manufacturer's under their warranties.

1.16 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver products to job site in manufacturer's original unopened crates or containers, clearly labeled with manufacturer's name, product number and brand. Repair damage sustained by product(s) in transit and handling. If damage sustained while transporting products to job site is unrepairable, replace the product(s) at no cost to Owner.

B. Store and protect materials and equipment to prevent damage of any kind. Keep products dry at all times. Protect exposed metal surfaces with a light oil or silicone coating to prevent rust while in storage.

C. Handle products in such a manner to prevent breakage of containers and damage of any kind.

D. Schedule delivery of materials to job site in accordance with requirements of job progress to avoid delaying work.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equivalent required for work shall be new, of good quality, furnished, delivered, erected, connected and finished in every detail, selected and arranged to fit properly into building spaces. Where no specific kind or quality of material is given, provide a good quality standard article as accepted by Project Architect/Engineer.

B. Equipment shall be of type and capacity shown on equipment schedules on drawings and in specifications and shall be as manufactured by one of manufacturers designated or equivalent, accepted in advance by Project Architect/Engineer.

C. For ease of maintenance and parts replacement, use equipment from a single manufacturer to maximum extent possible.

D. Equipment, materials and components shall be new, standard current products of manufacturers regularly engaged in production of such equipment and shall be manufacturer's latest design conforming to specifications. Materials shall be accepted by code enforcing authorities. Materials used in fire rated construction and in electrical work shall be UL listed, with UL labels as specified.

E. Hardware and accessory fitting shall be U.S. Standard sizes designed, intended or appropriate for the use, and complimenting items with which they are used. Furnish with corrosion protection suitable for the atmosphere in which they are installed.

F. Conform to Requirements of General Conditions of the Contract for Construction for coordinating space requirements, mounting arrangement(s) and service connections when substitute equipment is furnished instead of that used as a basis for design. Ascertain before ordering that equipment will fit assigned space and that it can be moved into position without interference from other construction, i.e., check door clearances, ceiling heights, crane access and the like. Be responsible for expenses generated by substitution of equipment used as a basis for design. Maintain clearances as required by the N.E.C.

2.02 IDENTIFICATION OF ELECTRICAL SYSTEM ITEMS

A. Identify electrical equipment and conductors in accordance with following:

1. Distribution Equipment: Major components of distribution system such as circuit breakers, switches, switchboards, panelboards, switchgear shall have nameplates with equipment identification, voltage and phase ratings and source of feed or circuit utilization. Equipment identification shall correspond to the designation on single line diagram. Panelboards shall have typed directories.
2. Starters, Disconnect Switches and Controls: Provide laminated phenolic nameplates with white letters on a black field secured with flush fastenings identifying equipment served.
3. Conductors: Color code wire and cable for feeders and branch circuits as follows unless otherwise required by local codes or electric utility company.

	a. 208Y/120V	480Y/277V		
1)	Black	Brown		
2)	Red		Purple	
3)	Blue		Yellow	
4)	Neutral		White	Gray

5)	Ground	Green	Green

b. Ground Fault Protected Devices:
   1) Identify devices protected by ground fault interrupters.
   2) Receptacles, not otherwise identified by manufacturer, shall have cover plates with words "Protected by GFI" and "Test Before Using" engraved thereon.

2.03 UNDERWRITERS' LABORATORIES LISTING AND LABELS

A. Where materials and equipment are available under continuing inspection and labeling of UL, provide such material and equipment.

B. Listing by Underwriters' Laboratories shall be evidenced by label or:

C. UL - Electrical Construction Materials List (Green Book).

D. UL - Electrical Appliance and Utilization Equipment List.

E. UL - Building Materials List.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify/examine that the surfaces, substrates, and conditions are satisfactory to receive electrical general provisions, and are free from deviations/defects affecting quality of the work.

B. Notify Contractor in writing of conditions detrimental to proper/timely completion of the work.

C. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

D. Beginning of installation will be construed as acceptance of existing substrates, surfaces, and conditions.

3.02 EQUIPMENT INSTALLATION

A. Obtain services of manufacturer's representatives of major electrical equipment at job site during erection or construction of their equipment to insure proper installation. Failure to have such checks made by manufacturers shall place full responsibility for proper installation on Contractor who shall make any corrections or remedy defects at no additional cost to Owner.

B. Where necessary to meet space conditions bring equipment to its ultimate location in pieces or otherwise disassembled, then assemble it in place. Provide flanges, studs and the like for matching, alignment and field assembly.

C. Conduct field tests of equipment after assembly and during under direct supervision of manufacturer's representative. Upon satisfactory conclusion of field tests, manufacturer shall furnish, for each such apparatus or equipment, a written statement certifying that there has been no invalidation of any warranties or guaranties, nor impairment of capacity or functioning of apparatus or equipment. Field tests shall be in addition to all factory tests, shop tests and final tests and adjustments.

D. Avoid field assembly wherever possible by suitable scheduling of the general construction work.
   1. Extra compensation will not be allowed for those cases where it is necessary to field assemble equipment or apparatus.

3.03 FABRICATION AND INSTALLATION

A. Workers: Use thoroughly trained and experienced workers, completely familiar with items to be installed and manufacturer's current recommended methods of installations.

B. Set equipment level, properly aligned and bolted together where in sections. Secure equipment and materials firmly in place. Screws, bolts, nuts, clamps, fittings or other fastening devices shall be made up tight.

C. Repair to a new condition, or replace materials damaged during delivery, storage or installation. Touch-up scratched or marred finishes on equipment to match original finish or completely refinish.

D. Factory paint or finish enclosures, panels, cabinets, relays, safety switches, fixtures and other exposed equipment or accessories except as indicated otherwise. Group mounted items shall be similar in finish and color.

E. Make connections for air conditioning and ventilating equipment and controls. Follow manufacturers recommendations and system requirements when no other information available.

F. Support electrical raceways, conduits and light fixtures from overhead structure, not from ducts, pipes, conduits or the like. Support piping and HVAC ducts from overhead structure, not from ducts, pipes, conduits or equipment.

G. In order to use same means of support for electrical and mechanical items, design combined support system and coordinate to safely support suspended items.

3.04 HOUSEKEEPING

A. Clean exposed surfaces raceways and equipment which have become covered with dirt, plaster or other material during handling and construction before such surfaces are prepared for painting or enclosed within building structure,

B. Keep raceway openings closed by means of plugs or caps to prevent entrance of foreign matter.
   1. Cover fixtures, equipment and apparatus to protect them against dirt, water, chemical or mechanical damage both before and after installation.
   2. Damaged fixtures, equipment or apparatus shall be restored to its original condition or replaced at no cost to Owner.

3.05 EXCAVATION AND BACKFILLING

A. Excavation, backfilling and compaction of trenches required for the installation of electrical services and to points of connection with exterior underground utilities outside of the building shall be performed as specified in Trenching, Backfilling and Compaction for Utilities - Refer to Division 2 sections.

3.06 SLEEVES BLOCKOUTS, CUTTING AND PATCHING, CORING AND DRILLING

A. Sleeves:
   1. All conduits passing through concrete slabs shall be provided with sleeves.
   2. All conduits passing through interior concrete or masonry walls and partitions shall be provided with sleeves.
   3. Where pipe motion due to expansion and contraction will occur, sleeves shall be of sufficient diameter to permit free movement of pipe.
   4. Cutting and Patching:
      a. Cut and patch as needed for installation of electrical equipment. Perform finish patching according to specifications for each finish, by mechanics skilled in each type finish.
      b. Install work so that no undue cutting and patching will be required in building construction. Do no cutting that may impair strength of building construction. Install work in various portions of building as construction progresses. Do not delay construction of building.

c. Cut and patch as needed for conduits where sleeves and inserts were not installed, or where incorrectly located.
d. Provide for cutting out holes in structural steel webs (number, size and location) by means of shop drawing submittal and review only as approved by Project Architect/Engineer. Reinforce holes as directed by Project Architect/Engineer.

5. Coring and Drilling:
   a. If a sleeve is omitted, core drill to permit insertion of a pipe sleeve with sufficient clearance to permit grouting in place with specified backer rod and sealant space between the line and sleeve.
   b. When core drilling or cutting duct holes in foundations, walls, beams, columns or structural slabs, determine the location of reinforcement and tendons before coring.
   c. Holes, except for small screws, may not be drilled in beams or other structural members, without obtaining prior acceptance of Project Architect/Engineer.

3.07 WATERPROOFING AND ROOFING

A. Where electrical work penetrates building envelope, or any waterproofed construction, method of installation shall be performed in a manner to prevent transmission of water, heat, cold and drafts.

B. Follow details, including architectural, which establish types of waterproofing construction for each penetration condition.

C. Where a detail suitable to encountered condition is lacking, request instructions from Project Architect/Engineer.

D. Provide necessary sleeves, sealing and flashing required to make opening watertight

3.08 FINAL TESTING, ADJUSTMENTS AND ACCEPTANCE OF ELECTRICAL EQUIPMENT AND SYSTEMS

A. Schedule testing and cleared through Project Architect/Engineer.
   1. No testing of any kind shall be done or scheduled without clearance by Project Architect/Engineer.
   2. Furnish Project Architect/Engineer with name of person who will be in charge of testing, energizing and start-up.
   3. Confer with Project Architect/Engineer on procedures to be followed in obtaining clearances for electrical equipment.
   4. Procedures as finally agreed upon shall be adhered to.
   5. Complete test and inspection records shall be made and incorporated into a report for each piece of equipment tested. Record readings taken. Submit four copies to Project Architect for review.
   6. Notify Project Architect in writing at least one week prior to test, establishing time that test is to be performed.
      a. Perform tests in presence of Project Architect/Engineer.
   7. Furnish necessary meters, instruments, temporary wiring and labor to perform required tests and adjustments of equipment and wiring including electrical equipment furnished by others, to determine proper polarity, phasing, freedom from grounds and shorts and operation of equipment. Measuring instruments shall be properly calibrated.
   8. Demonstrate materials and manner of installation to be in accordance with the requirements of state and local public authorities, the utility company and NFPA.
   9. Energize equipment following established procedures after certification by the Contractor that the installation is satisfactory.
   10. Wiring:
      a. Check system and equipment grounds for resistance using the Megger ground tester in accordance with manufacturer's instructions. Investigate circuits showing insulation resistance less than minimum values given in N.E.C. Correct weak points.

b. Overall resistance of the ground system shall be no greater than 25 ohms. Inspect grounding system to insure that above-ground cables and connections are suitably protected. Provide additional ground rod, if needed, to obtain the specified resistance.
c. Make ground resistance tests at test points designated by the Project Architect/Engineer. Make ground resistance tests in accordance with James G. Biddle Company Bulletins 25T2 and 25-J.
d. Correct or replace nominal current-carrying circuits which are defective or grounded. Correct other troubles encountered in these tests.

11. Breakers: Set breakers so equipment will be in proper operating condition before being placed in service. Perform final operational tests to determine that wiring connections are correct.
12. Lighting:

B. Check lighting fixtures and receptacles for proper operation. At completion of work, clean fixtures and lenses and replace missing and burned out lamps.

C. In residential projects, provide keyless lamp holders and bulbs to all lighting outlets for future tenant luminaires, in order to comply with inspecting authority requirements.

1. Motors:
   a. Make these tests on motors before start-up: Check motor nameplates for HP, speed, phase and voltage. Check bearings to see if they are filled with oil or grease. Lubricate. Check coupling alignment and shaft end-play.
   b. Make these tests on motors during start-up:
      1) Check shaft rotation before final connections are made. Check for bearing temperature and smooth operation.
      2) Take a current reading at full load using a clamp-on ammeter. If ammeter is over the rated full load current, determine reason for the discrepancy and take corrective action.
   c. After all connections are made, test motors and equipment for proper operation. Investigate cause of any motor operating above full load rating and remove cause, or report to Project Architect/Engineer instead of increasing overload heater rating. Check rotation of motors.
   d. Check overload elements in motor starters for suitability to the motor characteristics. Replace any overload element that does not conform to starter manufacturer's recommendations based on actual nameplate current rating of the motor. Investigate the cause of any motor operating above full load rating and correct. Under no circumstances shall oversize overload relay trip rating be substituted.
2. Transformers: Megger winding insulation resistance, primary and secondary-to-ground and primary-to-secondary. Windings shall exhibit resistance in megohms equal to eight times the voltage rating of the winding in kV.
3. Control and Alarms: Check control and alarm circuits for proper operation. Test switchgear, switchboards, fire alarm system, as specified in each Section.
4. Service Voltage: Check service voltage at no-load and at full load on the distribution system. The objective shall be to maintain the equipment terminal voltage at less than 10% above nameplate rating at full system load. Then set transformer no-load taps so that at normal loading the average operating voltages at the terminals of all utilization equipment matches the nameplate voltage of that equipment as closely as possible.
5. Test all circuits, which under any circumstances can be paralleled, for proper phasing using hot phasing.
6. Acceptance: Observation of the operation of the electrical installation and equipment by the Project Architect/Engineer does not constitute acceptance of the Work. Acceptance will be made after the Contractor has adjusted his equipment, demonstrated that it meets the requirements of the Contract Document, and has furnished all the required certificates.

