TOWN OF MEDLEY

Capital Projects & Economic Development Department
7777 NW 72nd Avenue, Medley, FL 33166

DESIGN CRITERIA PACKAGE

RFP No. 2018-007

(CPED Project No. GR-1808)

MEDLEY FIREARMS TRAINING CENTER
HURRICANE IRMA REPAIRS
DESIGN-BUILD

August 2018

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1.0 PURPOSE AND INTRODUCTION

A "Design Criteria Package" (DCP) means concise, performance-oriented drawings and / or specifications of public construction project. The purpose of the design criteria package is to furnish sufficient information to allow a Design Build Firm to prepare a bid or a response to Town's request for proposal, or to permit the Town to enter into a design build contract.

The Town of Medley has selected the design build delivery method for this project. The following DCP specifies performance-based criteria for the construction of the Medley Firearms Training Center Repairs including the legal description of the site and survey information concerning the site. Proposals shall include material quality standards, proposed site layout and building design criteria of the project, cost estimates, design and construction schedules, site development requirements, provisions for utilities, and principal contract provisions applicable to this project.

2.0 DEFINITIONS AND TERMS

2.1 GENERAL

The Town of Medley ("The Town") develop the following Plans and Specifications called "The Design Criteria Package (The DCP)" for the purpose of allowing the selected Design Build Firm to prepare the Technical Proposal and to propose to the Town the Guaranteed Maximum Price ("The GMP") and the Guaranteed Completion Date ("The GCD").

Following the release of the DCP, the Town will conduct a pre-proposal meeting pertaining to the scope and requirements of the DCP.

The provisions of the DCP represent the technical, material, and quality requirements for the foregoing project. The Design Build Firm is bound by these requirements during the design, permitting and construction of the Medley Firearms Training Center Repairs.

The Design Criteria Professional may amend the provisions of the Design Criteria Package after it has been released to the short-listed Design Build Firms but before the expiration of the period designated for submittal of the Technical Proposal, the GMP and the GCD to the Town.

A DCP amendment may be issued at the Town's initiative or at the request of the Design Build Firm, upon the approval by the Town, if the amendment is in the best interest of the Town.

2.2 ABBREVIATIONS

The following abbreviations, when used in the Design Criteria Package, represent the full text as shown:

ACI American Concrete Institute

AISI American Iron and Steel Institute

ANSI American National Standard Institute, Inc.

ASCE American Society of Civil Engineers

ASME American Society of Mechanical Engineers

ASTM American Society for Testing and Materials

AWG American Wire Gauge

AWPA	American Wood Preservers Association
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
EPA	Environmental Protection Agency of the United States Government
FBC	2007 Florida Building Code, including 2009 Supplement
FDEP	Florida Department of Environmental Protection
IEEE	Institute of Electrical & Electronic Engineers
IES	Illuminating Engineering Society
MSTCSD	Minimum Specifications for Traffic Control Signals and Devices
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electrical Code (NFPA No. 70, 2008 Edition)
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIST	National Institute for Standards and Technology
OSHA	Occupational Safety and Health Administration
SSPC	Steel Structures Painting Council
UL	Underwriters' Laboratories

The Design Build Firm shall use standards, specifications, test methods, or other codes as specified in the current Florida Building Code including Supplements. If not specified in the FBC, the Design Build Firm shall use the current addition of standards, specifications, test methods or codes at the time of submitting the Technical Proposal.

2.3 DEFINITIONS

The following terms, when used in the Design Criteria Package, have the meaning as described:

Architect: The Architect as defined in Section 481.203(3) Florida Statutes.

Architect of Record: The Architect or Architectural Firm registered in the State of Florida that performs services for the Design-Build Firm (Design Builder) in connection with the design and construction of buildings (Observation Towers) and replacement.

Architecture: The practice of architecture as defined in Section 481.203(6), Florida Statutes.

Bidder/Proposer: For the purpose of this DCP it is deemed to be a Design Build Firm or Team of Firms submitting the Technical Proposal, the Guaranteed Maximum Price and the Guaranteed Completion Date to Town of Medley.

Calendar Day: Every day shown on the calendar, ending and beginning at midnight.

Change Order: A written order issued by the Town and accepted by the Design Build Firm, covering changes in the plans, specifications, or quantities of work, within the Scope of the Contract, when prices for the items of work affected are negotiated between the Town and the Design Build Firm.

Consultant: The Professional Engineer or Engineering Firm, or the Architect or Architectural Firm, registered in the State of Florida and under Contract with the Town to perform professional services. The consultant may be the Engineer or Architect of Record or may provide services through and be subcontracted to the Engineer or Architect of Record.

Contract: "Contract" means the entire and integrated agreement between the Town and the Design Build Firm and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract Documents form the Contract between the Town and the Design Build Firm setting forth the obligations of parties, including, but not limited to, the performance of work and the basis of payment.

Contract Documents: The term "Contract Documents" includes: Advertisement, Request for Proposals (RFP), the Design Criteria Package (DCP), the Technical Proposal, the Guaranteed Maximum Price, the Guaranteed Completion Date, General Conditions, Instruction to Bidders, Non-collusion Affidavit, Executed Form of Contract, Performance Bond & Payment Bond, Builders Risk Insurance, Design Liability Insurance, Specifications, Town of Medley and Miami-Dade County Standard Details, Plans & Specifications prepared by the Design Build Firm and approved by the Engineer for the Medley Firearms Training Center Repairs, Amendments to the Design Criteria Package, change orders, contract amendments, and supplemental agreements, all of which are to be treated as one instrument whether or not set forth at length in the form of a Contract.

Contract Bond: The security furnished by the Design Build Firm and the surety as a guaranty that the Design Build Firm shall fulfill the terms of the Contract and pay, all legal debts pertaining to the construction of the project.

Contract Time: The number of calendar days allowed for the completion of the Contract work, including authorized time extensions.

Contractor: The individual, firm, joint venture, or company contracting with the Town to perform the work. The word "Contractor" is also deemed to include a Design Build Firm ("Design Builder") contracting with the Town for performance of work, including all architectural, engineering and permitting services and furnishing of materials.

Delay: Any unanticipated event, action, force or factor, which extends the Design Build Firm's time of performance of any controlling work item under the Contract. The term "delay" is intended to cover all such events, actions, forces or factors, whether described as "delay", "disruption", "interference", "impedance", "hindrance", or otherwise, which are beyond the control of and not caused by the Design Build Firm, or the Design Build Firm's subcontractors, material-men, suppliers or other agents. This term does not include "extra work".

Design Build Contract (DBC): Means a single contract agreement between the Town and a Design Build Firm in which the Design Build Firm agrees to both design and build the Medley Firearms Training Center Repairs including but not limited to the new construction of two (2) observation towers and replacement of one (1) damaged light pole and luminaire as specified in the Design Criteria Package and in Contract Documents.

Design Criteria Package (DCP): See Introduction.

Design Build: Design Build means combining the project's design, permitting and construction phases into a single Contract.

Designer of Record: The Architect of Record or the Engineer of Record.

Engineer: Town ("Engineer"), acting directly or through his duly authorized representatives; such representatives acting within the scope of the duties and authority assigned to them. In order to avoid cumbersome and confusing repetition of expressions in this Design Criteria Package, it is provided that whenever anything is, or is to be done, if, as, or, when, or where "acceptable, accepted, approval, approved, authorized, condemned, considered necessary, contemplated, deemed necessary, designated, directed, disapproved, established, given, indicated, insufficient, ordered, permitted, rejected, required, reserved, satisfactory, specified, sufficient, suitable, suspended, unacceptable, or unsatisfactory," it shall be understood as if the expression were followed by the words "by the Engineer", "to the Engineer", or "of the Engineer".

Engineer of Record: The Professional Engineer or Engineering Firm registered in the State of Florida that performs services for the Design Build Firm (Design Builder) in connection with the design, permitting and construction of the Medley Firearms Training Center Repairs.

Equipment: The machinery and equipment, together with the necessary supplies for upkeep and maintenance thereof, and all other tools and apparatus necessary for the construction and acceptable completion of the work.

Extra Work: Any work which is required by the Engineer to be performed and which is not otherwise covered or included in the project by the existing Contract Documents, whether it is in the natural of additional work, altered work, deleted work, work due to different site conditions, or otherwise. This term does not include a "delay".

Guaranteed Completion Date: It means the date by which the Design Builder shall make the proposed observation towers ready for occupancy by Medley Police under the provisions of the Design Build Contract.

Guaranteed Maximum Price: The total maximum cost to be paid by the Town for Design Build Firm's complete performance under the Design Build Contract Documents, including, without limitations, final completion of all work, all services of Design Build Firm under the Contract, and all fees compensation and reimbursements to Design Build Firm. The Guaranteed Maximum Price shall be submitted by the Design Build Firm to the Town in the spreadsheet format separately showing cost of principal elements of: (1) Professional Architectural / Engineering & Permitting Services and (2) Construction Services for the Medley Firearms Training Center Repairs. The cost of Professional Architectural / Engineering & Permitting Services shall be broken down to: (a) Site/Building Design; (b) Permitting. The cost of Construction Services shall be broken down to each applicable Level Two Division of the CSI Classification System (CSI-MasterFormat latest Edition). The Design Build Firm shall further separately identify for each principal element the cost of performing the requested work as well as the amount of the Design Build Firm's profit.

Holidays: Days designated by the Town as holidays, which include, but are not limited to New Year's Day, Martin Luther King's Birthday, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day and the following Friday, Christmas Eve and Christmas Day.

Inspector: An authorized representative of the Engineer, assigned to make official inspections of the materials furnished and of the work performed by the Design Build Firm.

Laboratory: Designated testing laboratory.

Materials: Any substances to be incorporated in the work under the Contract.

Plans: The signed, sealed and dated plans, drawings and specifications prepared by the Designer of Record and accepted by the Engineer, including reproductions thereof, showing location, character, dimensions, technical requirements, and details of the work to be performed under the Contract. Upon review by the Engineer, the plans will be stamped "Release for Construction" dated and initialed by the Engineer.

Project: Means all activities and work necessary for the design, permitting and construction of the Medley Firearms Training Center Repairs as described in the Request for Proposal (RFP) 2018-007 and the Design Criteria Package.

Project Site: Means Medley Police Firearms Training Center

Project Manager: Means a licensed design professional or an appointed Town employee, who serves as the Town's representative and who is responsible for the administration of the design build project.

Special Provisions: Specific clauses adopted by the Town that add to or revise the Standard Town Specifications and / or Details, setting forth conditions varying from or additional to the Town Standard Specifications that are applicable for this project.

Specialty Engineer: A professional Engineer registered in the State of Florida, other than Engineer of Record or his subcontracted consultant, who undertakes the design and drawing preparation of components, systems, or installation methods and equipment for specific portions of the project work. The Specialty Engineer may be an employee or officer of the Design Build Firm or a fabricator, an employee or officer of an entity providing components to a fabricator, or an independent consultant. Any Corporation or Partnership offering engineering services must hold a Certificate of Authorization from the Florida Department of Business and Professional Regulation.

Superintendent: The Design Build Firm's authorized representative in responsible charge of the work at the Medley Firearms Training Center Repairs site.

Supplemental Agreement: A written agreement between the Town and the Design Build Firm, modifying the Contract within the limitations set forth in this Design Criteria Package.

Surety (Surety Company): The corporate body licensed to do business in the State of Florida that is bound by the Contract Bond with and for the Design Builder and responsible for the performance of the Contract and for payment of all legal debts pertaining thereto.

Working Day: Any calendar day on which the Design Build Firm works or is expected to work at the Medley Firearms Training Center Repairs Site in accordance with the approved work progress schedule related to the Guaranteed Completion Date.

3.0 PROJECT SITE DEVELOPMENT CONDITIONS

3.1 GENERAL.

In anticipation of the Project, the Town has procured or obtained the following design documents pertaining to the proposed site of the Medley Firearms Training Center Repairs:

3.1.1 TOPOGRAPHICAL SURVEY

The Topographical Survey has been completed by Hadonne Corp., which included the field work and prepared survey in the electronic format (AutoCAD) as well as hard copies signed, dated and sealed

by Raul Izquierdo, Professional Land Surveyor; Florida Registration Number 6099. All inquiries pertaining to Boundary & Topographical Survey Maps shall be directed to Raul Izquierdo, PSM.

A CD as well as the signed, dated and sealed hard copy of the Topographical Survey Map for the Medley Firearms Training Center Repairs is made an integral part of the Design Criteria Package ("the DCP") as Appendix B.

3.1.2 PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

There is no Environmental Site Assessment Report for this project.

3.1.3 GEOTECHNICAL EXPLORATION REPORT

There is no Geotechnical Exploration Report for this project. Design Build Firm shall be responsible of obtaining a Geotechnical Exploration is report as necessary.

3.1.4 LOCATION OF THE MEDLEY POLICE FIREARMS TRAINING CENTER

9700 NW 97 Avenue, Medley, FL 33178.

3.1.5 SITE STORM WATER MANAGEMENT SYSTEM

An Environmental Resource Permit (ERP) has been acquired for the site based on the concept plans. It is the bidder's option to modify the permit and obtain all necessary storm- water permit(s) etc. and to verify all permit(s).

3.1.6 PROJECT SITE – MEDLEY FIREARMS TRAINING CENTER REPAIRS.

Zoning. All specific zoning, permits, and requirements to be the responsibility of The Design Built firm.

Utilities. The Design Build Firm shall be required to verify existing utilities, coordinate and secure approvals from the public utility companies and pay all required connection and permit / approval fees as required by the said public utility companies.

Floodplain Conditions. The Design Build Firm shall verify this designation.

Examination of Site. The Design Build Firm shall visit the project site and inform itself of all conditions under which the contract work is to be performed.

The Town will make the project site available to the Design Build Firm for the purpose of conducting such site investigation and examination.

Building Setbacks. Preferably, the observation tower building and all site elements shall be located as shown in the Preliminary Site Plan (see Appendix A).

The Design Build Firm shall secure permits and coordinate through the Town's Project Manager the final design and location of the towers.

3.2 EXECUTION OF CONTRACT

3.2.1 GENERAL

The Town Contract prepared and executed between the Town and the Design Build Firm shall consists of two (2) integral parts: (1) Professional Architectural / Engineering and Permitting Services for the Design of the Medley Firearms Training Center Repairs as specifically provided in the DCP; and (2) Construction Services for the construction of the Medley Firearms Training Center Repairs as specifically provided in the plans and specifications prepared and permitted by the Design Build Firm and approved by the Engineer in accordance with all provisions of the DCP.

At the conclusion of the contract negotiations, the Town and the Design Build Firm shall determine the following: (1) Approved Technical Proposal (Design Phase) (TP); (2) The Guaranteed Maximum Price (GMP); and (3) The Guaranteed Completion Date (GCD).

The provisions and requirements of the Request for Proposal 2018-007 are hereby incorporated as the integral part of the Design Criteria Package.

The Design Criteria Package shall become an integral part of the Town Contract for the design, permitting and construction of the Medley Firearms Training Center Repairs.

3.2.2 PROFESSIONAL ARCHITECTURAL / ENGINEERING DESIGN & PERMITTING SERVICES

The Professional Architectural / Engineering & Permitting Services shall consist of all work necessary for the preparation of final design plans and specifications for Medley Firearms Training Center Repairs as specifically listed and described in Section 4 – Scope of Work. This part shall also include permitting from and by all governmental agencies and utility companies such as Miami-Dade County, the Town of Medley Building Department, etc as it may be applicable to this project.

The Design Build Firm shall also obtain the Town's approval at each phase of project development indicating compliance with the requirements of the Contract and the DCP. However, the approval of plans and specification by the Town shall not constitute relaxation or modification of the requirements and provisions of the DCP. Any relaxation or modification of the requirements and provisions of the DCP contemplated by the Design Build Firm after the initial submittal of the TP, the GMP, and the GCD shall be presented during contract negotiations to the Town in writing with the sufficient technical justification, and the GMP cost impact. When approved by the Town, these relaxations and modifications of the DCP shall become an integral part of the Town Contract with the Design Build Firm.

The Design Builder shall furnish the Town's Project Manager with one (1) set of permitted final signed, sealed and dated plans and specifications for the Medley Firearms Training Center Repairs. In addition, the Design Build Firm shall provide the Town with the electronic version of all plans and specifications in AutoCAD – Microsoft Word format on a thumb drive. Furthermore, the Design Build Firm shall provide the Town with one complete set of permit and approvals required for the project.

As a part of the Construction Contract Documents, the Design Build Firm shall prepare and provide to the Town in the paper and electronic format (Excel) the complete Submittal Schedule & Sequence Listing ("Shop Drawing Schedule") consisting of all shop drawings and submittals called for in the Project Plans & Specifications.

The AutoCAD files shall comply with the following requirements: (1) All drawings shall be 100% AutoCAD files, 2007 Version or newer; (2) Use standard AIA layer system; (3) All AutoCAD files shall be transferred to thumb drive by "E-transmit" command; (4) Use standard AutoCAD fonts/text files only, no third party application; (5) The "z" coordinate shall be set to zero in all cases.

Upon receiving of copies of final plans, specifications, and permits from the Design Build Firm, the Town shall issue a Notice to Proceed for the construction of the Medley Firearms Training Center Repairs.

Insurance and indemnification in association with professional architectural / engineering services (design & permitting services) shall be as provided pursuant to the requirements in the Design-Build Agreement. Certificates of insurance shall be issued to the Town as a Certificate Holder and Additional Insured.

3.2.3 CONSTRUCTION SERVICES

The Design Build Firm shall provide all materials, equipment and labor necessary to construct the Medley Firearms Training Center Repairs, as specifically describe in the final construction contract documents prepared based on and in compliance with the DCP. The work shall include but not be limited to the following: new construction and demolition; all trades associated with site work; concrete work; concrete block masonry; carpentry; architectural woodwork; insulation; roofing; doors & frames; windows; hardware; interior finishes; pre-engineered wood trusses; HVAC, electrical; telecommunications infrastructure; and all other construction and installation work necessary for completion of Medley Firearms Training Center Repairs.

Licensing Requirements. The Design Build Firm and all his / her subcontractors shall be properly licensed as provided by applicable federal, state and local laws and regulations. The Design Builder shall verify that all his / her subcontractors are properly licensed.

Insurance Requirements. The Design Builder shall be properly insured as provided in the Design-Build Agreement". Certificates of insurance shall be issued to the Town as a Certificate Holder and Additional Insured.

Indemnification. The Design Builder shall comply with indemnification requirements as specifically provided in the Design-Build Agreement.

Bonding Requirements. The Design Builder shall provide the Town with payment and performance bonds as required in the contract of the Design-Build Agreement, as a condition of issuance of Notice to Proceed for the construction of the Medley Firearms Training Center Repairs.

Safety. The Design Build Firm shall be solely responsible for ensuring the safety of its crews, employees, and subcontractors, along with the safety of the public, when performing the work required under the contract. The Design Build Firm shall especially exercise caution while operating heavy equipment and conducting excavations.

Schedule and Progress Reports. The Design Builder shall develop an acceptable Schedule and Progress Report, which he shall submit to the Town within 10 days after the issuance of the Notice to Proceed, a detailed bar chart or other graphic method displaying pertinent information shall be used. The Design Build Firm shall be required to submit updated progress reports, including photographic records (8"x10 photographs) with each payment request.

Shop Drawings. Submit three (3) sets of paper copies of shop drawings / concrete mix design and other submittals and one electronic copy on a CD to the Town.

National Pollutant Discharge Elimination System (NPDES). The Design Builder shall comply at all times at the construction site with the provisions of the NPDES Program as established by the US EPA and published under the 40CFR122.22.

Existing Utilities. It shall be the responsibility of the Design Build Firm to notify each of the parties at least five (5) working days prior to construction and request that the location of their respective utility or material be located and staked in the field. The Design Build Firm is reminded that the law of the State of Florida requires him to notify any utility company which may have underground lines in the work are at least 48-hours in advance of any digging operation. The Design Build Firm shall contact Sunshine State One-Call of Florida, Inc. (SSOCOF) (1-800-432-4770) to request that it locate all facilities owned by the utilities which participate in this locator program. Failure by the Contractor to call SSOCOF prior to digging shall obligate the Design Builder for any damages to participating utility company facilities and associated repair costs thereto. It is the Design Build Firm's responsibility to request line rubber protection (when needed) from Florida Power and Light at least ten (10) working days in advance.

Tree Protection. The Design Build Firm shall be responsible for protecting all trees within each Project Site during construction work.

3.3 FEDERAL REGULATIONS RELATED TO THIS PROJECT

The Design Build Firm shall be responsible for compliance with all federal and state laws applicable to this project, including laws and regulations pertaining to authorization to work in the United States of America.

4.0 SCOPE OF WORK – DESIGN & CONSTRUCTION REQUIREMENTS

4.1 GENERAL.

The Town directs the Design Build Firm to utilize, for the design, permitting and construction of the Medley Firearms Training Center Repairs, the conceptual plans and specifications prepared for the Medley Firearms Training Center Repairs by the Town as incorporated herewith in Attachment A – the DCP.

The Design Build Firm shall review these plans and specifications and make necessary changes and modifications to comply with the soil conditions at the proposed location of the Medley Firearms Training Center Repairs. In addition, the Design Build Firm shall be responsible for all changes and modifications necessary to comply with the changes and modifications to the current Florida Building Code and Supplement.

The Design Build Firm shall then sign, seal, and date reviewed and modified as necessary plans in compliance with the provisions of the applicable laws and rules of the State of Florida governing Engineers, Architects, and Landscape Architects.

Project Site – Medley Firearms Training Center Repairs. The Design Build Firm shall utilize the preliminary site plan concept, depicted in Appendix A, with all functional elements of the project site consistent with the Medley Firearms Training Center Repairs project. Specifically: the construction of two (2) observation towers and the replacement of one (1) damaged light pole and luminaire.

4.2 SCOPE OF SITE DESIGN AND CONSTRUCTION WORK.

The following site elements shall be designed, permitted and constructed in accordance with site development conditions described in Section 2 and in compliance with applicable design criteria, standards, codes and specifications promulgated by but not limited to the following:

the Town, Miami Dade County, the State of Florida, ACI, ANSI, ASCE, ASTM, AWPA, EPA, FDEP, NFPA, OSHA, UL, NEC, NEMA (see Section 1).

Observation Tower Buildings. The two (2) observation tower buildings shall consist of two (2) one-story buildings with minimum exterior of 10-ft L x 10-ft W x 8-ft H. The minimum finish floor elevation shall be 6’ above the existing site grading with access steps preferable at the north side of the building structure. Observation tower shall meet the Florida Building Code, hurricane protection requirements, and all applicable Federal, State, and Local codes.

Electric Power Service. The Design Build Firm shall coordinate, design, and install electric power service for two (2) observation towers. The Design Build Firm shall verify and if necessary retrofit electric power service to one (1) damage light pole and luminaire as per plans and DCP.

Telephone and Comcast Services. The Design Build Firm shall obtain from Comcast a Comcast Fiber Optic Ethernet Connection

Electrical Site Lighting. Replace damaged light pole and luminaire as specified in the design plans.

New Interior. Window design as per DCP specifications and floor plan, Appendix A.

4.3 SCOPE OF BUILDING DESIGN AND CONSTRUCTION WORK – TWO (2) OBSERVATION TOWER BUILDINGS.

The observation towers building shall consist of two (2) one-story buildings with minimum exterior dimensions of 10-ft L x 10-ft W x 8-ft H. The minimum finish floor elevation shall be 6' above the existing site grading with access steps preferable at the north side of the building structure. The proposed two (2) observation towers shall be designed and constructed as shown and specified for the Medley Firearms Training Center Repairs provided in the DCP.

In general, the Design Build Firm shall utilize the functional layout of the Medley Firearms Training Center Repairs building as provided in Appendix A. The Town will need to authorize any major changes to the conceptual plans. The Design Build Firm may propose changes to the floor plan and any changes to materials and systems shown in Appendix A if the proposed materials and systems are similar to those specified and offer some tangible benefits to the Town. The Design Build Firm shall submit to the Town requests for approval of similar materials and systems at least 7-days before the deadline for submitting the Technical Proposal.

The Medley Firearms Training Center Repairs shall be designed and constructed in compliance with the provisions of the current Florida Building Code, hurricane protection requirements, and all applicable Federal, State, and Local codes.

Type of Building Construction & Structural Requirements. Design Build Firm to design foundation and determine the minimum allowable bearing pressure. It is assumed that the building will have continuous shallow footings at each wall location. Reinforce concrete columns will need to be designed to support the proposed elevated observation towers. Design Build Firm to design the slab on grade and determine the minimum thickness. The slab shall be reinforced as design drawings with crack protection. The structural system of the roof shall be composed of plywood over pre-engineered wood roof trusses spaced at 2 feet on center. All structural walls, for both sections of the building, will consist of reinforced concrete masonry. Lateral loads applied to the building, primarily generated from wind pressures, shall be resisted by masonry shear walls.

Electrical, mechanical, telecommunication, and other building systems. The two (2) observation towers shall be fully equipped in electrical, mechanical, telecommunication, and other building systems as generally indicated in the design criteria package drawings.

4.4 SCOPE OF PERMITTING.

The Design Build Firm shall apply on behalf of the Town, pay required application and permit fees and secure all approvals and permits from all the applicable regulatory agencies as required by law. Specifically, permits and approvals are required, but not limited to the Town, Engineering and the Building Departments as may be required for this project.

In addition, the Design Build Firm shall coordinate with FP&L, AT&T, Comcast and other utility companies as applicable all required utility services and pay all applicable fees.

Furthermore, the Design Build Firm shall provide the Town for the review and approval all plans and specifications at 60%, 90% and 100% project development phases. The Town may, at the request of the Design Build Firm waive the requirement for 90% Submittal Review if it is determined to be in the best interest of the Town. For the purpose of the foregoing reviews and approvals, the Design Build Firm shall provide the Town with 5 sets of drawings, specifications and engineering calculations.

The Design Build Firm shall provide the Town with five (5) sets of final plans, specifications and engineering calculations prior to the Preconstruction Conference and the issuance of the Notice to Proceed. In addition, at the same time the Design Build Firm shall provide the Town with two (2) copies of CD with the electronic version of all contract documents (drawings, specifications, engineering calculations, permits and approvals).

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XXVIII. Correction of Defective Work
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SECTION 00 01 00

GENERAL REQUIREMENTS

I. DEFINITIONSFORPURPOSESOFTHISCONTRACTDOCUMENT

A. OWNER

1. The Owner is the person or organization identified above.

2. The term Owner or the Town referred to throughout the Contract Documents means the Owner or his authorized representative.

B. DESIGNARCHITECT:

1. The term Architect is the person or organization identified above.

2. The term Architect referred to throughout the Contract Documents means TDA, or their authorized representative.

C. ENGINEER:

1. The Engineer is the organization identified above.

2. The term Engineer referred to throughout the Contract Documents means the group which signed and sealed the plans and specifications, or their authorized representative.

D. DESIGN-BUILD CONTRACTOR:

1. The term Design-Build Contractor or Contractor or General Contractor referred to throughout the Contract Documents means The Design-Build contractor, or their authorized representative or design professional.

E. SUBCONTRACTOR:

1. A Subcontractor is a person or organization who has a direct contract with the Design-Build Contractor to perform any of the Work at the site.

2. The term Subcontractor referred to throughout the Contract Documents means the Subcontractor or his authorized representative.

F. VENDOR:

1. A vendor is a person or organization who has a direct contract with the Contractor or Subcontractor to Supply materials or equipment but not labor.

2. The term Vendor referred to throughout the Contract Documents means the Vendor or his authorized representative.

G. SHOP DRAWINGS & SAMPLES:

1. Shop Drawings are drawings, diagrams, illustrations, schedules performance charts, brochures and other data which are prepared by the Contractor or any Subcontractor or Vendor and which illustrate some portion of the Work.

2. Samples are physical examples furnished by the Subcontractor or Vendor to illustrate material, equipment or workmanship, and to establish standards by which the Work will be judged.

H. CONTRACT DOCUMENTS: The Contract Documents forming the General Contract consist of the Purchase Order or Subcontract issued by the Contractor, the Drawings, the Specifications, all Addenda issued prior to execution of the General Contract, and all Modifications, Terms and Conditions listed on the Purchase Order or Subcontract.

I. THE WORK: The term Work includes all labor necessary and all materials and equipment incorporated or to be incorporated to produce the construction required by the Contract Documents.

J. THEPROJECT: The Project is the total construction designed by the Architect and Engineer of which the Work performed under the Contract Documents may be the whole or a part.

K. NIC: The term NIC used throughout the Contract Documents means "not included in this Contract".

II. GENERAL

A. These General Requirements shall be considered as being part of each technical section of this specification and shall be adhered to in every respect. In case of conflict between these General Requirements and individual technical sections, the technical sections will take precedence.

B. For the convenience of reference and to facilitate the letting of contracts, the organization of these specifications into divisions and sections shall not control the division of work among Subcontractors or in establishing the extent of work to be performed by each trade. Each Subcontractor shall be responsible for the settlement of labor disputes within his contract to avoid delay in the performance of his work.

III. PROTECTION

A. Each Subcontractor, according to his work, shall be responsible for the compliance with all building laws and safety regulations of all authorities having jurisdiction at the place of building.

B. Each Subcontractor shall exercise particular care of all finished work as the construction progresses and must protect it from damage or defacement. All work damaged must be made good to the Town's satisfaction at the expense of the Subcontractor causing the damage.

C. The loss of any material or equipment on the job site to be installed in the Work, including items assigned to the Subcontractor for installation, or Subcontractor's equipment, occasioned by theft, is the sole responsibility of the Subcontractor installing the material or using or installing the equipment.

IV. SITEVISIT

A. Each Subcontractor shall personally have visited the site to satisfy himself as to the physical limitations of access and working space and to have included in his price all work and materials required to complete the project as specified.

V. AREAUSELIMITS

A. The Contractors shall confine their tools, equipment, materials and the operations of his workmen to the limits indicated by law, ordinances, permits or directions of the Town and shall not unreasonably encumber the premises with said tools, equipment or materials.

B. The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

VI. REFERENCEPOINTS

A. All Work shall be referenced from benchmarks and building corner points established by the Design-Build Contractor.

VII. CLEANUP

A. The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his employees or Work, or the employees or Work of any of his Subcontractors, and at the completion of the Work, he shall remove all rubbish from and about the project and all his and his Subcontractors' tools, scaffolding, and surplus materials and shall leave the Work "broom clean" unless more exactly specified. In case of dispute between Subcontractors employed on or about the project, upon which the Work is to be done, as herein provided, as to the responsibility for the removal of the rubbish, etc., or in case the same be not promptly removed as herein required, the Contractor may remove the rubbish, etc., and charge the cost to the several Subcontractors, as the Contractor shall determine to be just.

VIII. TEMPORARYSERVICES

A. Protection: Unless otherwise specified, the Contractor shall provide and maintain all temporary enclosures, coverings and protection of the building.

B. Water: The Contractor will provide a temporary water line from the nearest available source and pay for any water charges imposed by the Water Authority. In cases where the nearest available source is through the Owner's existing system, the Owner will pay for any water charges.

C. Telephone: The Contractor will maintain telephone for his own use. Each Subcontractor will furnish any telephone service for their own use.

D. Offices, Sheds, Toilets: The Contractor will provide a field office for his own use. Each Subcontractor will furnish all

such facilities required for their own use. The Contractor will also provide suitable and adequate toilet facilities for all trades.

E. Electricity and Lights:

1. Electric installations for temporary light and power will be provided by the Electrical Subcontractor in accordance with the electrical section of these specifications.

2. Each Subcontractor requiring temporary light or power in his temporary buildings or elsewhere on the site outside of the building proper, shall make his own connections to the temporary service panelboard.

3. All Subcontractors requiring service for portable hand tools or localized lighting in excess of the general lighting or power outlets provided by the Electrical Subcontractor shall obtain same at their own expense from the outlets provided.

4. When permanent lighting and power has been placed in operation, temporary lights and power may be removed; however, at no time may any Subcontractor make connection to the permanent outlets for use of power tools.

5. The cost of electrical energy consumed through the temporary electrical installation shall be borne by the Contractor. Where the on-site electrical system is a part of an existing facility owned by the Owner, then the Owner will pay for all electrical energy consumed.

6. The cost of electrical energy consumed through the permanent installation shall be borne by the Owner.

7. At times during construction, the total electrical power available may be insufficient for the wants of all Subcontractors. The Contractor, in such case, will allocate the power use among the various Subcontractors.

IX. DRAWINGS & SPECIFICATIONS

A. An adequate number of sets of architectural, structural mechanical, civil and electrical drawings and specifications shall be furnished or made available by the Town at the Contractor's expense.

B. The Contractor shall examine all drawings listed in the drawing index before beginning the Work. Any doubt as to the meaning or scope of the drawings and specifications, or any other portion of the contract, may be clarified by submitting a request in writing for interpretation to the Engineer who will provide clarification. Absence of such request for clarification will imply a full understanding of the intent of the drawings and specifications.

C. The drawings and specifications are complementary and are intended to include all work necessary to the thorough and satisfactory completion of the project. Any work not indicated in the drawings, nor mentioned in the specifications, but obviously and reasonably necessary to the proper conclusion of the Work, shall be deemed a part of the Contract.

