

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF GENERAL SERVICES



Addendum No. 5

To

REQUEST FOR PROPOSALS NO. DCAM-21-CS-RFP-0017

DESIGN-BUILD SERVICES

FOR

AITON ELEMENTARY SCHOOL

Issued: November 23, 2021

This Addendum No. 5 is issued and hereby published on the DGS website and effective as of the date shown above. Except as modified hereby, the Request for Proposals (“RFP”) remains unmodified.

- Item No. 1:** The *Link* for the “HVAC OPR and new technical specifications” of the Addendum No. 4 is hereby revised and attached as **(Exhibit 1)**.
- Item No. 2:** **Attachment M (Form of Contract)** is hereby attached as **(Exhibit 2)** and incorporated to the RFP.
- Item No. 3:** **Attachment N (Form of Notice to Proceed and Letter Contract)** is hereby attached as **(Exhibit 3)** and incorporated to the RFP.
- Item No. 4:** The Proposal Due Date is hereby extended to **December 01, 2021, at 2:00 P.M.**

By: *Eric Njonjo*
Eric Njonjo
Contracting Officer

Date: 11/23/2021

- End of Addendum No. 5 -

Exhibit 1

HVAC OPR and new technical specifications



**Owner's MEP Project Requirements
for use in District of Columbia Public Schools**

District of Columbia Department of General Services

Washington, DC

Version: 2021-10.1

« Project Name [Subject] Project Name »

« Project Address 1 Click or tap here to enter text. Project Address 1 »

Project Address 2 Click or tap here to enter text. »

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1. Introduction

The District of Columbia Department of General Service (DGS) and DC Public Schools (DCPS) have always made sustainable, high performance schools for their students a priority. With the introduction of the Clean Energy DC Omnibus Amendment Act of 2018, which targets to increase the Renewable Portfolio Standard to 100% by 2032, and establishes a solar energy standard post 2032, DGS recognizes that its public schools play a considerable part in the District's energy reduction goals.

As the District continues to push its sustainable initiatives even further, with the goal of eliminating all fossil fuel use in public buildings, it is important that DGS, in collaboration with Design Teams, take a critical look at the systems that it designs for all modernized and new school buildings.

This document is meant to serve as a guideline and reference for Project Teams to use in the design of DC public school facilities, but it is not the only reference material available to teams. The following documents, issued by the Department of General Services and DC Public Schools with each project solicitation, should also be referred to, and considered as complimentary to this OPR:

- Department of General Services (DGS) Division 01 Specifications
- DC Public Schools Educational Specifications
- DGS ADA Compliance Quality Control Manual
- DGS MEP Systems-Commissioning-TAB Quality Control Manual

2. Scope

2.1 Overview and Definition

The Owner's Project Requirements (OPR) provide an explanation of the ideas, concepts and criteria that are considered to be very important to the Owner, coming out of the programming and conceptual design phases and which are desired to be tracked throughout design and construction. The OPR is developed by the owner, not the design team, but includes an area for the Design Team and Owner to include project specific targets and goals.

The OPR document sets the functional goals that the design is judged against and establishes the basis of the criteria used during construction to verify actual performance. The OPR does not list items that are already required by code. The OPR is generally not a description of what specifically will be included in the project design, but is the more general feature and categorical performance criteria to be met by the design. Where practical and known, the OPR includes measurable indicators used to verify that the performance requirements were met.

The OPR will be followed by the basis of design or design narrative written by the design team and included with design package submissions. The basis of design documents the primary thought processes and assumptions behind the design decisions and describes the design elements being incorporated to meet the OPR.

2.2 Scope

This document includes requirements for the building systems that are more likely to be included under the formal commissioning umbrella or be impacted by their interactions. For reference, systems not included in this project and OPR that are typically commissioned and should have an OPR developed for them include: process mechanical and plumbing, exterior envelope performance, and other moving mechanical devices.

This document is not a comprehensive project OPR, and does not include all project requirements and directives to the design team which could include: other disciplines such as fire protection, structural, landscaping, civil, geotechnical and other earth work, utilities, Division 01 specification requirements, demolition, all the materials, furnishings and special construction disciplines, drawing, specification and calculation requirements, codes and references, etc.