3.09 TOOLS AND SPARE PARTS

A. Use only tools designed for each operation. Keep tools in good condition. Do not use worn or broken tools. Wrench and vise teeth shall be sharp and clean to prevent damage to the materials. Screw drivers and wrenches shall be of the proper size to prevent damage to head or nuts.

B. Deliver special tools and spare parts provided with equipment to an authorized representative of the Owner. Obtain signed and dated receipts.

3.10 DEMONSTRATION

A. Demonstrate the essential features of the following mechanical and electrical systems upon completion of satisfactory testing:
   1. Power System.
   2. Lighting System.
   3. Fire Alarm System.
   4. Sound System.
   5. Security System.
   6. Hold the demonstrations in the presence of the Owner or his designated representatives and the Project Architect/Engineer to show functions, locations and relationships to the Drawings. Demonstrate how to "start-stop", reset, replace, and emergency procedures. Demonstrate one system at a time.

3.11 EXISTING CONDITIONS

A. All work herein described and shown on drawings and required to make project complete in every respect, plus any and all patching necessary shall be done to the complete satisfaction of the Project Architect/Engineer and shall be accomplished in strict accordance with the drawings and technical specifications. All materials shall match existing where applicable and all construction and alteration left in new condition.

B. All items to be removed shall be removed with utmost care and without damage, and those items not designated to be reused shall be delivered to the Owner or disposed of as per his written instructions.

C. All alterations, demolition, and removal, cutting and patching and other work necessary for construction of this contract shall be performed without additional cost to the Owner. This shall include removal, rerouting, etc., of all electrical items required to complete installation intended.

D. Patch or replace all damaged floor, wall, ceiling, etc. surfaces altered to accommodate the new construction. Patched surfaces shall match existing adjacent surfaces.

E. All cutting, patching, demolition, repairing, replacing etc., necessary under this Contract shall be coordinated by the General Contractor. Where applicable, coordinate work with utility companies, local and state authorities having jurisdiction, Owner's representative and all applicable codes.

F. Where alterations take place in occupied areas, Contractor shall clean up daily, and noise shall be kept to a minimum.

G. None of the services to existing buildings shall be disrupted in any way except with the express permission of the Owner.

H. All equipment presently "hot" and required to be maintained shall be returned to this condition after performing the changes to existing building. Reroute conduits and extend or replace circuits as required. Perform work at convenience of the Owner.

I. Execute all work in such a manner and to avoid interference with the use of passage to and from adjoining buildings or areas.

J. The Contractor shall be fully responsible for any damage to existing building and to contents thereof including machinery, furniture, equipment, etc., and damage to buildings or contents thereof due to Contractor operations, shall be repaired or replaced at direction of Project Architect/Engineer, by the Contractor, at no extra cost to the Owner.

K. Connection to existing structures shall be made in such a manner that as little time as absolutely possible will be taken, and Contractor will be required to coordinate fully with Owner in connection with convenience and safety of all persons involved, including employees.

L. Prior to commencement of work, verify measurements of building site. Submit discrepancies and differences to Architect/Engineer for consideration and decision before proceeding.

M. Obtain full information regarding peculiarities and limitations of space available for installation of all materials under contract. No extras will be allowed for any rework due to failure to bring this to the engineer's attention prior to rough-in.

END OF SECTION

SECTION 16023
CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

A. Comply with the latest edition, unless otherwise specifically noted, all or portions of the following codes and requirements:

1.02 The Florida Building Code (FBC)

A. The Standard Building Code, (SBC)

B. National Electric Code, (NEC)

C. NFPA, Life Safety Code and all other related NFPA codes

D. ANSI A117.1

1.03 ANSI A58.1 Wind Load Provisions

A. In addition to the foregoing the following shall apply:

1. Where materials and equipment are available under the continuing inspection and listing service of Underwrit-er's Laboratories, Inc., furnish materials and equipment so listed.

1.04 It is the contractors responsibility to be fully cognizant with all code sections as they apply to the work/installation at hand whether or not shown on the drawings but required by code. If any discrepancy arises between any design issues and code requirements, contractor must adhere to the most stringent approach.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

SECTION 16101
RACEWAYS AND CONDUIT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Raceways including necessary accessories indicated on drawings and specified in this section.

B. Related Sections:

C. Division 1 Section "General Requirements."

D. Division 2 Section "Site Work."

E. Division 7 Section "Firestopping and Fire and Smoke Barrier Caulking."

F. Division 7 Section "Sealants and Caulking."

G. Division 9 Section "Painting."

H. Division 16 Section "Wire and Cable."

I. Division 16 Section "Outlet, Pull and Junction Boxes."

J. Division 16 Section "Grounding."

1.02 DEFINITIONS: The word conduit used throughout the specifications and drawings refer to all type of conduits and tubings.

1.03 SUBMITTALS

A. Properly identified manufacturer's product data including printed installation instructions and recommendations in the form defined in Division 1 Section "Submittals" before commencing work. Submit samples if requested.

1.04 LABELING: Materials to bear Underwriters Laboratories labels.

PART 2 PRODUCTS

2.01 RIGID CONDUIT

A. Rigid Galvanized Steel Conduit (RGS): Hot dipped galvanized or electro-galvanized, with corrosion resistant coating on the inside, threaded, standard weight steel conduit conforming to ANSI C80.1-1966, and N.E.C. 344. Minimum size 3/4 inch unless noted otherwise.

B. Intermediate Metal Conduit (IMC): Hot dipped galvanized or electro-galvanized, threaded, steel conduit conforming to ANSI C80.1-1966 and N.E.C. 342. Minimum size shall be 3/4 inch, unless otherwise noted.

C. Rigid Non-Metallic (PVC): Schedule 40, PVC plastic 90? C. conforming to ANSI C33.91, UL 651, and N.E.C. 352. Minimum size 3/4 inch unless noted otherwise.

2.02 ELECTRICAL METALLIC TUBING (EMT)

A. Galvanized steel tubing with smooth interior coat of lacquer enamel or zinc coat.

B. Conform to ANSI C80.3-1977, and UL 797, and N.E.C. 358.

C. Minimum size 3/4 inch for feeders, home-runs and spare conduits. ½ inch for branch circuit work unless otherwise noted.

2.03 FLEXIBLE METAL CONDUIT

A. Steel: Flexible galvanized steel conduit (Greenfield) conforming to UL 1 and N.E.C. 348.

B. Liquid Tight: Flexible galvanized steel conduit with oil and water resistant overall plastic sheath, conforming to UL 1, and N.E.C. 350.

C. Minimum size for flexible metal conduit ½ inch except 3/8 inch where permitted by N.E.C. 360 for connections to lighting fixtures only.

2.04 CONDUIT FITTINGS

A. For Rigid Steel Conduit and Intermediate Metal Conduit: Zinc or cadmium plated steel or galvanized malleable iron conforming to ANSI C80.4. All fittings shall be threaded type. Die cast zinc alloy fittings shall not be used.

B. For rigid PVC conduit; 90o C. PVC fittings UL listed. Fittings to match conduit; conforming to UL 651.

C. For EMT fittings shall be zinc or cadmium plated steel or malleable iron of the compression type; (or stainless steel multiple point locking type). All connectors shall have insulated throats. Fittings shall conform to ANSI C80.

D. For flexible metal conduit fittings shall conform to Fed. Spec. W-F-406B and shall be of steel or malleable iron only with insulated throat.

E. All bushings and connectors shall incorporate an insulating insert of at least 150o C. rated plastic or 105o C. rated nylon. Conduit bushings made entirely of nonmetallic material shall not be used. Grounding and bonding bushings shall have clamp type terminal for copper conductor.

F. Expansion fittings and sealing fittings - UL listed with ground continuity means.

2.05 CONDUIT SUPPORTS

A. Straps: Formed zinc coated steel or malleable iron one-hole pipe straps or conduit clamps sized for conduits or tubing.

B. Fastenings: Zinc coated or cadmium plated steel screws, bolts, toggles and expansion anchors as required.

C. Electrical steel channels shall be equivalent to Unistrut P-3000 Series. Provide trapeze, clamps and supports, concrete inserts galvanized steel or plated steel with galvanized conduit clamps and threaded 1/4 inch diameter minimum suspension rods.

D. For individual branch circuit EMT or flexible metal conduit concealed above
   1. accessible hung ceilings only, "caddy clips" spring steel conduit clamps.

2.06 CONDUIT COATINGS: On steel conduit buried directly in contact with the earth; or in concrete slab; either factory applied PVC coating or Cabot Flexi-Black, 1/16 inch thick applied without thinning or approved equal.

2.07 WIREWAYS AND AUXILIARY GUTTERS

A. Hot dip galvanized code gauge sheet steel, complete with knockouts, enclosures and removable covers unless indicated as hinged. Units to be as manufactured by Square D, Hoffman, Asco or approved equals.

B. Exterior locations to have weathertight gasketed covers and joints, drip-proof rain shields and shall be painted after installation with exterior enamel paint.

C. Wireways and gutters shall conform to N.E.C. 366 and 376.

2.08 SURFACE RACEWAYS: Only where specifically indicated. UL Listed and conform to Fed. Spec. W-C-582, and N.E.C. 386. Surface raceways shall be as manufactured by Wiremold, Walker, Square D or Hubbell.

2.09 PULL WIRES: Nylon rope of sufficient strength to pull in the maximum size conductors into the trade size conduit. Minimum strength shall be 200 lbs.

PART 3 EXECUTION

3.01 GENERAL

A. Do not proceed with the work of this Section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

B. Provide where indicated and where required all ducts, conduits, tubing, wireways and gutters, to form a complete and integrally grounded raceway system. The system shall be installed in accordance with all National Electrical Code and local code requirements. All components of the system shall be of sufficient size, strength, and capacity to allow for placements, pulling-in or other installation of conductors, wires, cables, splices, taps and terminations whether included in this Contract or for future use without strain or injury to those items being installed.

C. Provide pull strings in all empty raceways where no conductors are installed in this Contract. Allow 10 inches minimum slack at each end of pull wire and securely caulk in place.

D. The minimum size of rigid conduit, EMT and flexible metallic conduit shall be in accordance with N.E.C. except:
   1. Unless otherwise specified in another section of the specification or shown on the drawings.
   2. Unless otherwise shown on the drawings, telephone conduits shall be not less than 1 inch trade size.

E. The Contractor's attention is directed to check the size of all raceways to determine that the green equipment ground conductor, specified, shown or required can be installed in the same raceway with phase and neutral conductors in accordance with the percentage of fill requirements of N.E.C. If necessary, the Contractor shall increase the duct, conduit, tubing or raceway sizes shown or specified to accommodate all conductors without additional cost to the Owner.

3.02 RACEWAY AND CONDUIT USE LOCATIONS

A. Unless indicated otherwise conduit types specified shall be used in the following locations. Any deviation from this schedule must be submitted for approval with corresponding price adjustments prior to installation. Any conduit not of the specified type, found to be installed shall be removed and replaced with the specified type at no additional cost to the Owner.

B. For exterior locations raceways shall be as follows:
   1. Below grade direct buried RGS (painted or PVC jacketed rigid steel). Where specifically noted on plans use PVC, (encased in concrete if so noted).
   2. Below grade concrete encased - PVC.
   3. Flexible Conduit - PVC jacketed with liquid tight fittings.
   4. Exposed Conduit - RGS or IMC.
   5. Gutters, wireways, and troughs shall be of the gasketed raintight type.

C. For interior locations raceways shall be as follows:
   1. Under slabs on grade - RGS, (painted or PVC coated) or PVC.
   2. Embedded in concrete walls or floor on or below grade: RGS with threaded or concrete tight steel fittings; PVC.

3. Embedded in concrete walls or floors above grade: [RGS or IMC with (threaded) (concrete tight steel fittings.]; [EMT with concrete tight steel fittings.]; PVC.
4. Concealed in masonry walls; [RGS or IMC with steel fittings]; [EMT with concrete tight fittings.]
5. Concealed in dry wall construction, or in suspended ceilings: EMT or flexible metal conduit.
6. For exposed work non-protected: RGS or IMC below 8 feet from floor, EMT above 8 feet from the floor.

D. Sealing fittings shall be installed at the following points, and elsewhere as shown:
1. Where conduits enter or leave hazardous areas and enclosures for explosion-proof lighting fixtures, switches, receptacles, etc., as per N.E.C. Sealing compound shall be of a type approved for the conduits and use to prevent passage of gases, vapors, etc.
2. Where conduits pass from warm locations to cold locations, such as refrigerated spaces and air conditioned spaces, to prevent passage of water vapor.
3. Where required by the N.E.C.

E. PVC conduit shall be not used indoors either exposed or concealed.

3.03 RACEWAY AND CONDUIT INSTALLATION

A. Route feeders, homeruns and conduits where indicated, except that minor deviations as accepted will be permitted. Maintain a minimum separation of 36 inches between conduits containing emergency feeders and conduits containing normal feeders.