X. SHOPDRAWINGS&DATAREQUIREMENTS

A. With such promptness as to cause no delay in his work or in the work of any other Subcontractor, but in no case later than two (2) weeks, after award of Sub-contract or Purchase Order the Contractor, Subcontractor or Vendor shall submit for the Town's approval, six (6) copies of all shop drawings (including erection, setting and equipment drawings), cuts, equipment data, performance data, test results and schedules required by the Contract Documents.

B. The Contractor shall examine each submission for compliance with the Contract Documents and shall indicate his approval thereupon that each submission does comply with the Contract Documents by stamp or in writing. Submissions shall be reviewed by the Design-Builder's design professional prior to submission to the Town. Any deviations from the Contract Documents requirements must be noted at the time of submission.

C. Submissions shall be specific so that compliance with the Contract Documents can be easily ascertained. Incorrect and/or incomplete submissions will be rejected and the Contractor or Vendor will be required to resubmit the required number of submissions prior to the start of the Work. Any Work begun or installed before approval of submission will be at the Contractor's own risk.

D. By approving and submitting shop drawings, data or samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data and that they have checked and coordinated the shop drawings, data or samples with the requirements of the Work and of the Contract Documents.

E. The Town's approval of submissions shall not relieve the Contractor of the responsibility for any deviation from the Contract Document Requirements unless they have informed the Town in writing of such deviation at the time of the submission and the Town has given written approval to the specific deviation. The Town's approval shall not relieve the Contractor, Subcontractor or Vendor from responsibility for errors or omissions in the submissions.

F. The Contractor, Subcontractors or Vendors shall make any corrections required by the Town and shall resubmit the required number of corrected submissions. The Subcontractor or Vendor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections required by the Town on previous submissions.

G. The Contractor, Subcontractors or Vendors shall indicate the following on all submissions:

1. Project name.

2. Identification of equipment, system or materials using the same symbols as used on the schedules, drawings or applicable paragraphs or sections of the specifications.

3. Manufacturer's name.

4. Contractor's or Subcontractor's name.

5. Identification of each sheet submitted by number.

H. The Contractor, Subcontractors or Vendors shall furnish for approval all samples requested by the specifications. The Work shall be in accordance with approved samples. If a sample is requested, it shall be the responsibility of the Subcontractor or Vendor to have the sample delivered to the Town or to arrange for the Town to examine it elsewhere. Failure to comply may be cause for rejection of the item.

XI. SUBSTITUTIONS

A. In these Specifications, one or more makes of materials, apparatus or appliances have been specified for use in this project. Should the Subcontractor or Contractor desire to substitute other makes of materials, apparatus or appliances than those mentioned herein, he shall make his request in the following way:

1. Prepare his bid based on the item or items specified herein and include the same in a separate alternate proposal, based on furnishing and installing the proposed substitute. This proposal shall contain the Contractor's installed price used in his bid for the item specified, and the price for which the Contractor will install the substitute, including the cost of modifying any other phase of the Work. This request shall be accompanied by complete plans and specifications of the substitution offered.

B. If requested by the Town, the Contractor shall also submit samples of both the specified materials, apparatus or appliance and the substitute. Should the substitute fail to conform to the requirements of the Contract Documents as determined by the Town, the Contractor shall install the specific make of material, apparatus or appliance specified herein.

C. Acceptance of substitution must be resolved prior to letting the Subcontract.

XII. INDEMNIFICATION

A. Each Subcontractor shall indemnify and hold harmless the Owner, Contractor, Engineer and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, other than the Work itself, including the loss of use resulting therefrom and is caused in whole or in part by any negligent act or omission of the Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

B. In any and all claims against the Owner, Contractor, Architect, Engineer, or any of their agents or employees by any employee of the Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Section shall not be limited in the amount or type of damages, compensation, or benefit payable by or for the Subcontractor under Workmen's compensation acts, disability benefit acts or other employee benefit acts.

XIII. TESTS

A. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to be inspected, tested or approved, the Contractor shall give the Town timely notice of its readiness and of the date arranged so the Town may observe such inspection, testing or approval. The Contractor shall bear all cost of such inspections, tests and approvals. This paragraph does not apply to soils and concrete testing, which will be arranged and paid by the Contractor.

B. Contractor, sub-subcontractors, vendors, etc., shall provide that all material required to be provided by their subcontract or purchase order shall not be hazardous, or contain hazardous components, as defined by the environmental authorities having jurisdiction. If required by the Town, appropriate documentation substantiating this requirement shall be submitted.

XIV. PROGRESSMEETINGS

A. The Contractor will hold progress meetings at the site. The time and occurrence will be established by the Contractor. Representatives of all Subcontractors working at the site, or scheduled to be working at the site will be required to attend. All representatives attending these meetings must have full authority to make decisions and commitments which will be binding upon his company in regard to scope of Work, schedules, manpower, or any other factors affecting the completion of his work.

XV. PERFORMANCE&PAYMENTBONDS

A. The Contractor shall have the right, prior to the signing of any Contract, to require any Subcontractor to furnish bond for performance of Contract and payment of all obligations arising thereunder. If such bond is required prior to submission of bids, it shall be paid by the Subcontractor; if subsequent thereto, it shall be paid for by the Owner or the Contractor, whichever requires the bond, and shall be considered an additional cost of the Work.

XVI. LIENS

A. Neither the final payment nor any part of the retained percentage shall become due until the Contractor has delivered to the Town a complete release of all liens which could arise out of the Contract and an affidavit that all labor, material and services committed for have been paid in full and that the release covers all labor and material for which a lien could be filed. If any lien remains unsatisfied after all payments are made, the Subcontractors shall refund to the Contractor all monies that the Contractor or Owner may be compelled to pay in discharging such lien, including all costs and attorney's fees.

XVII. CONTRACTOR'SCONTROL

A. The Contractor reserves the rights to prohibit the use of any men, tools, supplies, materials or pieces of equipment which, in his opinion, will not produce work meeting the requirements of the Contract Documents. The Subcontractors shall be entitled to no extra compensation because of any such prohibitions or changes resulting therefrom.

B. Each Subcontractor shall keep on the work during its progress a competent superintendent and any necessary assistants, all being satisfactory to the Contractor. The superintendent shall not be changed (except with the consent of the Contractor) unless the superintendent proves to be unsatisfactory to the Subcontractor and ceases to be in his employ. The superintendent shall represent the Subcontractor in his absence and all directions given to him shall be as binding as if given to the Subcontractor.

XVIII. CHANGEINTHEWORK

A. The Contractor, Architect, and Engineer reserve the right to require alterations in, additions to, or omissions from the work called for by this contract, and should any such alterations, additions or omissions be required, the same shall not make this contract void nor in any way affect the same, except that appropriate additions to or deductions from the contract price shall be made; provided, however, that unless otherwise provided in the contract documents, the Subcontractor shall not be entitled to any compensation for extra work unless orders therefore are given in writing duly executed by the Contractor and the amount of compensation for such extra work specified in such written orders.

B. No such change or alteration or modification of this Contract or of the Work called for hereunder shall release or exonerate any surety or sureties, if required, on any bond given to secure the performance of this contract or any party thereof and/or to insure to the benefit of any and all persons performing labor upon or furnishing materials used or to be used on said Work.

C. The value of the Work in additions or omissions shall be computed by one or more of the following methods as established by the Contractor:

1. Lump sum.

2. Unit prices.

3. Estimated cost plus percentages for overhead and profit.

4. Actual cost as established by signed labor reports and material vouchers, plus overhead and profit percentages.

XIX. SUBCONTRACTOR'SPAYMENTS

A. The Subcontractor shall submit to the Contractor an application for each payment and, if requested, receipts or other vouchers showing his payments for materials and labor.

B. The making of progress payments shall not be considered as an acceptance by the Contractor of the whole or any part of the work done up to the payment thereof. The entire work is to be subject to inspection and approval by the Owner and the Contractor when it shall be claimed by the Subcontractor that this contract is complete.

C. Payments will be made on a basis of 90% monthly, based upon work completed and material on the site. Final payment will be due and payable within 60 days after acceptance of the work by the Contractor and receipt of lien waivers.

D. The Contractor may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any payment to such an extent as may be necessary to protect from loss on account of:

1. Defective work not remedied.

2. Claims filed or reasonable evidence indicating probable filing of claims.

3. Failure of the Subcontractor to make payments properly to other Subcontractors or for material or labor.

4. Damage to another Subcontractor.

5. Failure of the Subcontractor to perform in accordance with the terms and/or conditions of the contract.

E. Any Subcontractor, Vendor, Workman, or anyone else having claim against any Subcontractor for or on account of work done or material furnished for the performance of the work provided for hereunder may give notice of said claim and the amount thereof to the Contractor who may, but shall not be obligated to, thereupon withhold any and all payments due or to become due thereafter to the Subcontractor until said claims are resolved.

XX. MATERIALS, TOOLS & WORKMANSHIP

A. All materials shall be new and the best of their respective kinds and subject to the Town's approval. The Subcontractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

B. Except as otherwise specified or agreed, the Subcontractor shall furnish at his own risk and costs all tools, apparatus, hoists, derricks, scaffolding and all temporary work and materials necessary for the proper execution of the Contract. Temporary equipment shall be installed in such a manner that finished work will not be damaged and shall be subject to the Contractor's approval.

C. All work shall be performed in the best manner by skilled workmen.

XXI. ASSIGNMENT OF WORK

A. The Subcontractor shall not assign or sublet any portion of his contract without written approval by the Contractor.

XXII. OWNER'SRIGHT TO OCCUPY THE FACILITY

A. The Owner reserves the right to occupy any portion of the project before it has been entirely completed, with the distinct understanding that such occupancy shall not in any way constitute acceptance of the Work or any part thereof.

XXIII. TAXES

A. The Subcontractor or Vendor agrees and states that the amount of all taxes now required or which may be required, including sales taxes, incident to performance of the contract, will be paid by the Subcontractor or Vendor.

XXIV. SIGNS&ADVERTISING

A. The Subcontractor shall enforce the Contractor's instructions regarding signs, advertisements, fires and smoking. No advertising signs or name labels of any description shall be placed on or near the premises without the Contractor's written consent thereto.

XXV. CUTTING&PATCHING

A. The Subcontractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Subcontractors shown upon or reasonably implied by the drawings and specifications for the completed structure and shall do all that is necessary to accomplish the joining of said several parts in a neat and workmanlike manner to satisfaction of the Contractor. Openings shall be done in such a manner as not to impair the appearance or structural integrity of the structure, including the deck and all load bearing walls or foundations and only with the approval of the Engineer. Any reinforcement or other work shall be furnished and installed by the Subcontractor cutting the opening.

XXVI. INSPECTION

A. All materials and equipment are subject to periodic inspection by the Town while the work is in progress, but approval of the work shall not release the warranty. The Town's failure to inspect the fabrication or installation of material or equipment shall not constitute a waiver by the Town of the right to reject the material or equipment for defective workmanship or material.

XXVII. SUBCONTRACTOR'SWARRANTY

A. Unless specified otherwise for a particular trade, all Subcontractors shall warrant that all work executed by him, or done under his supervision, will be free from defects of materials and workmanship for a period of one (1) year from the date of final acceptance. The Subcontractor shall further agree that he will, at his own expense, repair and replace all such defective work and any adjacent work that may be damaged by such repairs.

B. Unless specified otherwise for specific equipment, all Subcontractors shall pass through to the Contractor any warranty provided by the manufacturer on all equipment furnished under his contract starting from the date the equipment is accepted by the Contractor for normal operation.

XXVIII. CORRECTIONOFDEFECTIVEWORK

A. Any work or material condemned by the Town as failing to conform to the contract, whether incorporated in the work or not, shall be promptly removed from the premises by the Subcontractor and shall be promptly replaced or re-executed in accordance with the contract without expense to the Contractor or Town. The Subcontractor shall bear the expense of making good all work of other Subcontractors destroyed or damaged by such removal or replacement.

B. If, after ten (10) days written notice, the Subcontractor shall fail to remove and replace condemned work, the

Contractor may at his option cause such work to be done and may deduct all costs incurred in so doing from payments due the Subcontractor. If the payments then or thereafter due the Subcontractor are not sufficient to cover such amount, the Subcontractor shall pay the difference to the Contractor.

XXIX. CONTRACTOR'SLIABILITYINSURANCE

A. At its own expense and prior to commencing work, the Contractor shall procure all insurance coverages as required hereunder and furnish Town with certificates of insurance, and copies of additional insured endorsements, executed by an authorized representative from an insurer duly licensed to transact business at the location of the jobsite. Evidence of such insurance shall be provided to the Town through the warranty period of the Contractor's work. The insurance as set forth below shall be issued from companies satisfactory to the Contractor and with an AM Best rating of not less than A-VII. Securing and maintaining the insurance required hereunder is a condition precedent to payment to the Subcontractor. Failure of subcontractor to maintain the required insurance shall constitute a default under this Subcontract and, at Contractor's option, shall allow Contractor to terminate this subcontract for cause and/or purchase said insurance at subcontractor's expense.

1. Commercial General and Umbrella Liability Insurance: Contractor shall maintain commercial general liability (CGL) and, if necessary, umbrella insurance with a limit of not less than $2,000,000 each occurrence, subject to a general aggregate of not less than $2,000,000. The general aggregate limit shall apply separately to this contract or any subcontracts the Contractor enters into. The CGL insurance shall be written on ISO occurrence form CG 00 01 (or a substitute form providing equivalent coverage). The coverage shall include liability arising from premises, operations, independent contractors, products-completed operations. Personal injury and advertising injury, and liability assumed under an insured contract, including the tort liability of another assumed in a contract. The Town or Contractor (if Subcontractor providing insurance) shall be included as an additional insured under the CGL policy for both ongoing and completed operations. ISO additional insured endorsement CG 20 10 (for ongoing operations) and CD 20 37 (for completed operations) (or substitute endorsements providing equivalent coverage) will be attached to subcontractors CGL, and to the commercial umbrella, if any. Subcontractor shall maintain ongoing CGL coverage for the products- completed operations hazard, including liability assumed under an insured contract, and the required additional insured coverage for the period of time the subcontractor may be held legally liable for its work following substantial completion of the work. The coverage shall have a limit of not less than $2,000,000 each occurrence, and a products-completed operations aggregate of not less than $2,000,000. This coverage shall be maintained on ISO occurrence form CG 00 01 (or a substitute form providing equivalent coverage). The subcontractor's CGL insurance shall apply as primary with respect to any other insurance or self-insurance programs afforded to contractor. There shall be no endorsement or modification of the CGL to make it excess over the other available insurance.

2. Automobile and Umbrella Insurance: Contractor shall maintain automobile liability insurance and, if necessary, umbrella liability insurance with a limit of not less than $1,000,000 each accident. Such insurance shall cover liability arising out of "any auto", including owned, hired, and non-owned autos. Coverage shall be written on ISO form CA 00 01 or a substitute form providing equivalent liability coverage.

3. Worker's Compensation Insurance: Contractor shall maintain worker's compensation and employer's liability insurance. The workers compensation coverage shall provide the statutory maximum limit of liability. The employers liability limits shall not be less than $1,000,000 each accident for bodily injury by accident or $1,000,000 each employee for bodily injury by disease.

4. Pollution Liability Insurance: If subcontractor's commercial general liability (CGL) policy contains an

endorsement limiting or completely excluding coverage for fungus and/or mold, then subcontractor shall maintain a separate pollution liability policy to cover claims from fungus, including mold or mildew and any mycotoxins, spores, scents or byproducts produced or released by fungi, that may arise out of the subcontractor's ongoing operations or completed work. The limit of liability shall not be less than $1,000,000.

5. Professional Liability Insurance: If Contractor's scope of services includes design work or other professional services, then Contractor shall maintain insurance coverage for Contractor's errors, omissions and other wrongful acts arising out of the professional services performed by subcontractor. The limit of liability shall not be less than $1,000,000.

6. Waiver of Subrogation: Contractor waives all rights against contractor and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by any of the policies of insurance maintained pursuant to this subcontract.

7. Cross-Liability Coverage: If Contractor's liability policies do not contain the standard ISO separation of insureds provision, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

8. Subcontractor's Insurance: Contractor shall cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified in this agreement. When requested by Town, Contractor shall furnish to Town copies of certificates of insurance evidencing coverage for each Subcontractor.

9. No Representation of Coverage Adequacy: By requiring the insurance as set out in this contract, Town does not represent that coverage and limits will necessarily be adequate to protect Contractor, and such coverage and limits shall not be deemed as a limitation on Contractor's liability under the indemnities provided to Town in this contract.

B. An Umbrella Liability policy may be used as part of the indicated total required limits at the Contractor's option.

C. In addition to the above, an Umbrella Liability policy in the amount of at least $1,000,000 will be required for the following types of Subcontractors:

Electrical
Heating, Ventilating and Air-Conditioning
Masonry
Plumbing
Roofing

D. The foregoing provisions shall not operate to relieve any Contractor from the responsibility of carrying his own insurance to cover loss to his respective materials, tools, and other equipment owned by him, or his employees, which will not become an integral part of or be consumed by the construction of the project.

(END OF SECTION 00 01 00)

SECTION 00 01 00

LIST OF DRAWING SHEETS

C-1 Cover Sheet
C-2 General Notes and Utility Contacts
Overall Site Plan
Geometry Site Plan
C-3 Demolition Plan

A-1.0 Architectural Site Plan
A-1.1 Floor Plan
A-1.2 Roof Plan
A-2.0 Exterior Elevations
A-3.0 Building Sections
A-4.0 Room Finish and Door Schedules

S1.1 Foundation Plan
S1.2 Roof Framing Plan
S2.1 Sections and Details

M0.1 Mechanical Legend, Schedule, and Notes
Mechanical Floor Plan
Mechanical Details
Mechanical Controls

E0.1 Electrical Legend Notes Schedule
Riser Diagrams
Electrical Site Plan
Lighting Floor Plan
Power Floor Plan
Electrical Floor Plan
Telecom Floor Plan

SECTION 02010

DEMOLITION

PARTI–GENERAL

1.1 DESCRIPTION

A. The General Requirements, Section 00 01 00, are hereby made a part of this section as if fully repeated herein.

B. The Town of Medley Standard Specifications are hereby made a part of this section and are fully repeated herein. If there are any discrepancies, the more stringent specification shall take precedence.

C. Work Includes:
1. Permits.
2. Install erosion and sediment control devices.
3. Removal of existing concrete slabs, sidewalks, foundations, footings, etc.
4. Backfilling and compaction.

D. Related Work Specified Elsewhere:
1. Site clearing: Site Clearing & Earthwork - 02210
2. Removal of existing asphalt pavement: Site Clearing & Earthwork – 02210

E. Supervision: All work specified herein shall be under the supervision of the Contractor.

1.2 JOB CONDITIONS

A. Should any unusual conditions arise, the Engineer should be contacted for instructions prior to continuation of demolition operations.

1.3 PERMITS

A. Obtain and pay for all required permits and inspections.

1.4 HAZARDOUS MATERIALS

A. In the event hazardous material is discovered in the area of work, immediately notify the engineer for instruction.

PARTII–EXECUTION

2.1 NOTIFICATION OF UTILITY COMPANIES

A. Notify all utility companies that may have lines or services on or around the site prior to starting any work. Have the utility company identify and locate their underground lines.

B. Take responsibility for the repair or replacement of any lines or services damaged during the course of this work.

C. Remove, plug or cap all abandoned lines, meters, boxes, obstructions or piping in accordance with the requirements and approval of the agencies affected or as directed by the Engineer. Use licensed electricians or plumbers for this work.

2.2 PROTECTION

A. Take responsibility for furnishing, placing and maintaining all support, shoring and sheet piling which may be required for the protection of site personnel and adjacent existing improvements.

B. Maintain all bench marks, monuments, and other reference points furnished by others and replace any that are disturbed or destroyed during the course of this work.

1. Do not damage any trees not indicated for removal. Protect trees near this work so as to prevent damage to the branches, bark and soil around the root system.

2. Protect all underground utilities in the area of this work.

2.3 PROCEDURE

A. Demolition: Perform work in an orderly and careful manner. Take responsibility for damages to public property resulting from this operation.

B. Materials: Promptly remove all materials, rubbish and debris from the premises. Subcontractors shall dispose of demolition and construction debris only at approved and legally operating waste and debris sites. Subcontractors shall obtain and retain for duration of the contract and two (2) years thereafter receipts from the disposal site operator for all debris. Accumulation of same will not be permitted. Refer to the Town of Medley Contract Documents.

C. Backfill: Fill excavations created by this work in accordance with the requirements of Section 02210 of these specifications.

END OF SECTION2010

SECTION 02200

EROSION AND SEDIMENTATION CONTROL

PARTI–GENERAL

1.1 DESCRIPTION

A. The General Requirements, Section 00 01 00, are hereby made a part of this section as if fully repeated herein.

B. Work Included:
1. Furnishing, installing and maintaining erosion controls and sedimentation controls.
2. Clean up.

C. Related Work Specified Elsewhere:
1. Paving: Section 02800 – Asphalt Paving
2. Drainage Structures: Section 02700 – Storm Drainage
3. Planted Areas: Section 02900 - Landscaping (Landscape Work)

D. References: EPA, "Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices", 1992 Edition.

E. Supervision: All work specified herein shall be under the supervision of the Project Superintendent.

1.2 JOB CONDITIONS

A. The existing site is an undeveloped wooded site contractor is responsible to meet all local, state and federal criteria to protect adjacent land from erosion and sediment transport off the site.

1.3 QUALITY ASSURANCE

A. Provide erosion control methods in accordance with methods as indicated on the grading and erosion control plan and/or requirements of authorities having jurisdiction. The Contractor shall comply with all National Pollutant Discharge Elimination System (NPDES) rules and regulations in terms of both installation and maintenance during construction. Refer to per Town of Medley requirements.

PARTII–PRODUCTS

2.1 SILT BARRIER PRODUCTS

A. Hay bales shall be clean, seed-free cereal hay type, securely bound.

B. Netting shall be 1/2 in., galvanized steel chicken wire mesh.

C. Filter stone shall be crushed 1-in. stone without excessive fines or dust.

D. Silt barrier shall be nylon, polyester, propylene, or ethylene yarn with extra strength – 50 lb. / lin. in (minimum) and with a flow rate of at least 0.3 gal / SF / minute. Fabric shall have a minimum equivalent opening size (U.S. Standard Sieve) of 40 and a maximum equivalent opening size of 80. Fabric shall contain ultraviolet ray inhibitors and stabilizers.

E. Erosion control blankets shall be North American Green SC 150 Straw/Fiber Blanket.

2.2 TEMPORARY SEEDING

A. Provide seed mixture, mulch and fertilizer types and application rates in accordance with local agricultural recommendations.

PARTIII–EXECUTION

3.1 EROSION AND SEDIMENTATION CONTROL

A. Erosion controls shall include staked silt fencing, straw hay bales, grassing, mulching, watering, and reseeding on-site sloped surfaces, providing berms at the top of the slopes and providing interceptor ditches at the ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or minimized.

B. Sedimentation controls shall include temporary sedimentation basins, rock check dams and turbidity fencing, silt fence barriers, and appurtenances at the toe of slopes.

C. The Contractor shall construct the sedimentation basins and sediment control devices prior to clearing and grubbing the site to ensure complete silt control. When the silt or the debris level is greater than 1 ft. above the bottom of sedimentation basin, the Contractor shall remove the silt or debris to restore the proper storage elevation from the bottom of the sedimentation basin.

D. Silt dams, traps, barriers, and appurtenances shall be installed and shall be maintained in place for duration of construction. This is done by periodically replacing silted structures, or removing the silt from the up-gradient side of it.

E. Hay bales shall be staked with (2) 2-in. by 2-in. wood stakes or 2 steel rebar per bale driven 18 to 24-in. into the ground and finishing flush with the top of the bale.

F. Hay bales, which have deteriorated, shall be replaced with new materials.

G. Erosion and sedimentation controls shall be maintained in a condition, which will retain unfiltered water.

H. The Site Contractor shall be solely responsible for ensuring that no silt or debris leaves the immediate construction site. Any silt or debris that does leave the immediate site shall be cleaned up, and the area disturbed shall be returned to its natural state as directed by the Project Superintendent at the

subcontractor's expense.

3.2 Not used

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3.3 CLEAN UP

A. Minimize the transmission of dirt or debris by equipment or personnel to any property, public or private, outside the project site. Immediately remove any such debris or dirt transmitted.

END OF SECTION 02200

SECTION 02222

BUILDING EARTHWORK

PART1–GENERAL

1.1 DESCRIPTION

A. Provide earthwork, including clearing and grubbing, excavation, fill, backfill and compaction for building areas and building foundation and slabs, shown on the drawings and specified as required to complete work.

B. The Town of Medley Standard Specifications are hereby made a part of this section and are fully repeated herein. If there are any discrepancies, the more stringent specification shall take precedence.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork in compliance with applicable requirements of governing authorities having jurisdiction.

B. Testing and Inspection Service: Contractor shall employ and pay an independent soil testing and inspection service to perform a soil survey for satisfactory soil materials, sampling and testing for quality control during earthwork operations.

C. Test for Proposed Soil Materials:
1. Test soil materials proposed for use in the work and promptly submit test result reports.
2. Provide one optimum moisture-maximum density curve for each type of soil encountered in subgrade and fills under building foundations and slab areas. Determine maximum densities in accordance with ASTM D 1557, and ASTM D 4253, as applicable.
3. For borrow materials, perform a mechanical analysis, AASHTO-T88 plasticity index, AASHTO T91; moisture-density curve, AASHTO-T180 or ASTM D 1557.

D. Project Geotechnical Report: Perform earthwork in accordance with the recommendations of the geotechnical report for the project.

1.3 SUBMITTALS

A. Test Reports: Submit two original, signed and sealed copies of the following reports to the architect-Engineer:
1. Test report on borrow material.
2. Field density test reports.
3. Optimum moisture-maximum density curve for each type of soil encountered.

1.4 JOB CONDITIONS

A. Protection: Protect structures, utilities, sidewalks, pavements, and other facilities from damages caused by settlement, lateral movement, undermining, washout and other hazards created by excavation operations. Should any uncharted utilities be found, notify the utility company and Architect-Engineer immediately and await instructions before proceeding further with work in that location.

PART2–PRODUCTS

2.1 SOIL MATERIALS

A. Fill and Backfill Materials: Clean, free-draining sand (max. 10% passing the 200 mesh sieve) free from organic materials.

B. Excavated material conforming to requirements for fill and backfill material may be used for fill and backfill.

C. Provide additional fill material from off-site when required to complete the work.

2.2 VIBRATORY COMPACTION EQUIPMENT

A. Vibratory Roller: The vibratory drum roller shall be as recommended in the geotechnical report for the project. Vibratory roller shall not be used within 30 ft. of existing structures. Use mechanical hand tampers.

B. Mechanical Hand Tampers: Hand tampers shall be capable of meeting the compaction requirements specified herein.

PART3–EXECUTION

3.1 CLEARING AND GRUBBING BUILDING AREAS

A. Clear and grub the entire building area to at least 5 ft. beyond perimeter of building footings and foundation, walks and slabs to remove stumps, roots, trees, vegetation, organic material and other obstructions to the work. Grub out all roots larger than 1/4-in. diameter, matted roots and other organic material to at least 24-in. below existing surface.

B. Strip topsoil from areas within the building and slab areas and stockpile on the site for future use in site grading.

3.2 EXCAVATION

A. Excavate to depths and dimensions required for footings, slabs and structures. Remove and dispose of

all obstructions to the work that are encountered above and below grade during excavation operations. Removal and disposal includes the following:

1. Stumps, roots, trees and other organic materials.
2. Pavement, foundations, concrete, and other inorganic materials.
3. Abandoned utilities and utilities indicated to be removed.
4. Organic and other unsuitable soil materials.

B. Stability of Excavations:

1. Slope the sides of excavation to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
2. Shoring and Bracing: Provide shoring and bracing to comply with local codes and authorities having jurisdiction.

C. Dewatering:

1. Prevent surface water and subsurface or groundwater from flowing into excavations and flooding the project site and surrounding area.
2. Do not allow water to accumulate in excavations. Provide dewatering system components necessary to convey the water away from excavations.

D. Excavation for Structures:

1. Conform to the elevations and dimensions shown on the drawings, with a tolerance of plus or minus 0.10 ft., and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
2. In excavating for footings and foundations, take care not to disturb bottom of the excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to the required lines and grades to leave a solid base to receive concrete.
3. Where bottom of footing occurs in fill material, the fill and compaction operations shall continue until a minimum grade of 12-in. above bottom of footing is obtained. Footings may then be placed by excavating in accordance with methods herein specified.
4. Foundations shall be constructed as soon as possible after the foundation excavation to minimize damage to the bearing surface. If the bearing surface is softened by surface water intrusion or exposure, the softened soils must be removed immediately prior to placement of concrete. The bearing surface may be protected from extended exposure or imminent rainfall by placing a 2-in. mat of lean concrete on the bearing surface. Increase the foundation depth accordingly.

E. Cold Weather Protection: Protect excavation bottoms against freezing when the atmospheric temperature is less than 35° F.

3.3 COMPACTION REQUIREMENTS

A. General: Compact and fill and backfill to the same density as adjacent in-place material.

B. Compaction Under Slabs and Structures:
1. All building areas shall be compacted and densified using a vibratory drum roller as specified herein. Vibratory compaction shall extend at least 5 ft. beyond perimeter of building footings and foundations, slabs and walks. A minimum of twelve complete coverages, six in each direction, shall be made with the roller. Any soft yielding areas shall be excavated and replaced with acceptable fill material. Fill shall be placed in lifts not exceeding 12-in. in loose thickness (6-in. for mechanical hand tampers).Continue compaction until requirements specified herein are attained.

C. Percentage of Maximum Density Requirements: Compact soils to not less than the following percentages of the Modified Proctor maximum dry density, ASTM D 1557.
1. Existing Subgrades Under Structures: Compact subgrade 12-in. below existing grade to 95 percent maximum density at optimum moisture.
2. Fill and Backfill Under Footings and Foundations: Compact each layer of fill or backfill to 98 percent maximum density at optimum moisture.
3. Walks and Slabs: Compact top 12-in. of subgrade and each layer of fill or backfill to 95 percent maximum density at optimum moisture.

D. Moisture Control:
1. Where the subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to the surface or subgrade, or layer of soil material, to prevent free water appearing on the surface during subsequent to compaction operations.
2. Remove and replace, dewater, or scarify and air dry soil material that is too wet to permit compaction to specified density.

E. Backfilling Under Slabs and Structures:
1. Continue backfilling and compaction over entire building area to final elevation. Backfilling shall be in equal layers compatible with equipment used.

3.4 FIELD TESTING

A. Number of tests:
1. Make one optimum moisture-maximum density curve test in accordance with ASTM D 1557 for each class of material.
2. Make in-place density tests in accordance with ASTM D 1556, ASTM D 2937, or ASTM D 4253, as applicable, as fill and backfill work progresses. Test locations shall be as follows:
a) approximately every 185 cubic yards of fill and backfill, or 5,000-SF of building area, shall be tested;
b) at a minimum of 50% of isolated spread footings;
c) at 100 linear ft. of continuous wall footings.

B. Work on Tested Area: Placing permanent construction over fill that has not been tested and approved may require the Contractor to remove permanent work, recompact the fill and replace the work.

END OF SECTION 02222

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART I - GENERAL

1.1 SUBMITTALS

A. Submit concrete mix designs and laboratory test reports.

B. Comply with ASTM C 94; ACI 301, "Specifications for Structural Concrete for Buildings"; ACI 318, "Building Code Requirements for Structural Concrete"; and CRSI's "Manual of Standard Practice."

C. Subcontractor to engage a qualified independent testing agency to review and provide historical data for each concrete mix design to be submitted with mix design submittal.

D. Submit product data complying with all ASTM numbers.

E. The city standard specifications, section 130 is hereby made a part of this section and is fully repeated herein. If there are any discrepancies, the more stringent specification shall take precedence.

F. Submit mix design for the following items:

1. Footings / Foundations.
2. Interior slab on Grade.
3. Exterior concrete.
4. Exterior approach slab and steps.

PART II - PRODUCTS

2.1 MATERIALS

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

B. Welded Steel Wire Fabric: ASTM A 185, flat sheets, not rolls. C.

Portland Cement: ASTM C 150, Type 1.

D. Fly Ash: ASTM C 618, Type F.

E. Aggregates: ASTM C 33, Class 4S.

F. Fiber Reinforcement: ASTM C 1116, Type III, engineered polypropylene fibers. G.

Air-Entraining Admixture: ASTM C 260.

H. Chemical Admixtures: ASTM C 494, water reducing.

I. Water Stops: Flat dumbbell or center-bulb type, of either rubber (CRD C 513) or PVC (CRD C 572). J.

Vapor Retarder: Clear 15-mil-thick polyethylene.

K. Liquid Membrane-Forming Curing Compound: ASTM C 309, clear, Type I, Class A or B, solvent borne, wax free.

L. Curing & Sealing Agent: Ashford Formula or Curecrete Chemical Company. M.

Termite protection: Per Section 02282

2.2 MIXES

A. Proportion normal-weight concrete mixes to provide the following properties:

1. Footings / Foundations:
a. Compressive Strength: 3000 psi at 28 days.
b. Slump Limit: 4 ± 1 inch at point of placement.
c. Water-Cement Ratio: 0.50 maximum at point of placement. d.
Air Content: 2% to 4%.