This document focuses on the mechanical, energy and comfort related systems and on the sustainability requirements of the project. This document does not replace the Commissioning OPR, but rather should serve as a guide in its development.

2.3 Procedures

All products included in this document or the referenced appendix documents are Basis of Design (BOD) only.

2.3.1 Substitutions

Substitutions or deviations can be considered by the Owner on a case by case basis and should be communicated to the Owner and DC Public Schools during Concept or Schematic Design for evaluation and approval. Substitutions requested by bidders after Design Development must be submitted per the Division 01 specification requirements.

Under each area or building system is a list of pertinent questions and data needed to be answered. Blue, indented italicized text indicates the answers to the questions and specific information about the project requirements for this project.

2.3.2 Submittal Review

Submittal requirements outlined in the DGS Division 01 specifications and DGS MEP Quality Control Manual should be followed.

3. General Project Requirements

This section of the OPR is intended for the Owner and Design Team to input project specific information that may assist in the design and scheduling, as well as describe project specific goals and objectives.

3.1 Overall Objectives

Describe this project, including the general overall objectives:

[*Click or tap here to enter text.*](#)

3.2 Existing Site Conditions:

Describe any existing conditions of the site that may aid in, or impair, the ability to meet project objectives:

[*Click or tap here to enter text.*](#)

3.3 Occupants

What grades / age ranges does the school serve?

- Early Childhood (0 to 30 months)
- Pre-Kindergarten (Pre-K3 and Pre-K4)
- Elementary School (Kindergarten through 5th Grade)
- Middle School (6th Grade through 8th Grade)
- High School (9th Grade through 12th Grade)
- Other [Click or tap here to enter text.](#)

3.4 Zoning

What are the floor number and/or building height requirements, and zoning limitations of the site?

[Click or tap here to enter text.](#)

3.5 Community Use

What community function / activities must this facility accommodate?

[Click or tap here to enter text.](#)

3.6 Energy Efficiency Goals

What are the overall energy efficiency goals and objectives?

- pEUI of [Click or tap here to enter text.](#)
- International Energy Conservation Code [Click or tap here to enter text.](#)
- Energy Star
- Net Zero Energy (NZE)
- LEED version: [Click or tap here to enter text.](#); Certification Target: [Choose an item.](#)
- Other [Click or tap here to enter text.](#)

3.7 Sustainability Goals

What other environmental goals and requirements are there?

[Click or tap here to enter text.](#)

3.8 Schedule

Describe the expected phasing of the project for construction and occupancy:

[Click or tap here to enter text.](#)

4. Heating, Ventilation and Air Conditioning

4.1 Owner's Preferred Building Systems

4.1.1 HVAC System Performance and Design Considerations

The HVAC design must comply with all applicable DC Construction Codes and standards.

Occupant health and thermal comfort shall be provided by HVAC system that must be designed to maintain the thermal and humidity parameters as described in Section 4.5 below.

Outdoor Air (OA) ventilation for the thermostatic zones must be in accordance with latest edition of ASHRAE Standard 62.1: "Ventilation for Acceptable Indoor Air Quality".

Historically almost all large central HVAC systems showed poor part-load efficiencies.

In order to reduce annual power consumption and improve building HVAC system energy performance DGS considers de-centralized building HVAC system design approach to be most energy efficient for their new construction and modernization projects.

For a consistent HVAC system energy conservation design, the engineer should consider terminal units in each thermostatic zone/room coupled with Dedicated Outdoor Air System (DOAS) terminals.

Water Source Heat Pumps and Geothermal Heat Pumps are best suited for this application. DOAS unit(s) shall be Direct Expansion (DX) cooling with electric heat and integral total heat recovery equipment.

4.1.2 Water Source Heat Pump (WSHP) System

Geothermal Heat Pumps (GHP) and Water Source Heat Pumps (WSHP) are the preferred HVAC system for both school modernization and new school projects.

- Geothermal Loop: Where acreage, construction phasing, and programming allows, geothermal heat pump systems should be used.
- Cooling Towers:
 - Cooling Towers with remote basins or below grade basins should be used when GHP system is not feasible.
 - Cooling Towers shall be designed such that freeze protection is unnecessary or minimized.
 - Boilers shall be utilized for providing heat to the heat pump hydronic system.