B. The routing of conduit, as shown on the plans, is diagrammatic. Before installing any work, examine the working layouts of all other trades to determine exact locations and clearances. Where equipment is installed by other trades requiring connection under this Section, determine exact conduit entry locations from the approved shop drawings. Modifications to conduit runs shown on the electrical drawings as found necessary from the above shall be made without additional cost to the Owner, and shall be subject to the acceptance by the Architect/Engineer. In determining clearances, note that at no place shall conduit be run within 6 inches of any heated pipe or duct. Where crossing same is unavoidable, the conduit must be kept at least 1 inch from the outer covering.

C. 1. In finished spaces conduits, fittings, outlet boxes, and pull boxes shall be installed concealed in ceilings, floor slabs, walls or partitions of the buildings. Where concealed conduits are installed, sufficient space must be left over conduit and coupling for the applications of finished floor, walls and ceilings. Examine the architectural drawings, and if necessary, confer with the Project Architect/Engineer to determine the type of construction in which concealed conduits will be run and the space available for such conduits.
1. Unless otherwise noted conduits may be run exposed on unfinished walls, on unfurred basement ceilings, in mechanical rooms and in penthouses, attics and roof spaces. Exposed conduits shall be installed in a neat and workmanlike manner running parallel or perpendicular to the building lines.

D. Avoid running conduit on the roof wherever possible. If absolutely necessary, all roof mounted conduit shall be RGS or IMC, a minimum of 16 inches above roof on galvanized steel struts, securely supported, horizontally and vertically with pitch pans as required, on supports and conduit penetrations.

E. Conduits Penetrating Waterproof Membranes: Coordinate installation of conduits prior to installation of waterproof membrane. Membrane to be sealed waterproof to conduits as specified in other sections prior to pouring of slab over membrane.

F. Conduit Embedded In Concrete:
1. Conduit embedded in poured concrete shall be of the specified type, unless otherwise indicated. Metallic conduit buried in the ground shall be of the specified type. The outside diameter of any conduit buried in concrete shall not exceed one-third of the thickness of the structural slab, wall or beam in which it is placed. The conduit shall be

located entirely within the middle third of the member whenever possible. Lateral spacing of conduits buried in concrete slabs shall be not less than three diameters except where drawings definitely indicate that the concrete slab has been specially designed to accommodate a closer spacing of conduits entering signal or electric closets, panelboards, etc., or the arrangement is accepted by the Architect/Engineer.

2. In general, conduits shall not be run through beams, except where clearly indicated on drawings specified herein, or where permitted by the Architect/Engineer.
3. No vertical conduit passing through horizontal concrete beams shall interfere with reinforcing. Where accepted by the Architect/Engineer, horizontal conduit may pass through beams, provided they are not closer than 6 inches clear and are confined to middle half of span.
4. Where metallic conduits are installed in close proximity to reinforcing steel bars, paint the bars with approved bituminous compound in the area of possible contact between the conduit and reinforcing steel. Tie the conduit to the steel with nylon or other nonconductive ties.
5. Properly support conduit to be embedded to maintain correct location and spacing during concreting operations. If necessary, provide suitable metal supports for this purpose.
6. Where a concrete embedded conduit passes through an expansion or contraction joint in the structure, install the conduit at right angles to the joint, and provide an approved conduit expansion fitting at the joint installed in accordance with the manufacturer's instructions. Paint the conduit with an approved bituminous compound for one foot on either side of the expansion joint.
7. All metal conduits concealed in slabs on grade shall be installed over vapor barrier.
8. At any one point no more than two lines of conduits shall intersect in any portion of slab. In all such cases, any additional conduit shall be rerouted through other areas. All conduits and pipes shall have a minimum cover of one inch of concrete. Install no conduit in slabs 3 inches thick or less. Under no conditions shall aluminum conduit be buried in concrete slabs. Slab installed conduit shall be stubbed within webbing of block and shall be extended vertically concurrent with laying of block. Determine centerline of block partitions measured from column centerlines.

G. Conduit Bending Cutting and Placement:
1. Conduit bends and offsets shall be avoided where possible. Required bends shall be made with standard benders designed for the purpose and with a minimum radius of six times the internal conduit diameter. No torch will be allowed for PVC conduit bends. Make all conduit bends in accordance with N.E.C. Conduit which has been crushed or deformed shall not be installed. All bends shall be free from dents or flattening. No more than 360o in bends shall be permitted in conduit between any two terminations of pull boxes. Make no bend in surface raceways. Use factory formed fittings for surface raceways.
2. The ends of all conduit shall be carefully reamed out free from burrs before installation and after threading. All cuts shall be made square. Coupling of conduit by means of running threads is not permitted. Where it is impossible to run the conduit and coupling sections together, an Erickson coupling or approved equal.
3. Take care to prevent lodgement of plaster, dirt, or trash in raceways, boxes, fittings and equipment during course of construction. Clogged raceways shall be entirely freed of obstructions or replaced.
4. During installation of conduit, all unfinished runs and terminations in pull boxes, cabinets, etc., shall be capped until such time that conductors are installed.

H. Conduit Connections:
1. Conduit and EMT runs shall be mechanically and electrically continuous from service entrance to all outlets. Unless otherwise specified, each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet box by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter. Where nominal circuit voltage exceeds 250

volts, (1) in rigid conduit, an additional locknut shall be provided, one locknut being inside and one locknut outside and (2) in EMT or flexible metal conduit, the one locknut shall be made wrench-tight. All locknuts shall be the bonding type with sharp edges for digging into the metal wall of an enclosure and shall be installed in a manner that will assure a locking installation. Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into tapped connections.

2. Plastic conduit joints shall be made up by brushing a plastic solvent cement on the inside of the plastic coupling fitting and on the outside of the conduit ends. The conduit and fitting shall then be slipped together, until seated, with a slight twist to set the joint tightly, and the conduit then rotated one-half turn to distribute the cement evenly. Excess cement built up on the surface of the conduit shall then be removed.
3. The end of each conduit l inch and smaller shall be provided where it enters a junction box, outlet box, cabinet, etc., with the locknut and bushing. For conduits l-1/4 inches and larger, insulated bushings with ground stud shall be used. If insulated bushings are of the fully insulated type, additional locknuts shall be used inside the junction box or cabinet before installing the bushing. Conduit entering main distribution switchboard feeder pull boxes shall be provided with insulated bushing with ground stud regardless of size.
4. Install conduit so that any moisture collecting in the conduit will be drained to the nearest outlet or pull box, where possible.
5. Where metallic conduit is exposed to different temperatures, seal the conduit to prevent condensation and passage of air from one area to the other.
6. Care shall be taken to see that all light and power conduit run from a permanent and continuous ground return back to the service ground connection point. Conduits used on systems which are entirely isolated from the light and power distribution system shall be electrically continuous and grounded in an approved manner. All cable trays shall be grounded to the conduit system.

I. Conduit Penetrations, Supports:
1. Conduits penetrating the walls or smoke partitions shall be fire stopped (sealed). Filling materials for openings in floors shall be fire-resistive, and finished so as to prevent passage of water, smoke and fumes. Filling material for openings in walls shall be fire-resistive where it occurs in fire walls, and shall be installed so as to prevent the passage of air, smoke or fumes.
2. Roof penetrations shall be made using approved flashings and counterflashings. Where conduits penetrate exterior walls near flashings, penetration shall be at least 3 inches above the flashing reglet.
3. Where conduits passing through the openings are exposed in finished rooms, the finishes of the filling materials shall match and be flush with the adjoining floor, ceiling or wall finishes.
4. All conduits not embedded in concrete or masonry shall be securely and independently supported so that no strain will be transmitted to outlet box and pull box supports, etc. Supports shall be rigid enough to prevent distortion of conduits during wire pulling.
5. Wood hangers and perforated sheet metal hanger straps will not be permitted. Spacing of conduit supports shall not exceed eight feet. Horizontal feeder conduit banks shall have their hangers fastened to the building structure by approved means. Hangers for banks consisting of one or two conduits may be fastened from inserts in the slab. All auxiliary steel for fastening shall be furnished and installed under this section.
6. Support individual conduits not larger than 1-1/2 inch diameter by means of one-hole pipe straps or individual pipe hangers. Support individual horizontal conduits larger than 1-1/2 inch diameter by individual pipe hangers.
7. Conduit in hung ceilings shall be supported in approved manner similar to exposed conduits.
8. Branch circuit conduits above non fire rated suspended ceilings may be supported from the floor construction above or from the main ceiling support members, however, the

finished installation shall not interfere with the removability of ceiling panels. Branch circuit conduits above fire rated ceiling must be independently supported.

9. Unsupported vertical drops over 10 feet from bus ducts or at motors shall be in rigid steel conduit. For vertical drops of less than 10 feet EMT may be used. In any case, conduit shall be braced to prevent swaying.
10. Space conduits installed against concrete or masonry surfaces away from the surface by clamp backs or other approved means.
11. In dry locations, spring steel fasteners, clips, or clamps specifically designed for supporting exposed single conduits may be used in lieu of pipe straps or pipe hangers. Hanger rods used with spring steel fasteners shall be not less than 1/4 inch diameter steel with corrosion resistant finish. Spring steel fasteners shall be specifically designed for supporting single conduits. Type, size and spacing of spring steel fasteners together with accessories shall be approved by the Architect/Engineer and the Contractor shall submit all applicable load and rating data for approval. Wire shall not be used as a means of support. Nails are not allowed for the support of conduit.
12. Where two or more horizontal conduits run parallel and at the same elevation, they shall be supported on multiple (trapeze) pipe hangers. Each conduit or EMT shall be secured to the horizontal hanger member by a U-bolt, one-hole strap or other suitably designed and approved fastener.
13. Hanging Hardware shall be hot-dip galvanized after fabrication and provided as part of this contract.

J. Conduit Fastening: Fasten raceways as follows:
1. To Wood: Wood screws, sheet metal screws or screw type nails.
2. To Hollow Masonry: Toggle bolts or expansion bolts as required. Holes not used to be filled.
3. To Concrete or Solid Brick Masonry: By expansion bolts. Holes drilled to a depth of more than 1-1/2 inch.
4. To Steel Work: Machine screws, welded threaded studs, or spring-tension clamps. Raceways or pipe straps shall not be welded to steel structures.
5. To Light Steel Construction Partitions: Sheet metal screws. Bar hangers may be attached with saddle ties of 16 gauge double strand zinc-coated steel wire.
6. Nail-type nylon anchors with lock washers and nuts may be used in lieu of expansion bolts or machine screws.
7. Explosive charge setting devices are not permitted for any type of fastening on the project.
8. Conduits to be continuous from outlet to outlet and from outlet to cabinet, junction box or pull box.
9. Surface Wireways and Auxiliary Gutters: Fasten in accordance with manufacturer's directions.
10. Cable Supports in Vertical Raceways: In accord with N.E.C. 300-19. similar to O-Z type S.

K. Flexible Conduit:
1. Flexible conduits shall be used for connections to motors and other electrical equipment when it is subject to movement, vibration, misalignment, cramped quarters or where noise transmission is to be eliminated or reduced. Flexible conduit used to meet the above requirements shall in addition be of the liquid-tight type when installed under any of the following conditions:
2. Exterior locations.
3. Moisture or humidity laden atmosphere where it is possible for condensation to accumulate.
4. Corrosive atmospheres.
5. Where water or spray due to wash-down operations is frequent or possible.
6. Wherever there is a possibility of seepage, dripping, etc., of oil, grease or water.

7. Flexible conduit shall be used for short connections to control devices, recessed fixtures and similar items with enough slack to avoid tension. Connection between structure and first point of attachment to vibrating equipment to be flexible.

L. Painting: Paint all exposed conduit to match the surrounding wall or ceiling against which it is mounted in accordance with Section labeled Painting.

END OF SECTION

SECTION 16105
OUTLET, PULL AND JUNCTION BOXES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Outlet, pull and junction boxes including necessary accessories indicated on Drawings or specified in this section.

B. Related Sections:
   1. Division 9 Section - Painting.
   2. Division 16 Section - Raceways and Conduits.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Materials to bear Underwriters Laboratories labels.
   2. Conform in size to NEC for number and size of conductors in boxes. Conform in size to NEC for number and size of conduits entering and exiting each box.