2. Interior slab on grade:
a. Total cementitious content not to exceed 520 pounds (Use Type II Cement. Fly Ash, Silica Fume and Ground Granulated Blast Furnace Slag (GGBFS) are not allowed)
b. Aggregates
1. Size Number: 467 (1-1/2 inch normal).
2. Conform to ACI 302.1, Section 5.4.
3. Minimum Combined Aggregate gradation larger than one inch: Eight percent.
4. Blend different aggregate sizes as necessary to obtain required grading. Coarse aggregate must be crushed granite or limestone unless otherwise approved by Architect/Engineer. Rounded river gravel aggregate is not acceptable.
c. Compressive Strength: 4,000 psi at 28 days, see plan. d.
Slump Limit: 4 ± 1 inch at point of placement.
e. Water-Cement Ratio: 0.44 maximum at point of placement. f. Air Content: Maximum 2% (No Entrained Air).

3. Exterior concrete:
a. Compressive Strength: 3000 psi 28 days.
b. Slump Limit: 4 ± 1 inch at point of placement.
c. Water-Cement Ratio: 0.46 maximum at point of placement. d.
Air Content: 4% to 7%.

4. Exterior approach slab:
a. Compressive Strength: 4,000 psi at 28 days. b.
Slump Limit: 4 ± 1 inch at point of placement.
c. Water-Cement Ratio: 0.35 maximum at point of placement. d.
Air Content: 4% to 7%.

For normal weight concrete mixes, requirements of Section 130 Portland Cement Concrete Standard Specifications shall govern

if they conflict with the properties described above.

PART III - EXECUTION

3.1 CONCRETING

A. Construct formwork and maintain tolerances and surface irregularities within ACI 117 limits of Class A for concrete exposed to view and Class C for other concrete surfaces.

B. Set water stops where indicated to ensure joint watertightness.

C. Place vapor retarder on prepared subgrade, with joints lapped 6 inches and sealed.

D. Accurately position, support, and secure reinforcement.

E. Install construction, isolation, and control joints.

F. Place concrete in a continuous operation and consolidate using mechanical vibrating equipment.

G. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing.

H. Formed Surface Finish: Smooth-formed finish for concrete exposed to view, coated, or covered by waterproofing or other direct-applied material; rough-formed finish elsewhere.

I. Interior Covered Slab Finishes: Scratch finish for surfaces to receive mortar setting beds; float finish surfaces for interior steps and ramps and surfaces to receive waterproofing, or other direct-applied material; troweled finish for floor surfaces and floors to receive floor coverings, paint, or other thin film-finish coatings; trowel and fine broom finish for surfaces to receive thin-set tile; non-slip broom finish to exterior concrete platforms, steps, and ramps.

J. Interior Exposed Slab Finishes: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Ground Floor Slab: Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155 for a randomly trafficked floor surface:
a. Specified overall values of flatness, F_F 45; and levelness, F_L 35; with minimum local values of flatness, F_F 30; and levelness, F_L 24.

K. Cure formed surfaces by moist curing until forms are removed.

L. Begin curing unformed concrete after finishing. At Contractor's option keep concrete continuously moist for at least 7 days or apply membrane-forming curing compound to concrete.

M. Owner will engage a testing agency to perform tests and to submit test reports.

N. Protect concrete from damage. Repair surface defects in concrete.

(END OF SECTION 033000)

SECTION 03 35 00

CONCRETE FINISHING

PART 1 - GENERAL

1. 1 SUMMARY

A. This section includes the following.
1. Applying Sealer and Hardener, and polishing concrete to specified finish level.

B. Related Work:
1. Section 03 30 00 Cast-In-Place Concrete

1.2 REFERENCES

A. American Society for Testing and Materials:
1. ASTM-C779, Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces
2. ASTM G23-81, Ultraviolet Light & Water Spray
3. ASTM C805, Impact Strength

B. American Concrete Institute
1. ACI 302. 1R-89, Guide for Concrete Floor and Slab Construction

C. Other Test:
1. Reflectivity

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide polished flooring that has been designed, manufactured and installed to achieve the following:
1. Abrasion Resistance: ASTM C779, Method A, high resistance, no more than 0.008 inch (0.20 mm) wear in 30 minutes.
2. Reflectivity: Increase of 35% as determined by standard gloss meter.
3. Waterproof Properties: Rilem Test Method 11.4, 70% or greater reduction in absorption.
4. High Traction Rating: NFSI 101-A, ANSI B-101.1 2009 non-slip properties.

B. Design Requirements:
1. Hardened Concrete Properties:
a. Minimum Concrete Compressive Strength: 3500 psi (24 MPa). b.
Normal Weight Concrete: No lightweight aggregate.
c. Non-air entrained.
2. Placement Properties:
a. Natural concrete slump of 4-1/2 inches to 5 inches (114 to 127 mm). Admixtures may be used.
b. Flatness Requirements:
1) Overall FF 50.
2) Local FF 40.
3. Hard-Steel Troweled (3 passes) Concrete: No burnishing marks. Finish to ACI 302.1R, Class 5 floor.
a. Class 6 floors, special colored mineral aggregate hardener with repeated hard steel trowel

finish.
4. Curing Options:
a. Membrane forming curing compounds (ASTM C309, Type 1, Class B, all resin, dissipating cure). 1) Acrylic curing and sealing compounds not recommended.
b. Sheet membrane (ASTM C171); polyethylene film not recommended. c. Damp Curing: Seven day cure.

1.4 SUBMITTALS

A. Comply with pertinent provisions of Section 01600- Product Requirements.
1. Provide submittal information within 35 calendar days after the contractor has received the owner's notice to proceed.

B. Product data:
1. Submit special concrete finishes manufacturer's specifications and test data.
2. Submit special concrete finishes describing product to be provided, giving manufacturer's name and product name for the specified material proposed to be provided under this section.
3. Submit special concrete finishes manufacturer's recommended installation procedures; which when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
4. Submit special concrete finishes technical data sheet giving descriptive data, curing time, and application requirements.
5. Submit special concrete finishes manufacturer's Material Safety Data Sheet (MSDS) and other safety requirements.
6. Follow all special concrete finishes published manufacturer's installation instructions.

C. Test Reports:
1. Provide certified test reports, prepared by an independent testing laboratory, confirming compliance with specified performance criteria.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
1. Use an experienced installer with at least 5 year polished concrete experience and adequate number of skilled workmen who are thoroughly trained and experienced in the necessary craft.
2. The special concrete finish manufacturer shall certify applicator.
3. Applicator shall be familiar with the specified requirements and the methods needed for proper performance of work of this section.

B. Manufacturer's Certification:
1. Provide letter of certification from concrete finish manufacturer stating that installer is certified applicator of special concrete finishes, and is familiar with proper procedures and installation requirements required by the manufacturer.

C. Mock-ups:
1. Apply mock-ups of each type finish, to demonstrate typical joints, surface finish, color variation (if any), and standard of workmanship.
a. Build mock-ups approximately 50 square feet in the location indicated or if not indicated, as directed by the Architect or Owner Representative.
b. Notify Architect or Owner Representative seven days in advance of dates and times when mock-ups will be constructed.
c. Obtain from the Architect or Owner Representative approval of mock-ups before starting

construction.

d. If the Architect or Owner Representative determines that mock-ups do not meet requirements, demolish and remove them from the site and cast others until mock-ups are approved.

e. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed work.

f. Approved mock-ups may become part of the completed work if undisturbed at time of substantial completion.

D. Protection

1. No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Prevention is therefore essential.

a. All hydraulic powered equipment must be diapered to avoid staining of the concrete. b. No trade will park vehicles on the inside slab. If necessary to complete their scope of work, drop cloths will be placed under vehicles at all times.

c. No pipe cutting machine will be used on the inside floor slab. d. Steel will not be placed on interior slab to avoid rust staining.

e. Acids and acidic detergents will not come into contact with slab. f. All trades informed that the slab must be protected at all times.

E. Pre-Installation Conference:

1. Conduct conference at project site with Owner and Architect prior to installation.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original containers, with seal's unbroken, bearing manufacturer labels indicating brand name and directions for storage.

B. Dispense special concrete finish material from factory numbered and sealed containers. Maintain record of container numbers.

1.7 PROJECT CONDITIONS

A. Environmental limitations:

1. Comply with manufacturers written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting topping performance.

a. Concrete Floor Flatness rating recommended at least 40, where possible.

b. Concrete Floor Levelness rating recommended at least 30, where possible.

c. Concrete must be cured a minimum of 45 days or as directed by the manufacturer before application of Retro Plate can begin.

d. Application of Retro-Plate shall take place 10 days prior to installation of equipment and substantial completion, thus providing a complete, uninhibited concrete slab for application.

B. Close areas to traffic during floor application and after application, for time period recommended in writing by manufacturer.

PART 2 – PRODUCTS

2.1 MATERIALS AND MANUFACTURERS

A. HARDENING/SEALING AGENT

1. Retro-Plate 99, manufactured by Advanced Floor Products, Inc., P.O. Box 50533, Provo, Utah 84605, 801-812-3420.
a. Performance Criteria:
i. Abrasion Resistance: ASTM C779 – Up to 400% increase in abrasion resistance. ii. Impact Strength: ASTM C805 – Up to 21% increase impact strength.
iii. Ultra Violet Light and Water Spray: ASTM G23-81 – No adverse effect to ultra violet and water spray.
iv. Reflectivity: Up to 30% increase in reflectivity.
2. Certified Applicators
3. Manufacturer's Regional Representative

2.2 RELATED MATERIALS

A. Neutralizing Agent:
1. Tri-sodium Phosphate

B. Water:
1. Potable

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS:

A. Examine substrate, with installer present, for conditions affecting performance of finish. Correct conditions detrimental to timely and proper work. Do not proceed until unsatisfactory conditions are corrected.

B. Verify that base slab meet finish and surface profile requirements in Division III Section 03 30 00 "Cast-In-Place Concrete," and Project Conditions above.

C. Prior to application, verify that floor surfaces are free of construction latents.

3.2 APPLICATION

A. Start any of the floor finish applications in presence of manufacturer's technical representative. B.

Sealing, Hardening and Polishing of Concrete Surface
1. Concrete must be in place a minimum of 45 days or as directed by the manufacturer before application can begin.
2. Application is to take place at least 10 days prior to racking and other in-store accessory installation, thus providing a complete, uninhibited concrete slab for application
3. Only a certified applicator shall apply Retro-Plate 99. Applicable procedures must be followed as recommended by the product manufacturer and as required to match approved test sample.
4. Achieve waterproofing, hardening, dust-proofing, and abrasion resistance of the surface without changing the natural appearance of the concrete, except for the sheen.
5. Polish to required sheen level.

3.3 WORKMANSHIP AND CLEANING:

A. The premises shall be kept clean and free of debris at all times. B.

Remove spatter from adjoining surfaces, as necessary.

C. Repair damages to surface caused by cleaning operations.

D. Remove debris from jobsite
1. Dispose of materials in separate, closed containers in accordance with local regulations.

3.4 PROTECTION:

A. Protect finished work until fully cured in accordance with manufacturer's recommendations.

END OF SECTION 03 35 00

SECTION 04 22 23

ARCHITECTURAL CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including 00 01 00 General Requirements, apply to the Section.

1.2 SUMMARY

A. This Section includes the following:

1. Concrete masonry.
2. Reinforced unit masonry.
3. Thru wall flashing.
4. Unit drainage system.

B. Related Sections:

1. Division VII Section 07 60 00 "Flashing and Sheet Metal" for exposed sheet-metal flashing installed in masonry.
2. Division VII Section 07 60 00 "Flashing and Sheet Metal" for sill pans.
3. Division IX Section 09 91 00 "Painting" for water repellant applied to Masonry.

C. Products installed but not furnished under this Section include the following:

1. Manufactured reglets in masonry joints for metal flashing specified in VII Section 07 60 00 "Flashing and Sheet Metal".
2. Hollow metal frames in unit masonry openings specified in Division VIII Section 08 11 13 "Steel Doors and Frames".

1.3 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops the following installed compressive strengths (f m) at 28 days. B.

For concrete unit masonry: as follows based on net area:

1. fm = 1500 psi
2. As indicated on the structural drawings.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to Town requirements.

B. Product Data for each different masonry unit, accessory and other manufactured product specified. This includes, but not limited to, CMU, reinforcement, through wall flashing, unit drainage system and mortar/grout.

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

D. Shop Drawings for Powers Lintels.

E. Material test reports for the following:

1. Mortar complying with property requirements of ASTM C 270.
2. Mortar complying with BIA M1.
3. Grout mixes. Include description of type and proportions of grout ingredients.
4. Masonry units.

F. Submit letter of certificate for the use of Dry-Block admixture in masonry units. G.

Submit control joint material and cut sheets.

1.5 QUALITY ASSURANCE

A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.

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

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

1.6 DELIVERY, STORAGE AND HANDLING

A. Store masonry units on elevated platforms, under cover and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion and other causes. If units become wet, do not install until they are in an air-dried condition.

B. Store cementitious materials on elevated platforms, under cover and in a dry location.

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

1.7 PROJECT CONDITIONS

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

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

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

C. Stain Prevention: Prevent grout, mortar and soil from staining the face of masonry to be left exposed or painted.

Immediately remove grout, mortar and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
2. Protect sills, ledges and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:

1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:

a. 40 to 32 deg F: Heat mixing water or sand to produce mortar temperatures between 40 and 120 deg F.
b. 32 to 25 deg F: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F. Heat grout materials to produce grout temperatures between 40 and 120 deg F. Maintain mortar and grout above freezing until used in masonry.
c. 25 to 20 deg F: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F. Heat grout materials to produce grout temperatures between 40 and 120 deg F. Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F if grouting. Use heat on both sides of walls under construction.
d. 20 deg F and Below: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F. Heat grout materials to produce grout temperatures between 40 and 120 deg F. Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F. Provide enclosures and use heat on both sides of walls under construction to maintain temperatures above 32 deg F within the enclosures.

2. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:

a. 40 to 25 deg F: Cover masonry with a weather-resistant membrane for 48 hours after construction.
b. 25 to 20 deg F: Cover masonry with insulating blankets or provide enclosure and heat for 48 hours after construction to prevent freezing. Install wind breaks when wind velocity exceeds 15 mi./h.
c. 20 deg F and Below: Provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 48 hours after construction.

3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS (ALL COLORS BY OWNER)

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

1. Portland Cement, Mortar Cement, Masonry Cement, and Lime:

a. Essroc Materials, Inc.
b. Glen-Gery Corporation. c. Lafarge Corporation.
d. Lehigh Portland Cement Co. e. Riverton Corporation (The).
f. National Cement Company, Inc. g. Holcim (US) Inc.
h. Capital Materials Corporation; Flamingo Color Masonry Cement.

2. Mortar Pigments:

a. Bayer Corporation, Industrial Chemicals Div.; Bayferrox Iron Oxide Pigments b. Davis Colors.
c. Lafarge Corporation.
d. Solomon Grind-Chem Services, Inc.

3. Joint Reinforcement, Ties, and Anchors:

a. Dur-O-Wal, Inc.
b. Heckman Building Products, Inc. c. Hohmann & Barnard, Inc.
d. Masonry Reinforcing Corp. of America. e. National Wire Products Industries.
f. Southern Construction Products.

4. Colors by Architect and the Town.

2.2 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows for each form of concrete masonry unit required.

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Provide square-edged units for outside corners.

B. Concrete Masonry Units: ASTM C 90 and as follows:

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

a. 1900 psi.
b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.

2. Weight Classification: Normal weight.
3. Provide Type I, moisture-controlled units.
4. Size: Manufactured to the actual dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings:

a. 8 inch nominal: 7-5/8 inch actual.
b. 12 inch nominal: 11-5/8 inch actual.

C. Exposed Faces: Provide integral colored split,smooth and ground-faced concrete masonry units.

D. Design Basis: Oldcastle Coastal® split-face, smooth-face, and/or ground-face masonry units. Other acceptable suppliers include A1- block as supplied by W.R. Grace Construction Products, Anchor/Demaco Architectural Masonry Systems, Trenwyth Premium Architectural Masonry Units.

E. Color: by Architect/Government, with “dry block” additive for base of wall, columns and screenwall. F.

Dry Block Masonry and Mortar System by Grace Construction Products or RainBloc Admixtures.

1. Applicable Standards – ASTM International:
a. ASTM C90 Standard Specification for Load Bearing Concrete Masonry Units.
b. ASTM C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
c. ASTM C1314 Standard Test Method for Constructing and Testing Masonry Prisms used to Determine Compliance with Specified Compressive Strength of Masonry.
d. ASTM C1357 Standard Test Method for Evaluating Masonry Bond Strength.
e. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
f. ASTM E514 Standard Test Method for Water Penetration and Leakage Through Masonry.

2. Concrete Masonry Units Qualified Dry-Block Producers manufacturer water repellent CMUs incorporating Dry-Block admixture for block using qualified mix designs and dosage rates.
3. Mortr – DryBlock mortar admixture is added at the recommended dosage rate, which is dependent on the type of mortar being used.
4. Mortar mixing procedure – Agitate dry-block mortar admixture before using. DryBlock should be added to the mix water prior to charging the cement and sand. Reduce the initial water used in the mortar.

2.3 MORTAR AND GROUT MATERIALS

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

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

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

D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

E. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin based material formulated for use as pointing mortar for, and approved by manufacture of, structural clay tile facing units; in color indicated or, of not otherwise indicated, as selected by Architect from manufacturer's standard colors.

F. Water: Potable.

G. Mortar color by Architect. H.

See DryBlock above.

2.4 REINFORCING STEEL

A. Steel Reinforcing Bars: Material and grade as follows:

1. Billet steel complying with ASTM A 615. a.

Grade 60 (Grade 400).

B. Deformed Reinforcing Wire: ASTM A 496, with ASTM A 153, Class B-2 zinc coating.

2.5 JOINT REINFORCEMENT

A. General: Provide joint reinforcement formed from the following:

1. Galvanized carbon-steel wire, coating class as follows: ASTM A 153, Class B-2, for both interior and exterior walls.

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

1. Wire Diameter for Side Rods: 0.1483 inch.
2. Wire Diameter for Cross Rods: 0.1483 inch.

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

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

2.6 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.

B. Wire: As follows:

1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
2. Wire Diameter: 0.1875 inch.

2.7 BENT WIRE TIES

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

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

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated; formulated from the following material:

1. Neoprene.

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

C. Concrete Masonry Unit Drainage System

1. #BN120 CMU Drainage System as manufactured by Mortar Net, Inc., Gary IN, 800-664-6638 or equivalent.

2.9 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: manufacturer's standard strength, general purpose cleaner designed for removing mortar/grout stains, efflorescence and other new construction stains form new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned.

B. Available Products: Subject to compliance with requirements, products that may be used to clean unit masonry surfaces include, but are not limited to the following:

1. 202 New Masonry Detergent; Diedrich Technologies, Inc.
2. 200 Lime Solv; Diedrich Technologies, Inc.
3. 202V Vana-Stop; Diedrich Technologies, Inc.
4. Sure Klean No. 600 Detergent; ProSoCo, Inc.
5. Sure Klean No. 101 Lime Solvent; ProSoCo, Inc.
6. Sure Klean Vana Trol; ProSoCo, Inc.

2.10 INSULATION

A. Foamed-in-Place Masonry Insulation: Two component thermal insulation produced by combining a plastic resin and catalyst foaming agent surfactant which, when properly ratioed and mixed, together with compressed air produce a cold-setting foam insulation in the hollow cores of hollow unit masonry walls.

B. Available Manufacturers:

1. Manufacturers subject to compliance with requirements, provide products from the flowing or equal:

a. Core-fill Tailored Chemical Products (500). b. Air Krete, Inc.
c. Jesco, Inc. (Rabco Foam Insulation).

2.11 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including air-entraining agents, accelerators, retarders, anti- freeze compounds or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Provide "dry block" additive to mortar and grout mixes maintain water repellency for the exterior wall. Provide in quantity and mix as recommended by the manufacturers.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for job-mixed mortar; and ASTM C 1142for ready-mixed mortar, of types indicated below:

1. Limit cementitious materials in mortar to portland cement and lime.
2. For masonry below grade in contact with earth, and where indicated, use Type S.
3. For exterior, above-grade, load-bearing use Type N.

C. Pig mented Mortar: Select and proportion pigments with other ingredients to produce color required.

1. Limit pigments to the following percentages of cement content by weight. For mineral oxide pigments and Portland cement-lime mortar, not more than 10 percent.

2. Design Basis: Holcim o r Mortamix Custom Color Masonry Cement; Color: As selected by architect.

D. Grout for Unit Masonry: Comply with ASTM C 476. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement that will completely fill spaces intended to receive grout.

1. Use fine grout in grout spaces less than 2 inches in horizontal dimension, unless otherwise indicated.
2. Use coarse grout in grout spaces 2 inches or more in least horizontal dimension, unless otherwise indicated.

C. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's directions.

2.12 SOURCE QUALITY CONTROL

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

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.

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

3.2 INSTALLATION, GENERAL

A. Thickness: Build single-wythe walls to the actual thickness of the masonry units, using units of thickness indicated.

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

C. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

D. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.

3.3 CONSTRUCTION TOLERANCES

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

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet, nor 1/2 inch in 40 feet or more. For top surface of bearing walls, do not exceed 1/8 inch in 10 feet, nor 1/16 inch within width of a single unit.

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

D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch nor plus 1/2 inch.

E. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8 inch. Do not vary from head-joint thickness indicated by more than plus or minus 1/8 inch. Do not vary head-joint thickness from adjacent head-joint thickness by more than 1/8 inch. Do not vary from collar-joint thickness indicated by more than minus
1/4 inch or plus 3/8 inch.

3.4 LAYING MASONRY WALLS

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

B. Install concrete masonry unit drainage system in accordance with manufacturers written instructions.

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

D. Bond Pattern for Exposed Masonry: Lay exposed masonry in One-half running bond with vertical joint in each course centered on units in courses above and below. Do not use units with less than nominal 4-inch horizontal face dimensions

at corners or jambs.

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

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

G. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

H. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

I. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
4. Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 3/8-inch joints.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

3.6 MASONRY-CELL INSULATION

A. General: Install formed-in-place insulation from interior, or as specified, prior to installation of interior finish work and after all masonry and structural concrete work is in place; comply with manufacturer's instructions.

B. Installation: Fill all open cells and voids in hollow concrete masonry walls where shown on drawings. The foam insulation shall be pressure injected though a series of 5/8" to 7/8" holes drilled into every vertical column of block cells (every 8 feet on center) beginning at an approximate height of four (4) feet from finished floor level. Repeat this procedure at an approximate height of 8 feet above the first horizontal row of holes (or as needed) until the void is completely filled. Patch holes with mortar and score to resemble existing surface.

3.7 HORIZONTAL-JOINT REINFORCEMENT

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

1. Space reinforcement not more than 16 inches o.c.
2. Provide reinforcement in mortar joint 1 block course above and below wall openings and extending

12 inches beyond opening.

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

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

3.8 CONTROL AND EXPANSION JOINTS

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

B. Form control joints in concrete masonry as follows:

1. Fit bond-breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.

3.9 LINTELS

A. Provide masonry / “Powers” lintels where shown and where openings of more than 12 inches for brick size units and 24 inches for block size units are shown without structural steel or other supporting lintels.

1. Provide lintels as specified on the structural drawings matching concrete masonry units compressive strength as required to support loads indicated. Exposed portions of installed lintels to be painted to match masonry units.

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

3.10 THRU WALL FLASHING

A. In masonry thru wall flashing details used Pre-Kleened EPDM thruwall flashing by Carlisle. Install as per manufacturer's instructions.

B. Install weep holes in the head joints in exterior wythes of masonry as indicated on drawings.

1. Space weep holes 16 inches o.c.

3.11 INSTALLATION OF REINFORCED UNIT MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

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

1. Do not exceed the following pour heights for fine grout:

a. For minimum widths of grout spaces of 3/4 inch or for minimum grout space of hollow unit cells of 1-1/2 by 2 inches, pour height of 12 inches.
b. For minimum widths of grout spaces of 2 inches or for minimum grout space of hollow unit cells of 2 by 3 inches, pour height of 60 inches.
c. For minimum widths of grout spaces of 2-1/2 inches or for minimum grout space of hollow unit cells of 2-1/2 by 3 inches, pour height of 12 feet.
d. For minimum widths of grout spaces of 3 inches or for minimum grout space of hollow unit cells of 3 by 3 inches, pour height of 24 feet.

2. Do not exceed the following pour heights for coarse grout:

a. For minimum widths of grout spaces of 1-1/2 inches or for minimum grout space of hollow unit cells of 1-1/2 by 3 inches, pour height of 12 inches.
b. For minimum widths of grout spaces of 2 inches or for minimum grout space of hollow unit cells of 2-1/2 by 3 inches, pour height of 60 inches.
c. For minimum widths of grout spaces of 2-1/2 inches or for minimum grout space of hollow unit cells of 3 by 3 inches, pour height of 12 feet.
d. For minimum widths of grout spaces of 3 inches or for minimum grout space of hollow unit cells of 3 by 4 inches, pour height of 24 feet.

3. Provide cleanout holes at least 3 inches in least dimension for grout pours over 60 inches in height. a.

Provide cleanout holes at each vertical reinforcing bar.
b. At solid grouted masonry, provide cleanout holes at not more than 32 inches o.c.

3.12 FIELD QUALITY CONTROL

A. The Contractor will employ and pay a qualified independent testing agency to perform the following testing for field quality control. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.

B. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. (460 sq. m) of wall area or portion thereof.

C. Mortar composition and properties will be evaluated per ASTM C 780.

D. Grout will be sampled and tested for compressive strength per ASTM C 1019.

E. Prism-Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:

1. Prepare 1 set of prisms for testing at 7 days and 1 set for testing at 28 days.

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

3.13 REPAIRING, POINTING, AND CLEANING

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

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

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain present on exposed surfaces.

E. Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04 22 23

SECTION 05 12 00

MISCELLANEOUS STEEL

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Conditions Section 00100 apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Girder truss Hurricane ties.
2. LVL Beam bearing devices.

B. Related Sections include the following:

1. Division 5 Section "Structural Steel."
2. Division 6 Section "Rough Carpentry" for metal framing anchors.

1.3 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. 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, ambient; 180 deg F, material surfaces.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Paint products.

B. Shop Drawings: Show fabrication and installation details for metal fabrications. (Shops not required for girder truss hurricane ties or LVL beam bearing devices.

C. Include plans, elevations, sections, and details of metal fabrications and their connections.

D. Cut-sheets on hurricane ties.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

1.6 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings for field use, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART II - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

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

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 FASTENERS

A. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

B. Anchor Bolts: ASTM F 1554, Grade 36.

1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.

C. Eyebolts: ASTM A 489.

D. Machine Screws: ASME B18.6.3 (ASME B18.6.7M). E.

Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

F. Wood Screws: Flat head, ASME B18.6.1.

G. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

H. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

I. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.

J. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material for Anchors in Exterior Locations: Alloy Group 1 (A1) 2 (A4) stainless-steel bolts complying with ASTM F 593 (ASTM F 738M) and nuts complying with ASTM F 594 (ASTM F 836M).

2.4 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded. B.

Shop Primers: Provide primers that comply with Division 9 painting Sections.

C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

1. Use primer with a VOC content of 420 g/L (3.5 lb/gal.) or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Pre-assemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.

E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

F. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

G. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

H. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Furnish inserts if units are installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated or required when exposed to weather. D.

Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.7 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

C. ASTM A 123/A 123M, for galvanizing steel and iron products.

1. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

D. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on insulation, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART III - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC- PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 051200

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Wood furring, grounds, nailers, and blocking.
2. Sheathing.
3. Framing with engineered wood products.

1.2 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.

1.3 SUBMITTALS

A. Product Data for the following products:

1. Product Data for engineered wood products, blocking, furring, nailers, sheathing, and metal framing anchors.

2. Material certificates for engineered wood products specified to comply with minimum allowable unit stresses.

B. Warranty of chemical treatment manufacturer for each type of treatment.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

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

1. Wood-Preservative-Treated Materials:

a. Baxter: J. H. Baxter Co. b.

Chemical Specialties, Inc.
c. Continental Wood Preservers, Inc. d. Hickson Corp.
e. Hoover Treated Wood Products, Inc. f. Osmose Wood Preserving, Inc.
g. Great Southern Wood Preserving.

2.2 LUMBER, GENERAL

A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.

B. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

C. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

1. Provide dressed lumber, S4S, unless otherwise indicated.
2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing for 2- inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

1. Do not use chemicals containing chromium or arsenic.

B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

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

2.4 MISCELLANEOUS LUMBER

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

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

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

D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.5 CONCEALED, PERFORMANCE-RATED STRUCTURAL-USE PANELS

A. General: Where structural-use panels are indicated for the following concealed types of applications, provide APA-performance-rated panels complying with requirements designated under each application for grade, span rating, exposure durability classification, and edge detail (where applicable).

1. Thickness: Provide panels meeting requirements specified but not less than thickness indicated.
2. Span Ratings: Provide panels with span ratings required to meet "Code Plus" provisions of APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial."

B. Wall Sheathing: APA-rated Structural I sheathing.

1. Exposure Durability Classification: Exterior.
2. Exposure Durability Classification: Exposure 1.
3. Span Rating: 12/0, 16/0, 20/0, or Wall - 16 for stud spacing of 16 inches (406 mm) or less.

C. Roof Sheathing: APA-rated Structural I sheathing.

1. Exposure Durability Classification: Exterior.
2. Exposure Durability Classification: Exposure 1.
3. Span Rating: As required to suit rafter spacing indicated.
4. Span Rating: 32/16.
5. Span Rating: 16/0 or Roof - 16.

2.6 STRUCTURAL-USE PANELS FOR BACKING

A. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant- treated plywood panels with grade, C-D Plugged Exposure 1, in thickness indicated or, if not otherwise indicated, not less than 15/32 inch (11.9 mm) thick.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

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

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

Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M)

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.8 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25- mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

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

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

D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

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

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.

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

C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 INSTALLATION OF STRUCTURAL-USE PANELS

A. General: Comply with applicable recommendations contained in APA Form No. E30, "APA

Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.

1. Comply with "Code Plus" provisions of above-referenced guide. B.

Fastening Methods: Fasten panels as indicated below:

1. Sheathing: Screw to framing.
2. Plywood Backing Panels: Screw to supports.

3.4 AIR-INFILTRATION BARRIER

A. Cover sheathing with air-infiltration barrier as follows:

1. Apply air-infiltration barrier to comply with manufacturer's written instructions.

END OF SECTION 06 10 00

SECTION 06 17 53

PREFABRICATED WOOD TRUSSES

PART I - GENERAL

1.1 SCOPE

A. General Conditions Section 0100 apply to this section.

B. The work under this section shall include prefabricated wood trusses.

1.2 SUMMARY

A. This Section includes the following:

1. Wood roof trusses.
2. Wood girder trusses.
3. Wood truss bracing.
4. Metal truss accessories

1.3 SUBMITTALS

A. Product Data: Fabricator's technical data covering lumber, metal plates, metal-plate connectors, metal truss accessories, hardware, fabrication process, treatment and handling and erection

B. Certificates:

1. Submit certification, signed by an officer of the fabricating firm, indicating that trusses to be supplied for project comply with indicated requirements.

C. Shop Drawings and Calculations:

1. Show species, sizes and stress grades of lumber to be used; pitch, span, camber, configuration and spacing for each type of truss required; type, size, material, finish, design values, location of metal connector plates; and bearing and anchorage details.
2. Shop drawings and calculations shall be prepared by a structural engineer licensed to practice in the State of Florida. Provide drawings and calculations bearing the impressed seal and signature of the Engineer responsible for the design, in accordance with the Florida Board of Professional Engineers.

1.4 QUALITY ASSURANCE

A. Truss Plate Institute (TPI) Standards: Comply with applicable requirements and recommendations of the following TPI publications:

1. Design Specification for Metal Plate Connected Wood Trusses.
2. Design Specification for Metal Plate Connected Parallel Chord Wood Trusses.
3. Commentary and Recommendations for Handling and Erecting Wood Trusses.
4. Commentary and Recommendations for Bracing Wood Trusses.
5. Quality Standard for Metal Plate Connected Wood Trusses.

B. Wood Structural Design Standard: Comply with applicable requirements of N.F.P.A. National Design Specification for Wood Construction.

C. Design by Manufacturer: Trusses shall be designed by Connector plate manufacturer to support all superimposed dead and live loads indicated, with design approved and certified by a structural engineer licenses to practice in the State of Florida.

D. Connector Plate Manufacturer's Qualifications: Proved truss connector plates manufactured by a firm which is a member of TPI and which complies with TPI quality control procedures for manufacture of connector plates published in TPI, Quality Standard for Metal Plate Connected Wood Trusses.

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

F. Refer to structural drawings for additional information for wind loading.

1.5 DELIVERY, STORAGE AND HANDLING

A. Handle and store trusses with care, and in accordance with manufacturer's instructions and TPI recommendations to avoid damage from bending, overturning or other cause for which truss is not designed to resist or endure.

B. Time delivery and erection of trusses to avoid extended on site storage and to avoid delaying work of other trades whose work must follow erection of trusses.