1.03 SUBMITTALS

A. Submit manufacturer's literature and technical data before commencing work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Outlet Boxes:
   1. Provide outlet boxes at all locations requiring same, where shown on the drawings, and as hereinafter speci-fied. All fixture studs shall be securely fastened in an acceptable manner. All plaster covers shall have depths suitable to the finish being applied to the walls. All sheet steel boxes shall be properly drilled and tapped. There shall be no more holes in any of the outlet boxes than are required for the conduits entering same. Depth of all boxes shall be such as to allow for easy wire pulling and proper installation of wiring devic-es.
   2. Outlet boxes shall be galvanized steel or rust resis-tant malleable iron alloy and shall conform to Fed. Spec. WC-583 and ANSI-C33.65.
   3. Outlet Boxes shall be as follows:
      a. For recessed ceiling fixtures 4 inch square sheet steel box with blank cover and suitable hanger bar-box to be fastened to ceiling suspension members in an acceptable manner not more than 1 foot from fix-ture opening.
      b. For surface or stem mounted ceiling fixtures from slab with concealed conduit, 4 inch sheet steel octagon concrete ring of a depth suitable to the construction and furnished with top cover having a 3/8 inch fixture stud.
      c. For ceiling and wall bracket outlets on exposed conduit in dry locations, 4 inch octagon sheet steel box with 3/8 inch fixture stud.
      d. For surface mounted ceiling fixture or hung ceil-ings, 4 inch octagon sheet steel hung ceiling box with suitable hanger bars and 3/8 inch fixture stud. Box to be fastened to ceiling suspension in an acceptable manner.
      e. For surface mounted wall bracket fixtures with con-cealed conduit, 4 inch square sheet box with round opening plaster cover and 3/8 inch fixture stud.
      f. For ceiling and wall bracket outlets on exposed conduit at damp or wet locations, 4 inch cast iron.

g. For switches and receptacles in tile, plastered or gypsum board walls, 4 inch square sheet steel box or multigang box with proper plaster covers as required. Two gangs may be provided by means of a 4 inch square box with two gang plaster cover.
h. For switches and receptacles in enameled or face brick walls, unfinished walls and woodwork, single or multigang sheet steel utility boxes as required.
i. For switches and receptacles on exposed exterior conduit work, Type FS or FD conduit.
j. For telephone or computer outlets 4-11/16 inches square X 2-1/2 inches deep.

4. All boxes for specialty equipment, such as for fire alarm or signal systems, clocks, pilot lights and sim-i-lar equipment, shall be manufactured by the manufacturer of the enclosed equipment.
5. Wet/Damp Locations:
   a. Gasketed, weathertight, screw covers, code gage galvanized steel pull boxes with weatherproof con-duit hubs equivalent to Myers Scru-Hub for pull boxes with multiple conduit entries.
   b. Cast metal hub type, dipped in rust inhibitor and provided with gaskets for individual conduit runs.
6. Extension Rings: Do not use to increase the volume of boxes, except where necessary due to multiple conduit run conflicts.
   a. Where such conflicts occur an extension ring may be permitted for changes in direction of conduit to effect necessary clearances.
   b. In such or other specifically permitted cases no more than one extension ring may be used for each box where necessary.

B. Pull and Junction Boxes:
1. Where indicated in the plans and specifications or where necessary for compliance with code requirements for cable installation, install junction and pull boxes of the proper size for all conduits over one inch trade size. All pull and junction boxes shall be of ade-quate size to accommodate instal-lation of conductors without excessive bending of conductors which would damage insulation.
2. Pull and junction boxes shall conform to Fed. Spec. WJ-800 and shall be of all steel construction, spot or seam welded at joints and hot dip galvanized after fabrica-tion.
3. Boxes shall be drip proof with screw attached covers. Each box shall have a turned-in lip which shall be weld-ed at joint to develop full strength. Lip shall be drill-ed and tapped for 1/8 inch or 3/16 inch round head screws, symmetrically placed. To provide adequate length of thread, nuts shall be tack welded on inside of lip, or lip shall be made double thickness.
4. Pull and junction boxes shall be sufficiently rigid to with-stand moderate twisting strains. Steel boxes of 100 cubic inches or less shall be of No. 14 gage steel; between 101 and 8500 cubic inches shall be No. 12 gage steel; larger boxes shall be No. 10 gage steel. Bar-riers and reinforcing angles shall be supplied as required.

2.02 Floor Boxes:

2.03 Box shall meet Fed. Spec. W-C-583b Type I fully adjustable, Class 2 concrete tight, Style A round, UL listed. Boxes shall be similar and equal to Steel City Series 68, Catalog No. 68 D, 4-11/16 in. square 2-1/8 in. deep stamped steel box body with flush knockouts on sides and bottom. (1-3/4 in. and 1-1 in. each side). Electro-galvanized with aluminum edge ring. Tops shall have interior leveling screws to adjust floor plate to meet finished floor conditions.

2.04 Covers for Duplex Receptacles: Polished die-cast aluminum with stainless steel screws and 2 separate hinged lids which will permit use of either or both receptacles. The 2 hinged lids shall be located in a 4 in. diameter aluminum floor plate and each lid shall be secured by a special locking screw with straight slotted head. One half turn of the locking screw shall release the hinged lid. Steel City Catalog No. P60-DC-AL with P60-LCP clear plastic carpet plate.

2.05 Covers for Telephone Outlets: 4 in. diameter polished die cast aluminum - Steel City P60 Series with combination plug (1/2 in. and 2 in.) with P60-LCP clear plastic carpet plate. Provide one Cat No. 700-AL aluminum split bell nozzle with 2 inch thread size for each telephone floor box.

2.06 Covers for AV and Other Outlets: Same as telephone.

2.07 Floor Gang Boxes: Watertight construction with cast iron body, painted inside and out, two or three gang boxes, as shown on the drawings, fully adjustable with interior leveling screws for precise adjustment, as manufactured by Steel City Series 640 or approved equivalent.

2.08 Concealed Service Floor Box:

2.09 To deliver both power and communications without exposed service fittings housing.

2.10 Underfloor box to be galvanized No. 14 steel, approximately 9 inches long, 5 inches wide, 3-5/8 inches deep, with slot-head screws at each corner through a leveling plate welded to the bottom of the box. Box to house a duplex 20A, 120 volt, grounded, mounted on a slanted face place at one end, leaving ample space (±60 cubic inches) for communication connections.

2.11 Box to be covered with a hinged floor plate, level with the finished floor. This concealed service top to include the floor flange and then hinged floor plate reinforced with a 5/32 inch plate. The floor plate to accept a piece of carpet or tile; color as selected by the Project Architect. Also to include a retractable exit port for power cords and communication cables.

2.12 As manufactured by Steel City Cat. No. 664 or approved equivalent, with required accessories.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work or this section until condi-tions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Location of outlets on electrical drawings are approx-imate only. Do not scale the drawings. Consult the architectural plans, sections, elevations, and details for exact locations of outlets and equipment and rooms and spaces having furring or hung ceilings. Verify door swings on architectural draw-ings for properly locating light switches. Coordinate wall outlet locations with cabinets and equipment.

B. Determine the proper position of all outlets and recepta-cles, and relocate any outlet or receptacle without addi-tion-al cost to owner if same is improperly located.

C. The Architect/Engineer reserves the right to change the loca-tion of any outlet, apparatus, or equipment up to the time of roughing in without additional cost to owner, provided conduit runs are not substantially increased.

D. Fasten and secure all such boxes to the building structure independent of the conduit. Provide acceptable plaster stops for all boxes set in plastered walls and ceilings.

E. Boxes and supports shall be fastened as follows:
   1. To concrete or brick with bolts and expansion shields.
   2. To hollow masonry with toggle bolts, or bolts and expan-sion shields.
   3. To steel work with machine screws or welded studs.
   4. Explosive charge setting devices are not permitted.

F. All recessed wall outlets shall be flush with the wall sur-face. Install box in wall with cover to permit block or wall surface to fit tight against lip of cover.

G. Where shown together on the plans, switches shall be ganged in one outlet. Switches and receptacles shall be ganged together only where plans specifically indicate such combi-na-tions. Outlets for duplex receptacles shall be arranged for vertical mounting of the receptacles except as speci-fi-cally indicated on plans. Barriers shall be pro-vided as necessary to isolate voltage classes.

H. Under no circumstances shall outlet boxes for adjoining spaces be placed back to back in partition walls.

I. Circuit breakers and switches shall not be grouped or ganged in outlet boxes unless they can be so arranged that the volt-age between exposed live metal parts of adjacent switc-hes does not exceed 300 volts. 120 and 277 volt switches shall not be ganged together.

J. Take special care in aligning rows of outlet boxes for ceil-ing lights.

K. Unless noted or specified or directed otherwise, wall out-lets shall be centered above finished floor as follows:
   1. Convenience and utility outlets 18 inches to bottom of box

3.03 Counter Mounted Outlets 44" to centerline of box

A. Clock outlets 90 inches to center

B. Exit lights 6 inches over doorway

C. Switch outlets 46 inches to bottom of box

D. Special purpose outlets as directed

E. Telephone outlets . 18 inches to bottom of box

F. Fire alarm combination audio/visual appliances 80 inches to bottom of box

3.04 or 6" below ceiling whichever is lower

A. Fire alarm station 46 inches to bottom of box

B. Refer to Architectural drawings for additional mounting heights.

C. Pull and junction boxes shall be provided at such locations as required to reduce length of cable pull or reduce number of elbows between outlets. Boxes must be rendered accessible.

D. Provide blank covers for all outlet boxes when devices or wiring has been removed or not installed.

E. Paint exposed boxes to match the color of the wall or ceil-ing to which they are mounted.

F. Where several feeders pass through a common pull box, tag each feeder to clearly indicate electrical characteristics, circuit number and panel designation.

3.05 Floor boxes shall be installed with top ring flush with concrete floor. Floor box shall be leveled after concrete has hardened by means of interior leveling screws.

A. Cover Color Coding:
   1. Color code covers of each box and panel, except for normal power system, for identification as follows to those applicable systems:
      a. Fire alarm - Orange
      b. Security alarm - Blue
      c. Sound - Yellow
      d. Telephone - Green
      e. TV - Brown
      f. Controls - Purple
      g. Clock - Violet

END OF SECTION

SECTION 16120
WIRE AND CABLE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Wires and cables including necessary accessories.

B. Related Sections:
   1. Division 16 Section - Raceways and Conduit.
   2. Division 16 Section - Motor Power and Control Wiring.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials to bear Underwriters Laboratories labels.

1.03 SUBMITTALS

A. Submit product data and descriptive litera-ture before com-mencing work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Wire and Cable: Shall be soft annealed 98% conductivity cop-per with 600 volt A.C. thermoplastic insulation unless otherwise noted and shall be new and manufactured not more than 12 months prior to installation. Each coil or reel shall bear Underwrit-er's label and all wire marked with AWG or circular mil wire size, voltage rating, insulation type, type stranding and the manufacturer's name. Unmarked wire found installed shall be replaced at no additional cost. Wiring shall conform to NEMA WC-5, NEMA WC-7, IPCEA S-61-402 and IPCEA S-66-524.

B. Light and Power Wiring Circuit Conductors: Shall be solid in sizes No. 10 AWG and smaller, and concentric strand Class B for conductors No. 8 AWG and larger. Stranded copper con-ductors No. 14 AWG may be used for final connections to indi-vidual recessed lighting fixtures and for control and sig-nal circuit wiring only with crimp-on type terminations. Do not use stranded wire for wiring to receptacles, unless insulated crimp-on connectors are installed on the wiring ends.

C. Wiring Insulation Shall be as Follows:
   1. For feeders and motor and equipment power circuits type THW - 75 degrees C., XHHW - 75 degrees C., or THWN - 75 degrees C. in wet or dry locations. For dry locations only THHN or XHHW 90 degrees C. may be used.
   2. For branch circuit wiring for lighting and power cir-cuits type THW - 75 degrees C., THWN - 75 degrees C. in wet or dry loca-tions. For dry locations only 90 degrees C., THHN may be used.
   3. For fixture wiring through fluorescent fixtures in accordance with N.E.C. 410-31, where fixture is used as wireway, shall be type THHN 90 degrees C.

D. Color Coding:
   1. Wire of Size No. 8 and smaller shall be factory color coded 600 volt, THW, THWN or THHN; sizes larger than No. 8 may be factory color coded or color coded with tape such as that manufactured by the Minnesota Mining and Manufacturing Company for this purpose. Should tape be used, it shall cover not less than 6 inches of cable within enclosure.
   2. Colors to be used in coding shall be:
      a. 120/208 Volt System 277/480 Volt System

b. Neutral - White Neutral - Gray
c. Phase A - Black Phase A - Brown
d. Phase B - Red Phase B - Purple
e. Phase C - Blue Phase C - Yellow
f. Ground - Green Ground - Green
g. Electrical grounding and static - bare wire, where per-mitted by N.E.C.

3. All other colors (violet, traced, etc.) shall be reser-ved for, and shall only be used for switch legs, control or communica-tion circuits.
4. Conductors for control wiring shall be color coded, using different color coding than for the energy con-duc-tors specified above. All control wires shall be num-ber-ed.

E. Minimum Wire Size: No. 12 AWG, except control wiring may be No. 14 AWG if distance is less than 200 feet. Use No. 12 AWG for control over 200 feet, unless otherwise noted.

F. Wire and Cable Connectors and Terminations:
1. For splices in branch circuit conductors solid or strand-ed size No. 10 AWG and smaller use UL Listed soft plastic wire nut with sharp self-cutting interior threads, 3M Scotchlok, Ideal Supernut or T&B Piggy of the size to match the wire.
2. For terminations of stranded or solid wire in size No. 10 AWG and smaller at equipment terminals use UL Listed, tin plated copper, 600 volt vinyl insulated compression type ring or fork type equivalent to T&B "Sta-Kon", Burndy "Vinylug" or approved equivalent.
3. For No. 8 AWG and Larger: T&B "Locktite" connectors; Burndy "Versitap" connectors, or OZ-Gedney solderless connectors, with insulating covers, tape or heat shrink insulation system. Terminations and splices in feeders may be made with solderless pressure type connectors complete with composition insulating covers, field in-sulat-ing tape, or heat shrink insulation system. Con-nectors and lugs for 250 mcm cable and larger shall be of the two-hole type and for compression type shall have at least 2 in-dents. Compression lugs and connectors shall be tin plated wrought copper, of size to match the cable.
4. Splices in underground exterior wiring shall be made fully waterproof by potting or encapsulating.
5. Insulating tapes shall be of a type approved for the applica-tion and shall be flame retardant. Tapes shall be as manufac-tured by 3M or Bishop Electric.
6. Cable Ties: T&B "Ty-Rap" or Burndy "Unirap".
7. Cable identification: Branch circuits wire markers 3M "Scotch Code" or approved equivalent. For feeder sizes, non-ferrous metal stencil tags.
8. Thermal fusion connections, "catalytic thermal weld" as manu-fac-tured by Cadweld or approved equivalent.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until condi-tions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Wire and Cable Installation:
1. Wire and cable shall be suitably protected from weather or damage during storage and handling and shall be in first-class condition when installed.
2. Conductors shall not be pulled into conduit until race-way system is substantially complete. All wiring shall be contin-uous within conduit runs. Splices will be per-mit-ted only at outlet and junction boxes. Joints must be mechanically and electrically secure.
3. Pulling lubricants, if used, shall conform to UL re-quire-ments for the type of conduit material and cable insulation being used.

4. Care shall be taken to prevent cutting and abrasion of cable insulation during the pulling of feeders. Ropes used for pulling of feeders shall be made of poly-ethyl-ene or other suitable nonmetallic material. Pulling lines shall be at-tached to conductor cables by means of either woven basket grips or pulling eyes attached dir-ectly to the conductors. Rope hitches shall not be used. All cables to be installed in a single conduit shall be pulled in together. Where polyethy-lene insu-lation is used and a pulling lubricant is required, the lubricant shall be certified by the manufacturer to be non-injurious to such insulation.
5. Do not bend cables during installation, either perma-nently or temporarily, to radii less than 12 times the outer diameters, except where conditions make the speci-fied radius impracticable and shorter radii are permit-ted by the NEC and NEMA Standards.
6. Neatly and securely bundle conductors located in branch circuit panelboards, cabinets, control boards, switch-boards, and motor control centers. Use nylon bundling straps.
7. Provide suitable installation equipment to prevent or cutting distortion of conduits during the pulling of feeders. Use masking or other means to prevent oblit-era--tion of cable identi-fi-cation when solid color coating or colored tracers are used.
8. Control wiring color codes, to be of type as required by its equipment manufacturer. Interconnections of control wiring to be on numbered terminal strips.
9. Where two neutrals are installed in same conduit, their sets of wiring shall be grouped and clearly identified by permanent tags or other means.
10. At each outlet, a loop or end of wire not less than 9 inches long shall be left for connection to lead.
11. Leading end of each conductor pulled shall be carefully exam-ined for damage to jacket. If damage is evident, cable shall be extended and further checked for damage, with good cable only to remain.
12. Cables in junction and pull boxes shall be properly trained and racked.
13. Branch circuit wiring in panelboard gutters shall be installed vertically in the gutter with a ninety degree bend at the supply circuit breaker, wire shall enter the circuit breaker lug horizontally.
14. Cable supports and boxes shall be installed for all ver-ti-cal feeders in accordance with the schedule in the N.E.C. Boxes shall be built of heavy steel plates not less than No. 10 USS gage fastened to an angle iron frame with removable covers secured by brass machine screws. The cable support shall be of the split wedge type which clamps each conductor firmly and tightens due to the weight of the conductor.

B. Wire and Cable Splicing and Terminations:
1. Splices and terminations of conductors shall be made utilizing specified materials and methods installed in accordance with the manufacturer's recommendations.
2. Splices in branch circuit wiring shall be made by strip-ping conductor insulation, twisting conductors until me-chan-ically secure and installing a self-threading insu-lated type connec-tor. No splices will be allowed within panelboards.
3. Conductors shall be squarely cut, and fully inserted into the lug barrel or connector. Insulation shall be stripped without cutting the conductor or removing strands, exposing the conduc-tor for the minimum distance required for connection. Splice connectors shall be of a type and be so installed that the conductor is fully insulated by a skirt of such design, or taped in such a manner that cold flow of the conductor insula-tion will not be induced when the conductor is positioned in its final operating position.
4. Do not combine conductors under the same lug. Provide indivi-dual lugs for individual conductors. Re-tighten bolt type connectors 24 to 48 hours after initial in-stall-ation and before taping.
5. Connectors shall be insulated by approved type, inte-gral or separate cover, or by means of taping with approved plastic or rubber and friction tapes to provide insu-la-ting value equal to that of the conductors being joined. The number and size and combinations of conductors per-mitted by the Underwriters' Laboratories, Inc. as listed on manufac-turers' packaging of connector shall be strict-ly complied with.

6. Terminations at equipment terminal blocks shall be made uti-lizing compression type connectors suitable to match terminal type.
7. Continuity of neutral on multi-wire branch circuits shall not be made on any device at terminal blocks, but shall be spliced and a tap brought out, thereby assuring no openings of the neutral in the replacement of a device.
8. Feeders shall be identified by means of nonferrous tags or pressure-sensitive labels securely fastened to all cables, feeders, and power circuits in vaults, pull box-es, manholes, switchboard rooms, terminations of cables, etc. Tags or labels shall be stamped or printed to in-clude the feeder number, source and equipment sup-plied. If suspended type tags are provided, they shall be attached by nylon cables ties or other nonconductive per-manent means.
9. Branch circuit conductors shall be identified at supply circuit breakers, with the circuit number using pressure sensitive adhesive wire markers.
10. Branch circuit wiring for lighting and other single phase 277 volt or 120 volt applications shall be multi-wired utilizing common neutrals. Under no circumstances shall any switch break a neutral conductor. Branch cir-cuit wiring extending more than 100 feet to the nearest outlet from a panel shall be No. 10. Ensure that cir-cuit--ing work fulfills the following conditions:
    a. Loads on panel busses shall be balanced on phases as evenly as possible.
    b. No neutral conductor shall be common to more than one circuit conductor connected to the same phase leg of the supply system.
    c. Circuiting of panelboards to be such that breakers are grouped logically by functions.

C. Voltage Drop:
1. Branch Circuits: Limit to a maximum drop of 3%.
2. Service Source to Individual Panelboards: Limit to a maximum drop of 2%.
3. Total Allowable drop for Service Source to load:
    a. Limit to a maximum drop of 5%. Increase wire size, where necessary, to comply with this requirement.

END OF SECTION

SECTION 16140
WIRING DEVICES

PART 1 GENERAL

1.01 SUMMARY

1.02 Section Includes:

1.03 Wiring devices including necessary accessories indicated on drawings and specified in this section.

1.04 Related Section:

1.05 Division 1 Section "Mechanical and Electrical General Requirements."

1.06 SUBMITTALS

A. Properly identified manufacturer's product data in the form defined in Division 1 Section "Submittals" before commencing work.

PART 2 PRODUCTS

2.01 WIRING DEVICES

A. All wiring devices furnished under this section of specifications shall conform to NEMA WD-I.

B. Switches shall conform to Fed. Spec. W-S-896, be of specification grade, quiet type. Switches shall be rated at 20 amps, 277 volts AC, horsepower rated for 1HP at 120 volts. Provide for back or side wiring. Switches shall be Leviton CSB-20 Series or equivalent. Key type switches shall be keyed identically. (Offices, house side of condominium buildings.)

C. Duplex convenience receptacles shall conform to Fed. Spec WC-596F be of specification grade, back and side wired, U-slotted grounding type, 3-wire, rated 20 amp, 125 volts AC. Receptacles shall be Leviton CR-20 Series or equivalent. Double duplex shall consist of two receptacles under a common plate. Single receptacles shall be similar to duplex receptacles. (Offices, house side of condominium buildings.)

D. Ground Fault Receptacles shall be NEMA 5-20R type, rated at 20 amps, 120 volts with 5+ 1 mA trip threshold, and UL nominal trip time 0.025 sec. Receptacle shall be Leviton 6898 feed thru type or equivalent.

E. Isolated ground duplex receptacles where indicated on the drawings shall have a pure grounding path separate from the normal grounding circuit. Rating to be 20 amps at 125 volts, Leviton 5362-IG (Orange) Series.

F. Special purposes receptacles shall conform to ANSI C73, of specification grade, back or side wired. Ratings and type as indicated on drawings.

G. Dimmers for incandescent lighting, when not remote controlled, shall be solid state type, UL Listed. Dimmers shall be rated to control indicated load, and shall be Leviton 6621 Series (600w), or equivalent or as otherwise specifically noted on drawings. Dimmer to match power rating of load served.

H. Transient Voltage Surge Suppression (TVSS) devices shall provide an efficient 3-level MOV protection for phase to neutral, phase to ground and neutral to ground. Indicator light is on continuously when protection is active but flashes on and off as well as an audible tone when deactivated. UL Suppression rating in accordance with Category B ANSI/IEEE C62.41 Leviton 8380 Series.

I. Ceiling fan speed control to operate single or multiple fans as shown on drawings. Rated 7.5, 10 or 15 amps at 120V as required. Leviton 6627 (single fan) or 80000 Series (multiple fans.)

J. Wiring devices shall be as manufactured by Hubbell, Arrow Hart, Slater, Leviton, Pass and Seymour or equivalent.

K. All wiring devices shall be ivory unless noted otherwise. Devices to be gray finish when stainless steel cover is used or indicated to be used in these specifications or drawings.

2.02 COVER PLATES

A. Device covers shall be equal to Leviton 84000 Series to fit devices used. Cast covers on exposed work. (Offices, Stainless Steel, Select Devices Gray.)

B. Outlets in kitchens other than residential shall have brushed stainless steel plates.

C. Ganged switches shall be provided to a maximum of three, if more are required on drawings, provide in multiples of two and/or three.

D. Outdoor wiring devices in damp or wet locations shall be provided with a weatherproof enclosure that allows the device to maintain its rainproof capability while in use in accordance with N.E.C. 406-8. Acceptable manufacturers to be Leviton, Intermatic, Taymac or Equal.

2.03 Exposed devices to have cast cover plates.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 ALL WIRING DEVICES shall be installed in strict accordance with manufacturer's recommendations.

A. Wiring devices location shall be checked prior to rough-in of outlet boxes and conduit with architectural drawings for door swings and furniture details. Duplex receptacles in finished areas shall be mounted vertically.

3.03 Boxes mounted back-to-back shall not be permitted.

A. Devices shall be installed tightly within box with screws provided. Do not rely upon plate for device alignment and support assure that all devices are grounded to box, in the case of receptacles use self-grounding screws, separate ground conductor or bond wire to box.

B. All convenience outlets installed within two feet of water supplies, wet locations, toilet rooms and the exterior shall have a ground fault circuit interrupt protection device. Requirement not applicable to single receptacles serving only water coolers.

C. Contractor at no charge to owner shall relocate wiring devices shown on the drawings within a reasonable distance, prior to rough-in.

END OF SECTION

SECTION 16150
MOTOR POWER AND CONTROL WIRING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Motor power and control wiring including necessary accessories.

B. Related Sections:
   1. Division 11 - Equipment.
   2. Division 15 Section - HVAC Control System.
   3. Division 16 Section - Raceways and Conduits.
   4. Division 16 Section - Wire and Cable.
   5. Division 16 Section - Outlet, Pull and Junction Boxes.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials shall Underwriter's Laboratories labels.

1.03 SUBMITTALS

A. Submit manufacturer's literature and technical information before commencing work. Refer to temperature control sup-pliers.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Materials for power and control circuit wiring system shall be as specified in the applicable sections of the specifi-cations.

B. Horse power rated toggle switches for control and/or discon-necting devices shall be 20 or 30 ampere type as specified in Section 16140 - Wiring Devices.

2.02 Thermostat wiring as required by A/C manufacturer. Thermostat wiring shall include necessary raceways and outlet box for a complete installation.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until condi-tions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Motor Power:
   1. Under this section of the specifica-tion, provide as shown on the drawings, complete power circuit wiring and connec-tions for each and every item of permanent mechan-ical equipment requiring electrical power supply. Power circuit wiring under these specifications shall encom-pass all work up to and including connections at motor terminals unless there are specific indications to the contrary. All references to motors and motor starters in this section apply equally to electric heaters and controllers.
   2. In addition to providing all runs of power circuiting, the following specific items of work are required under this section.