PART II - PRODUCT

2.1 MATERIALS

A. Lumber: Factory mark each piece of lumber with type, grade, mill, and grading agency. Provide lumber manufactured to actual sized required by PS 20 to comply with requirements indicated below:

1. Dressed, S4S, unless otherwise indicated.
2. Moisture Content: Seasoned, with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 in. or less in nominal thickness, unless otherwise indicated.
3. Species: As required to meet design. Provide trusses all of the same species.
4. Grade: All truss members shall be No. 2 or better.
5. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Division 06 Section "Rough Carpentry"

B. Connector Plates: Hot dip galvanized steel sheet; Structural (physical) quality steel sheet complying with ASTM A 446 Grade A; zinc coated by hot dip process to comply with ASTM A 525, Designation G60; minimum coated metal thickness indicated but not less than 0.036 in.

C. Fasteners and Anchorages: Provide size, type, material and finish for nails, screws, bolts, nuts, washers and other anchoring devices as required by design.

2.2 FABRICATION

A. Cut truss members to accurate lengths, angles and sizes to produce close fitting joints with wood-to-wood bearing in assembled units.

B. Fabricate metal connector plates to size, configuration, thickness and anchorage details required for types of joint

designs indicated.

C. Assemble truss members in design configuration indicated using jigs or other means to ensure uniformity and accuracy of assembly with close fitting joints. Position members to produce design camber indicated.

D. Connect truss members by means of metal connector plates accurately located and securely fastened to each side of wood members by means indicated or approved.

PART III - EXECUTION

3.1 INSTALLATION

A. Erect and brace trusses to comply with recommendations of manufacturer, the Truss Plate Institute, and as specified.

B. Erect trusses with plane of truss webs vertical (plumb) and parallel to each other, located accurately at design spacings as indicated.

C. Hoist units in place by means of lifting equipment suited to sizes and types of trusses required, applied at designated lift points as recommended by fabricator, exercising care not to damage truss members by joints by out of plane bending or other causes.

D. Provide temporary bracing as required to maintain trusses plumb, parallel and in location indicated, until permanent bracing is installed.

E. Anchor trusses securely at all bearing points to comply with methods and details indicated.

F. Install permanent bracing and related components to enable trusses to maintain design spacing, withstand live and dead loads including lateral loads, and to comply with other indicated requirements.

G. Do not cut or remove truss members.

END OF SECTION 061753

SECTION 06 20 23

INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Plastic-laminate cabinets and countertops.
2. Casework hardware.

1.2 RELATED WORK

A. General millwork and/or special conditions specifically noted on plans. B.

Blocking within walls for anchoring casework.

C. Sinks, mechanical and electrical fixtures, service and waste lines, and all connections furnished and installed under Mechanical and Electrical Divisions.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall show evidence of a minimum of five (5) years experience in providing manufactured casework. Manufacturer shall also show evidence of adequate facilities and personnel required to perform on this project.

B. Single-Source Manufacturing and Installation Responsibility: Engage a qualified Manufacturer to assume undivided responsibility for woodwork specified in this section, including fabrication, finishing, and installation.

C. Installer Qualifications: Arrange for installation of architectural woodwork by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.

D. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI) except as otherwise indicated.

E. Design of architectural woodwork including layouts, door and drawer arrangements and countertop configurations shall conform to the drawings.

F. Construction methods, joiner, materials and material thickness are shown on the drawings and specified herein. Bids not complying to these requirements will be rejected.

1.4 SUBMITTALS

A. Product Data

In addition to general conditions relating to prior approvals, submittals of manufacturer's data and samples are required for items including but not limited to drawer slides, grommets, pulls, hooks and other hardware, edge band, laminate samples etc. Any changes in color by owner if required.

B. Shop Drawings

1. Submit shop drawings for casework and countertops showing plan view, elevations, details, casework joinery, sizes of casework, and method of anchoring.
2. Include layout of units with relation to other building components and coordination with other trades, including floor base trim height/clearance

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, spoilages, and deterioration.

B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet-work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Environmental Limitations: Obtain and comply with woodwork fabricator's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork will be within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

C. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork by accurate field measurements before being enclosed. Record measurements on final shop drawings.

1.7 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

A. It is the intent of this specification to establish performance and quality criteria consistent with pre-established standards of design and function herein described. Casework not meeting these minimum standards will not be accepted.

B. Specific materials, finish options, construction details, modularity, hardware, and test data are specified herein.

2.2 DEFINITIONS

A. Listed are definitions and materials commonly used in defining laminate clad casework. Refer to FABRICATION section for those items selected for use on this project.

B. Definitions: Identification of casework parts by surface visibility.
1. Open Interiors: Any open storage unit without solid doors or drawer fronts and units with glass doors. Material, GP28 high pressure decorative laminate, color per schedule. (Note: Thermofused melamine, CL20 cabinet liner or glued on top coated melamine papers are not acceptable).
2. Closed Interiors: Any closed storage unit behind hinged solid door or drawer fronts and sliding solid doors. Material, GP28 high pressure decorative laminate, white, or light gray. (Note: Thermofused melamine, CL20 cabinet liner or glued on top coated melamine papers are not acceptable).
3. Exposed Surfaces: Any unit door/drawer front when closed and exposed ends. Material GP28 high pressure decorative laminate. (Colored melamine is not acceptable).
4. Semi-Exposed Surfaces: Tops of wall and tall cabinets and exterior bottoms of wall cabinets, unless otherwise designated, shall be GP28 high pressure decorative laminate, white, or light gray.
5. Concealed Surfaces: Any surface not normally visible after installation such as cabinet backs to wall and cabinet sides to cabinet sides. Material shall be a balanced backer. These flat surfaces shallbelaminatedandnotleftraw orpainted.
6. Balanced construction of all laminated panels is mandatory.

2.3 CORE MATERIALS

A. Veneer-Faced Panel Products (Hardwood Plywood): HPVA-1 without particleboard, MDF or hardboard core and made with adhesive containing no urea formaldehyde.

2.4 DECORATIVE LAMINATES

A. Countertops: Solid or pattern high pressure decorative laminates GP50 (.050) or post forming horizontal grade. NEMA test LD-3-1985. Changes in color by owner if required.
1. Finish – Watch Countertop: Wilsonart “Tuscan Walnut” 7921-38
2. Finish – Kitchen: Countertops: Natural quartz surface, color to be selected.

B. Exposed Cabinet Surfaces: Solid or pattern color high pressure decorative laminates GP28 (.028). NEMA test LD-3-1985. Thermofused melamine is not acceptable. Changes in color by owner if required.
1. Finish - Dispatch: “Dove Gray” D92-60.
2. Finish – Bunker Room Gear Shelves: Wilsonart “Graphite Nebula” 4623-60.
3. Finish - Boot Stowage: “Pewter Brush” 4779-60
4. Finish- Laundry Rm, Dining, Kitchen: Wilsonart “Tuscan Walnut” 7921-38
5. Finish-All Remaining Linen Cabinets (Private Rooms and Vestibule): Wilsonart “Tuscan Walnut” 7921-38

C. High pressure cabinet liner CL20 (.020) for balance to GP28. NEMA test LD-3-1985. D.

High pressure backer BK20 (.020).

E. Acceptable manufacturers: Wilsonart, Formica, Nevamar, and Pionite. F.

Coordinate color selection with owner prior to shop drawing submittal.

2.5 EDGING MATERIALS

A. 3mm PVC banding, machine applied with waterproof hot melt adhesive. Use 3mm for all doors, drawer fronts, end panels, exposed shelves, and intermediate vertical panels on exposed shelving.
B. Color: The Contractor shall submit samples of PVC edging that closely match color of countertops, doors, drawer fronts, end panels, exposed shelves, and intermediate vertical panels on exposed shelving for final approval by the Architect together with samples of laminates.

2.6 CABINET HARDWARE AND ACCESSORY MATERIALS A.

Hinges
1. Concealed (European Type) hinges conforming to BHMA B01602.
2. For doors to 24" wide:
a. Two hinges for doors weighing up to 20 lbs. b. Three hinges for doors weighing 20 - 40 lbs. c. Four hinges for doors weighing 40 - 60 lbs.
3. Two hinges for doors up to 35-1/2" high.
4. Three hinges for doors up to 63" high.

B. Pulls
1. Wire pulls - 4 inches (100 mm) long, 5/16 inches (8 mm) in diameter, satin chromium plated (BHMA 626) with 1" finger clearance.

C. Drawer Slides
1. Standard Drawers: Bottom mount, self-closing design, epoxy powder coated to match drawer body color, with positive in-stop, out-stop, and out-keeper to maintain drawer in 80% open position. Captive nylon rollers, both front and rear. Minimum 100 lb. dynamic load rating. Provide adjuster cam to regulate body side sway. Approved: Knape & Vogt K-V 8400, 100 pound load.
2. File Drawers: Full extension, 3-part progressive opening slide, minimum 100 lb., zinc plated or epoxy coated at manufacturer's option. Approved: Knape & Vogt K-V 8400, 100 pound load.
3. File Drawer Accessory: Pendaflex rack.

D. Adjustable Shelf Supports
1. To be twin pin design with anti tip-up shelf restraints for both 3/4 inch and 1 inch shelves. Design to include keel to retard shelf slide-off, and slot for ability to mechanically attach shelf to clip. Load rating to be minimum 300 lbs. each support. Approved: Knape & Vogt K-V 346 ANO.

E. Locks
1. Where indicated on drawings, provide door locks complying with E07121 (BHMA).
2. Where indicated on drawings, provide drawer locks complying with E07041 (BHMA).
3. Keying:
a. Supplier shall meet with the Owner's representative to finalize keying requirements. Submit to the owner's representative a separate detailed schedule indicating clearly how the owner's final instructions on keying of the cylinders has been fulfilled.
b. Comply with the owner's requirements for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
c. Permanently inscribe each key with keyset and "Do not Duplicate". Provide keys of nickel silver only.

F. Grommets
1. Grommets for cable passage through countertops: 2-3/8" (60 mm) OD molded-plastic grommets with hole and plastic cap with slot for wire passage, color to be black.

G. Silencers

1. Provide vinyl silencers to all cabinet doors, two (2) per door.

H. Storage Room Heavy Duty Shelf Standards and Brackets

1. Heavy Duty Shelf Standards: 12 gauge steel standards 7/8" wide x 11/16" high with 2" slot adjustment Knape & Vogt KV 87 WH
2. Heavy Shelf Supports: Steel supports with single molded nylon cam lock lever. Knape & Vogt KV 187LL WH

I. Hat and Coat Hook

1. Tubular Specialties 895 Hat & Coat Hook. Satin Finish

2.7 FABRICATION

A. Fabricate casework to dimensions, profiles and details shown on drawings. B. Cabinet Body Construction

1. Joinery shall be AWI's custom grade.
2. Unless specifically indicated, core shall be 3/4" thick plywood before lamination. Edging and surface finishes as indicated herein.
2. Unit backs on fixed cabinets shall be 1/2" thick plywood, laminated with GP28 high pressure decorative laminate and balanced backer on concealed side, captured four sides and glued. Exposed backs shall be 3/4" plywood with exterior surface GP28 laminate as selected.
3. All fixed base and tall units shall have a separate and continuous pressure treated pine or exterior grade plywood base.
4. All under counter units, except sink base units, shall be provided with a full subtop. All sink cabinet bodies shall be exterior grade plywood core laminated with CL20 cabinet liner.
5. All exposed and semi-exposed edges of the cabinet body shall be factory edged with 3mm PVC banding, machine applied with waterproof hot melt adhesive.
6. Adjustable shelf core shall be 3/4" thick plywood up to 30" wide.
7. All upper wall cabinets shall provide a clear inside depth of 12 inches.
8. Exposed ends of double sided shelving units shall be covered with one piece of GP28 high pressure decorative laminate finish material. No joints permitted.

C. Drawers

1. Back and sides shall be 1/2" thick plywood, laminated with GP28 high pressure decorative laminate. Subfront shall be 5/8" plywood. Sides, back, and sub-front shall be connected by glued lock shoulder or doweled.
2. Drawer bottoms shall be 3/8" thick plywood with the drawer box bottom sides, hardwood edged. All surfaces shall be laminated with laminated with GP28 high pressure decorative laminate. Drawer bottom shall be captured four sides with a continuous bead of glue. Drawers over 24" shall have the bottoms reinforced.

D. Door/Drawer Fronts

1. Core for all doors and applied drawer fronts shall be 3/4" thick plywood. All edges shall be finished with 3mm PVC. Color as selected by Architect.
2. Double doors shall be used on all cabinets in excess of 24" wide.
3. Exterior faces shall be laminated with high pressure decorative laminate GP28, color as selected, balanced with cabinet liner CL20 to match basic cabinet interior body color.

2.8 DECORATIVE LAMINATE COUNTERTOPS

A. All countertops (excluding vanity & kitchen countertops) shall be self edged with a 1-1/2" thick built-up front edge. Top face laminated with GP50 (.050) high pressure laminate and balanced with backer underside. Exposed corners shall have a 2" radius.

B. All vanity countertops shall be self edged (see drawings for dimensions). Top face laminated with GP50 (.050) high pressure laminate and balanced with backer underside. Back and side splashes shall be 3/4" butt type and fastened to the deck with a waterproof caulk and screwed. Core material shall be a marine grade plywood core.

C. Splices in core materials or laminate shall not be over knee spaces or vanity locations.

PART 3 – EXECUTION

3.1 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

A. Quality Standard: Install woodwork to comply with AWI Section 400 for the same grade specified in Part 2 of this Section for type of woodwork involved.

B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) in 8'-0" for plumb and level (including tops) and no variations in flushness of adjoining surfaces.

C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.

D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for complete installation.

E. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.

F. Tops: Anchor securely to base units and other support systems as indicated. Caulk space between backsplash and wall with specified sealant.

1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
2. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c.
3. Complete the finishing work specified in this Section to the extent not completed at shop or before installation of woodwork. Fill nail holes with matching filler where exposed.

Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats were applied in the shop.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance. B. Clean, lubricate, and

adjust hardware.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

A. Provide final protection and maintain conditions in a manner acceptable to fabricator and Installer that ensures that woodwork is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 06 20 23

SECTION 07 21 00

BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Blanket (Batt) insulation at interior acoustical partitions.
2. Board Insulation at the CMU exterior walls.

3. Foam cavity insulation

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division IV Section 04 22 23 "Architectural Concrete Unit Masonry" for insulation installed in cavity walls and masonry cells

1.2 SUBMITTALS

A. Product Data for each type of insulation product specified including fire and flame spread data and product data indicating compliance with applicable ASTM requirements.

B. Product test reports from and based on tests performed by a qualified independent testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test- response characteristics, fire & flame-spread data, water-vapor transmission, water absorption, and other properties, based on comprehensive testing of current products.

C. Research or evaluation reports of the model code organization acceptable to authorities having jurisdiction that evidence compliance of foam-plastic insulations with building code in effect for Project.

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated on Drawings or specified elsewhere in this Section as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
1. Surface-Burning Characteristics: ASTM E 84.
2. Fire-Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect plastic insulation as follows:
1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction. PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering insulation products that may be incorporated in the work include:

B. Manufacturers: Subject to compliance with requirements, provide insulation products by one of the following:
1. Glass-Fiber Insulation: (R-11)
a. CertainTeed Corporation. b.
Knauf Fiber Glass GmbH.
c. Owens-Corning Fiberglas Corporation.
d. Manville Bldg. Materials Corp. e.
United States Gypsum Co.
f. Guardian Fiberglass, Inc.
2. Polyisocyanurate Board Insulation: (R-7 fully adhered, min. 4'x8' nom square edges taped). a.
Celotex Corporation (The).
b. NRG Barriers, Inc.
c. DOW Chemical Company
d. Rmax, Inc.
e. Atlas Roofing Corporation
3. Foamed-in-place Masonry Insulation: Two component thermal insulation produced by combining a plastic resin and catalyst foaming agent surfactant which, when properly ratioed and mixed, together with compressed air produce a cold-setting foam insulation in the hollow cores of hollow unit masonry walls. (R-4.91 per inch).
a. Available Manufacturers
1. Manufacturers subject to compliance with requirements, provide products from the following.
i. Core-Fill 500 Tailored Chemical Products.
ii. Air Krete, Inc.
iii. Jesco, Inc. (Rabco Foam Insulation).
2. Install as per manufacturer's instructions.

2.2 INSULATING MATERIALS

A. General: Provide insulating materials that comply with requirements and with referenced standards.
1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.

B. Unfaced Mineral-Fiber Blanket Insulation: Thermal insulation combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665, Type I (blankets without membrane facing).
1. Mineral-Fiber Type: Fibers manufactured from glass.
2. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indices of 25 and 50, respectively.

C. Polyisocyanurate Board Insulation: Rigid, cellular polyisocyanurate thermal insulation with core formed by using hydrochlorofluorocarbons as blowing agent and faced on both sides with aluminum foil to comply with referenced standards and with other requirements indicated below:

1. Federal Standard: FS HH-I-1972/1, reinforced core.
2. ASTM Standard: ASTM C 1289, Type I, Class 1 or 2.
3. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indices of 75 and 450, respectively, based on tests performed on unfaced core on thicknesses up to 4 inches (101 mm).
4. Thermal Resistivity: 7.2 deg F x h x sq. ft./Btu x in. at 75 deg F (50 K x m/W at 24 deg C).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated. B.

Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Apply single layer of insulation to produce thickness indicated.

E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

F. Installation guidelines (for foamed-in-place masonry insulation): Fill all open cells and voids in hollow concrete masonry walls where shown on drawings. The foam insulation shall be pressure injected through a series of 5/8" to 7/8" holes drilled into every vertical column of block cells (every 8" on center) beginning at an approximate height of four (4) feet from finished floor level. Repeat this procedure at an approximate height of ten (10) feet above the first horizontal row of holes (or as needed) until void is completely filled. Patch holes with mortar and score to resemble existing surface.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive to provide permanent placement and support of units.

B. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:

1. Use blanket widths and lengths that fill cavities formed by framing members. Where more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.

2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically.

C. Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

3.5 INSTALLATION OF RIGID INSULATION

A. For units of rigid insulation, install adhesive on inside face of exterior wall, as recommended by manufacturer. Press units firmly against inside wall to adhere to CMU. Fit courses of insulation with edges butted tightly both ways. Seal all joints with vapor retardant tape.
1. Coat edges of insulation units with full bed of adhesive to seal joints between insulation and between insulation and adjoining construction.

3.6 PROTECTION

A. General: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 31 13

ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Asphalt shingles.
2. Self-adhering sheet underlayment.

B. Related Sections include the following:
1. Division VI Section 06 10 00 "Rough Carpentry" for roof deck wood structural panels.
2. Division VII Section 07 60 00 "Flashing and Sheet Metal" for metal gutters and downspouts and counterflashings not part of this Section.

C. Compliance with the 2017 Florida Building Code, Sixth Edition
1. Asphalt shingles shall comply with all pertinent provisions of the 2017 Florida Building Code and specifically with the provisions of Chapter 15 Roof Assemblies and Rooftop Structures
2. For roof slopes from two units vertical in 12 units horizontal (17-percent slope), up to four units vertical in two12 units horizontal (33-percent slope), underlayment shall be two layers applied in the following manner. Apply a minimum 19-inch-wide strip of underlayment parallel with and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide sheets of underlayment overlapping successive sheets 19 inches and fastened sufficiently to hold in place.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated including lead boots, underlayment, primer, sealants, nails, roof vents, etc.

B. Samples for Initial Selection: For each type of asphalt shingle indicated.
1. Include similar Samples of trim and accessories involving color selection.

C. Research/Evaluation Reports: For asphalt shingles. Data indicating compliance with applicable codes. D.

Sample Warranties: Special warranties specified in this Section.

E. Fire-Test-Response Characteristics data indicating compliance with applicable ASTM or UL requirements. F.

Product data to indicate compliance with applicable building codes.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual that is approved, authorized, or licensed by asphalt shingle roofing system manufacturer to install roofing system indicated.

B. Source Limitations: Obtain ridge and hip cap shingles and self-adhering sheet underlayment through one source from a single asphalt shingle manufacturer.

C. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire- test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

D. Preinstallation Conference: Conduct conference at Project site with owner and architect prior to installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.
1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.
1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.
1. Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first 5 years non-prorated.
2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 140 mph ultimate wind speed or as noted by local authorities having authorities whichever is most stringent for 5 years from date of Substantial Completion.

B. Special Project Warranty: Roofing Installer's warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle

roofing that fail in materials or workmanship within the following warranty period:

1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. The design basis is GAF-ELK Corporation's Prestique Plus High Definition. Other acceptable manufacturers are listed below.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.

1. Manufacturing Products:
a. Atlas Roofing Corporation b.
Celotex Corporation
c. CertainTeed Corporation
d. EMCO Limited, Building Products Division e.
Georgia-Pacific Corporation
f. Globe Building Materials, Inc.
g. IKO
h. Malarkey Roofing Company i.
Owens Corning;
j. TAMKO Roofing Products, Inc.
2. Butt Edge: Straightened cut.
3. Strip Size: Manufacturer's standard.
4. Algae Resistance: Granules treated to resist algae discoloration.
5. Color and Blends: As selected by Owner from manufacturer's full range standard and of premium colors.

2.3 UNDERLAYMENT MATERIALS

A. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mil thick, slip- resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.

1. Available Products:
a. Carlisle Coatings & Waterproofing, Div of Carlisle Companies Inc.; Dri-Start "A"
b. Grace, W.R. & Co.; Grace Ice and Water Shield. c.
Henry Company, Perma-Seal PE
d. Johns Manville International, Inc; Roof Defender.
e. NEI Advanced Composite Technology; AC Poly Ice and StormSeal. f.
Owens Corning; WeatherLock M.
g. Polyguard Products, Inc.; Polyguard Deck Guard. h.
Protecto Wrap Company; Rainproof TM.
i. Safseal Innovations; SafSeal 7740.

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inchdiameter, barbed shank, sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

2.5 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division VII Section 07 60 00 "Flashing and Sheet Metal."
1. Sheet Metal: Aluminum, mill finished.

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.
1. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

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

3.2 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install on entire roof deck below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within 7 days.
1. Prime concrete and masonry surfaces to receive self-adhering sheet underlayment.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."
1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

C. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

D. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT SHINGLE INSTALLATION

A. Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with self-sealing strip face up at roof edge.
1. Extend asphalt shingles 3/4 inch over fascia at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full length first course followed by cut second course, repeating alternating pattern in succeeding courses.

F. Fasten asphalt shingle strips with a minimum of 5 or as required by local authorities having jurisdiction, whichever is more stringent, roofing nails located according to manufacturer's written instructions.
1. Where roof slope exceeds 20:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
3. When ambient temperature during installation is below 0 deg F, seal asphalt shingles with asphalt roofing cement spots.

G. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley 12 inches beyond center of valley. Use one-piece shingle strips without joints in the valley. Fasten with extra nail in upper end of shingle. Install asphalt shingle courses from other side of valley and cut back to a straight line 2 inches short of

valley centerline. Trim upper concealed corners of cut-back shingle strips.
1. Do not nail asphalt shingles within 6 inches of valley center.
2. Set trimmed, concealed-corner asphalt shingles in a 3-inch- wide bed of asphalt roofing cement.

H. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

END OF SECTION 07 31 13

SECTION 07 60 00

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes sheet metal flashing and trim in the following categories:
1. Metal counter flashing and base flashing.
2. Metal wall flashing.
3. Exposed metal trim, drip edges, and fascia.
4. Copings.
5. Reglets.
6. Downspouts/ seamless gutters.
8. Sill pans.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division IV Sections for through-wall flashing and other integral masonry flashings specified as part of masonry work.
2. Division VII Section 07 92 00 "Joint Sealants" for elastomeric sealants.
3. Division VII Roofing Sections for flashing and roofing accessories installed integral with roofing membrane as part of roofing-system work.

1.2 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

1.3 SUBMITTALS

A. Samples, cut sheets and product data for each type of flashing or sheet metal product including flashing, masonry thru-wall flashing, reglets, gutters, downspouts and gutter screens. Include product information that indicates installation method and compliance with any applicable ASTM requirements. Product data for copper sheet metal to indicate bending method.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in- service performance.

1.5 PROJECT CONDITIONS

A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 SHEET METAL FLASHING AND TRIM MATERIALS

A. Sill pans: ASTM B 370, sheet copper flashing consisting of full single copper sheet weighing 5 oz. per square foot coated each side with asphalt compound weighing 6 ounces per square foot minimum. “Cop- R-Cote” as manufactured by Advanced Building Product, Inc. or approved equal.

B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:
1. Factory-Painted Aluminum Sheet: ASTM B 209 (ASTM B 209M), 3003-H14, with a minimum thickness of 0.040 inch (1.0 mm), unless otherwise indicated. Approved manufacturer: Pac-Clad.

C. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet, with a minimum thickness of 0.0625 inch (1.6 mm) except not less than 0.0937 inch (2.4 mm) thick for applications where burning (welding) is involved.

E. Masonry thru wall flashing and other integral masonry flashings indicated in Division IV Section 04 22 23 "Architectural Concrete Unit Masonry" are specified as part of masonry work.

2.2 REGLETS

A. General: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces and compatible with flashing indicated.

B. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.

C. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.

D. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of the counterflashing lower edge.
1. Material: Stainless steel, 0.0187 inch (0.5 mm) thick.

E. Manufacturers: Subject to compliance with requirements manufacturers offering products that may be incorporated into the Work include the following:
1. Fry Reglet Corporation.
2. Hickman: W.P. Hickman Co.
3. Keystone Flashing Company.

2.3 MISCELLANEOUS MATERIALS AND ACCESSORIES A.

Burning Rod for Lead: Same composition as lead sheet. B.

Solder: ASTM B 32, Grade Sn50, used with rosin flux.

C. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

D. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.

E. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

F. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division VII Section 07 92 00 "Joint Sealants."

G. Epoxy Seam Sealer: 2-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.

H. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather- resistant seaming and adhesive application of flashing sheet metal.

I. Paper Slip Sheet: 5-lb/square (0.244 kg/sq. m) red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.

J. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- (0.15-mm-) thick black polyethylene film, resistant to decay when tested according to ASTM E 154.

K. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

L. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

2.4 FABRICATION, GENERAL

A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

E. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

G. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.
1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.5 SHEET METAL FABRICATIONS

A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

B. Downspouts: Fabricate from the following material:
1. Aluminum: 0.024 inch (0.6 mm) thick.

C. Conductor Heads: Fabricate from the following material:
1. Aluminum: 0.0320 inch (0.8 mm) thick.

D. Splash Pans: Fabricate from the following material:
1. Aluminum: 0.040 inch (1.0 mm) thick.

E. Exposed Trim and Fascia: Fabricate from the following material:
1. Aluminum: 0.050 inch (1.2 mm) thick.

F. Copings: Fabricate from the following material:
1. Aluminum: 0.050 inch (1.2 mm) thick.

G. Base Flashing: Fabricate from the following material:
1. Aluminum: 0.040 inch (1.0 mm) thick.

H. Counterflashing: Fabricate from the following material:
1. Aluminum: 0.0320 inch (0.8 mm) thick.

I. Flashing Receivers: Fabricate from the following material:
1. Aluminum: 0.0320 inch (0.8 mm) thick.

J. Drip Edges: Fabricate from the following material:
1. Aluminum: 0.0320 inch (0.8 mm) thick.

K. Eave Flashing: Fabricate from the following material:
1. Aluminum: 0.0320 inch (0.8 mm) thick.

L. Equipment Support Flashing: Fabricate from the following material:
1. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch (0.7 mm) thick.

M. Roof-Penetration Flashing: Fabricate from the following material:
1. Lead-Coated Copper: 16 oz./sq. ft. (0.55 mm thick).

O. Roof Drainage System Installation:
1. General: Install aluminum sheet metal roof drainage items to product complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

2. Hanging Gutters: Provide seamless continuous gutters. Attach gutters at eave or fascia to firmly anchor gutter brackets spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
a. Install gutter with expansion joints at locations indicated, but not exceeding, 25 feet apart. Install expansion-joint caps.
b. Install continuous gutter screens on gutters with non-corrosive fasteners, hinged to swing open for cleaning gutters.
3. Downspouts: Join sections with 1-1/2-inch (38 mm) telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
4. Hanging Gutters: Fabricate 0.040" thick aluminum to "K" cross section indicated, complete with end pieces, outlet tubes and other accessories as required. Fabricate in continuous sections, furnish flat- stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.
5. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen wire ball downspout strainer valley baffles.
6. Downspouts: Fabricate square 0.032" thick aluminum downspouts complete with mitered elbows. Furnish with metal hangars, from same material as downspouts, and anchors.
7. Finish on gutters, downspouts, hangers and accessories to be:
a. General: Comply with Aluminum Associations (AA) "Designation system for aluminum Finishes" for finish designations and application recommendations.

2.6 ALUMINUM FINISHES

A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.

B. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
1. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
a. Color and Gloss: Match Architect's sample. i. Clear anodize for concealed flashing.
ii. White fluoropolymer for all fascias, soffits, gutters, downspouts and drip edges. Color to match Pac-Clad "Gloss White"

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units

of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone meeting the requirements of basic wind speed of 120-mph (3-second gust) and importance factor I_w=1.15.

D. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pretinned surface would show in finished Work.

1. Do not solder the following metals:
a. Aluminum.
2. Pretinning is not required for the following metals:
a. Lead.
3. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.

1. Use joint adhesive for nonmoving joints specified not to be soldered.

G. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.

H. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

I. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.
2. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.

J. Install reglets to receive counterflashing according to the following requirements:

1. Where reglets are shown in masonry, furnish reglets for installation under Division 4 Section "Unit Masonry."

K. Counterflashings: Coordinate installation of counterflashings with installation of assemblies to be protected by counterflashing. Install counterflashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant, lead wedges and sealant, interlocking folded seam, or blind rivets and sealant. Lap counterflashing joints a minimum of 2 inches (50 mm) and bed with sealant.

L. Roof-Drainage System: Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item manufacturer, to drain roof in the most efficient manner. Coordinate flashing and sheet metal items with roofing installation.

M. Equipment Support Flashing: Coordinate equipment support flashing installation with roofing and equipment installation. Weld or seal flashing to equipment support member.

N. Roof-Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating roof. Install flashing as follows:

1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
2. Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.

O. Splash Pans: Install where downspouts discharge on low-sloped roofs, unless otherwise shown. Set in roof cement or sealant compatible with roofing membrane.

3.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION 07 60 00

SECTION 07 42 93

VINYL SOFFITS AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES A. Vinyl

soffits.

B. Accessories and trim.

1.2 RELATED SECTIONS

A. Section – 6100 Rough Carpentry. B.

Section – 7901 Joint Sealants.

1.3 REFERENCES

A. ASTM D 1435 - Standard Practice Method for Outdoor Weathering of Plastics.

B. ASTM D 3679 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding and trim.

1.4 PERFORMANCE REQUIREMENTS

A. Provide vented vinyl soffits and accessories that comply with requirements of ASTM D 3679, Class 2 as follows:
1. Cell classification: 1334.
2. Tensile strength: 7,344 psi.
3. Modulus of elasticity: 455,750-psi average.
4. Izod impact, standard 1/8-inch bar: 1.5 ft.lbs/in average.
5. Deflection temperature: 168 degrees F.
6. Flash ignition temperature: 752 degrees F.
7. Self-ignition temperature: 842 degrees F.
8. Maximum smoke density: 86 percent.
9. Smoke density rating: 52.4 percent average.
10. Flammability, horizontal:
a. Burn distance: Less than 10 mm. b.
Burn time: Less than 5 seconds.
11. Flammability, vertical: Non-burning.
12. Wind load resistance: 58.2 ft-lbs./sq. ft.

1.5 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Construction details , material descriptions, descriptions of individual components and profiles and finishes for vinyl soffit panels.
2. Compliance with applicable performance requirements including ASTM requirements.
3. Preparation instructions and recommendations.

4. Storage and handling requirements and recommendations.
5. Installation methods.

B. Verification Samples: For each type of finish product specified, two samples of size indicated below
1. Vinyl Soffit Panels: Minimum size 12 inches (305 mm) long by actual panel width, representing actual product, color, and patterns. Include fasteners, clips closures, other accessories and sealants.
2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
3. Accessories: 12-inch long samples for each type of accessory. C. Qualification

Data: For installer.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Provide installer with not less than three years of experience with products specified or has obtained Master Craftsman credentials from Wolverine Siding Systems.

B. Mock-Up: Provide a mock-up for evaluation of installation techniques and workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship and color is approved by the Government Agency responsible.
3. Reinstall mock-up area as required to produce acceptable work.
4. Mock-up if approved can remain part of work.

1.7 DELIVERY, STORAGE, AND HANDLING

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

1.8 PROJECT CONDITIONS

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

1.9 WARRANTY

A. Provide soffit standard lifetime warranty. PART 2

PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Wolverine Vented Vinyl Soffits, 750 E. Swedesford Rd., Valley Forge, Pennsylvania 19482. ASD. Tel: (888) 838-8100. Fax: (610) 341-7940; Email: ctsiding@certainteed.com; Web: www.certainteed.com.

2.2 MATERIALS

A. Wolverine: Beaded triple 2" – wainscot style, .039 thickness.
B. Polyvinyl Chloride: Soffit materials made of PVC that meet or exceed the following properties:
1. Shrinkage: 3 percent.
2. Coefficient of linear expansion: 0.000031 in/in./degree F.
3. Gardner impact: 1.74 in./lb. ft/mil.
4. Surface distortion at 120 degrees F: None.