3. Receive from other trades at grade level, handle, pro-vide storage for, if and when required, install and con-nect all individually mounted motor starters, including thermal overload switches from fractional horsepower motors. Provide suitable angle iron racks for mounting such starters where the drawings indicate them to be standing free from walls, columns, or wherever field conditions may require such mounting.
4. Provide where specified motor starters in existing motor control cen-ters. Where existing starters are to be replaced, veri-fy the size and rating of such starters to be used with the new motors being supplied.
5. Furnish and install all power circuit safety switches as shown on the drawings and/or as required by the N.E.C.
6. Verify all other locations in accordance with mechani-cal contractors and Shop Drawings.
7. Under this section of the Specifications is included responsi-bility for the safe and proper operation of motor--ized equipment to the extent that it is affected by work included in this section. Cooperate with the other trades in making all tests required to assure that such operation is achieved. Any special electrical equipment necessary for these tests shall be made available under this section of the Specifications. Particular note under this item is to be given to proper phasing out for the correct rotation of all motors.

B. Motor Control:
1. Provide all control circuit wiring including raceway and outlet boxes and con-nections for all mechanical equipment as indi-cated and scheduled on the plans and as here-in-after specified and in accordance with approved engineering drawings submitted under the Temp-er-a-ture Control Section and the Energy Man-age-ment Section of these specifica-tions. Par-ti-cular attention is directed to the HVAC con-trols drawings and specification.
2. The manner in which other trades will present con-trol devices and for wiring work under this section of the specification is as follows.
   a. All motor starter actuating devices required in start-er covers will be delivered by other trades so mounted as part of the starters.
   b. All devices for remote actuation of motor start-ers which require air, water, pneumatic, or other non-electrical piping connections, as well as devices which are to be mounted in tanks and ducts, will be provided in place by other trades.
   c. All devices for remote actuation of motor start-ers, which are not required in starter covers, and which require electrical connec-tions only (such as push button stations, and electrical contacting thermostats,) will be delivered by other trades unless otherwise noted in suitable enclo-sures, and ganged together in single enclosure where so required. These devices shall be installed and wired under this section.
3. In addition to providing all general runs of con-trol circuiting throughout the project as shown on the plans and control shop drawing and herein spec-ified, the following specific items of work in connection with motor control circuit wiring are included under this section:
   a. Provide all connections at motor starter actu-ating devices and starters with necessary ac-ces-sories.
   b. Mount all motor starter actuating devices which are not indicated above as being set in place by other trades.
   c. Modify factory internal wiring of motor start-ers if and where required by the indicated con-trol schemes, including fan interlocks for fire alarm system.
   d. Provide wiring for all interlocks between fans, pumps and other equipment that form part of a common HVAC system in accordance with control schemes indicated. For example, provide re-quired inter-locks between supply and exhaust fans when required.
   e. Provide all required wiring for the existing Energy Manage-ment System (EMS). Wiring shall include but not be limited to all conduit, and wire to all remote sensors start-ers and controllers in accordance with the equipment manufacturers wiring diagrams. In addi-tion, provide 120 volt receptacles wired to the nearest panelboard for each component of the EMS re-quir-ing power; this shall include all Field

Processing Units (remote panels), as well as CPU's, CRT's, printers, etc. Provide inter-wiring consisting of multiplex, and intercom loop between central equipment and all remote panels.

4. Although it is in the intent of the plans and spec-i-fica-tions to fully delineate the control circuit wiring re-quired for all motorized and other elec-tri-cal equipment being provided at the project, the possibility of varia-tions from the plans due to the difference between the manufac-turers of mechanical and control equipment and other conditions is anticipated. Include in the work any modifi-cations to the control wiring made necessary by these vari-ations, without subjecting the owner to addi-tional cost.
5. Accept the responsibility for providing complete elec-tric control circuit wiring required for the permanent equipment furnished by all trades and the owner involved in the project, without subjecting the owner to any additional cost.

3.03 Contractor shall provide all required control wiring, raceways, outlets and fittings associated with the thermostat.

END OF SECTION

SECTION 16440
DISCONNECT SWITCHES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Disconnect switches including necessary accessories.

B. Related Sections:
   1. Division 9 Section - Painting.
   2. Division 16 Section - Overcurrent Protective Devices

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials shall bear Under-writers' Laboratories (UL) labels. Label for "SERVICE ENTRANCE" where so applied.

1.03 SUBMITTALS

A. Submit manufacturer's literature and technical data before commenc-ing work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Disconnect Switches: G.E., Siemens I.T.E or Square "D".

2.02 EQUIPMENT

A. Disconnect switches shall conform to Fed. Spec. W-S-865 and NEMA KSI-1975 for type HD and shall be of heavy duty type, enclosed, of quick-make, quick-break construction. Rating shall be as indicated on drawings. All switches shall be horsepower rated, UL listed and so labeled.

B. Disconnect switch enclosure shall be NEMA 1 for indoor and NEMA 3R for outdoor use.

C. Disconnect switch operating handle shall be of insu-lated box mounted type that directly drives switch mecha-nism suitable for padlocking in OFF position.

D. Defeatable, front accessible, "coin-proof" interlocks shall be provided to prevent opening of cover when switch is in ON position, and prevent turning switch ON when door is open. Securely fastened metallic nameplate shall include highly visible "ON-OFF" indication.

E. Motor Disconnect Means: Provide each motor with a discon-nect means, when required by N.E.C., and where shown on the drawings.

F. Provide fuses for all disconnect switches so indicated. Fuses shall be dual element type as specified in Section 16475 -Overcurrent Protective Devices.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until condi-tions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Install the disconnect switches vertically with top not more than 6 feet above the floor, and rigidly and securely attach-ed to the building. Disconnect switches shall not depend upon conduit for support.

B. Where used as service entrance main disconnects, switches shall be permanently labelled "main switch 1 of 4"; "main switch 2 of 4" etc.

C. One of the following mounting methods shall be employed in order to avoid direct contact of the enclosures with the concrete:

3.03 Plywood Panel: Mount panelboards and disconnect switches on backboard of 3/4 inch exterior grade plywood, finished one side, primed all surfaces, painted with one coat gray of fire re-tardant enamel (finished side) and secure to wall with approved shields and/or screws as directed by the Pro-ject Architect.

A. Unitstrut: Mount panelboards on Unistrut P-3000 mount-ing channels at top and bottom, secured similarly to wall.

B. Label switch covers in one inch high stenciled letters (painted) show-ing equipment served. As an option a black engraved Micarta label will be accepted.

END OF SECTION

SECTION 16452
GROUNDING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Grounding systems including necessary accessories.

B. Related Sections:
   1. Division 16 Section - Wire and Cable.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials to bear Underwriters' Laboratories (UL) labels.

1.03 SUBMITTALS

A. Submit manufacturer's literature giving materials, finishes, accessories and installations where required.

B. Ground resistance tests.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Grounding system installation shall conform to Article 250 NFPA 70 National Electrical Code, latest edition.

B. Coordination: Arrange with Plumbing Contractor to have 3/4 inch copper water line stubbed 6 inches inside rooms with transformers for ground connection whether shown on drawings or not.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Grounding system shall conform to ANSI C33.8, IEEE-81. The electrical system and equipment shall be grounded in accor-dance with the requirements of the Nation-al Electrical Code (N.E.C.) and as specified. The grounding conduc-tor shall be an insulated copper wire of size indicated. Where not indi-cat-ed, the conduc-tor shall be in accordance with the require-ments of the N.E.C. except that minimum size shall be No. 8 copper for system ground. Inaccessible connections shall be made with the exothermic welding process using equipment manufactured by Burndy or Erico Products. Accessible con-nec-tions shall be made with multiple bolt silicon bronze con-nectors specifically designed and accepted for the con-nection to be made. Connectors shall be as manufactured by Burndy or O.Z. Electric. Grounding jumpers shall be pro-vided across metal parts which are separated by non-conducting materials or joined so that there is a high re-sis-tance at the joints. Grounding cable shall not be buried directly in concrete, but a conduit sleeve shall be provided where cable passes through concrete.

B. Grounding Source: Consisting of a ground mat buried beneath the switchgear room, counterpoise and ground rods as shown on drawings, and a connection to the cold water main. All ground sources shall be connected to the 4" x 1/4" ground bus mounted on the switchgear room wall.
   1. Maximum resistance to ground shall be limited to 25 ohms. Additional ground rods shall be driven if required to maintain this level. Maximum ground resistance to each of individual rods shall be 25 ohms. Submit test re-sults for acceptance indicating that these values have been met, using the fall of potential method as directed in IEEE Standard 81-1983.

C. System Grounds: Neutral bus and ground bus in service switchgear shall be connected together by means of an accepted bus link.

D. Ground Rods: Copper clad steel not less than 3/4 inch in diameter, 10 feet long, driven full length into the earth.

E. Cold Water Pipe:
   1. Ground loop shall be connected to the building steel and shall also be grounded to main cold water pipe at point of entrance of the metallic water service with copper conductor in conduit.
   2. Connection to cold water pipe shall be made by a suit-able ground clamp.
   3. If flanged pipes are encountered, connections shall be made with the lug bolted to the street side of the flange connection.

F. Parts to be Grounded: Switchgear frame, panelboard frames, fittings, fixtures and devices, cable sheaths, neutral of transformers, boxes and raceways, motor frames, outdoor lighting poles, emergency generator set, non-current carry-ing parts of appliances and devices, and all other parts and equipment as required by N.E.C. Neutral wire shall never be used as grounding means.

G. Conductor: All grounding cable shall be green insulated copper stranded cable, soft drawn or annealed. Sized as indicated on drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install grounding system as shown on draw-ings.

B. All connections to equipment, bus or conduit shall be made with approved type of solderless connector and shall be thoroughly cleaned and made bright before connections is made to insure a good metal contact.

C. All connections which will be inaccessible after completion of project shall be made by exothermic weld process.

D. The grounding medium for all lighting branch circuits shall be the metallic conduit system unless otherwise noted. Ground the lighting fixture by means of a conductor between the outlet box and the fixture. All locknut connections to cabinets, pull-boxes, junction boxes, etc., shall be drawn up sufficiently tight to assure a con-tinu-ous metal-to-metal bond, where a separate ground conduc-tor is not provided. Where GFCI type receptacles are indi-cated, provide a separate ground conductor from the panel-board.

3.02 All non-metallic branch circuit runs and metallic conduit runs embedded in concrete shall have a ground conductor sized in accordance with N.E.C. 250-122.

A. Bond all conduits stubbing under switchboard, motor control center and similar locations using bonding bush-ings. Run a separate ground conductor with the phase conductors from the motor control center ground bus or a grounding bushing in the starter enclosure to each motor frame.

B. Do not use flexible conduit as a grounding medium. Provide a bonding wire in all flexible conduits and connect to the boxes at each end in an approved manner.

C. Unless otherwise indicated, provide in each feeder conduit an equipment grounding conductor sized as per N.E.C. 250-122 or rated at 1/3 the ampacity of the circuit conductors specified whichever is greater. For parallel runs, provide a ground conductor in each conduit.

D. Provide a ground rod driven through or near pole bases and weld a No. 10 AWG wire or as indicated on drawings, to the top of the rod and extend the wire to a grounding lug in the base and bond the anchor bolts. Ground wire shall be con-nect-ed to metallic feed conduit or circuit ground conductor if non-metallic feed conduit is used.

E. All underground pull boxes shall have the metal cover bonded to the circuit equipment ground in accordance with N.E.C. minimum #10 connected to cover ground lug or exothermic connection.

F. All metal piping present in the building shall be bonded with a conductor sized in accordance with N.E.C. 250-122 to the service equipment grounding system.

END OF SECTION

SECTION 16515
LIGHTING FIXTURES AND LAMPS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Lighting fixtures and lamps including necessary accessories.

B. Related Sections:
1. Division 9 Section - Metal Studs, Lath, Suspension Ceiling, Plaster and Stucco.
2. Division 9 Section - Acoustical Ceilings.
3. Division 16 Section - Raceways and Conduits.
4. Division 16 Section - Wire and Cable.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials to bear Under-writers Laboratories (UL) labels. Explo-sion-proof, shielded and vapor tight and wet location fixtures shall bear UL labels appropriate for the type of application.

1.03 SUBMITTALS

A. Submit manufacturer's literature and technical data before commen-cing work.

B. Furnish photometric data for all fixtures.

C. A sample of each fixture proposed for use shall be submitted to the Project Architect/Engineer for review upon request.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Use only the manufacturers and products listed in the Lighting Fixture Schedule.