5. Gloss (75 degree T Gloss Meter): Uniform.
6. Weathering per ASTM D 1435: Free of any visual surface defects, such as peeling, chipping, cracking, flaking or crazing due to manufacturing conditions.
7. Chalking: Number 6 Rating caused by manufacturing defects within 5 years in vertical exposure.
8. Color: Uniform on surface and throughout the panels.

2.3 FASTENERS

A. Provide galvanized or other corrosion-resistant nails as recommended by manufacturer of siding products.

B. Joint Sealants: As specified in Section 079200.

PART 3 EXECUTION

3.1 EXAMINATION

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

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

3.2 PREPARATION

A. Examine, clean, and repair as necessary any substrate conditions that would be detrimental to proper installation.

B. Do not begin installation until unacceptable conditions have been corrected.

3.3 INSTALLATION

A. Sub-contractor to provide and install blocking to complete turn-key soffit scope.

B. Install products in accordance with the latest printed instructions of the manufacturer. Installer should have current Master Craftsman credentials.

C. Install products with all components true and plumb.

D. Allow space between both ends of siding panels and trim for thermal movement. Overlap horizontal panel ends one-half the width of factory pre-cut notches.

E. Stagger lap joints in soffit in uniform pattern as successive courses of soffit are installed.

F. Joint Sealants: install gaskets, joint fillers and sealants where system meets walls and where required for performance of vinyl soffit panel assemblies. Provide types of gaskets, fillers and sealants indicated, or if not indicated, types recommended by vinyl soffit panel manufacturer.

3.4 PROTECTION

A. Protect installed products until completion of project.

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

3.5 CLEANING

A. At completion of work, remove debris caused by siding installation from project site.

END OF SECTION 07 42 93

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes joint sealants for the following locations:
1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:
a. Control and expansion joints in cast-in-place concrete. b.
Control and expansion joints in unit masonry.
c. Joints between different materials.
d. Perimeter joints between materials listed above and frames of doors and windows. e.
Other joints as indicated.
2. Exterior joints in horizontal traffic surfaces as indicated below:
a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
b. exterior approach slab and steps.
c. Other joints as indicated.
3. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
a. Perimeter joints of exterior openings where indicated.
b. Joints between tops of non-load-bearing unit masonry walls and underside of cast-in- place concrete slabs and beams.
c. Tile control and expansion joints.
d. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
e. Perimeter joints of toilet fixtures.
f. Millwork joints at interior wall surfaces. g.
Other joints as indicated.
4. Interior joints in horizontal traffic surfaces as indicated below:
a. Control and expansion joints in cast-in-place concrete slabs. b.
Control and expansion joints in tile flooring.
c. Other joints as indicated.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 7 Section "Flashing and Sheet Metal" for sealing joints related to flashing and sheet metal for roofing.
2. Division 8 "Glass and Glazing" for sealants used in glazing.
3. Division 9 Section "Gypsum Board Assembleis" for sealing concealed perimeter joints of gypsum board partitions to reduce sound transmission.
4. Division 9 Section "Tile" for sealing tile joints.

1.2 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.

B. Provide joint sealants for interior applications that have been produced and installed to establish and

maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

1.3 SUBMITTALS

A. Product data and samples from manufacturers for each exterior vertical non-traffic joint sealant product required. Product data and samples from manufacturers for each exterior horizontal traffic joint sealant product required. Product data and samples from manufacturers for each interior vertical and horizontal non-traffic joint sealant product required. Product data and samples from manufacturers for each interior horizontal traffic joint sealant product required.

B. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.

B. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4 deg C).
3. When joint substrates are wet.

B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.7 SEQUENCING AND SCHEDULING

A. Sequence installation of joint sealants to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors: Provide color of exposed joint sealants to comply with the following:
1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2.2 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Provide manufacturer's standard elastomeric sealants that comply with ASTM C 920 and other requirements indicated on each Elastomeric Joint Sealant Data Sheet at end of this Section, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.
B. For use at pre-cast or poured concrete, masonry, window and door perimeters, and other manufacturer recommended applications.

C. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to, the products specified in each Elastomeric Sealant Data Sheet.

2.3 SOLVENT-RELEASE-CURING JOINT SEALANTS

A. Acrylic Sealant: For use in glazing and framing and other manufacturer recommended applications. Manufacturer's standard one-part, nonsag, solvent-release-curing acrylic terpolymer sealant complying with AAMA 808.3 or FS TT-S-00230 or both, with capability when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the following percentage change in joint width existing at time of application and remain adhered to joint substrates indicated for Project without failing cohesively:
1. 12-1/2 percent movement in both extension and compression for a total of 25 percent.

B. Butyl Sealant: For use at storefronts, bedding thresholds, against neoprene or EDPM gaskets and other manufacturer recommended applications. Manufacturer's standard one-part, nonsag, solvent- release-curing, polymerized butyl sealant complying with ASTM C 1085 and formulated with minimum of
75 percent solids to be nonstaining, paintable, and have a tack-free time of 24 hours or less.

C. Available Products: Subject to compliance with requirements, solvent-release-curing joint sealants that may be incorporated in the work include the following:
1. Acrylic Sealant:
a. "60+Unicrylic," Pecora Corp. b.
"Mono," Tremco, Inc.
2. Butyl Sealant:
a. "Tremco Butyl Sealant," Tremco, Inc. b.
Press-Seal Gasket Corporation
c. Polylok, Inc.

2.4 LATEX JOINT SEALANTS

A. General: For use at vinyl soffits, kitchen and bathroom fixtures general interior and other manufacturer recommended applications. Provide manufacturer's standard one-part, nonsag, mildew- resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that

accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.

B. Acrylic-Emulsion Sealant: Provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.

C. Available Products: Subject to compliance with requirements, latex joint sealants that may be incorporated in the Work include the following:
1. Acrylic-Emulsion Sealant:
a. "AC-20," Pecora Corp.
b. "Sonolac," Sonneborn Building Products Div., ChemRex, Inc. c.
"Tremco Acrylic Latex 834," Tremco, Inc.

2.5 PREFORMED FOAM SEALANTS

A. Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water repellent agent; factory-produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements:
1. Properties: Permanently elastic, mildew-resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
2. Impregnating Agent: Chemically stabilized acrylic.
3. Density: Manufacturer's standard.
4. Backing: Pressure-sensitive adhesive factory applied to one side with protective wrapping.
5. Available Products: Subject to compliance with requirements, preformed foam sealants that may be incorporated in the Work include the following:
a. "Emseal," Emseal Corp.
b. "Emseal Greyflex," Emseal Corp.
c. "Wil-Seal 150," Wil-Seal Construction Foams Div., Illbruck. d.
"Wil-Seal 250," Wil-Seal Construction Foams Div., Illbruck.

2.6 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
1. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
2. Proprietary, reticulated, closed-cell polymeric foam, nonoutgassing, with a density of 2.5 pcf (40 kg/cu. m) and tensile strength of 35 psi (240 kPa) per ASTM D 1623, and with water absorption less than 0.02 g/cc per ASTM C 1083.

C. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil- free compressed air.
3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

a. Do not leave gaps between ends of joint fillers.

b. Do not stretch, twist, puncture, or tear joint fillers.

c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

E. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

2. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated. a. Use masking tape to protect adjacent surfaces of recessed tooled joints.

3. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.

F. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's recommendations.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or

deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 08 11 13

STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes steel doors and frames.

B. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division VIII Section 08 14 16 "Flush Wood Doors" for solid-core wood doors installed in steel frames.
2. Division VIII Section 08 71 00 "Finish Hardware" for door hardware and weather stripping.
3. Division VIII Section 08 81 00 "Glazing" for glass in steel doors and sidelights.
4. Division IX Section 09 91 00 "Painting" for field painting primed doors and frames.

1.2 SUBMITTALS

A. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

B. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

C. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
1. Indicate coordination of glazing frames and stops with glass and glazing requirements.
2. Indicate frame data and compliance with applicable ASTM requirements.
3. Indicate applicable Florida NOA number or Florida product approval number where required.

1.3 QUALITY ASSURANCE

A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces

between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include the following:

1. Steel Doors and Frames:

a. Amweld Building Products, Inc. (Florida Product Approval # FL5753 where required). b. Ceco Door Products.

c. Curries Co. (NOA No. 03-0812.07 where required). d. Habersham Metal Products Co.

e. Kewanee Corp.

f. Republic Builders Products. g. Steelcraft.

2.2 MATERIALS

A. Impact-Resistant Galvanized Steel Sheets (Insulated): Units shall comply with the Miami-Dade County product approval system or the Florida Building Code approval system. Panels shall be manufacturered from hot-dipped galvannealed steel having an A90 or G90 zinc-iron alloy coating conforming to ASTM designations A 653 and A 924.

B. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.

C. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot- dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.3 DOORS

A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:

1. Impact-Resistive Exterior Doors: Face sheets shall be 14 gage (maximum), hot-dipped galvannealed with continuous vertical mechanical interlocking joints at lock and hinge edges with edge seams welded filed and ground smooth. Panels to be reinforced and sound deadened by 20 gage vertical stiffners manufactured from galvannealed steel conforming to ASTM designations A 653 and A 924 and welded to each face sheet and rigid polystyrene core laminated to the inside faces of both panels.

2.4 FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 0.0478-inch- (1.2-mm-) thick cold-rolled steel sheet.

1. Fabricate frames with mitered or coped and continuously welded corners.
2. Fabricate frames for interior openings over 48 inches (1220 mm) wide from 0.0598-inch- (1.5-mm-) thick steel sheet.
3. Form exterior frames from 0.0635-inch- (1.6-mm-) thick galvanized steel sheet.
4. Impact-Resistant Frames: Provide units of 16 gage hot-dipped galvannealed steel having an A90 or G90 zinc-iron alloy coating conforming to ASTM designations A 653 and A 924, with mitered or coped and continuously welded corners, formed from 0.0635-inch- (1.6-mm-) thick galvanized steel sheet.

B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single- door frames and 2 silencers on heads of double-door frames.

2.5 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.

1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:

a. Resin-impregnated paper honeycomb.

b. Rigid polyurethane conforming to ASTM C 591. c.
Rigid polystyrene conforming to ASTM C 578.

2. Clearances: Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between non-fire-rated pairs of doors. Not more than 3/4 inch (19 mm) at bottom. a. Fire Doors:
Provide clearances according to NFPA 80.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel sheet.

C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot- rolled steel sheet.

E. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI 112. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch- (1.6-mm-) thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.

1. At exterior locations.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.

1. Unless otherwise indicated, provide thermal-rated assemblies with U-value rating of 0.41 Btu/sq. ft. x h x deg F (2.33 W/sq. m x K) or better.

H. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.

I. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.

J. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

K. Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.

1. Provide nonremovable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.

2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

2.6 FINISHES, GENERAL

A. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes. B.

Apply primers and organic finishes to doors and frames after fabrication.

2.7 GALVANIZED STEEL SHEET FINISHES

A. Surface Preparation: Clean surfaces with nonpetroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC- Paint 20.

B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.

1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

2.8 STEEL SHEET FINISHES

A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).

B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.

C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

B. Placing Frames: Comply with provisions of SDI 105, 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.

1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
2. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws.
3. Install fire-rated frames according to NFPA 80.

C. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.

1. Fire-Rated Doors: Install with clearances specified in NFPA 80.

3.2 ADJUSTING AND CLEANING

A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 08 11 13

SECTION 08 51 13

LARGE MISSILE IMPACT ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes Architectural Grade aluminum windows of the performance class indicated. Window types required include the following:
1. Heavy duty large missile impact aluminum single hung windows.

1.2 PERFORMANCE REQUIREMENTS

A. General: Provide large missile impact aluminum windows engineered, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading without failure, as demonstrated by testing manufacturer's standard window assemblies representing types, grades, classes, and sizes required for Project according to test methods indicated.

B. Impact Resistant Glass: Provide materials that comply with the Miami-Dade County product approval system or the Florida Building Code product approval system.
1. Ultimate Wind Speed Criteria: 140mph Exposure: C
2. Importance Factor: 1.5
3. Building Category: Fully Enclosed

C. Performance Requirements:
1. When tested according to ANSI/AAMA 101 requirements, conforms to or exceeds an H-R60 rating using 3/16" annealed glass, and an H-R65 rating using 5/16" laminated glass.
2. Air Infiltration: 0.3 (ft^3)/min (ft^2) maximum when tested per ASTM E 283 at a 1.57 psf staticair pressure difference.
3. Water Resistance: no leakage when tested per ASTM E 547 at a static air pressure difference of 15% of the positive design pressure.
4. Uniform Load Structural: after testing per ASTM E 330 with a load equal to 150% of the positive design pressure, the unit must be operable, with a maximum permanent deformation in any member of 0.4% of the member's length.
5. See Structural Drawing Sheets of the Construction Documents for additional loading requirements.

1.3 SUBMITTALS

A. Provide cut sheets, manufacturer’s standard details, specifications and catalog information, recommendations, and installation instructions.

B. Shop Drawings showing fabrication and installation of each type of window required including information not fully detailed in manufacturer's standard Product Data and the following:
1. Layout and installation details, including anchors.
2. Elevations at 1/4 inch = 1 foot (1:50) scale and typical window unit elevations at 3/4 inch = 1 foot (1:20) scale.
3. Full-size section details of typical composite members, including reinforcement and stiffeners.
4. Location of weep holes.

5. Panning details.
6. Hardware, including operators.
7. Window cleaning provisions.
8. Glazing details.
9. Accessories.
10. Window finish.

C. Samples for initial color selection on 12-inch- (300-mm-) long sections of window members. Where finishes involve normal color variations, include Sample sets showing the full range of variations expected.

D. Provide product data that indicates compliance with the Miami-Dade County product approval system or the Florida Building Code product approval system including Notice of Acceptance (NOA). E. Sample

warranty.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: minimum five (5) years documented experience in the manufacture of aluminum windows as required for this project.

B. Installer Qualifications: Engage an experienced installer who has completed installation of aluminum windows similar in material, design, and extent to those required for this Project and with a record of successful in- service performance.

C. Single-Source Responsibility: Obtain missile impact aluminum windows from one source and by a single manufacturer.

1.5 PROJECT CONDITIONS

A. Field Measurements: Check window openings by field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Where field measurements cannot be made without delaying the Work, guarantee opening dimensions and proceed with fabricating aluminum windows without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to guaranteed dimensions.

1.6 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Submit a written warranty signed by aluminum window manufacturer agreeing to repair or replace window components that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
1. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
2. Faulty operation of sash and hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty Period: 3 years after date of Substantial Completion.

D. Warranty Period for Metal Finishes and Glass: 5 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include the following:
1. Single-Hung (Impact-resistant) Windows:
a. PGT Industries Series SH-701 Heavy Duty Single Hung Aluminum Window, NOA No. 07-0322.06.

2.2 MATERIALS

A. Main Frame Members: extruded from 6063-T5 alloy, nominal 0.062" wall thickness.

B. Sash Members: extruded from 6063-T5 aluminum alloy, nominal 0.062" wall thickness.

C. Hardware: two spiral torsion spring balances. Two steel and tin-lead-zinc alloy cam lever sash locks on each vent locking beneath a groove in the fixed meeting rail (one sash lock if window width is less than 43").

D. Weatherstripping: sides and top of vent weatherstripped with .1270 x .270 fin seal, bottom of vent weatherstripped with compressed finned vinyl bulb.

E. Glazing attachment with silicone adhesive.

F. Screens: tubular aluminum frame with fiberglass screen cloth, vinyl spline, two plastic screen pull tabs and two compression retention springs per screen.

2.3 FABRICATION

A. Main frame and sash joints constructed with butt joint fit, assembled with phillips pan head screws, and factory sealed with Parabond sealer.

B. All hardware factory installed.

C. Bug screens constructed and installed in unit prior to shipping.

2.4 FINISHES

A. Finish: High-Performance clear anodized finish AA-M10C21A41 / AA-M45C22A41, Architectural Class I (.7 mils minimum) Color: Clear

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that openings provide an acceptable anchoring surface, being clean, level, plumb, and dimensionally

within the manufacturer's tolerance of clearance

B. Verify that rough or masonry opening is correct and sill plate is level.
1. Masonry surfaces shall be visibly dry and free of excess mortar, sand, and other construction debris.
2. Metal surfaces shall be dry; clean; free of grease, oil, dirt, rust and corrosion, and welding slag; without sharp edges or offsets at joints.

3.2 INSTALLATION

A. Comply with manufacturer's specifications and recommendations for installing window units, hardware, operators, and other components of the Work.

B. Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
1. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified under "Dissimilar Materials" Paragraph in appendix to AAMA 101.

C. Set sill members and other members in a bed of sealant or with joint fillers or gaskets, as shown on Shop Drawings, to provide weathertight construction. Refer to Division VIII Section 07 92 00 "Joint Sealants" for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the Work.
1. Sealants, joint fillers, and gaskets to be installed after installation of window units are specified in another Division VII Section.

D. Place insulation materials around shim spaces as required to ensure continuity of the thermal barrier of the structure.

E. Apply caulk all around between the aluminum frame and the structure, ensuring that a continuous air tight and watertight perimeter seal results. Leave exposed surfaces clean and free of caulk.

3.3 ADJUSTING

A. Ensure that units freely operate in a normal fashion, and that vents make proper contact with weatherstripping perimeter seal. Adjust frame, vent, or hardware as needed.

3.4 CLEANING

A. Clean aluminum surfaces promptly after installing windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

B. Leave units thoroughly clean and free of dirt or other construction residue.

3.5 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to aluminum window manufacturer, that ensure window units are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08 51 13

SECTION 08 81 00

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:
1. Window units.
2. Vision lites.

B. Related Sections: The following sections contain requirements that relate to this Section.
1. Division X Section 10 28 00 "Toilet and Bath Accessories" for mirrored glass requirements.

1.2 DEFINITIONS

A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.

B. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's directions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:
1. Minimum glass thickness, nominally, of lites in exterior walls is 6 mm.
2. Tinted and heat-absorbing glass thicknesses for each tint indicated are the same throughout Project.
3. Minimum glass thicknesses of lites, whether composed of annealed or heat-treated glass, are selected so the worst-case probability of failure does not exceed the following:
a. 8 lites per 1000 for lites set vertically or not over 15 degrees off vertical and under wind action.

Determine minimum thickness of monolithic annealed glass according to ASTM E 1300. For other than monolithic annealed glass, determine thickness per glass manufacturer's standard method of analysis including applying adjustment factors to ASTM E 1300 based on type of glass.

C. Normal thermal movement results from the following maximum change (range) in ambient and surface temperatures acting on glass-framing members and glazing components. Base engineering calculation on materials' actual surface temperatures due to both solar heat gain and nighttime sky heat loss.
1. Temperature Change (Range): 120 F deg (67 C deg), ambient; 180 F deg (100 C deg), material

surfaces.

1.4 SUBMITTALS

A. Product data for each glass product and glazing material indicated.

B. Samples for verification purposes of 12-inch (300 mm) square samples of each type of glass indicated except for clear monolithic glass products, and 12-inch (300 mm) long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative in color of the adjoining framing system.

C. Compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.

D. Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.

E. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

F. Provide product data that indicates compliance with the Miami-Dade County product approval system or the Florida Building Code product approval system.

G. Provide product data that indicates compliance with the applicable ASTM requirements

H. Submit sample warranty.

1.5 QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. FGMA Publications: "FGMA Glazing Manual."
2. SIGMA Publications: TM-3000 "Vertical Glazing Guidelines" and TB-3001 "Sloped Glazing Guidelines".

B. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.

1. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.

C. Fire-Resistive Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

D. Fire-Resistive Glazing Products for Window Assemblies: Products identical to those tested per ASTM E 163, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

E. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.

F. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
1. Primary glass of each (ASTM C 1036) type and class indicated.
2. Heat-treated glass of each (ASTM C 1048) condition indicated.

G. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.
1. Install liquid sealants at ambient and substrate temperatures above 40 deg F (4 deg C).

1.8 WARRANTY

A. General: Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Manufacturer's Warranty on Coated Glass Products: Submit written warranty signed by coated glass manufacturer agreeing to furnish replacements for those coated glass units that deteriorate as defined in "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to glass manufacturer's published instructions.
1. Warranty Period: Manufacturer's standard but not less than 5 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRIMARY FLOAT GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class as indicated below, and Quality q3 (glazing select) Acceptable manufacturers are Pittsburgh Plate Glass Company, Libby-Owens Ford Glass Company, American Saint Gobain Corporation, Mississippi Glass Company, or Ford Glass Company, SAF-Glas, LLC.
1. Class 2 (tinted, heat-absorbing, and light-reducing) where indicated.
2. Tinted glass design basis: “Solorgray” by SAF.

B. Refer to coated glass product requirements for tint color and performance characteristics of coated tinted glass for monolithic glazing relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

C. Refer to requirements for sealed insulating glass units for performance characteristics of assembled units composed of tinted glass, coated or uncoated, relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

2.2 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.
3. Colors: Provide color of exposed joint sealants to comply with the following:
a. Match colors indicated by reference to manufacturer's standard designations.

B. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements indicated on each Elastomeric Glazing Sealant Product Data Sheet at the end of this Section, including those referencing ASTM classifications for Type, Grade, Class and Uses.

1. Additional Movement Capability: Where additional movement capability is specified in Elastomeric Glazing Sealant Product Data Sheet, provide products, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, with the capability to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.

C. Glazing Sealant for Fire-Resistant Glazing Products: Identical to product used in test assembly to obtain fire-resistive rating.

2.3 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent, non-staining and non-migrating in contact with nonporous surfaces, with or without spacer rod as recommended by tape and glass manufacturers for application indicated, packaged on rolls with a release paper backing, and complying with AAMA 800 for products indicated below:
1. AAMA 804.1.

2.4 GLAZING GASKETS

A. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C 542, black.

B. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. Neoprene, ASTM C 864.
2. EPDM, ASTM C 864.
3. Silicone, ASTM C 1115.
4. Thermoplastic polyolefin rubber, ASTM C 1115.
5. Any material indicated above.

C. Soft Compression Gaskets: Extruded or molded closed-cell, integral-skinned gaskets of material indicated below, complying with ASTM C 509, Type II, black, and of profile and hardness required to maintain watertight seal:
1. Neoprene.
2. EPDM.
3. Silicone.
4. Thermoplastic polyolefin rubber.
5. Any material indicated above.

2.5 MISCELLANEOUS GLAZING MATERIALS

A. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.

B. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

C. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).

D. Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-staining, non-extruding, non-outgassing, strips of closed-cell plastic foam of density, size, and shape to control sealant depth and otherwise contribute to produce optimum sealant performance.

2.6 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

B. Clean cut or flat grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:
1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials

except where more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass from edge damage during handling and installation as follows:
1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
2. Remove damaged glass from Project site and legally dispose of offsite. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass sizes larger than 50 united inches (1250 mm) (length plus height) as follows:
1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
2. Provide 1/8-inch (3 mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

B. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

C. Do not remove release paper from tape until just before each lite is installed.

D. Apply heel bead of elastomeric sealant.

E. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

F. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

C. Install gaskets so they protrude past face of glazing stops.

3.6 LOCK-STRIP GASKET GLAZING

A. Comply with ASTM C 716 and gasket manufacturer's printed recommendations. Provide supplementary wet seal and weep system unless otherwise indicated.

3.7 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

D. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION 08 81 00

SECTION 09 21 00

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Non load-bearing steel framing members for gypsum board assemblies.
2. Gypsum board assemblies attached to steel framing.

1.2 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.3 ASSEMBLY PERFORMANCE REQUIREMENTS

A. Fire Resistance: Provide gypsum board assemblies with fire-resistance ratings indicated.

1.4 SUBMITTALS

A. Product Data for each type of product listed in Section 2 as specified including but not limited to insulation, joint compound, tape, screws, light gauge framing and furring members, etc.

B. Provide data indicating compliance with applicable ASTM testing requirements.

C. Submit one 12" x 12" sample for each type of gypsum board assembly required.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.

B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

D. Fire-Test-Response Characteristics: Where fire-resistance-rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:
1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. 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. Neatly stack gypsum panels flat to prevent sagging.

C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.7 PROJECT CONDITIONS

A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, the following:

1. Steel Framing and Furring:
   a. Consolidated Systems, Inc. b. Dale Industries, Inc.
   c. Dietrich Industries, Inc.
   d. National Gypsum Co.; Gold Bond Building Products Division. e. Abercrombie
   f. All Steel & Gypsum Products, Inc.
   g. Southeastern Stud & Components, Inc. h. Steel Construction Systems
   i. The Steel Network
   j. Clark Western Building Systems
2. Gypsum Board and Related Products:
   a. Georgia-Pacific Corp.
   b. National Gypsum Co.; Gold Bond Building Products Division. United States Gypsum Co.
   c. American Gypsum Co.
   d. Lafarge North America, Inc. e. BPB America, Inc.
   f. PABCO Gypsum g. Temple

2.2 STEEL FRAMING FOR WALLS AND PARTITIONS

A. General: Provide steel framing members complying with the following requirements:
1. Protective Coating: G40 hot-dip galvanized coating per ASTM A 525.
2. Maximum Deflection: L/120 at 5 lbf. per square foot.

B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- (5-mm-) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
1. Thickness: 25 guage (min.).
2. Depth: 3-5/8 inches (92.1 mm), unless otherwise indicated.
3. Depth: 6 inches (152.4 mm) where indicated.
4. Depth: 2-1/2 inches (63.5 mm) where indicated.
5. Depth: 1-1/2 inch (41.3 mm) where indicated.

C. Deflection Track: Manufacturer's standard top runner designed to prevent cracking of gypsum board applied to interior partitions resulting from deflection of the structure above fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M). Thickness as indicated for studs, and width to accommodate depth of studs

2.3 GYPSUM BOARD PRODUCTS

A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to- end butt joints in each area indicated to receive gypsum board application.
1. Gypsum Wallboard: ASTM C 36 and as follows:
2. Type: Regular for vertical surfaces, unless otherwise indicated.
3. Type: Sag-resistant type for ceiling surfaces.
4. Edges: Tapered.
5. Thickness: 5/8 inch (12.7 mm), unless otherwise indicated.

2.4 CEMENTITIOUS BACKER UNITS

A. Provide cementitious backer units complying with ANSI A118.9, of thickness and width indicated below, and in maximum lengths available to minimize end-to-end butt joints.
1. Thickness: 5/8 inch, unless noted otherwise.

B. Available Products: Subject to compliance with requirements, cementitious backer units that may be incorporated in the Work include, the following:
1. DUROCK Cement Board; United States Gypsum Co.
2. Util-a-crete; FinPan, Inc.
3. Wonderboard; Custom Building Products, Inc.

2.5 TRIM ACCESSORIES

A. Accessories for Interior Installation: Corner bead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
1. Material: Formed metal or plastic, with metal complying with the following requirement:
a. Steel sheet zinc coated by hot-dip process.
2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
a. Corner bead on outside corners, unless otherwise indicated.

b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
c. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

2.6 JOINT TREATMENT MATERIALS

A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

C. Joint Tape for Cementitious Backer Units: As recommended by cementitious backer unit manufacturer.

D. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
1. Ready-Mixed Formulation: Factory-mixed product.
2. All-purpose compound formulated for both taping and topping compounds.

E. Joint Compound for Cementitious Backer Units: Material recommended by cementitious backer unit manufacturer.

2.5 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

C. Steel drill screws of size and type recommended by unit manufacturer for fastening cementitious backer units.

D. Sound-Attenuation Blankets: Unfaced fiber glass blanket insulation

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLING STEEL FRAMING, GENERAL

A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with United States Gypsum

Co.'s "Gypsum Construction Handbook."

C. Do not bridge building control and expansion joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

3.3 GYPSUM PANEL INSTALLATION

A. Apply gypsum panels first to ceiling and then to walls. Position all edges of gypsum panels at framing members. Extend ceiling board to corners and make firm contact with wall angle, channel or top plate. To minimize end joints, use panels of maximum practical lengths. Fit ends and edges closely, but not forced together. Cut ends, edges, scribe or make cutouts within the field of panels in a workmanlike manner. Cut gypsum board to size using a knife and straight edge.

B. Attach Gypsum Panels to the suspension system main runners, cross tees and cross channels with conventional gypsum panel fasteners (No. 6 Type S HILO bugle head, self-drilling,self-taping steel screws) spaced 8" on center at periphery of gypsum panels and located 3/8" in from panel edges and spaced 12" o.c. in the field. Drive fasteners heads slightly below surface of gypsum panels in a uniform dimple without breaking face paper.

C. Install trim at all internal and external angles formed by the intersection of panel surfaces or other disimiliar materials. Apply corner bead to all vertical or horizontal external corners in accordance with manufacturer's directions.

D. Spacing of drywall grid is designed to support only the dead load. Heavy concentrated loads should be independently supported. Lighting fixtures or troffers, air vents and other equipment should be separately supported from the structure; Gypsum Panels will not support these items.

E. To prevent objectionable sag in new gypsum panel ceilings, the weight of overlaid unsupported insulation should not exceed 2.2 psf for 5/8" panels 24" on center.

F. Provide Control Joint No. 093 which has a 3/32" ground for drywall. Ceiling areas should not exceed 50 ft. (2500 sf) with a perimeter relief, 30 ft. (900 sf) without perimeter relief.

3.4 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS

A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
1. Where studs are installed directly against exterior walls, install asphalt felt strips or foam gaskets between studs and wall.

B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8 inch (3 mm) from the plane formed by the faces of adjacent framing.

C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
1. For STC-rated and fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.

D. Install steel studs and furring in sizes and at spacings indicated but not less than that required by the referenced steel framing installation standard to comply with maximum deflection and minimum loading requirements specified:

1. Single-Layer Construction: Space studs 16 inches (610 mm) o.c., unless otherwise indicated.
2. Cementitious Backer Unit Construction: Space studs 16 inches (406 mm) o.c., unless otherwise indicated.

E. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.

F. Frame door openings to comply with details indicated, with GA-219, and with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
1. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.

G. Frame openings other than door openings to comply with details indicated or, if none indicated, as required for door openings. Install framing below sills of openings to match framing required above door heads.

3.5 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

B. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

C. Install gypsum wall panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate both edge or end joints over supports. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

E. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

F. Attach gypsum panels to framing provided at openings and cutouts.

G. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

H. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.
1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

I. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U- bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

J. Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

K. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

L. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.6 GYPSUM BOARD APPLICATION METHODS

A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On ceilings apply gypsum panels horizontally (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
3. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless parallel application is required for fire-resistance-rated assemblies. Use maximum-length panels to minimize end joints.
a. Stagger abutting end joints not less than one framing member in alternate courses of board. b. At stairwells and other high walls, install panels horizontally.

B. Wall Tile Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, comply with the following:
1. Install cementitious backer units to comply with ANSI A108.11 at showers, tubs, and where indicated.
2. Install cementitious backer units to comply with ANSI A108.11 at locations indicated to receive wall tile.

C. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
1. Fasten with screws.

3.7 INSTALLING TRIM ACCESSORIES

A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B. Install cornerbead at external corners.

C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.
1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.

D. Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

3.8 FINISHING GYPSUM BOARD ASSEMBLIES

A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.

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

D. Apply joint tape over gypsum board joints and to flanges of trim accessories as recommended by trim accessory manufacturer.

E. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
1. Level 1 for 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.
2. Level 4 for gypsum board surfaces, unless otherwise indicated.

F. For Level 4 gypsum board finish, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects and ready for decoration. Use the following joint compound combination:
1. Embedding and First Coat: Ready-mixed, drying-type, all-purpose or taping compound.
2. Fill (Second) Coat: Ready-mixed, drying-type, all-purpose or topping compound.
3. Finish (Third) Coat: Ready-mixed, drying-type, all-purpose or topping compound. G.

Where Level 1 gypsum board finish is indicated, embed tape in joint compound.

H. Finish cementitious backer units to comply with unit manufacturer's directions.

3.9 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09 21 00

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Suspended metal grid ceiling system.
2. Acoustical panels.
3. Perimeter trim.

B. Related Documents: Additional requirements and information necessary to complete the Work of this Section may be found in other documents.

C. Related Sections:
1. Section 23 31 13 - Metal Ducts
2. Section 23 33 00 - Duct Accessories
3. Section 23 37 13 - Diffussers, Registers and Grilles.
4. Section 26 51 13 - Light Fixtures: Light fixtures attached to ceiling system.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C 635 - Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
2. ASTM C 636 - Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
3. ASTM E 84 Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E 580 - Specification for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.

1.3 SYSTEM DESCRIPTION

A. Design Requirements: Rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

1.4 SUBMITTALS

A. Submittal Procedures:
1. Product Data: Metal grid suspension system components, hold down clips and acoustical panel units. Provide data that indicates compliance with applicable ASTM testing requirements. Include flame- spread and smoke density data.
2. Samples: Two samples 6 inches x 6 inches illustrating each panel type, pattern and color and two 8” long samples of the metal grid. Provide 2 samples of hold down clips.
3. Assurance/Control Submittals:
a. Qualification Documentation: Acoustical ceiling installer documentation of experience indicating compliance with specified qualification requirements.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of this Section with minimum 5 years documented experience.

B. Regulatory Requirements: Surface Burning Characteristics in Accordance with ASTM E 84 for Class III or C finish:
1. Flame Spread: Less than 200.
2. Smoke Density: Less than 450.

1.6 DELIVERY, STORAGE AND HANDLING

A. Product Requirements: Transport, handle, store, and protect products.

B. Deliver acoustical units in manufacturer's original unopened containers with brand name and type clearly marked.

C. Store under cover in dry, watertight conditions.

D. Prior to installation, store acoustical units for 24 hours minimum at same temperature and relative humidity as space where Work will be installed.

1.7 PROJECT CONDITIONS

A. Jobsite Requirements: Maintain uniform temperature range of 60-85 degrees F, and humidity of no more than 70 percent relative humidity prior to, during, and after installation.

1.8 MAINTENANCE

A. Extra Materials: Provide 1 box of extra acoustical panels for each panel type, pattern, and color to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Suspension System: Subject to compliance with project requirements, manufacturers offering specified items which may be incorporated in the Work include the following:
1. Armstrong World Industries Incorporated, Lancaster, PA (800) 448-1405.
2. Celotex Building Products Division, Tampa, FL (800) 523-4684.
3. USG Interiors, Chicago, IL (800) 950-3839.

B. Acoustical Panels: Subject to compliance with project requirements, manufacturers offering specified items which may be incorporated in the Work include the following:
1. Armstrong World Industries Incorporated, Lancaster, PA (800) 448-1405.
2. Celotex Building Products Division, Tampa, FL (800) 523-4684.
3. USG Interiors, Chicago, IL (800) 950-3839

C. Product Requirements: Product options and substitutions. Substitutions: Permitted.

2.2 CEILING SYSTEMS

A. Acoustical Panels:

1. USG Interiors, Inc: ClimaPlus, Orion 210 Lay-in, Square Edge Size: 24" x 24" x 1/2"
Color: White
Gypsum substrate with washable vinyl surface.
Provide Armstrong Retention Clips where hold down clips are indicated.

B. Suspension System:

1. USG Interiors, Inc: DONN ZXLA W/VACT
Grid: ASTM C635, intermediate duty galvanized grid system with aluminum cap.
Nominal Width: 15/16" width, provide hold down clips where indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
1. Verify that layout of hangers will not interfere with other Work.

B. Report in writing the Architect prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.

C. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the Owner.

3.2 INSTALLATION - SUSPENSION SYSTEM

A. Install system in accordance with ASTM C 636 [ASTM E 580] and manufacturer's published instructions.

B. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.

C. Locate system on room axis according to Reflected Ceiling Plan, where indicated on Drawings, or locate system to a balanced grid design with edge units no less than 50 percent of acoustical panel size where Reflected Ceiling Plan not shown on Drawings

D. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Do not eccentrically load system, or produce rotation of runners.

E. Install edge molding at intersection of ceiling and vertical surfaces using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. Secure at 16 inches (41 cm) on center.

F. Install four (4) hold-down clips per tile within five feet of exterior doors and throughout the Apparatus Bay.

G. Rivet cross tees at 4 feet on center to edge mould.

H. Install compression struts and secure system with tie wires as indicated on Drawings.
1. Provide hanger wires, splayed 45 degrees, within 3 inches of intersection between main runner and cross runner.
2. Provide compression strut and splayed hanger wires as follows:
a. One assembly for each light fixture. b.
Located within 6 feet of wall.
c. Located at maximum 12 feet on center or as indicated on Drawings.

3.3 INSTALLATION - ACOUSTICAL PANELS

A. Fit acoustic units in place free from damaged edges or other defects. Install acoustic units level, in uniform plane, and free from twist, warp, and dents.

3.4 CONSTRUCTION

A. Interface with Other Work:
1. Do not install acoustical ceiling tiles until building is enclosed, heating is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
2. Schedule installation of acoustic units after interior wet work is completed.
3. Install after major above ceiling work is complete.
4. Coordinate location of hangers with other Work.

B. Site Tolerances:
1. Variation from Flat and Level Surface: 1/8 inch in 12 feet.

3.5 FIELD QUALITY CONTROL

A. Inspect acoustical panel placement, ceiling grid suspension system installation and connection to structure.

3.6 SITE ENVIRONMENTAL PROCEDURES A.

Indoor Air Quality:
1. Temporary ventilation: Ventilate products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degree F maximum continuously for minimum 72 hours.

3.7 CLEANING

A. Clean exposed surfaces of acoustical ceilings including trim, edge mouldings, and suspension system members.

END OF SECTION 09 51 00

SECTION 09 65 13

RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Wall base.
2. Molding accessories.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated including resilient wall base, accessories and glue. B.

Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.4 PROJECT CONDITIONS

A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg, in spaces to receive resilient wall base and accessories during the following time periods:
1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

1.5 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the

Work include products listed in other Part 2 articles.

2.2 COLORS AND PATTERNS

A. Colors and Patterns: As indicated by manufacturer's designations. B.

Design Basis: Johnsonite Wall Base, color as selected.

2.3 RESILIENT WALL BASE

A. Wall Base: ASTM F 1861.
1. Armstrong World Industries, Inc.
2. Azrock Commercial Flooring, DOMCO.
3. Burke Mercer Flooring Products.
4. Johnsonite.
5. Marley Flexco (USA), Inc.
6. Roppe Corporation.
7. VPI, LLC, Floor Products Division. B.

Type (Material Requirement): TV (vinyl).

C. Group (Manufacturing Method): I (solid, homogeneous) or II (layered). D.

Style: Cove (with top-set toe).

E. Minimum Thickness: 0.125 inch. F.

Height: 4 inches.

G. Lengths: Coils in manufacturer's standard length. H.

Outside Corners: Premolded.

I. Inside Corners: Jon formed. J.

Surface: Smooth.

2.4 RESILIENT MOLDING ACCESSORY

A. Description: Joiner for tile and carpet.
1. Burke Mercer Flooring Products.
2. Johnsonite.
3. Marley Flexco (USA), Inc.
4. Roppe Corporation. B.

Material: Vinyl.

C. Profile and Dimensions: As indicated.

2.5 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended

hydraulic cement based formulation provided or approved by resilient product manufacturers for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
1. Coved Base Adhesives
2. Rubber Floor Adhesives

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.

B. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

C. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

D. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

1. Do not install resilient products until they are the same temperature as the space where they are to be installed.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 RESILIENT WALL BASE INSTALLATION

A. Apply wall base to walls, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

D. Do not stretch wall base during installation.

E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.

F. Premolded Corners: Install premolded corners before installing straight pieces. G.

Job-Formed Corners:

1. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing resilient product installation:
1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.
a. Do not wash surfaces until after time period recommended by manufacturer.

B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

END OF SECTION 09 65 13

SECTION 09 65 19

RESILIENT TILE FLOORING

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes: Heavy duty quartz tile flooring.

B. Conform with requirements of all Sections of Division 1, General Requirements, as it applies to the work of this Section.

1.2 RELATED SECTIONS

A. Section(s) related to this Section include:
1. Concrete: Division III.
2. Wood & Plastics: Division VI.
3. Thermal & Moisture Protection: Division VII.
4. Mechanical: Division XXIII.

1.3 REFERENCES

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

B. American Society for Testing & Materials (ASTM):
1. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
2. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
3. ASTM E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
4. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
5. ASTM F970 Standard Test Method for Static Load Limit.
6. ASTM F1482 Standard Guide to Wood Underlayment Products Available for Use under Resilient Flooring.
7. ASTM F1066 Standard Specification for Vinyl Composition Floor Tile.
8. ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
9. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

C. Resilient Floor Covering Institute (RFCI)
1. RFCI Standard Slab Moisture Test Method (Calcium Chloride Method).

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: Provide heavy duty quartz tile flooring which has been manufactured and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit product data, including manufacturer's information, for specified products. C. Shop Drawings:

Submit shop drawings showing layout, profiles and product components, including drain details, accessories, finish colors, patterns, and textures.

D. Samples: Submit selection and verification samples for finishes, colors and textures. E. Quality Assurance

Submittals: Submit the following:

1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
2. Manufacturer's Instructions: Current published manufacturer's installation and maintenance instructions.
3. Manufacturer's Field Reports: Manufacturer's field reports specified herein.

F. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
2. Warranty: Warranty documents specified herein.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Experienced in performing work of this section and who is specialized in the installation of work similar to that required for this project. Installation of UPOFLOOR Quartz Tile should follow the instructions detailed in the UPOFLOOR Quartz Tile Installation Guide.

1. Training: Installer who has attended an UPOFLOOR installation training clinic.

B. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.7 DELIVERY, STORAGE, & HANDLING

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

B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.

1.8 PROJECT CONDITIONS

A. Temperature Requirements: If storage temperature is below 68F (20C), move the UPOFLOOR Quartz Tile to a warmer place and allow to reach this temperature before installation. Maintain temperature of installation area between 68F (20C) and 80F (26C) for a period of at least 72 hours prior to, during, and after completion of the installation for acrylic adhesives (12 hours after completion for polyurethane adhesives).

1.9 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
1. Warranty Period: Fifteen (15) years commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 QUARTZ TILE

A. Manufacturer: UPOFLOOR
P.O. Box 8 37101 Nokia, Finland Tel. +358 207 409 600 Fax +358 207 409 736

B. Proprietary Product(s)/System(s): UPOFLOOR Quartz Tile:
1. UPOFLOOR Quartz Tile is a homogeneous combination of high quality calcium carbonate, and fine and naturally weathered quartz. UPOFLOOR Quartz Tile meets the requirements of ASTM F1066, Class l, Type A.
2. MOSAIC COLLECTION: 24" X 24" / 12" X 12"
a. CD 9302: Thickness: 0.08" (2 mm); Width: 24" (61 cm) x 24" (61 cm) or 12" (30 cm) x 12" (30 cm)
b. Weight: 0.82 lbs/Sq. ft. (4.0 kg/m2) Area per box 24" 24": 48 Sq. ft. (4.46 m2) Area per box 12" x 12": 58.13 Sq. ft. (5.4 m2)
c. CD 9301: Thickness: 0.08" (2 mm); Width: 24" (61 cm) x 24" (61 cm) or 12" (30 cm) x 12" (30 cm)
d. Weight: 0.82 lbs/Sq. ft. (4.0 kg/m2) Area per box 24" x 24": 48 Sq. ft. (4.46 m2) Area per box 12" x 12": 58.13 Sq. ft. (5.4 m2)

C. Proprietary Accessory Products: Provide UPOFLOOR accessories for use with UPOFLOOR Quartz Tile:
1. Acrylic Adhesive: For dry areas with no spillage, use UPOFLOOR 5900, a one-part, water-based, acrylic adhesive as recommended by manufacturer.
2. Approved alternate adhesive: Schonox EMI Classic or XLBrands XL Stix 2230

D. Proprietary Product(s) Standard and Testing:
1. Product Standard: Tested in accordance with ASTM F1066 for minimum product standards.
2. Fire Resistance: Flammability exceed minimum for Class 1 rating per ASTM E648.
3. Smoke Density: Less than 450 when tested in accordance with ASTM E662.
4. Chemical Resistance: UPOFLOOR Quartz Tile is virtually unaffected by surface water and most

chemicals which do not have a solvent action on vinyl. Certain chemicals can cause staining, and acids and dyes can affect the color, which should be selected accordingly.

5. Flexibility: UPOFLOOR Quartz Tile meet flexibility requirements of ASTM F1066.
6. Indentation Resistance: UPOFLOOR Quartz Tile meets indentation resistance requirements of ASTM F1066.
7. Slip Resistance: UPOFLOOR Quartz Tile meets and exceeds current published slip resistance requirements of OSHA. Tests were performed in accordance with ASTM D2047 for dry conditions.
8. Static Load Limit: UPOFLOOR Quartz Tile has been tested to 3500 psi (12410 Kpa) in accordance with ASTM F970.
9. Light Resistance: UPOFLOOR Quartz Tile meets light resistance requirements of ASTM F1066.
10. Color Selection: Select color with expected traffic conditions and usage in mind.

2.2 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted.

2.3 SOURCE QUALITY

A. Source Quality: Obtain flooring products from a single manufacturer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions and product label instructions for installation.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

3.3 PREPARATION

A. Quartz Tile flooring shall be installed over subfloors conforming to ASTM F710 for concrete and other monolithic floors.

B. Moisture Testing: Moisture emissions from concrete subfloors must not exceed 5 lbs per 1000sf per 24 hours (2.25 kg H2O/24 hr/93 m2) via the Calcium Chloride Test Method (ASTM F1869) and not to exceed 85% internal concrete relative humidity as tested in accordance with ASTM F2170-02. If subfloor moisture exceeds the allowable maximum for installing UPOFLOOR Quartz Tile, please call your local UPOFLOOR distributor for advice.

C. Wood subfloors shall not exceed 10% moisture content when measured with a Delmhorst Wood Moisture Tester.

D. The pH level of the subfloor surface shall not be higher than 9.9. If higher, subfloor must be neutralized.

E. Underlayment and Patching Compounds: Use only Schonox SL cement based, rapid drying, smoothing compound. Use to provide a smooth finish on various substrates - filling cracks, holes, leveling. Schonox SL can be used to create a true featheredge.

F. For leveling of monolithic subfloors, use only Schonox ZM cement based, self-leveling compound and follow manufacturer instructions. Schonox ZM can be installed up to 1".

G. If self-leveling is required, prime substrate with Schonox VD - universal acrylic primer. Schonox VD is for use prior to applying SCHÖNOX underlayments on porous and non-porous substrates.

3.4 INSTALLATION

A. Quartz Tile Installation: Install UPOFLOOR Quartz Tile in accordance with the current published UPOFLOOR Installation Guide. Failure to install UPOFLOOR Quartz Tile in accordance with recommended procedures will void the UPOFLOOR Limited Product Warranty.

3.5 FIELD QUALITY REQUIREMENTS

A. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.6 CLEANING

A. Specifier Note: UPOFLOOR Quartz Tile is virtually unaffected by surface water and most chemicals which do not have a solvent action on vinyl. Certain organic solvents and chemicals can cause staining, and acids and dyes can affect the color, which should be selected accordingly. Contact manufacturer for a detailed list of the effect of chemicals on UPOFLOOR safety flooring.

B. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

3.7 PROTECTION

A. Protection:

1. Protect the newly installed flooring from foot traffic for 24 hours and heavy rolling traffic for 72 hours.
2. Protect installed product and finish surfaces from damage during construction.

B. Cover and protect finished installation from damage that may be caused by other trades using a plywood or non-staining temporary floor protection system, such as textured plastic sheeting.

END OF SECTION 09 65 19

SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and field painting of the following:
1. Exposed interior and exterior items and surfaces.
2. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1.2 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
1. Flat refers to a lusterless or matte finish with a gloss range between 0 and 5 when measured at a 60- degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60- degree meter.
3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60- degree meter.
4. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
5. Full gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60- degree meter.

1.3 SUBMITTALS

A. Product Data: For each paint system specified. Include block fillers and primers.
1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.
3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated including stains, paints/colors and waterproofing materials.
1. After color selection, the Architect will furnish color chips for surfaces to be coated.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in- service performance.

B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 PROJECT CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 deg F (7.2 and 35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.7 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to the Owner.

1. Quantity: Furnish the Owner with an additional 5 percent, but not less than 1 gal. (3.785 L) or 1 case, as appropriate, of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include products listed in the paint schedules and those by approved manufacturers.

B. Products: Subject to compliance with requirements, provide one of the products in the paint schedules.

C. Manufacturers Names: The following are approved manufacturers referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:

1. ICI Dulux (Dulux).
2. Benjamin Moore & Co. (Moore).
3. Sherwin-Williams Co. (S-W).

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat 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.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of other approved manufacturers.

C. Colors: See finish schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral- fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of

surface preparation.

a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.

c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.

c. When transparent finish is required, backprime with spar varnish.

d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.

e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

4. 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 the Steel Structures Painting Council's (SSPC) recommendations.

a. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of SSPC-SP 10.

b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

c. 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 the same primer as the shop coat.

5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

F. Masonry Sealing: Provide spray applied water repellant to alleviate block and exposed Apparatus Bay block by Grace Construction Products, Intinseal DB or approved substitute. Install per manufacturers instructions. Ensure that all cleaners, dirt, dust and loose particles of block and mortar are removed.

3.3 APPLICATION

A General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
2. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
4. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
5. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
6. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
7. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer on metal surfaces that have been shop primed and touchup painted.

until paint film is of uniform finish, color, and appearance. Give special attention to ensure 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, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.
2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and in occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Mechanical ductwork supports.

G. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

H. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the

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.

I. 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.

J. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
1. Provide satin finish for final coats.

K. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

work not complying with requirements.

3.4 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.6 EXTERIOR PAINT SCHEDULE

A. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Prime any damage on shop-primed items.
1. Semigloss, Acrylic-Enamel Finish: One Waterborne Acrylic Low VOC Primer & Two Finish Coats.
a. Primer:
1) Dulux: 4020 Devflex Waterborne Acrylic Direct to Metal Primer. b.
First and Second Coat:
1) Dulux: 4206 Deflex Waterborne Acrylic Semi-Gloss Enamel

B. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:
1. Semigloss, Acrylic-Enamel Finish: One Waterborne Acrylic Low VOC Primer Coat & Two Waterborne Acrylic Finish Coats. a. Primer:
1) Dulux: 4020 Devflex Waterborne Acrylic Direct to Metal Primer
b. First and Second Coats:

1) Dulux: 4206 Deflex Waterborne Acrylic Semi-Gloss Enamel

C. Concrete Masonry Units (CMU): Provide the following finish systems over exterior CMU surfaces and interior exposed block not scheduled for paint:

1. Product Name:

a. Infiniseal DB Water Repellant sealer for Dry-Block Admixture Wall systems. b. Sure Klean® Weather Seal Siloxane PD (predilute)

2. Manufacturers:

a. Grace Construction Products, 62 Whittemore Ave. Cambridge, MA 02140, (877) 423-6491, Fax (877) 423-6492. www.graceconstruction.com. or approved substitute.

b. PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046. Phone: (800) 255-4255; Fax: (785) 830-9797. E-mail: CustomerCare@prosoco.com

3. Infiniseal DB Sealer is then either sprayed, oiled or brush applied to the outside surface of the walls, further enhancing the water repellency of the overall system.

4. Technical Data:

a. Applicable Standards – ASTM International

1) ASTM D3278 Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus.

2) ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.

3) ASTM E514 Standard Test Method for Water Penetration and Leakage Through Masonry.

5. Installation:

a. Surface Preparation: The surface to be treated must be clean and dry, free of chemical cleaners, efflorescence, dirts, oils, mortar smears and other surface contaminants. Any loose, cracked or disintegrated mortar must be re-pointed at least 7 days prior to the application of sealer. Joint sealant and caulking work should be completed at least 6 hours or longer (depending on surface cure timing) prior to application of block sealer.

3.7 PAINT SCHEDULE

A. Concrete Masonry Units (CMU): Provide the following finish systems over interior CMU surfaces scheduled to be painted:

1. Semi-gloss Finish: One coat of interior block filler, two coats of acrylic enamel. a. Filler:

1) Dulux: 3010 Ultra-Hide Interior Vinyl/Acrylic Block Filler

b. First and Second Coat:

1) Dulux: 216 HP DEVFLEX High Performance Waterbourne Acrylic Semi-gloss Enamel.

3.8 QUALITY ASSURANCE

A. Include on label of container, manufacturer's name, type of material, catalog number, color and instructions for reducing where applicable.

B. Volatile Organic Compounds (VOC). The paints specified herein have a VOC not exceeding 3.5 pounds of volatile organic compounds for each gallon of paint product, according to the manufacturer's published literature.

1. The VOC emission level permitted in different localities is dependent on the federal, state and local regulations legislated for that particular locality.

2. The painting contractor shall notify the architect if lower VOC limits, than those of the paints specified, are required in the locality where the painting work will be done.
3. If lower VOC levels are required the painting contractor shall submit, with this proposal a list of alternate materials which he proposes to use, and which do comply with the VOC emission limits.
4. Alternate materials proposed shall be of the same generic types as specified materials and shall be, as much as possible, the products of one manufacturer.
5. Alternate materials proposed for any single paint system must be the products of one manufacturer. Complete manufacturer's data, including VOC, shall be submitted for each alternate material proposed.

END OF SECTION 09 91 00

SECTION 23 81 26

MINI-SPLIT AIR-CONDITIONING UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. This Section includes split-system air-conditioning and heat pump units consisting of separate evaporator- fan and compressor-condenser components. Units are designed for exposed or concealed mounting, and may be connected to ducts.

1.3 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

B. Shop Drawings: Diagram power, signal, and control wiring.

C. Samples for Initial Selection: For units with factory-applied color finishes. D.

Field quality-control test reports.

E. Operation and Maintenance Data: For split-system air-conditioning units to include in emergency, operation, and maintenance manuals.

F. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of split-system units and are based on the specific system indicated.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Energy-Efficiency Ratio: Equal to or greater than prescribed by ASHRAE 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings."

D. Coefficient of Performance: Equal to or greater than prescribed by ASHRAE 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings."

E. Units shall be designed to operate with HCFC-free refrigerants.

1.5 COORDINATION

A. Coordinate size, location, and connection details with roof curbs, equipment supports, and roof penetrations.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Carrier Air Conditioning; Div. of Carrier Corporation.
2. Mitsubishi Electronics America, Inc.; HVAC Division.
3. Sanyo Fisher (U.S.A.) Corp..
4. Daikin
5. LG

2.2 WALL-MOUNTING, EVAPORATOR-FAN COMPONENTS

A. Cabinet: Enameled steel with removable panels on front and ends in color selected by Architect, and discharge drain pans with drain connection.

B. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with thermal-expansion valve.

C. Fan: Direct drive, centrifugal fan.

D. Fan Motors: Comply with requirements in Division 15 Section "Motors."

1. Special Motor Features: Multitapped, multispeed with internal thermal protection and permanent lubrication.

E. Filters: Permanent, cleanable.

2.3 AIR-COOLED, COMPRESSOR-CONDENSER COMPONENTS

A. Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage

ports on exterior of casing.

B. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.

1. Compressor Type: Reciprocating or Scroll.
2. Compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
3. Refrigerant Charge: R-410A.

C. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with ARI 210/240, and with liquid subcooler.

D. Heat Pump Components: Reversing valve and low-temperature air cut-off thermostat. E.

Fan: Aluminum-propeller type, directly connected to motor.

F. Motor: Permanently lubricated, with integral thermal-overload protection. G.

Low Ambient Kit: Permits operation down to 45 deg F (7 deg C).

H. Mounting Base: Polyethylene.

2.4 ACCESSORIES

A. Thermostat: Low voltage with subbase to control compressor and evaporator fan.

B. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:

1. Compressor time delay.
2. 24-hour time control of system stop and start.
3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
4. Fan-speed selection, including auto setting.

C. Automatic-reset timer to prevent rapid cycling of compressor.

D. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install compressor-condenser components on equipment supports. Anchor units to supports with

removable, cadmium-plated fasteners.

D. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Install piping adjacent to unit to allow service and maintenance.

B. Ground equipment.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 23 81 26

SECTION 26 00 00

ELECTRICAL GENERAL REQUIREMENTS

PART1-GENERAL

1.1 SCOPE

A. General Conditions of the Contract, Special Conditions and Instructions to Bidders contained herein are a part of these specifications.

B. This Contractor shall furnish all labor, materials and equipment and perform all operations necessary for installation of complete electrical work within the intent of, and as indicated on, the Drawings and as herein specified.

1.2 CONTRACTDOCUMENTS

A. The contract drawings are diagrammatic and are not intended to indicate every detail of construction, or every item of material or equipment required.

B. Contractor shall maintain on the job site one complete set of contract documents of all trades, and shall coordinate with other trades so as to avoid conflicts.

C. Indicated locations of outlets, equipment connections, etc. are approximate and shall be verified by reference to related documents (i.e., Architectural casework drawings, equipment shop drawings, etc.).

1.3 RECORDDRAWINGS

A. During construction of this project, contractor shall maintain one complete set of electrical contract drawings, on which shall be recorded all significant changes in equipment locations, circuit assignments, etc. This set of drawings shall be used to prepare as-built drawings to be submitted to Owner upon completion.

B. Upon completion of the project, contractor shall prepare operation and maintenance manuals for all electrical equipment, which shall include shop drawings, catalog data, equipment information, detailed maintenance instruction, wiring diagrams, warranty information, etc. for the electrical installation. Sub- mit three copies to the Architect/Engineer for approval and presentation to the Owner.

1.4 REGULATIONSANDCOMPLIANCE

A. Latest editions of National Electrical Code, state codes or ordinances govern this work. All their requirements shall be satisfied.

B. This Contractor shall secure and pay for all permits, fees, inspections and licenses required (see Article 10 of the General Conditions). Upon completion of job, he shall present to the Architect/Engineer a certificate of inspection and approval from inspection authorities.

1.5 UTILITY COORDINATION

A. This Contractor shall verify with the serving electric, telephone and cable TV utilities all respective utility requirements for the provision of service for this project. All fees, materials and labor required for service installations shall

be included in the bid.

B. Should utility requirements vary greatly from those shown on the drawings, the contractor shall notify the Architect/Engineer of those requirements prior to bid. Additional costs associated with utility services shall not be grounds for change order without pre-bid notification or bid clarification.

1.6 TEST AND GUARANTEE

A. Upon completion of work, contractor shall demonstrate installation and make such test as may be required to satisfy the Architect/Engineer and Owner that work is installed in accordance with drawings, specifications and instructions.

B. Contractor shall guarantee the work done in accordance with drawings and specifications, and to be free of imperfect materials and defective workmanship. Anything unsatisfactory shall be corrected immediately and at contractor's expense.

C. For a period of one year after acceptance, contractor shall replace, without any expense to the Owner, any imperfect materials or defective workmanship.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials shall be new, with required Underwriter's Laboratories label, and manufacturer's label or nameplate giving complete electrical data.

B. Where a manufacturer's catalog number is used, all parts shall be furnished to make it complete and fit the construction intended.

2.2 SUBMITTALS, ETC.

A. Within twenty days after award of contract, contractor shall submit to Architect/Engineer a complete list in triplicate of ALL materials he proposes to use. List shall show a single manufacturer for each item. List shall include not only major materials and equipment, but also such items as conduit fittings, bushings, ground clamps, anchors, outlet boxes, gutters, terminal cabinets, splice connections, fuses, etc.

B. Materials shall be provided by manufacturer and catalog number given in these specifications or shown on drawings or approved equal. If contractor wishes to furnish another make or number, he shall furnish complete, detailed data and obtain approval of it in writing from the Architect/ Engineer.

C. Submit cuts of fixtures, shop drawings on panels, and any other descriptive materials requested, in six copies.

D. Completely adequate housing shall be provided on the site for orderly and careful storage of all materials and equipment.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Required excavation and backfill for installation of all electrical work shall be provided by the Electrical Contractor.

3.2 CUTTING, PATCHING, ETC.

A. Contractor shall place his own sleeves and advise other trades of required chases and openings so they can be properly built-in. Where any raceways, supports, etc. installed under this contract pierce the roof, suitable pitch pockets shall be provided and coordinated with the roofing contractor as necessary to maintain roof warranty and to be acceptable to the Architect. Provide suitable fittings where any raceways or equipment cross expansion joint. Expansion fittings shall be complete with grounding type bond fittings.

B. Permitted cutting or patching necessary to the electrical installation shall be done by this contractor. Structural members shall not be cut except by written permission of Architect/Engineer.

3.3 CLEANING, ETC.

A. Contractor shall properly protect his work against damage by weather or other trades. All work shall be left well cleaned, and damaged finishes shall be restored to original condition.

B. Contractor shall keep premises free of debris resulting from his work.

3.4 PAINTING, FINISHING

A. Suitable finishes shall be provided on all items of electrical equipment, conduit, etc. which are exposed. This shall consist of either an acceptable finish as manufactured and supplied to the job or application of suitable finishes after installation.

B. Where installed in finished areas, exposed equipment, raceways, etc. (eg. panel covers, wiremold, etc.) shall be supplied with prime coat, and shall be professionally painted or enameled as directed to match or blend with adjacent surfaces.

C. In unfinished areas, such as equipment rooms, etc., exposed equipment shall be furnished with suitable factory applied finishes. (i.e., standard gray enamel finish for panelboards, etc.).

D. Equipment furnished in finishes such as stainless steel, brushed aluminum, etc. shall not be painted. E.

All finishing shall be as directed by and shall be satisfactory to the Architect/Engineer.

3.5 EQUIPMENT LABELS

A. Suitable labels shall be provided for the identification of major items of electrical equipment including switchboards, panelboards, motor starters, safety switches, enclosed circuit breakers, etc.

B. Labels shall be of engraved plastic laminate, not less than 1/16" thick, with black letters on white field.

C. Engraving shall be of professional quality, with block style letters, minimum 1/4" high.

D. Nameplates shall be attached with 2 cadmium plated screws. Nameplates shall under no conditions be at- tached with epoxy glue or double stick tape.

E. All conduit penetrations of fire-rated assemblies shall be protected by a UL approved penetration system.

This Contractor shall field verify all required locations.

END OF SECTION 26 00 00

SECTION 26 05 19

CONDUCTORS

PART 1 - GENERAL

1.1 SCOPE

A. Furnish and install a complete system of wiring and cable as shown, specified and required.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conductors shall be as manufactured by Phelps Dodge, Anaconda, Triangle, Southwire, or approved equivalent.

B. Normal trade standard "Building Wire", copper, types THHN for dry locations, THWN for wet locations. Feeders rated greater than 150 amperes may utilize compact aluminum conductors, XHHW or XHHW-Z insulation equivalent to Alcan Stabiloy 8000 series. All wire to be used shall be new manufactured within the last 6 months.

C. Conductors #10 AWG and smaller shall be solid. #8 AWG and larger shall be stranded.

D. Each conductor shall bear easily readable markings along entire length, indicating size and insulation type. Dates of manufacturer shall be submitted to Architect/Engineer upon request.

E. Insulation on conductors #8 AWG and smaller shall be suitably colored in manufacturing.

F. Insulation on service and feeder conductors shall be 600 volt type THW, or THWN, unless code requires a different type.

G. Branch circuit conductors shall be minimum #12 AWG, with 600 volt type THWN insulation, unless code requires a different type.

H. Conductors in any location subject to abnormal temperature shall be furnished with an insulation type suitable for temperature encountered.

I. Where no indication is made of wire size (including that noted in panel schedules), the conductor shall be of N.E.C. size to match its overcurrent protective device, but in no case smaller than #12 AWG unless specifically called for.

J. Control and signal conductors shall be type and size indicated in those sections of the specifications.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Joints in conductors #10 AWG and smaller shall be made with approved twist-on type connectors as manufactured by T & B, Ideal, or approved equivalent.

B. Joints in conductors #8 AWG and larger shall be made with mechanical pressure type connectors or lugs. C.

Circuit joints may not be made up on terminal screws of wiring devices. Make circuit joints as above, and connect single leads to device terminals.

D. Conductors shall be labeled within all junction boxes, etc. using plastic "punch" tape, identifying the conductors according to panel and circuit numbers.

E. Where connected under screw or bolt heads, stranded wire shall be fitted with a lug of proper size. Make solid conductor loops clockwise so as to be forced closed as screw is tightened. Only one solid wire loop may be held under a single screw.

F. Make all connections tight. Torque-tighten all connections to lugs per manufacturer's and UL requirements. G.

Wires within panelboards, terminal cabinets, and similar equipment shall be neatly squared and "bunched" together and held so with plastic ties at several places.

H. Where paralleling of conductors is shown for feeders or service entrance, it is absolutely required they be exactly the same length between points of bonding together.

I. Where aluminum feeders are used, conductors shall be terminated with crimp compression type connectors.

3.2 COLOR CODING

A. All wiring shall be color coded.

B. On 120/208V, 3 phase, 4 wire power systems, conductors shall be color coded black (Phase A), red (Phase B), blue (Phase C), and white (Neutral).

C. Ground conductors on all systems shall be green. Isolated grounds shall be color coded green with yellow stripe.

D. Conductors #8 AWG and larger may be identified with two or more bands of proper color plastic tape applied near each termination. Painting of wire will not be acceptable.

E. Unless noted otherwise, or another arrangement is approved by the Engineer, busses in panels and switch gear shall be considered "A", "B", and "C" from left to right, top to bottom or front to back when facing equipment.

F. Control and signal wiring shall not use the above named colors except green for grounding. Any other colors or striping may be used but the coding shall provide same color or striping between any two terminals being joined.

G. "Travelers" in switching circuits shall be of same color as phase conductors serving the circuits.

3.3 WIRING METHOD FOR BRANCH CIRCUITS

A. Unless shown differently, single-phase circuiting shall be limited to one neutral per raceway (a maximum of three different phase wires but with a single neutral in any case). Three-phase circuits shall be limited to one circuit per raceway (three different phase wires and a neutral if needed).

B. In "3 wire" and "4 wire" branch circuits, a neutral shall not serve more than one circuit tied to the same phase.

The neutral carrying all or any part of the current of any specific load or run shall be contained in the same raceway or enclosure with the phase wire or wires also carrying that current. No split neutrals permitted.

C. Circuits shall be connected to panels as shown in the panel schedules.

D. Under the above requirements and with required color coding system, no feeder or branch circuit raceway will contain more than one wire of the same color, except for switch legs and control circuits.