2.02 EQUIPMENT

A. Surface mounted fixtures in student areas or outdoors shall be vandalproof type.

B. Lighting Fixtures:
1. Provide all lighting fixtures as indicated on the draw-ings and as specified.
2. The schedule and details of lighting fixtures, appear-ing on the drawings, indicate the type, construction, ap-pear-ance, quality and performance of the fixtures re-quired. Any proposed devia-tion from the fixtures speci-fied must equal or be superior to the item specified un-der these headings. Proposed substitute lighting fix-tures will be judged on overall quality on con-struction. The fixture manu-facturers products scheduled are considered accept-able, based on the equivalency of indi-vidual units as determined by the Project Architect/Engineer.
3. All materials used in the manufacture of fixtures shall be new and the best of their respective kind, and shall be formed and assembled in a neat, accurate and profes-sional manner. Sheet metal shall be of sufficient thick-ness or shall be ribbed, flanged or otherwise rein-forced so that all lighting fixtures and their component parts will withstand the stresses of normal handling and installation and service without undue distortion of shape. Plastering or other installation procedures shall not be relied on to reinforce lighting fixtures or their component parts.
4. Painted sheet steel shall be processed with a phosphate treatment or shall be Paintlok or Galvanneal; un-painted sheet steel shall be Galvanneal, both as manufactured by Republic Steel, or approved equiv-alent. Springs shall be of full hard temper stain-less

steel. Fasteners of ferrous metal shall be cadmium plated or zinc plated with chromate. Screws mount-ing fixture housing in plaster ring shall be min. #10, point-ed to facilitate installation. Plaster frame rings shall be of sufficient strength to withstand deformation during installa-tion, and of suitable materials and/or finish to prevent corrosion from ceiling plasters and mortars. The contractor shall furnish the fixture manu-facturer a complete list of fixtures that will be in-stall-ed in acoustical plaster ceilings with types and quantities. All painted finishes shall be baked epoxy, acrylic of fully equivalent finish suitable for the service required including temperature and shall be to the accep-tance of the Project Architect/Engineer.

5. All fixtures shall be complete with canopies, suspen-sions of proper lengths, hickeys, casing, sockets, hold-ers, reflectors, hardware, and shall be completely wired and assembled. Troffers to have earthquake clips, posi-tive spring loaded catches and safety hinges.
6. Furnish suitable plaster rings or plaster stops for fix-tures which are to be set in plaster ceilings. Consult the "Finish Schedules" on drawings for locations and ex-tent of plaster ceilings. Coordinate the mounting meth-ods of all recessed fluorescent lighting fixtures with ceiling suspension system and ceiling trades. Contractors coordination is expected regardless of fixture specified. Contractor shall ensure perfect ceiling and fixture match.
7. All fluorescent and H.I.D. ballasts shall be low watt-age, high efficiency 277 volt or 120 volt as noted on drawings. Ballasts shall be individually fused and shall be high power factor, non-PCB construction UL list-ed Class P and be listed by Electric Testing Labora-tories. Provide dimming ballasts where indicated. All ballasts used outdoors shall be suitable for 0 degrees F. operation. Ballasts shall be magnetic or electronic type as scheduled, offering a perfect match with lamp specified.
8. Fluorescent Lampholders shall be General Electric Leviton or Bryant. Silicone-fiberglass insulated wire rated at 150 degrees or 200 degrees C. or Teflon-fiberglass insulated wire rated at 250 degrees C. shall be provided as required with recessed incandescent and HID fixtures for connection of fixtures to adjacent boxes. All medium and mogul screw base lampholders shall have porcelain bodies. Screw-shell sockets shall be nickel plated and shall have spring contacts wherever possible.
9. Provide a positive device to assure proper axial align-ment of lamps with asymmetric distribution when relamp-ing. This device may be preset or adjustable as re-quired by the specifications. Axial and angular lamp adjustments shall have provision for locking in adjusted position by hex head or hex socket bolts or nuts with special toothed washers that resist turning in both directions.
10. Fluorescent ballasts and lampholders shall be readily and simply replaceable without demounting the fixture. Bottom and one side of ballast shall be in full contact with metallic fixture surfaces for maximum heat conduc-tance. Exposed lamp fluorescent sockets shall be tele-scop-ing type.
11. Exposed bare lamps on fluorescent fixtures shall be pro-tected with wire guards or protective tubular shield; for HID lamps consult with respective manufacturer as to requirements of enclosure made of suitable material ca-pa-ble of withstanding the glass lamp particles if the outer jacket of the lamp bursts or shatters.
12. Incandescent and HID Reflectors shall be fabricated from minimum .050 Alcoa #12 reflector sheet or approved equiv-alent, free from forming lines and other visible imperfections. Black anodized finish shall be minimum .001 thick guaranteed against fading and discoloration. Plain anodized finish used indoors shall be Alcoa MI Alzak or approved equivalent. Plain anodized finish used outdoors shall be Alcoa SI Alzak with fixture protected with glass cover or other means.
13. Concealed fluorescent specular reflectors shall be Alcoa MI Alzak finish, Dynasyl, Reflex or approved equivalent. Visible reflectors shall be Alcoa reflector sheet type 1 or approved equivalent.

2.03 Glass lenses for incandescent and HID fixtures shall be boro--silicate glass with max. co-efficient of expansion of .33 x 10-7. Glass lenses for fluorescent fixtures shall be Corning Glass or approved equivalent.

A. Plastic lenses and diffusers used on fluorescent fix-tures shall be 100% prime virgin acrylic KSH K-12 (0.125-inch thick) or approved equivalent and shall be furnished with antistatic treatment. Injection molded lenses shall be as manufactured by Holophane or approved equivalent.
   1. Exposed fixture housings or frames shall have a continu-ous, smooth surface with no visible seams and a neat and workmanlike appearance. All hinges and fastening de-vices shall be fully concealed except with special per-mis-sion of the Project Architect/Engineer.
   2. The thickness of visible edges of mounting frames and rings at the ceiling line shall be a maximum .050 inch, minimum .035 inch. Light leaks around trim frame or lens or between any of these are unacceptable.
   3. Where fixture type is not indicated on drawings, fixture type used in similar locations shall be provided, as ac-cepted by the Project Architect/Engineer.
   4. Surface mounted lighting fixtures in exterior locations and areas subject to vandalism as determined by Owner, shall be vandalproof, with tamperproof screws and be mounted as per manufacturer's instructions. Exit lights shall also be vandalproof.
   5. Components of the same type, size, rating, functional charac-teristics and make of similar interior lighting fixtures shall be interchangeable. All fixture stems shall be furnished by the manufacturer of the fixture specified or as shown on the drawings. Fixtures for use outdoors or in wet areas suitably gasketed to prevent access of mois-ture or insects into fixture or diffuser. All metal parts of fixtures for use in damp locations that are specified as requiring painting shall be paint-ed with suitable weather and moisture resistant paints exhibiting moisture resisting qualities equal to epoxy based coatings. All aluminum parts of fixtures for use in damp locations that are specified as requiring an unpainted finish shall be anodized.

B. Lamps:
   1. Provide lamps for all lighting fixtures as specified and indicated on the drawings.
   2. Incandescent lamps shall be suitable to operate on 120 volts, 60 Hertz supply, with the following requirements:
      a. Wattage rating as shown on fixture schedule.
      b. Type of lamp as shown on fixture schedule.
      c. Lamps shall be inside frosted unless noted other-wise.
      d. Unless noted otherwise lamps shall be extended service type rated at 130V.
   3. Fluorescent lamps shall be suitable to operate with spec-ified ballasts on 277 or 120 volts, 60 Hertz supply as required, with the following minimum requirements unless otherwise specifically noted on drawings:
      a. Wattage rating as shown on fixture schedule.
      b. Type of lamp shall be rapid start reduced wattage type (32 watt for 48") with characteristics equivalent to -Sylvania Octron T-8 lamps - 3000 lumen output. (4 foot).
      c. Lamps shall be T-8, length as shown on drawings and fixture schedule.
      d. Lamps shall be 4 foot with medium bi-pin base.
      e. Color Temperature: 4100 K.

2.04 Rated Life: 20000 hours.

2.05 Compact fluorescent lamps shall have ratings as specified on the drawings. Base shall be 4 pin type and color temperature 2700 K (warm).

A. High intensity discharge lamps shall be suitable to operate with specified ballasts on 480 volts, 277 volts or 120 volts, 60 hertz supply with the following require-ments:
   1. Wattage ratings and lamp designation as shown on fixture schedule.
   2. Lamp base shall be mogul base.
   3. Rated life shall be a minimum of 24,000 hours for mercury vapor, and high pressure sodium.

2.06 Ballasts shall be part of the luminaire integral manufacturer. All fluorescent luminaires shall be provided with electronic type ballast with minimum 10% THD.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until condi-tions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Install fixtures in strict accordance with manufac-turer's recommendations.

B. Install "Lay-In" type fixtures with 6 foot length of flex-ible conduit to enable fixture relocation with minimum inconve-nience. Fixture to be securely fastened to ceiling frame members by mechanical means as per the N.E.C.

C. Exit signs shall be wall or ceiling mounted as shown on draw-ings. Install directional arrows required to provide correct path to EXIT. Install exit lights at a loca-tion and height to assure a clear line of sight from the egress pass-ageway. Relocate exit lights which are not readily visible at no additional cost.

D. Fixture Supports: Support each fixture securely. Each re-cess-ed fluorescent fixture shall be lay-in supported from ceiling suspension system, provide earthquake clips. Where pendant fixtures are mounted in continuous rows, the number of hangers shall equal the number of 4 foot lengths, plus 1. Do not support fixtures to plaster or gypsum board ceilings. Furnish and install all steel members and supports to fasten and suspend fixtures.

E. In the Mechan-ical and Electrical Equipment Rooms certain lighting fixtures shall be installed on ceilings or walls after all piping ductwork and equipment therein are install-ed. Exact location and switching for such fixtures will be determined at the job site during the course of the work. Fixtures shall be located so as to give maximum illumination to items of equipment requiring servicing, and moving ma-chin-e-ry. Any lighting fixtures blocked, inacces-sible or improp-erly located shall be relocated at no extra cost. Where fan rooms are used as an air plenum provide gasketed vaportight lighting fixtures.

END OF SECTION

SECTION 16470
PANELBOARDS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Panelboards including necessary acces-sories.

B. Related Sections:
   1. Division 9 Section - Painting.
   2. Division 16 Section - Wire and Cable.
   3. Division 16 Section - Overcurrent Protective Devices.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials to bear Underwriter Lab-oratories (UL) labels. Panelboards used as service entrance equipment shall be so labeled.

B. Panelboards shall conform to Fed. Spec. W-P-115c, NEMA PBI.

1.03 Load centers with copper bus bars shall be provided only when specifically noted on drawings.

1.04 SUBMITTALS

A. Submit manufacturer's literature and technical data before commenc-ing work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Panelboards: Siemens, General Electric, I.T.E. and Square D.

2.02 EQUIPMENT

A. Panelboards:
   1. All interiors shall be completely factory assembled. They shall be so designed that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors, so that circuits may be changed without machining, drilling or tapping.
   2. Branch circuits shall be arranged using double row con-struction except when narrow column panels are indi-cated. A nameplate shall be provided listing panel type and ratings. All circuit breakers shall be bolt-on type.
   3. Unless otherwise noted, full size insulated neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neu-tral connection. (A ground bus shall be included in all panels.)

B. Boxes and Trim:
   1. Boxes shall be at least 20 inches wide made from code gage galvanized sheet steel. Provide minimum gutter space in accordance with National Electric Code. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional re-quired wiring space. At least four interior mounting studs with adjustable nuts shall be provided.
   2. Switching device handles shall be accessible. Doors and panelboard trims shall not uncover any live parts. Doors shall have flush chrome plated handle with cyl-in-der lock and catch except doors over 48 inches in height shall have auxiliary fasteners top and

bottom of door in addition to the flush type cylinder lock and catch. Panel-board switching devices with individual dead front doors shall be acceptable in lieu of standard door in trim design. Panelboard trim clamps shall be of the indi-cating type.

3. Door hinges shall be concealed. All locks shall be key-ed alike; directory frame and card having a trans-par-ent cover shall be furnished with each door.
4. All exterior and interior steel surfaces of the trim shall be properly cleaned, primed with rust inhibiting phosphatized coating and finish with manufacturer's stan--dard gray paint. Exposed flush panels in kitchens shall have stainless steel front. Trims for flush panels shall overlap the box for at least 3/4 inch all around. Surface trims shall have the same width and height as the box. Trims shall be mountable by a screw-driver without the need for special tools. After in-stal-l-ation, trim clamps shall not be accessible when the panel door is closed and locked.
5. Panelboards exposed to the weather shall have NEMA type 3R raintight enclosure.

C. Electrical Components:

1. All main bus bars shall be copper sized in accordance with UL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C. above an ambient of 40 degrees C. maximum. Provide main circuit breakers, main lugs or sub-feed lugs as re-quired.
2. Lighting and power panels for use at 120/208 volts, 225 Amp, ac maximum shall incorporate circuit breakers as shown rated at minimum 10K A.I.C. symmetrical at 240 volts un-less otherwise indicated. They shall be Square 'D' type NQOD with pole and trip ratings as indicated.
3. Lighting and power panels for use at 480/277 volts, 225 amp maximum shall incorporate circuit breakers as shown rated at 18K A.I.C. symmetrical at 480 volts unless in-di-cated otherwise and shall be Square 'D' type with NF with poles, and trip rating as indicated.
4. Panels for use at 120/208 volts shall be UL listed with inte-grated assembly rating of 22K A.I.C. where shown.
5. Panels tested and listed in accordance with UL 67 and bearing an integrated short circuit rating shall be ac-cept--able where system designs call for short circuit ratings of 22,000 A.I.C. or 100,000 A.I.C. at 240 volts or 480 volts.
6. Any two single pole circuit breaker shall be replace-able by one two-pole circuit breaker and any three single-pole shall be replaceable by a three-pole circuit break-er.
7. Where new circuit breakers are specified to be installed within existing panelboards, they shall be compatible in terms of manufacture and type.
8. Distribution panelboards (400 amperes and over) shall be provided with molded case circuit breakers tested and UL labeled per UL 489.
9. Breakers 100 ampere through 400 ampere frame sizes shall be thermal-magnetic trip with inverse time current char-acter-istics, unless otherwise noted.
10. Provide ground fault circuit interruptor circuit break-ers where indicated.
11. Emergency Panelboards Identification (When installed inside rooms or closets): Paint door red and stencil in one inch high letters, in yellow, the words "EMER-GENCY PANEL" in addition to appropriate indi-vidual panel identification as shown on drawings.

2.03 No twin breakers will be allowed.

2.04 All single pole breakers to be switching duty.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until condi-tions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Install in accordance with manufacturer's recommendations and in accordance with applicable codes and regulations.

B. Panelboards shall be installed where indicated and with top of cabinet 6 feet 6 inches above floor, and shall be rigidly and securely attached to building construction and shall not depend upon conduit for support. Allow at least ½ inch air space behind all wall mounted panelboards. Provide 3/4" plywood backboard fire rated painted to mount panels in exposed concrete (or block) rooms.

C. Install panelboards in accordance with manufacturer's rec-om--mended data. Maintain clearances required by the National Electric Code, with particular attention to working space around panelboards. Maintain clear space above panelboards, coordinate with other trades to avoid placement of panel-boards below piping, ductwork or other foreign appur-te-nances. Relo-cate panels at no additional cost should such interferences occur.

D. All panelboards shall be supplied with phenolic nameplate one by three inches on exterior of panels and engraved with panel designation and voltage rating. All lighting and power panelboards shall be provided with a clear plastic enclosed typewritten directory inside. Circuit identifica-tion shall include load type (lighting, receptacles, etc.) and room(s) served.

E. Where flush type panelboards are indicated, provide one 3/4 inch empty conduit terminated in accessible ceiling above for each three spare circuit breakers provided in the panel-board.

F. Install circuit breakers in existing panelboards in accor-dance with manufacturer's recommendation. Verify tightness of all connections including mains. Identify new circuits on the panel directory; if none exists provide one.

G. Clean and touch up panelboard as required at completion of the project.

END OF SECTION

SECTION 16475
OVERCURRENT PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Circuit breakers including necessary accessories.

B. Related Sections:
   1. Division 16 Section - Switchboards.
   2. Division 16 Section - Disconnect Switches.
   3. Division 16 Section - Panelboards.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS

A. Submit properly identified manufacturer's literature and technical data before commen-cing work.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Fuses shall conform to Fed. Spec. W-F-791, NEMA FUI, ANSI C33.42.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Circuit Breakers: GE, Square D, or Siemens I.T.E.

B. Fuses: Bussman, Shawmut or Little-Fuse.

2.02 EQUIPMENT

A. Circuit Breakers:
   1. Circuit breakers shall conform to Fed. Spec. W-C-375, and shall be a circuit interrupting device which shall operate both manually for normal switching functions and automati-cally under overload and short circuit condi-tions. It is to provide circuit and self protection when applied in its ratings. Provide at voltage, phase, and amps indicated, with symmetrical amperes inter-rupt-ing rating to be equal or larger than that shown on draw-ings. Control and signaling function may be incor-porated by use of accessories.
   2. Operating mechanism shall be entirely trip-free so that contacts cannot be held closed against an abnormal over-cur-rent or short circuit condition.
   3. Operating handle of circuit breaker shall open and close all poles of a multi-pole breaker simultaneously. Cir-cuit breakers shall meet applicable NEMA AB-1 and have UL label. Each circuit breaker shall have a trip unit to provide overload and short circuit protection. Trip element shall operate a common trip bar which shall open all poles in case of an overload or short circuit through any one pole.
   4. Ampere rating shall be clearly visible; contacts shall be of non-welding silver alloy. Circuit breakers to be used in switchboards, lighting and power panel-boards, distribu-tion panelboards and individually enclosed shall be 1, 2, or 3 poles as indicated on drawings.

B. Molded Case:

1. Molded case circuit breakers shall be bolt-on type, mounted in lighting and power panelboards and individu-ally enclosed units.
2. Molded case circuit breakers shall be quick-make, quick--break action.
3. Molded case circuit breakers for panelboards shall have the following minimum ampere interrupting capaci-ties (RMS):
   a. 120 volts - 10,000 AIC power panelboards.
   b. 277 volts - 18,000 AIC lighting panel-boards.
   c. 277/480 volts - up to 50,000 AIC distribution panelboards, or as shown on drawings.
4. Each molded case circuit breaker shall have a thermal magnetic trip device with trip ratings as shown on draw-ings.

C. Combination Molded Case and Current Limiting Fuse:
1. Bolt-on type mounted in switchboard.
2. Circuit breaker section shall be molded case and shall have all the features previously mentioned for molded case breakers.
3. Fuse compartment located within molded case enclo-sure with accessibility for fuse replacing.
4. Unit circuit breaker shall trip as any of its fuses blows.
5. Unit shall be rated at 100,000 AIC RMS minimum.
6. Current limiting fuses provided as specified in this section.

D. Fuses:
1. Provide fuses for all fusible equipment regardless of which trade has furnished such equipment.
2. The time-current characteristic and ratings shall be such that positive selective coordination is assured.
3. Fuses, 601 amperes and larger, shall conform to UL Class L standard and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap".
4. Fuses, 600 amperes and lower, where applied to general feeder and branch circuit protection, shall conform to UL Class RKl standards and be Shawmut dual element "Amp-Trap" or Bussman "Low Peak" Limitron.
5. Dual element fuses shall have low resistance and rela-tive--ly low operating temperatures. Fuses shall be pro-vided with thermal protection against damage from poor contact; fuse shall open when temperature at thermal cut-out reaches 280 degrees F., preventing damage to clips and switches before fuse opens. They shall com-bine high interrupting capacity (200,000 ampere RMS symmetrical) with time delay, holding 500% load for a minimum of ten seconds.
6. Current limiting fuses shall be designed to provide high interrupting capacity (200,000 AIC SYM RMS) plus fast clearing time restricting let-thru current and energy to very low values. Clearing time on a severe short cir-cuit shall be limited to less than 1/4 cycle.
7. Individual motor circuit fuses shall be sized at approx-i-mately 150% of motor full load current or as otherwise shown on the drawings. Fuses, below 600 amperes shall conform to UL Class RK5 standards and be Shawmut dual element "Amp-Trap" or Bussman Fusetron, Fuses 60l amperes and larger, shall conform to UL Class L standards and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap" KTU.
8. Fuses, where required for circuit breaker back-up pro-tec-tion shall conform to UL Class RKl standards and be Chase-Shawmut Class RK1 "Amp-Trap" or Bussman "Limitron."
9. Provide 10% spares (minimum of three) of each size and type of fuses furnished. Spare fuses shall be placed in a wall-mounted cabinet which shall be located in the main electric room.

PART 3 EXECUTION

3.01 INSPECTION

A. Do not proceed with the work of this section until condi-tions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Install in accordance with manufacturer's recommendations applicable codes and regulations and accepted submittals.

B. Two and three pole breakers must be true two and three pole breakers.
   1. Do not combine single pole breakers with common handle connection to meet multiple pole breaker requirements.

C. Label circuit breaker enclosures with one inch high sten-ciled letters showing equipment served.

END OF SECTION

SECTION 16740
TELEPHONE RACEWAY SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Complete empty raceway system for telephone/data communications cables, including necessary accessories indicated on drawings and specified in this section. Provided wiring closets, plywood backboards, terminal cabinets, conduits, pull and outlet boxes to form an empty raceway system.

B. Related Sections:
   1. Division 16 Section - Basic Materials and Methods.
   2. Division 16 Section - Raceways and Conduits.
   3. Division 16 Section - Wire and Cable.
   4. Division 16 Section - Outlet, Pull and Junction Boxes.
   5. Division 16 Section - Grounding.
   6. Division 16 Section - Lighting, Fixtures and Lamps.

C. Main Telephone Room:
   1. The main telephone switch room shall is existing.
   2. The lighting in the switch room is existing.
   3. AC power requirements for the main telephone switch room is existing.
   4. Existing walls covered with 3/4" plywood painted with fire retardant paint.

D. Grounding: Provide ground for the cabinets used in the equipment room is essential. A direct connection to the main building electrical ground electrode system.

1.02 SUBMITTALS

A. Submit for review, properly identified product data giving materials, finishes, accessories and installation directions where required.

B. Furnish a set of "As-Built Drawings" to Project Architect indicating accurate plan layout, conduit runs and the like as actually installed.

PART 2 PRODUCTS

2.01 MATERIALS

A. Telephone/Data Communications Raceway System
   1. Refer to the telephone/data riser diagrams indicated on the Drawings.
   2. Branch conduits to final telephone/data outlet locations from main or satellite locations shall be 3/4" minimum and a maximum length of 250 feet. Furnish and install all necessary interior conduit, sleeves, strip cabinets, pull boxes, outlet boxes, bushed cover plates, and other materials for a complete conduit system for telephones/data as shown on the Drawings. The conduit shall be installed in the same manner and as specified for lighting work. Provide pull wires in all conduits.
   3. Raceways to contain not more than two 90 degree bends or equivalent. Provide additional junction or pull boxes to meet this requirement.

B. Backboards and Terminal Cabinets in Main and Satellite Closets
   1. Terminal Cabinets: The size of this cabinet will depend on the number of workstations cables terminating in the wiring closet. The width of the cabinet shall be wide enough to accommodate a 19" rack mountable device, 10" deep and either 2', 4', or 6' high. The front panels shall be mounted on a swing arm frame which allows for easy access for

wiring, installation and maintenance. The cabinets shall have a lock on the door for security protection.

C. Outlets
   1. Wall telephone/data outlet boxes shall be four inch boxes. Faceplates and jacks shall be furnished by others-.
   2. Underground service entrance conduit will be PVC schedule 40 and rigid metallic when exposed above ground.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install all materials in strict accordance with local and national codes.

3.02 GENERAL

A. Conduit from branch telephone/data outlets shall terminate inside the terminal cabinets for data and on the outside for telephone unless indicated otherwise. All empty conduit shall be provided with suitable pull wires. Allow ten inches minimum slack at each end of pull wire.

B. Underground conduit shall be buried a minimum of 24 inches below grade.

C. Provide a No. 6 AWG grounding wire from the main telephone room to the main grounding point connection in the main electrical room as indicated on plans.

D. Telephone Company shall be contacted during all phases of each project (new constructions and renova-tions). The department should also be contacted for assistance in equipment requirement and a more detailed explanation of this section.

E. The General Contractor shall ensure that the empty raceway system installed for voice and data communications is clearly marked and is not used for any other purpose by any subcontractor.

END OF SECTION

SECTION 16781
SPECIAL SYSTEMS

PART 1 GENERAL

1.01 Provide communications, television and control systems as detailed on the plans.

1.02 Furnish only new equipment and materials fabricated by recognized manufacturer.

1.03 Installation shall be made under direct supervision of competent installation supervisor.

1.04 Instructions: Furnish operating instructions and complete wiring diagrams to the Architect/Engineer for approval before purchasing for installation. Diagram shall show all component parts with their rating and tolerances and shall include the radio and phonograph and their connections to the console. Instructions and diagrams shall be furnished for the central console and each separate amplifier.

PART 2 GENERAL

2.01 Conductors: As specified in Section 16120.

2.02 Raceways: As specified in Section 16101.

2.03 Junction Boxes and Pull Boxes: As specified in Section 16105.

2.04 Control Items: To be furnished under this heading only where so indicated on the Drawings.

PART 3 EXECUTION

3.01 Provide junction boxes, conduit system, raceways, outlet boxes and devices plates as required for a complete system.

3.02 Provide all wiring in accordance with equipment supplier's instructions. Coordinate all work with individual equipment/system supplier.

3.03 Identify all wire ends.

3.04 Mount equipment neatly and firmly, plumb and square with adjacent surfaces.

3.05 Provide shelves for mounting of components as required.

3.06 Conduct all tests after all systems are complete and adjusted.

3.07 Extend 120 Volt control circuits to equipment controlled.

3.08 Complete control wiring to thermostats, zone panels, control devices, electronic panels, etc.

3.09 Coordinate all wiring with control schematic Shop Drawings.

END OF SECTION