END OF SECTION 26 05 19

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. Grounding and bonding of the electrical system shall be provided in accordance with requirements of the National Electrical Code, and the requirements of these specifications and the drawings.

B. Contractor shall note that not all required grounding conductors are specifically noted on the drawings or in the schedules or specifications.

C. All feeders and branch circuits shall be provided with grounding conductors separate from the conduit system.

PART 2 - PRODUCTS

2.1 GROUNDING CLAMPS, BUSHINGS, ETC.

A. Materials shall be as manufactured by T & B or approved equivalent.

B. Clamps for attachment of grounding conductors to water pipes, etc. shall be of bronze or brass, with conduit hub with insulated bonding bushings and compression type lugs.

2.2 GROUNDING CONDUCTORS

A. Grounding conductors shall be sized in accordance with the requirements of the NEC, or as noted on the drawings or specified herein.

B. Grounding conductors shall be of copper. Insulation as required by NEC or as noted or specified.

2.3 MADE ELECTRODES

A. Provide "made" grounding electrodes in accordance with NEC Article 250 and as detailed on the drawings.

B. Driven grounding electrodes shall consist of copper clad steel rods not less than 10 feet in length and 3/4 inches in diameter.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. All systems and equipment shall be grounded in accordance with NEC Article 250.

B. All grounding conductors shall be contained within raceway, unless specifically noted otherwise.

3.2 SERVICE GROUNDING

A. Where available on the premises, bond together the following:
1. Metal water pipe.
2. Concrete encased electrode
3. Driven ground rod(s).

B. Where required by NEC Article 250, and as shown on drawings, provide "made" grounding electrodes to supplement the above. Bond together all available and made electrodes.

C. Service ground clamp shall be attached to cold water main at an accessible point and before its size is reduced. Clamp shall be accessible after construction is complete. Grounding conductor shall be without splice into the service enclosure where it shall be connected to the main service ground buss, and interconnected with system neutral.

3.3 EQUIPMENT GROUNDING, ETC.

A. Ground all fixed and portable appliances and equipment connected under this contract with a green grounding conductor, or metal conduit. The ground wire shall be carried inside the raceway or flex from equipment to ground bus in the panel. Connect at both ends with suitable lugs.

B. Each grounding type receptacle shall have a green ground wire from its grounding terminal to the ground bus in the panel, or to the nearest grounding portion of the raceway system. Ground wire shall be sized by NEC with #12 AWG minimum.

C. Any feeder raceway anywhere in the system which enters a box or cabinet through part of a concentric knockout shall be fitted with a bonding bushing and jumper. The jumper shall be sized by NEC Table 250-122 and be lugged to the box.

END OF SECTION 26 05 26

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. Full and proper support shall be provided for all items of electrical equipment, raceway, etc.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials used shall be good quality, made of steel or of other non-corroding material.

B. Inserts in masonry shall be lead, plastic, or fiber type, installed in drilled holes. Lead only shall be used for exterior locations or for interior locations subject to moisture.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All equipment and flat raceways attached to outside walls or interior walls subject to permanent moisture shall be shimmed out with non-corrodible material so as to provide 1/4" air space between wall and equipment or raceway.

B. All materials, whether exposed or concealed, shall be firmly and adequately held in place. Fastening and support shall afford safety factor of three or higher.

C. All fixtures, raceways, equipment shall be supported from the structure. Nothing may be supported on suspended ceilings or ceiling hangar wires unless definitely noted otherwise on the Drawings or specifically permitted by the Architect/ Engineer.

D. Fixtures shall be supported with (minimum) 10 gauge steel wire, (independent of ceiling support wires) or with threaded steel rods, adjusted as necessary to level fixture. For troffer fixtures, use minimum of two supports for each opposite corner. Use one support for downlights and exit signs. See architectural ceiling plans for rated ceiling system fixture support requirements.

E. Where installed recessed in grid type ceilings, attach each fixture to grid with minimum of two "earthquake clips" or other approved method. This requirement is in addition to dedicated support as described in "D" above.

END OF SECTION 26 05 29

SECTION 26 05 33

RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.1 SCOPE

A. Provide a complete system of raceways for the installation of wiring as indicated by applicable codes. B.

All wiring shall be installed in raceways unless specifically noted otherwise.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Metal raceway system components shall be as manufactured by G.E., Kaiser, Republic, T & B, or other approved manufacturers.

B. Non-metallic raceway system components shall be as manufactured by Carlon, Queen City Plastics, or other approved manufacturers.

2.2 APPLICATIONS

A. Raceways shall be of metal except as specifically noted, or where non-metallic raceway is permitted by these specifications.

B. In general, non-metallic Schedule 40 PVC raceway will be permitted for use underground or in poured concrete (including panel feeders, branch circuits, etc.) provided all 90 degree E11s up out of floor are heavy wall rigid metal conduit or pvc shall be wrapped with expansion joint material through the slab penetration. Non-metallic raceways will not be permitted for any exposed work for raceways in ceiling spaces, etc.

C. Use electric metallic tubing (EMT) for most other general applications unless otherwise noted.

D. Flexible conduit for appropriate applications. Galvanized type for dry locations. Liquid-tight type for wet locations, or as noted. Flexible conduit shall be minimum 1/2" diameter. Liquid-tight flexible metal conduit shall be used for final connection to all motors, transformers, and other rotating or vibrating equipment. Flexible metal conduit shall be used for final connection to lighting fixtures mounted in or on suspended ceilings, and similar applications. Metal-clad cable systems (MC Cable) may be used for all branch circuits rated 30 amperes or less in concealed, dry locations or above bottom chord of roof joists.

E. No raceway may be exposed in any finished space unless specifically so approved, in written form, prior to rough-in.

F. Raceways exposed in finished spaces shall be of an appropriate type "wiremold" type surface raceway or approved equal.

G. Minimum metal conduit size shall be 1/2" (interior) and 3/4" (exterior) for premises wiring system.

2.3 COUPLINGS, CONNECTIONS, ETC.

A. EMT couplings and connectors shall be steel set screw type.

B. Flexible conduit connectors shall be T & B "Tite-Bite" type or approved equivalent, with insulated throats. "Anti-short" bushings shall be used at all motor connections.

C. "Split" or "Erickson" couplings shall be manufactured by O.Z. or approved equivalent. D.

Expansion couplings shall be manufactured by O.Z. or approved equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Heavy wall intermediate metal conduit to be made up with full threads, to which a conductive pipe compound (T & B Kopr-Shield or equal) has been applied, and butted in couplings.

B. Underground runs outside building footprint shall have minimum of 24" cover, filled and tamped in 6" layers. An 8" wide, yellow warning tape reading "Danger Electrical Conduits" shall be provided for each underground conduit run. Bury maximum 12" below finished grade entire length of conduit run.

C. Support conduit as required by code.

D. All raceways shall be concealed unless specifically shown or approved otherwise. E.

Make all cuts square. Remove any burrs by reaming.

F. EMT shall be attached to boxes or enclosures with approved couplings only.

G. EMT and IMC shall be attached to boxes or enclosures with flanged connector and locknuts with insulating bushing.

H. All hard raceways both exposed and concealed shall be run at right angles, either parallel or perpendicular to building lines. Flexible conduit may be run point-to-point only in concealed locations, but must be installed in a neat, workmanship-like manner, that is easily traced. Random, sagging runs shall not be allowed.

3.2 SLEEVES AND PENETRATIONS

A. Electrical Contractor shall provide sleeves and openings for raceways penetrating exterior walls, fire rated partitions, and roofs. Provisions for all such penetrations shall be as approved by the Architect/Engineer.

B. For any raceway passing through an exterior wall, above or below grade, provide appropriate sleeve and water proofing. Fill space between conduit and sleeve with appropriate compound (eg. lead and oakum) and then apply caulking compound - Thiocaulk or approved equivalent - flush finished surfaces.

C. For raceways penetrating floor slabs, smoke partitions, and other fire-rated walls, provide UL listed penetration protection system as approved by the Architect/Engineer. Sealing compound used shall provide same fire

rating as barrier being penetrated.

D. Conduits penetrating roof surfaces for purpose of connecting to mechanical equipment (eg. rooftop HVAC units, exhaust fans, etc.) shall utilize openings, curbs, etc. provided for the equipment where possible.

E. For raceway penetrations through roof (except as described in item D above), contractor shall provide appropriate prefabricated roof curb assembly, pate pipe assembly with boots, or equal method as approved by Architect/Engineer and roofing subcontractor.

F. After service entrance conduits have been installed, wire pulled, "meggered" and accepted, seal using UL listed and approved duct seal.

END OF SECTION 26 05 33

SECTION 26 05 34

OUTLET AND JUNCTION BOXES

PART 1 - GENERAL

1.1 SCOPE

A. Provide and install outlet boxes, junction boxes, pedestal boxes, etc. as required for installation of electrical work, as shown, specified and required.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Unless specifically noted or approved otherwise, boxes shall be of metal (steel or aluminum) as manufactured by Steel City, T & B, Raco, Appleton, or approved equivalent.

B. Size all boxes in accordance with applicable NEC articles (eg. 362, 370, 373, 375, etc.).

C. Device boxes shall be section type of 4" square, equipped with plaster rings as required to mount devices.

D. Where appropriate, use masonry boxes as manufactured by Raco. PART 3

- EXECUTION

3.1 INSTALLATION

A. Set all boxes with edges flush with finished surface.

B. Immediately after installation, cover raceways and boxes to prevent entrance of foreign matter, mortar, paint, etc.

C. Contractor shall coordinate with other trades, and shall study the Architectural Plan Drawings, casework drawings, etc. to determine proper placement and mounting heights of all devices.

D. Where not shown or required otherwise, the following standard mounting heights and positions shall apply:

1. Boxes beside doors shall be mounted so edge of trim plate is 2" from edge of door trim on strike side.
2. Panelboard enclosures 6'-4" (plus or minus 4" in concrete block construction) from finished floor to top of can.
3. Fire alarm signal devices 6'-8" to bottom of strobe lens - or 6" below ceiling to top of device for areas with ceilings lower than 7'-2".
4. Receptacle boxes shall be mounted at unobstructed locations.
5. When multiple switch/fire alarm pull stations are mounted side-by-side on same wall, all devices shall be mounted at the same height (does not include receptacle/telephone).

END OF SECTION 26 05 34

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SCOPE

A. Furnish and install power distribution panelboards as scheduled on the drawings and as herein speci- fied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Panelboards shall be manufactured by Square D or approved equivalents by Siemens, General Electric or Cutler-Hammer.

B. Panelboard types indicated on the drawings are those of Square D, and the standard construction features of those types shall be considered as minimum requirements, with additional requirements as specified herein.

2.2 CONSTRUCTION FEATURES

A. Types, sizes, capacities, and characteristics shall be as shown on riser diagrams or in schedules on the drawings.

B. Equipment shall be built on NEMA Standards where such standards exist.

C. Housing shall be constructed of galvanized sheet steel and shall be securely fabricated with screws, bolts, rivets, or by welding. Housings for panelboards shall be a minimum 20" wide and 5-3/4" deep, unless noted otherwise. Top or bottom gutter space shall be increased 6" where feeder loops through panel. Housing dimensions shall not exceed those of specified panelboards without written approval of Engineer.

D. Covers shall be constructed of high grade flat sheet steel with:
1. Door flush with face and closed against a full inside trim stop. Hinges shall be inside type.
2. A flush latch and tumbler type lock, so panel door may be held closed without being locked. All such locks on same job shall be keyed alike. Furnish two keys with each lock.
3. Four or more cover fasteners of a type which will permit mounting plumb on box. Cover shall also have inside support studs to rest on lower edge of can while being fastened. For flush mounted panelboards, cover fastener hardware shall be concealed behind the hinged door.

E. A means of readily adjusting projection of panel interior assembly with all connections in place shall be provided. A method requiring stacking of washers is not acceptable.

F. Interior trim shall fit neatly between interior assembly and cover leaving no gaps between the two. Where (2) section panels are specified, both panel trims shall be the same height. G. Busses shall

be of 98% conductivity copper.

H. Minimum interrupting capacity rating of any panelboard assembly shall be 10,000A (120/208V systems). Furnish panelboards with higher rating as required for the available fault current.

I. Where drawing schedules indicate spaces for addition of future circuit breakers, furnish all necessary bussing, brackets, hardware, etc.

J. Breakers in distribution or branch circuit panelboards shall be physically arranged in locations shown in panel schedules on the drawings. They shall be connected to the phases as shown.

K. All panels shall be supplied with copper ground bars. L. All

circuit breakers shall be bolt-on type.

M. All 120V, 15 or 20 amp breakers serving receptacles located in bedrooms shall be arc fault interrupting type.

N. Service equipment shall be labeled "UL approved for Service Entrance Use." PART

3 - EXECUTION

3.1 INSTALLATION

A. All equipment, either surface or flush mounted, shall be perfectly plumb and level.

B. All openings in boxes, cabinets, or gutters shall be cut or sawed with tools made for that purpose. Burning of openings is absolutely unacceptable. C. All unused

openings shall be closed.

D. Only one solid wire is allowable under a screw. Provide an approved lug for connecting stranded wire or more than one solid conductor.

E. Front edges of all flush mounted panel housings shall be exactly flush with finished wall.

3.2 LABELING

A. For branch circuit power panelboards, directory cards shall be neatly typed to indicate load served by each breaker or fuse. Directory cards shall indicate circuits in a manner analogous to the physical circuit breaker arrangement (eg. odd numbered circuits in one column, even numbered circuits in another). Mount cards behind heavy plastic shields in metal frames. Mark spares and spaces in pencil only.

B. Next to each breaker within main or distribution panel boards, attach a label indicating load served. Wording shall be as shown on its diagram or schedule on the drawings.

C. Attach a label indicating panel designation centered above the door in each panelboard. Add voltage, for example, "DPI - 120/ 208V." Use black letters on white background.

END OF SECTION 26 24 16

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SCOPE

A. Contractor shall furnish and completely install lighting switches, convenience outlets, special purpose receptacles, etc. along with appropriate outlet boxes, trim plates, etc. as indicated on the drawings and schedules, and as herein specified.

B. Where connection to an item of equipment is required under this contract, and where such equipment requires a wiring device (special purpose receptacle) for connection, contractor shall furnish and install the appropriate device, whether or not the device is specifically shown or specified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. All wiring devices of any one general type (eg. all duplex receptacles, all wall switches, etc.) shall be of the same manufacturer and shall match throughout.

B. All wiring devices (i.e., receptacles and switches) and associated trim plates shall be manufactured by General Electric, Hubbell, P & S, Arrow, or approved equivalent. Snap switches shall be rated 20 AMP 120-277 volts, 60 HZ, AC. All duplex receptacles shall be rated 15 AMP, NEMA 5-15R, unless otherwise noted.

2.2 WIRING DEVICES

A. Devices shall be specification grade.

B. Devices unless otherwise noted or approved shall be white in color.

C. Receptacles noted as “WP” (weatherproof) shall be UL listed for “in-use” operation in the weather.

D. 120V, 15 or 20 amp receptacles located in bedrooms shall be protected arc fault interrupting type circuit breaker.

2.3 TRIM PLATES

A. All trim plates shall be of same style, matching throughout project.

B. Unless noted otherwise, trim plates shall be smooth white nylon. All plates shall look identical except for required openings and sizes.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Devices shall be mounted tightly to boxes, and be adjusted plumb and level.

B. Where two or more devices are indicated for adjacent installation, they shall be trimmed with gang type plates.

C. Ground each receptacle by means of a separate code size ground wire (#12 minimum) connecting the receptacle ground terminal to the branch circuit panel ground bus. The conduit system shall not be the code required return ground path.

END OF SECTION 26 27 26

SECTION 26 28 16

DISCONNECTS (MOTOR & CIRCUIT)

PART 1 - GENERAL

1.1 SCOPE

A. This section includes low voltage disconnect switches.

PART 2 - PRODUCTS

2.1 LOW VOLTAGE FUSIBLE SWITCHES RATED 600 AMPERES AND LESS

A. Quick-make, quick-break type in accordance with UL98, NEMA KS 1 and NEC. B.

Shall be capable of accepting UL and NEMA standard fuses.

C. Shall be rated at 100,000 A.I.C. when provided with the proper rated fuses.

D. Shall have the following features:
1. Switch mechanism shall be the quick-make, quick-break type.
2. Copper blades, visible in the OFF position.
3. An arc chute for each pole.
4. External operating handle shall indicate ON and OFF position and shall have lock-open padlocking provisions.
5. Mechanical interlock shall permit opening of the door only when the switch is in the OFF position, defeatable by a special tool to permit inspection.
6. Fuse mounting for the size and type of fuses specified. Furnish switches completely fused. Furnish a complete set of spare fuses for each switch being installed. Provide additional sets of spare fuses to constitute not less than two complete sets for the type, size, and rating of each set installed. Deliver the fuses to the Owner prior to the final inspection.
7. Enclosures:
a) Shall be the NEMA types shown on the drawings for the switches.
b) Where the types of switch enclosures are not shown, they shall be the NEMA types which are most suitable for the environmental conditions where the switches are being installed.

E. Shall be heavy duty, Type HD, and horsepower rated as required.

2.2 LOW VOLTAGE UNFUSED SWITCHES RATED 600 AMPERES AND LESS

A. Shall be the same as Low Voltage Fusible Switches rated 600 amperes and less, except it shall not accept fuses.

2.3 FUSES

A. Provide dual element, time delay fuses equal to Fusetron RK-1 or RK-5 unless otherwise noted.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation shall be in accordance with the NEC and as shown on the drawings.

B. Provide fusible switches and fuses as required by nameplates of equipment served.

END OF SECTION 26 28 16

SECTION 26 41 00

FACILITY LIGHTING PROTECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The requirements of Section 16000 govern the work specified in this section.

1.2 DESCRIPTION OF WORK

A. The work includes the design and installation of a lightning protection system meeting all the criteria set forth in NFPA 78 and that required for UL Master Label for the protection of the facility.

B. Service entrance transient voltage surge suppression (TVSS) shall be included as specified.

1.3 QUALITY ASSURANCE

A. The lightning protection system shall conform to the following requirements:
1. National Electric Code.
2. Lightning Protection Institute Installation (LPI) Code LPI-175.
3. Underwriter's Laboratories Lightning protection Components Code 96 (UL).
4. Underwriter's Laboratories Master Label Code 96A (UL).
5. National Fire Protection Association Standard 780 (NFPA).
6. Underwriter's Laboratories Standard for Transient Voltage Surge Suppressors 1449, 4th Edition (UL).
7. National Electrical Manufacturer's Association Low Voltage Surge Protective Devices Standard LS1 (NEMA).

B. Underwriter's Laboratories Master label shall be furnished affixed as required.

C. The system shall be the standard product of a manufacturer regularly engaged in the production of lightning protection systems and shall be the manufacturer's latest approved design.

1.4 SUBMITTALS

A. Shop Drawings: Submit the type, size, and locations of all equipment, grounds, and cable routing on a set of dimensioned drawings prepared by the Contractor to the same scale as the contract drawings.

B. Manufacturer's product data.

C. UL Master Application Form and LPI Forms 175A and 175B.

PART 2 – PRODUCTS

2.1 GENERAL

A. All material and equipment shall be UL approved and labeled with each terminal bearing an "A" label and all main conductors bearing a "B" label at 10-0" intervals.

B. All equipment shall be the product of a single manufacturer and of a design and construction to suit the application for which it is to be used, in accordance with accepted industry standards, LPI, NFPA and UL Code requirements.

2.2 TRANSIENT VOLTAGE SURGE SUPPRESSOR

A. Refer to section 26 43 13.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation shall be accomplished by an experienced installer employed by the approved manufacturer.

B. All equipment shall be installed in the most inconspicuous manner possible. System shall be installed complete with cable network on the roof, air terminals, splices, and bonds with cable downleads routed in conduit to ground.

C. All conductors shall be copper with bronze connections. Equipment shall not be connected to or allowed prolonged contact with aluminum surfaces except by a UL approved bimetal transition fitting.
1. Where aluminum or aluminum alloys are used in surfaces which shall support lightning system conductors and components (i.e., aluminum roofs or siding), those portions of conductors and components shall also be aluminum. Once those portions are no longer supported by aluminum surfaces, provide bimetal transition to copper for the remainder of the system.

D. Air terminals and cable fasteners shall be located and spaced in compliance with LPI and UL requirements.

E. See Architectural, Mechanical, Plumbing and Electrical Plans for locations of all equipment requiring bonding and air terminal protection.

3.2 COORDINATION

A. Coordinate lightning protection with all trades work to insure a correct, neat, and unobtrusive installation.

B. Provide a tight, mechanical sound bond to the main water service to assure inter-connecting with other building ground systems.

C. Verify that the TVSS equipment is installed at the service entrance in accordance with the manufacturer's written recommendations.

3.3 TESTING

A. Upon completion of installation of lightning protection system, test ground resistance with a Megger ground tester or equal. Ground resistance shall be a maximum of 5 ohms.

3.4 LABEL

A. Secure and deliver a UL Master label to the Owner.

END OFSECTION 26 41 00

SECTION 26 43 13

TRANSIENT VOLTAGE SUPPRESSION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The requirements of Section 26 00 00 govern the work specified in this section.

1.2 DESCRIPTION OF WORK

A. Service entrance surge protective devices (SPDs) shall be included as specified.

1.3 QUALITY ASSURANCE

A. The system shall conform to the following requirements:
1. National Electric Code Article 285.
2. Underwriter's Laboratories Standard for Surge Protective Devices, UL 1449 Fourth Edition (UL).

B. The system shall be the standard product of a manufacturer regularly engaged in the production of Surge Protective Devices and shall be the manufacturer's latest approved design.

1.4 SUBMITTALS

A. Manufacturer's product data shall include UL 1449 Listing documentation verifying Short Circuit Current Rating (SCCR), Voltage Protection Ratings (VPRs) for all modes, Maximum Continuous Operating Voltage rating (MCOV), I-nominal rating (I-n), Type 1 Device Listing. UL data and visual inspection takes precedence over manufacturer's published documentation.

B. Submittals shall include shop drawings including the manufacturer installation instruction manual and line drawings detailing dimensions and weight of enclosure, internal wiring diagram illustrating all modes of protection in each type of SPD required, wiring diagram showing all field connections and manufacturer's recommended wire and breaker sizes.

C. Upon request, an unencapsulated but complete SPD shall be presented for visual inspection; proprietary technology included. MOV type & quantity shall reflect kA ratings on cutsheets, verification of diagnostic monitoring, thermal & overcurrent protection, etc.

D. Minimum of five (5) year warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Subject to compliance, the following manufacturers are acceptable:
1. Current Technology
2. Siemens
3. SquareD

4. Advanced Protection Technologies, Inc.
5. Innovative Technology, Inc.

2.2 RATINGS

A. Every suppression component of every mode noted elsewhere in this specification, including N-G, shall be protected by internal overcurrent and thermal overtemperature controls.

B. Minimum Single Impulse Surge Current Capacity per phase (phase = L-N + L-G) shall be as follows: Service Entrance or Transfer Switch: 200 kA

C. SPD shall provide surge current paths for all modes of protection, (7-mode) L-N, L-G, and N-G for Wye systems

D. UL 1449 Fourth Edition Listed Let-through Voltage Protection Ratings (VPRs) shall not exceed the following:

System Voltage	L-N	L-G	L-L	N-G
208Y/120	700 V	700 V	1000 V	800 V

E. The SPD shall have UL 1283 EMI/RFI filtering with minimum attenuation of -50 dB at 100 kHz.

F. UL 1449 Fourth Edition Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV
208Y/120	25%	150V

G. SPD shall be UL labeled with 20 kA Inominal (I-n), which is verifiable at UL.com, for compliance to UL 96A Lightning Protection Master Label and NFPA 780.

H. SPD shall be UL labeled with 200 kA Short Circuit Current Rating (SCCR). Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD, per NEC 285.6.

I. Suppression components shall be heavy duty 'large block' MOVs, each exceeding 30 mm diameter.

2.3 FEATURES AND ACCESSORIES

A. Surge Protective Device Description: Provide the following features and accessories:
1. The SPD shall have visual LED diagnostics including a minimum of one green LED indicator per phase and one red service LED, visible without opening the enclosure door.
2. The SPD shall be provided with 1 set of NO/NC Form C dry contacts for remote monitoring.
3. Utilizing thermally protected metal oxide varistors, which are continuously monitored.
4. The SPD shall be provided with an integral disconnect switch when a 3-pole breaker is not available to connect the SPD.
5. Nema 1 style enclosure suitable for indoor installation.
6. SPD shall include an audible alarm with on/off silence function and diagnostic test function (excluding branch).

PART 3 – EXECUTION

3.1 INSTALLATION

A. At Service Entrance or Transfer Switch, a UL approved disconnect switch shall be provided as a means of servicing disconnect if a 60A breaker is not available.

B. The surge protective device shall be installed per manufacturer's instructions with lead lengths as short (less than 24") and straight as possible. Gently twist conductors together.

C. Installer may reasonably rearrange breaker locations to ensure short & straightest possible leads to SPDs.

D. SPD shall be installed on the load side of the main service disconnect.

E. Verify that the SPD is installed in accordance with the manufacturer's written recommendations.

F. Before energizing, installer shall verify service and separately derived system Neutral to Ground bonding jumpers per NEC.

END OF SECTION 26 43 13

SECTION 26 51 13

LIGHTING FIXTURES

PART 1 - GENERAL

1.1 SCOPE

A. Contractor shall furnish and install completely the lighting fixtures indicated on the Drawings and as herein specified.

B. All fixtures shall be equipped with lamps.

C. A lighting fixture shall be provided for every lighting outlet indicated. Any omission shall be brought to the attention of the Architect/Engineer before submitting proposal; otherwise, a unit selected by the Architect/Engineer shall be furnished and installed at no additional charge.

PART 2 - PRODUCTS

2.1 FIXTURES AND BALLASTS

A. Fixture types shall be as indicated on the Drawings.

B. Catalog numbers shown on the Drawings are for general identification of fixtures only. All related parts, such as plaster rings, junction boxes, louvers, shields, mounting stems, canopies, connectors, straps, nipples, etc., required to fit them properly to the construction, shall be furnished and installed.

C. Unless noted otherwise, all fixtures shall utilize LED lamping.

D. Fixtures/drivers shall be serviceable while the fixture is in its normally installed position; drivers shall not be mounted to removable reflectors or wireway covers.

E. Provide all lighting fixtures with a specific means for grounding their metallic wireways and housings to an equipment grounding conductor.

2.2 LENSES

A. Shall be 100 percent virgin acrylic prismatic or injection molded as noted in light fixture schedule on the drawings.

B. Flat lens panels shall have no less than 1/8-inch thickness.

2.3 LAMPS

A. LED fixtures shall be provided with certified performance data of total luminous flux, efficacy and color to LM-79 standards and of lumen maintenance to LM-80 standard.

B. Refer to Lighting Fixture Schedule in the Drawings for fixture LED lumen and color ratings.

PART 3 - EXECUTION

3.1 COORDINATION

A. Contractor shall verify ceiling or wall type in or on which each fixture is to be mounted, and shall furnish unit with appropriate trim type, mounting hardware, feed through junction boxes, etc., to fit the construction and maintain proper access to system wiring.

3.2 INSTALLATION

A. Installation shall be in accordance with the NEC, and as shown on the drawings.

B. Align, mount and level the lighting fixtures uniformly.

C. Avoid interference with and provide clearance for equipment. Where the indicated locations for the lighting fixtures conflict with the locations for equipment, change the locations for the lighting fixtures by the minimum distances necessary as approved by the Architect/Engineer.

D. Lighting Fixture Supports:
1. Shall provide support for all fixtures. Supports may be anchored to channels of the ceiling construction, to the structural slab or to structural members within a partition, or above a suspended ceiling. See also Section 26 05 29 of this specification.
2. Shall maintain the fixture positions after cleaning.
3. Shall support the lighting fixtures without causing the ceiling or partition to deflect.

E. Where fixtures are connected to the rigid raceway system by flexible conduit, a green grounding conductor shall be run within the flexible conduit. This grounding jumper shall be connected to the fixture and to the raceway system using screws, bolts, or clips, equivalent to Steel City "G" clip.

END OF SECTION 26 51 13

SECTION 27 00 00

COMMUNICATION RACEWAYS

PART 1 - GENERAL

1.1 SCOPE

A. Contractor shall furnish and install a system of raceways and backboards as indicated on the drawings and as herein specified.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Raceways, boxes, etc. shall be in compliance with the relevant sections of these specifications.

B. Wall outlet shall consist of a standard 2" x 4" x 2-1/2" outlet box, with single device ring. Trim plate shall be standard "telephone" type, to match wiring device trim plates.

C. Telephone equipment boards shall be of size noted or shown on the drawings, and shall be constructed of 3/4" plywood, with finish grade front. Paint board with gray fire-retardant paint.

D. Provide 3/4" electrical metallic tubing from voice or data only outlet boxes or 1" electrical metallic tubing from combination voice/data outlet boxes to above accessible ceiling. Provide insulating nylon bushings on all ends of all conduit stubs.

E. Special outlets, floor outlets, etc. shall be noted on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install pull boxes as necessary in all conduits to limit runs to two (2) 90 degree bends (or equivalent) and to 100 feet in length.

B. Leave all spare raceways with 200 lb. test nylon pull cord.

C. Install raceways, boxes, etc. in accordance with relevant sections of these specifications.

D. Coordinate with the telephone utility to provide service conduits extended underground to property line.

END OF SECTION 27 00 00

SECTION 27 10 00

COMMUNICATION CABLING

PART 1 - GENERAL

1.1 SCOPE

A. The contractor shall furnish and install a system of cabling as indicated on the drawings and as herein specified for voice-data systems as required. The goal of the project is to provide a finished, complete, certified Category 6 Structured Cabling System with the functionality, capacity, and flexibility, to support the Owner equipment additions.

1.2 QUALIFICATIONS

A. The Contractor directly responsible for the cabling portion of the work shall be a licensed and registered Low Voltage Contractor with the State, who is, and who has been, regularly engaged in providing the installation of non-residential, communication and technology systems of similar size and complexity to the requirements of this project.

B. The cabling installation and terminations shall be performed under the direct supervision of a technician with BICSI level 2 certification

1.3 SHOP DRAWINGS

A. It is the Contractors responsibility to provide all material in accordance with the Contract Documents. Material not fully complying with the Contract Documents will be removed and replaced at the personal expense of the Contractor. Shop Drawings shall be submitted for the following:

1. Specified products and materials.
2. Ancillary products and materials.
3. Pathway and support systems.
4. Termination hardware.
5. Unspecified or unidentified Cabling.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Products shall be identified by the descriptions or descriptive functions stated in the Contract Documents. Only NEW (virgin) products shall be used for this scope of work. Used, discounted, salvaged, refurbished, or reused products shall not be used.

B. Raceways, boxes, etc. shall be in compliance with the relevant sections of these specifications.

C. Open Supports: The Contractor shall install appropriately rated “J-hook” or trapeze type supports for cabling installed above the ceiling outside of a dedicated raceway system.

D. Special outlets, floor outlets, etc. shall be noted on the drawings. E.

Cabling shall be Cat 6 UTP, non-plenum rated.

F. Outlet terminations shall be modular Cat 6 RJ-45, RJ-11 or RJ-31X as noted on the plans. Terminating jacks shall be modular-to-110 (IDC) type utilizing a UNIVERSAL T568-A/B termination scheme (verify with Owner.)

G. Patch panel terminations shall be provided as required. All patch panels shall be mounted into a standard 19-inch wall mounted rack or cabinet. All patch panels shall be a regularly produced manufactured assembly, possessing a standard, total port count in multiples of twenty-four (24).

PART 3 - EXECUTION

3.1 INSTALLATION

A. Raceways:
1. Install raceways, boxes, etc. in accordance with relevant sections of these specifications.
2. 'J' hook supports shall be typically spaced at four (4) feet on center and not exceeding five (5) feet on center. Open supports shall be staggered between centerline measurements, so as to reduce the induction of reflective harmonics onto, and tension deformations of the supported cabling. Provide a minimum of two (2) hangers at all corners and 90-degree turns.

B. Cabling
1. Cable Identification: All technology cabling shall be marked, on each terminating end, with machine generated, self-adhesive, wrap-type labels. All hardware and equipment termination and interconnection points shall be labeled. Where cable terminations occur within terminal cabinets
or equipment enclosures, the inside portion of the cabinet or enclosure door shall display a
protected drawing with all connections shown and described as to color code, number assigned or connection function of the associated conductors and their destination.
2. Cable Dressing: Cables shall be guided and dressed using approved cable supports. All cables shall be neatly led to terminations.

C. Avoiding EMI: To avoid EMI, all pathways shall provide clearances of at least four (4) feet from motors or transformers; one (1) foot from conduit and cables used for electrical-power distribution; and six (6) inches from fluorescent lighting. Pathways shall cross perpendicular to fluorescent lighting and electrical power cables and conduits. The Contractor shall not place any distribution cabling parallel and/or alongside power lines, or share the same conduit, channel and/or sleeve with any electrical apparatus.

D. Cabinets and Racks: All equipment cabinets and racks shall be labeled with an engraved plastic laminate label permanently affixed to the door or frame. Cabinet designation shall be as shown on the Contract Drawings. All cabinet(s) and rack(s) shall be mounted to the floor or wall and grounded as per EIA/TIA standards.

E. Equipment Installation: All equipment and devices shall be mounted in accordance with the manufacturers' instruction and shall be level and plumb.

F. Final: The system, upon notification of completion, shall be complete in every respect, clean, operating and properly adjusted.

3.2 TESTING/CERTIFICATION

A. All circuits shall be tested and certified for compliance with Cat 6 requirements.

3.3 AS-BUILT DOCUMENTATION

A. General: As-Built Drawings shall be provided as part of this Contract. All addendum information or Project

revisions resulting in drawing changes that occurred, during the construction period, shall be documented and included in the As-Built Drawings. All required As-Built documentation is mandatory and shall be required prior to project closeout.

B. The Contractor shall maintain two (2) sets of black or blue line on white paper drawings to submit as record, "As-Built" drawings (Record Drawings). One set shall reside on the Project site and at all times, be accurate, clear, and complete, showing the actual location of all equipment as installed. At the completion of the Project, the Contractor shall transfer onto the second, clean set of drawings all changes and submit them to the Contract Manager.

C. Project test results along with the documented testing procedures shall be included in a separate binder.

END OF SECION 27 10 00

APPENDIX A
CONCEPTUAL PLANS

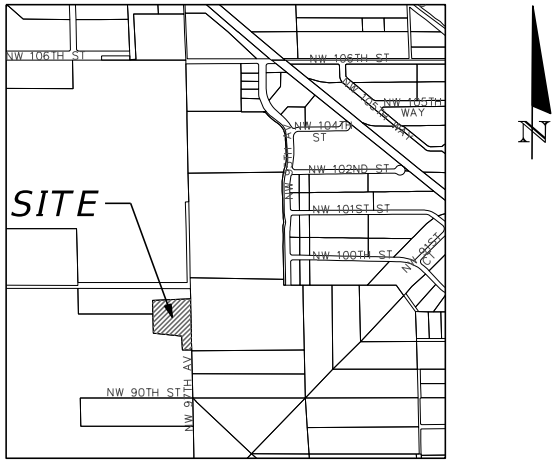
TOWN OF MEDLEY

CAPITAL PROJECTS & ECONOMIC DEVELOPMENT DEPARTMENT

MEDLEY POLICE FIREARMS TRAINING CENTER
HURRICANE IRMA REPAIRS - FEMA # 4337-DR-FL

NOTES:

1. CURSORY REVIEW BY TOWN OF MEDLEY BUILDING DEPARMENT OFFICIAL AND INSPECTORS

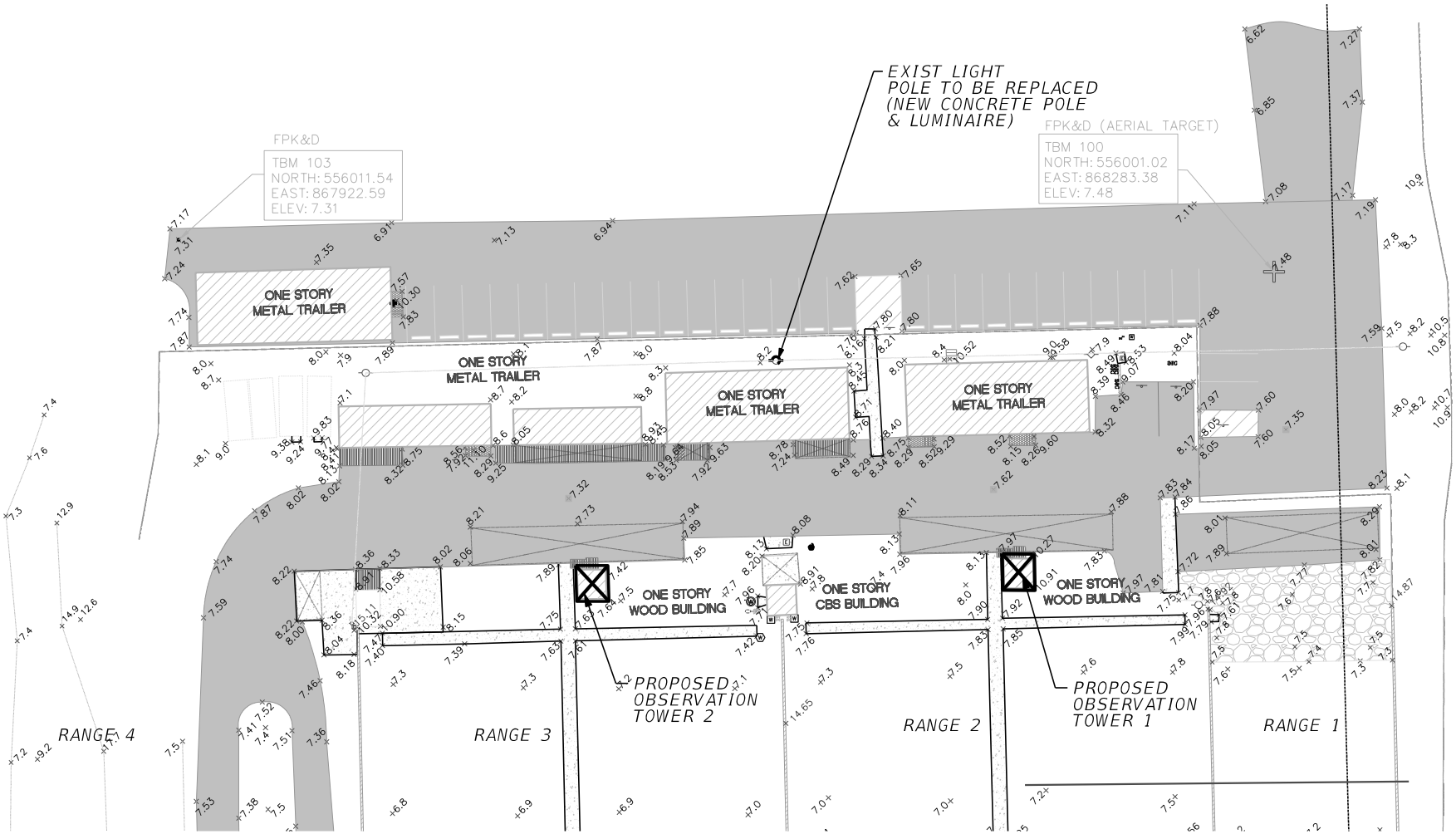


LOCATION MAP

SCOPE OF WORK:

1. Preparation of Construction Design Plans and specifications.
2. Permitting. Obtaining general building permits and required permits from regulatory agencies.
3. Selective Demolition. Removal of existing foundation, footings, masonry walls, and remaining materials of existing observation towers.
4. Masonry and Concrete. Construction of foundation, footings, slabs, walls, and columns as per design plans and specifications.
5. Electrical. Replacement of light pole and luminaire with concrete pole. Installation of electrical panel, receptacles, switches, circuits, and additional minor electrical work as per design plans and specifications.
6. HVAC. Install 5,000 BTU HVAC unit as per design plans and specifications.
7. Finish. Finish work as per design plans and specifications. Paint color to be approved by the Town of Medley.
8. Roof. Furnish and install shingle roof and ceiling as per design plans and specifications.
9. Landscape. Landscape work is limited to site restoration as per design plans and specifications.

REVISIONS				
DATE	DESCRIPTION	CP&ED DEPARTMENT TOWN OF MEDLEY 7777 NW 72ND AVE MEDLEY, FL 33166	DESIGN CRITERIA DOCUMENTS MEDLEY POLICE FIREARMS TRAINING CENTER HURRICANE IRMA REPAIRS	SHEET NO. 1

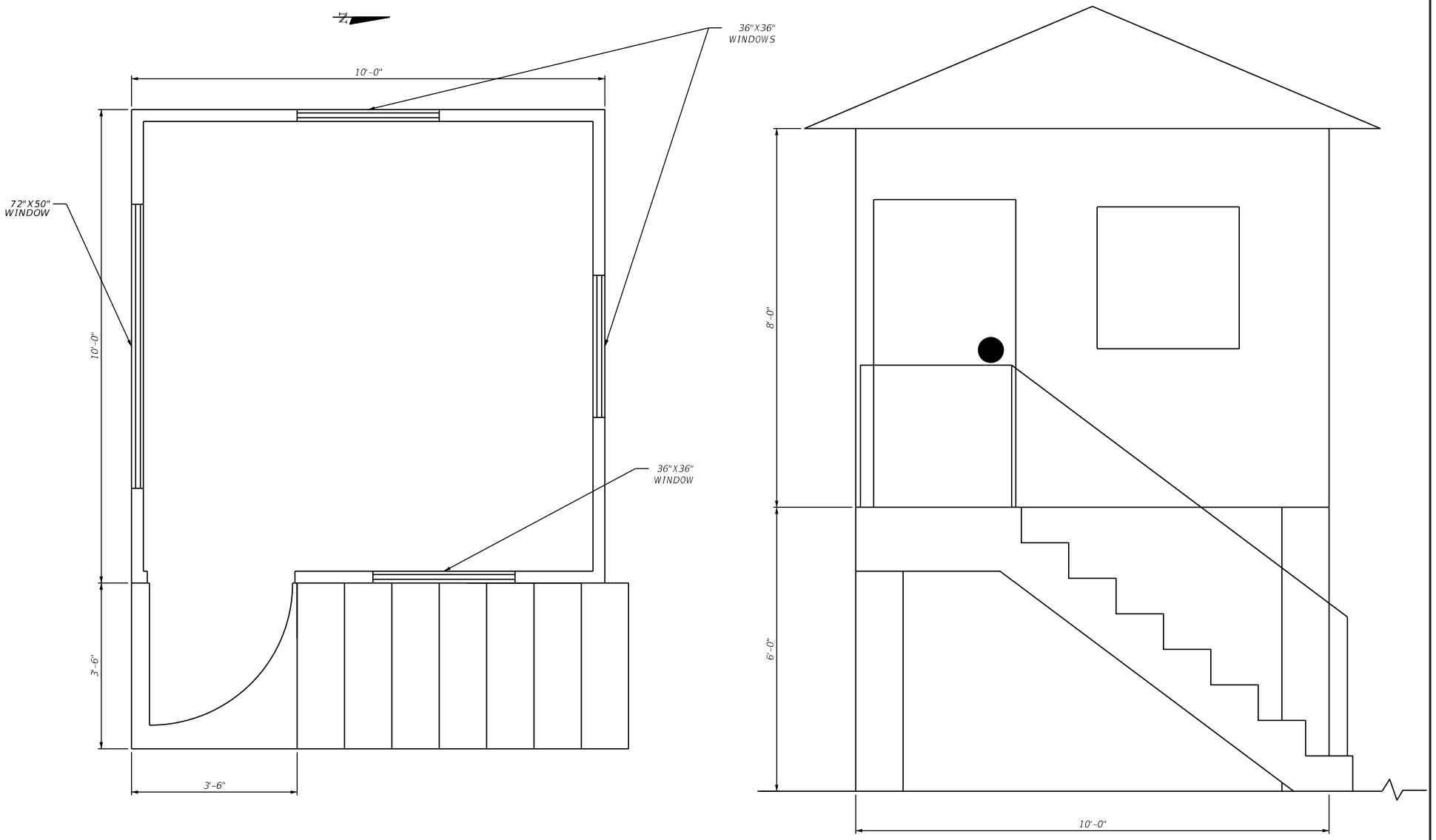


REVISIONS	
DATE	DESCRIPTION

CP&ED DEPARTMENT
TOWN OF MEDLEY
7777 NW 72ND AVE
MEDLEY, FL 33166

CONCEPTUAL SITE PLAN
MEDLEY POLICE FIREARMS TRAINING CENTER
HURRICANE IRMA REPAIRS

SHEET NO. 2



REVISIONS	
DATE	DESCRIPTION

CP&ED DEPARTMENT
TOWN OF MEDLEY
7777 NW 72ND AVE
MEDLEY, FL 33166

CONCEPTUAL FLOOR AND ELEVATION PLAN
MEDLEY POLICE FIREARMS TRAINING CENTER
HURRICANE IRMA REPAIRS

SHEET NO. 3

APPENDIX B

SURVEY

SURVEYOR'S NOTES:

SECTION 1) DATE OF FIELD SURVEY:

1. The date of completion of the field work of the Topographic Survey was on April 28, 2017.

SECTION 2) LEGAL DESCRIPTION:

Medley Firearms Training Center

Address: 9700 NW 97th Ave Miami, Florida.
Folio: 22-3005-001-0515

SECTION 3) ACCURACY:

The accuracy obtained by field measurement methods and office calculations of closed geometric figures meets and exceeds the Standards of Practice requirement for this Type of Survey as defined in Rule 5J-17.051, Florida Administrative Code.

Elevations of well identified features as depicted on the Survey Map were measured to an estimated vertical position accuracy of 1/100 of a foot on hard surfaces and 1/10 of a foot on ground surfaces.

Well identified features as depicted on the Survey Map were measured to an estimated horizontal position accuracy of 1/10 of a foot.

This Map of Survey is intended to be displayed at a scale of (1"=30') or smaller.

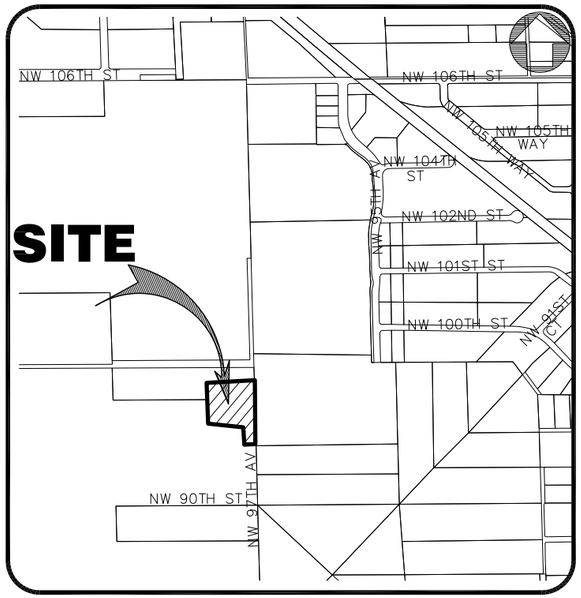
SECTION 4) SOURCES OF DATA:

This property is to be located in Flood Zone "X", as per Federal Emergency Management Agency (FEMA) Community Number 120649 (Town of Medley), Map Panel No. 12086C0276, Suffix L, Map Revised Date: September 11, 2009.

Legal Description was furnished by client.

Elevations as shown hereon are based on the National Geodetic Vertical Datum of 1929, as per Miami-Dade County's Benchmark Number M-100, Elevation 8.27 feet.

SECTION 05 - TOWNSHIP 53 SOUTH - RANGE 40 EAST



LOCATION MAP

NOT TO SCALE

SECTION 5) LIMITATIONS:

Since no other information were furnished other than what is cited in the Sources of Data, the Client is hereby advised that there may be legal restrictions on the Subject Property that are not shown on the Survey Map that may be found in the Public Records of Miami-Dade County.

The Surveyor makes no representation as to ownership or possession of the Subject Property by any entity or individual who may appear of public records of this County.

No excavation or determination was made as to how the Subject Property is served by utilities.

No improvements were located, other than those shown. No underground foundations, improvements and/or utilities were located or shown hereon.

SECTION 6) CLIENT INFORMATION:

This Topographic Survey was prepared at the request of and certified to:

Town of Medley

SECTION 7) SURVEYOR'S CERTIFICATE:

I hereby certify: That this "Topographic Survey" and the Survey Map resulting therefrom was performed under my direction and is true and correct to the best of my knowledge and belief and further, that said " Topographic Survey" meets the intent of the applicable provisions of the "Standards of Practice for Land Surveying in the State of Florida", pursuant to Rule 5J-17.051 through 5J-17.052 of the Florida Administrative Code and its implementing law, Chapter 472.027 of the Florida Statutes.

HADONNE CORP., a Florida Corporation
Florida Certificate of Authorization Number LB7097

By: _____
Raul Izquierdo, PSM
For the Firm
Registered Surveyor and Mapper LS6099
State of Florida

NOTICE: Not valid without the signature and original raised seal of a Florida Licensed Surveyor and Mapper. Additions or deletions to Survey Maps by other than the signing party are prohibited without the written consent of the signing party.

REVISIONS	
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2.	7.
3.	8.
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5.	10.

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TOPOGRAPHIC SURVEY
for
TOWN OF MEDLEY
of
9700 NW 97th AVE

Job No.:	17040
Field Book:	FIELD
DRAWN BY:	LD
TECH BY:	RI
QA/QC BY:	AH

LEGEND:

DRWY	= DRIVEWAY	P.C.C.	= POINT OF COMPOUND CURVE
D.M.E.	= DRAINAGE MAINTENANCE EASEMENT	℄	= BASELINE
C.M.E.	= CANAL MAINTENANCE EASEMENT	N.G.V.D.	= NATIONAL GEODETIC VERTICAL DATUM
UE	= UTILITY EASEMENT	INV. EL.	= INVERT ELEVATION
A	= ARC DISTANCE	P.B.	= PLAT BOOK
BLDG.	= BUILDING	P.C.P.	= PERMANENT CONTROL POINT
C.B.	= CATCH BASIN	CMP	= CORRUGATED METAL PIPE
C.B.S.	= CONCRETE BLOCK STRUCTURE	P.I.	= POINT OF INTERSECTION
CH.	= CHORD DISTANCE	B/C	= BLOCK CORNER
C	= CALCULATED VALUE	R	= RADIUS
(C)	= CLEAR	RAD.	= RADIAL
℄	= CENTER LINE	RES.	= RESIDENCE
CONC.	= CONCRETE	R/W	= RIGHT OF WAY
P.R.C	= POINT OF REVERSE CURVE	SEC.	= SECTION
P.C.	= POINT OF CURVATURE	S.I.P.	= SET IRON PIPE
F.N.D.	= FOUND NAIL/DISK	T.O.P.	= TOP OF PIPE
		SWK	= SIDEWALK

LEGEND:

P.G.	= PAGE		= WOOD UTILITY POLE
P.O.B.	= POINT OF BEGINNING		= ANCHOR POLE
℄	= PROPERTY LINE		= CONCRETE LIGHT POLE
N.T.S.	= NOT TO SCALE		= CONCRETE POWER POLE
+8.38	= ELEVATION		= FIRE HYDRANT
	= WATER OUTLET	E	= ELECTRIC BOX
BL.	= BLOCK	CATV	= CABLE TV BOX
	= CLEANOUT	WPB	= WIRE PULL BOX
	= MONUMENT LINE	WV	= WATER VALVE
	= DRAINAGE CATCH BASIN	SAN	= SEWER VALVE
△	= CENTRAL ANGLE	MLP	= METAL LIGHT POLE
	= TRAFFIC SIGN	W	= WATER MANHOLE
	= CATCH BASIN (INLET)	T	= TELEPHONE MANHOLE
	= MAST ARM		

LEGEND:

Ⓓ	= DRAINAGE MANHOLE
Ⓢ	= SANITARY SEWER MANHOLE
T.B.M.	= TEMPORARY BENCH MARK
	= PARKING METER
	= FLAG POLE
F.F.E.	= FINISH FLOOR ELEVATION
S.I.R.	= SET IRON REBAR
P.O.C.	= POINT OF COMMENCEMENT
F.N.	= FOUND NAIL
P.T.	= POINT OF TANGENCY
E.N.C.	= ENCROACHMENT
F.H.	= FIRE HYDRANT
F.I.P.	= FOUND IRON PIPE
F.I.R.	= FOUND IRON REBAR
L.F.E.	= LOWEST FLOOR ELEVATION
L.P.	= LIGHT POLE
(M)	= MEASURED VALUE
(R)	= RECORD VALUE

LEGEND:

= SHADE TREE X–Y–Z

= PALM TREE X–Y–Z

X=TRUNK DIAMETER
Y=TREE HIGH
Z=CANOPY DIAMETER

	= BRICK
	= CONCRETE
	= GRAVEL
	= TILE
	= PAVEMENT
	= CBS WALL
	= RIGHT OF WAY LINE
	= PROPERTY LINE
	= EASEMENT LINE
	= IRON FENCE
	= WOOD FENCE
	= CHAIN LINK FENCE
OUL	= OVERHEAD UTILITY LINE
	= WATER LINE
UNK	= UNKNOWN LINE
	= STORM LINE
	= SEWER LINE
	= ELECTRIC LINE
	= GAS LINE

ASSUMED

0 15 30

SCALE
1" = 30'

FPK&D
TBM 103
NORTH: 556011.54
EAST: 867922.59
ELEV: 7.31

FPK&D (AERIAL TARGET)
TBM 100
NORTH: 556001.02
EAST: 868283.38
ELEV: 7.48

64.20'
ONE STORY
METAL TRAILER
F.F.ELEV.=11.18'
64.19'
23.87'
24.00'

METAL STAIRS

8' HIGH CHAIN LINK FENCE

16 PARKING SPACES

ASPHALT PAVEMENT

GATE

11 PARKING SPACES

FIBERGLASS STAIRS

CONC.

ASPHALT PAVEMENT

8' HIGH CHAIN LINK FENCE

ONE STORY
METAL TRAILER

50.10'
F.F.ELEV.=11.32'
50.09'
13.65'
13.72'

42.14'
F.F.ELEV.=11.66'
42.16'
12.00'

60.06'
ONE STORY
METAL TRAILER
F.F.ELEV.=11.47'
60.16'
23.44'
23.48'

60.16'
ONE STORY
METAL TRAILER
F.F.ELEV.=10.99'
59.96'
23.82'
23.78'

2 PARKING SPACES

6' HIGH CBS WALL

8' HIGH CHAIN LINK FENCE

BOTTOM SLOPE

METAL CONTAINER

CONC.

WOOD RAMP

METAL STAIRS

WOOD RAMP

WOOD STAIRS

WOOD RAMP

METAL STAIRS

GATE

TOP SLOPE

METAL ROOF

METAL SHED

WOOD RAMP

CANOPY REST AREA

ASPHALT PAVEMENT

CONC.

CANOPY REST AREA

CANOPY REST AREA

ASPHALT PAVEMENT

ASPHALT PAVEMENT

GRASS

WOOD STAIRS

ONE STORY
WOOD BUILDING
F.F.ELEV.=11.66'

ONE STORY
CBS BUILDING
F.F.ELEV.=8.12'

ONE STORY
WOOD BUILDING
F.F.ELEV.=12.18'

4' CONC. SIDEWALK

4' CONC. SIDEWALK

5' CONC. SIDEWALK

5' CONC. SIDEWALK

GRAVEL

CONC.

BOTTOM SLOPE

8' HIGH CBS WALL

GRASS

8' HIGH CBS WALL

GRASS

8' HIGH CBS WALL

8' HIGH CBS WALL

EAST LINE SECTION 5–53–40

GRASS

FOR CONTINUATION SEE SHEET 3 OF 4

REVISIONS	
1.	6.
2.	7.
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4.	9.
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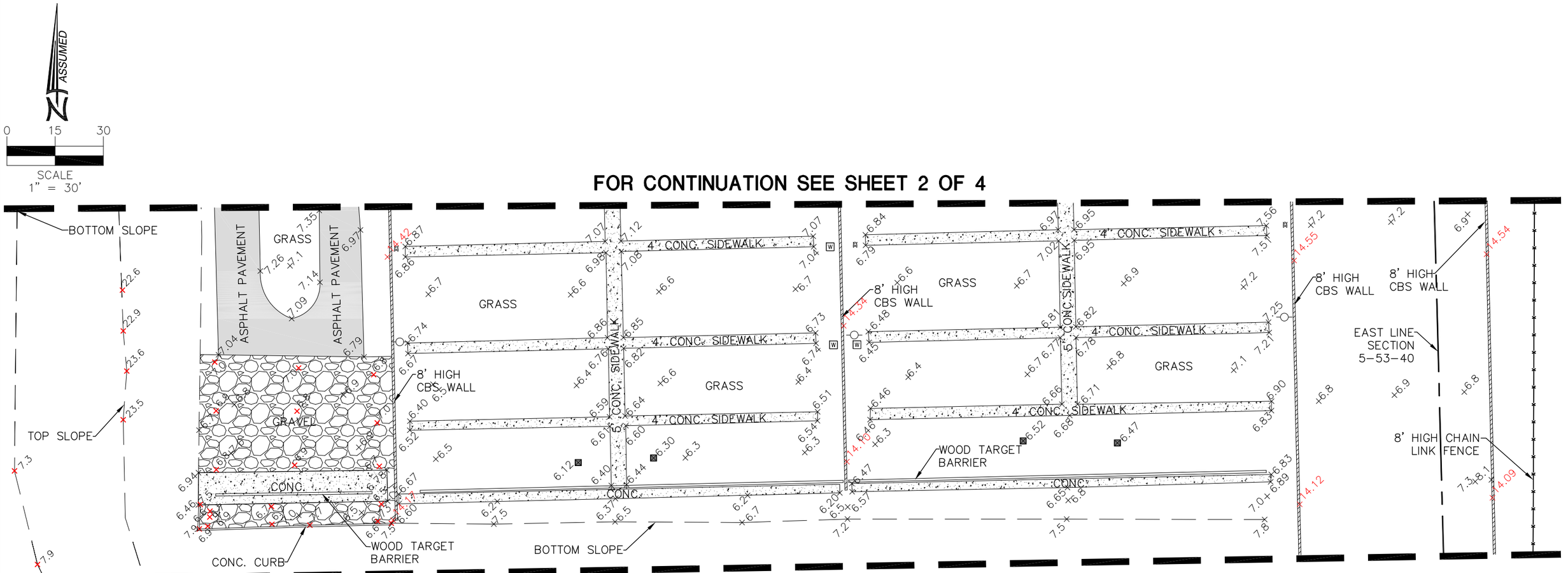

LEGEND:

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D.M.E.	= DRAINAGE MAINTENANCE EASEMENT	℄	= BASELINE
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		SWK	= SIDEWALK

LEGEND:

P.G.	= PAGE
P.O.B.	= POINT OF BEGINNING
℄	= PROPERTY LINE
N.T.S.	= NOT TO SCALE
+8.35	= ELEVATION
	= WATER OUTLET
BL.	= BLOCK
	= CLEANOUT
M	= MONUMENT LINE
	= DRAINAGE CATCH BASIN
△	= CENTRAL ANGLE
	= TRAFFIC SIGN
	= CATCH BASIN (INLET)
	= MAST ARM

	= WOOD UTILITY POLE
	= ANCHOR POLE
LP	= CONCRETE LIGHT POLE
PP	= CONCRETE POWER POLE
	= FIRE HYDRANT
E	= ELECTRIC BOX
CATV	= CABLE TV BOX
WPB	= WIRE PULL BOX
WV	= WATER VALVE
SMV	= SEWER VALVE
MLP	= METAL LIGHT POLE
W	= WATER MANHOLE
T	= TELEPHONE MANHOLE

D	= DRAINAGE MANHOLE
S	= SANITARY SEWER MANHOLE
T.B.M.	= TEMPORARY BENCH MARK
P	= PARKING METER
	= FLAG POLE
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F.I.P.	= FOUND IRON PIPE
F.I.R.	= FOUND IRON REBAR
L.F.E.	= LOWEST FLOOR ELEVATION
L.P.	= LIGHT POLE
(M)	= MEASURED VALUE
(R)	= RECORD VALUE

LEGEND:

X-Y-Z	= SHADE TREE
X-Y-Z	= PALM TREE
	X=TRUNK DIAMETER Y=TREE HIGH Z=CANOPY DIAMETER
	= BRICK
	= CONCRETE
	= GRAVEL
	= TILE
	= PAVEMENT
	= CBS WALL

	= RIGHT OF WAY LINE
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	= ELECTRIC LINE
	= GAS LINE

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TOWN OF MEDLEY

of

9700 NW 97th AVE

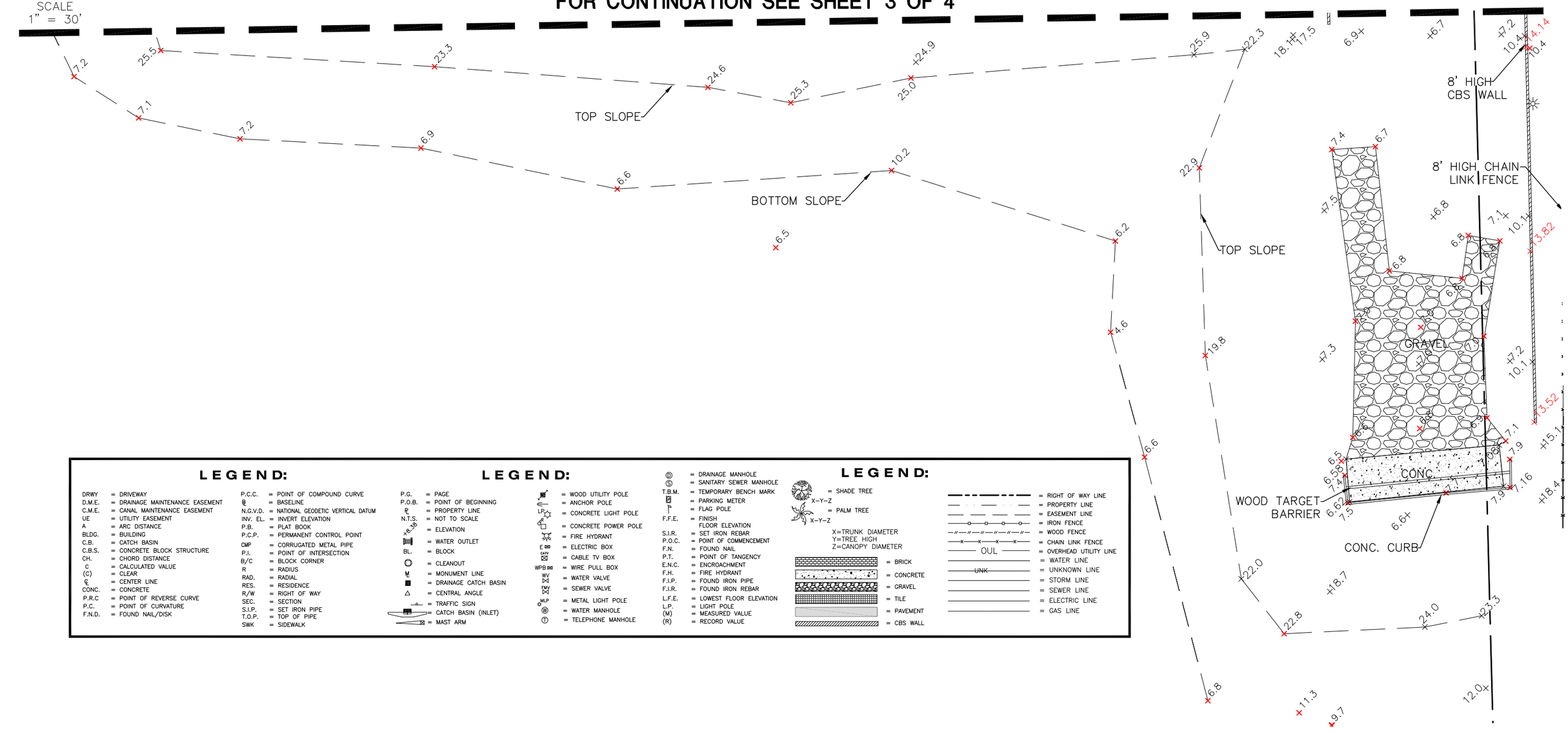
Job No.:	17040
Field Book:	FIELD
DRAWN BY:	LD
TECH BY:	RI
QA/QC BY:	AH

ASSUMED

0 15 30

SCALE
1" = 30'

FOR CONTINUATION SEE SHEET 3 OF 4



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LEGEND:

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N.T.S.	= NOT TO SCALE		= CONCRETE POWER POLE
+18.45	= ELEVATION		= FIRE HYDRANT
	= WATER OUTLET	E	= ELECTRIC BOX
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△	= CENTRAL ANGLE	MLP	= METAL LIGHT POLE
	= TRAFFIC SIGN	W	= WATER MANHOLE
	= CATCH BASIN (INLET)	T	= TELEPHONE MANHOLE
	= MAST ARM		

LEGEND:

D	= DRAINAGE MANHOLE		= SHADE TREE
S	= SANITARY SEWER MANHOLE	X–Y–Z	
T.B.M.	= TEMPORARY BENCH MARK		= PALM TREE
	= PARKING METER	X–Y–Z	
	= FLAG POLE		X=TRUNK DIAMETER
F.F.E.	= FINISH FLOOR ELEVATION		Y=TREE HIGH
S.I.R.	= SET IRON REBAR		Z=CANOPY DIAMETER
P.O.C.	= POINT OF COMMENCEMENT		
F.N.	= FOUND NAIL		= BRICK
P.T.	= POINT OF TANGENCY		= CONCRETE
E.N.C.	= ENCROACHMENT		= GRAVEL
F.H.	= FIRE HYDRANT		= TILE
F.I.P.	= FOUND IRON PIPE		= PAVEMENT
F.I.R.	= FOUND IRON REBAR		= CBS WALL
L.F.E.	= LOWEST FLOOR ELEVATION		
L.P.	= LIGHT POLE		= RIGHT OF WAY LINE
(M)	= MEASURED VALUE		= PROPERTY LINE
(R)	= RECORD VALUE		= EASEMENT LINE
			= IRON FENCE
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		UNK	= UNKNOWN LINE
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