4.1.3 Dedicated Outdoor Air System (DOAS)

DOAS unit(s) shall be capable of pre-filtering, pre-conditioning and delivering OA to all school building zones served by WSHP or GHP system. DOAS unit(s) shall operate during occupied mode to meet ASHRAE Std. 62.1 requirements and shall be "off" during un-occupied mode. DOAS unit(s) shall modulate their respective supply fan(s) and deliver needed amount of OA in response to demand by each individual control zone. Each zone OA quantity demand shall be controlled by the level of CO₂ as measured by the zone CO₂ censor.

Whenever possible, DOAS units should be located within the building so as to preserve rooftop area for photovoltaics. Acoustic performance of the units so as not to disturb classrooms when located inside the building, or neighbors if located on the roof, are a priority. The highest level of internal acoustical dampening and isolation shall be specified for either instance.

4.2 Potential Alternate Building Systems

4.2.1 Variable Refrigerant Flow (VRF) Systems

Water cooled Variable Refrigerant Flow (VRF) systems may be acceptable for use in select projects with DGS approval. The use of air cooled VRF systems is not permitted.

- Water cooled condensers must be located within the building in close proximity to the associated fan coil evaporator units.
- Refrigerant piping between the terminal evaporator units and water-cooled condensers shall be kept reasonably short to minimize refrigerant piping runs in the building.
- All refrigerant piping connections must be brazed. Mechanical fittings are strictly prohibited.

- Refrigerant leak tracing must be provided where ever refrigerant piping is used.
- Approved basis-of-design manufacturers include:
 - Mitsubishi / Trane
 - Daikin
 - Samsung
- The following manufacturers are not approved for use:
 - LG

The use of VRF indoor fan coil units shall be limited to concealed ceiling mounted or concealed floor mounted ducted type units. The use of ceiling mounted VRF cassettes should be avoided.

4.2.2 Variable Air Volume (VAV) system with Hydronic Terminal Reheat

The VAV system with Hydronic Terminal Reheat may be an acceptable alternate for use in select projects with DGS approval. The VAV system represents a central system that is inherently less energy efficient than Water Source or Ground Source Heat Pumps. The design team will need to offset the increased energy use by the VAV system equipment with premium efficiency motors and energy reduction measures elsewhere, or by additional onsite renewable energy sources which has a potential added cost to the project.

4.3 Zoning and Distribution

On projects where the Building Automation System (BAS), connectivity, and enteliWEB® integration allows, the building should be zoned by use and occupancy to the greatest extent possible, to allow for different spaces (floors, wings, cafeterias, auditoriums, gyms, administrative areas, and lobbies) to be programmed to different setpoints and occupancy schedules as appropriate.

Different program areas may require different systems, and each should be evaluated against how it may affect the space available for the program.

4.3.1 Water Source Heat Pump Closets

Water Source Heat Pump units are well suited to academic and administrative spaces. WSHP units shall be ducted type to allow for even air distribution to the spaces served.

- Indoor vertical ducted type water source heat pump units are preferred to large rooftop equipment because it allows more rooftop area to be available for photovoltaic panels. WSHP units shall be placed in a dedicated heat pump closets to allow for easy maintenance access. Heat pump closet quantity and distribution should be carefully evaluated before a decision is made to ensure they are not taking too much interior space away from what is needed to meet the DC Public School Educational Specifications.
- If excess floor space is not available, concealed horizontal ducted type water source heat pumps could be located in the ceiling plenum. Accessibility to above ceiling units should be planned carefully. Heat pumps require routine filter replacement.

4.3.2 Direct Expansion (DX) rooftop systems

Direct Expansion packaged rooftop systems with gas or electric heating can be considered for large program spaces such as gymnasiums, cafeterias and auditoriums. For those systems minimum code required OA will be mixed with return air at the rooftop unit mixed air section.

4.4 Occupancy

4.4.1 Time of day schedules.

Buildings will be considered in “occupied mode” during the standard school day. A school will be set to “unoccupied mode” for any hours outside of the standard school day, weekends, DC Government holidays, and during scheduled school closures.

The school building occupancy schedule is as follows:

Day of Week	State	Morning	Occupied	Unoccupied	Special Event
School Year Weekdays	On	5:00 a.m.	6:30 a.m.	5:00 p.m.	5:00 p.m.
	Off	6:30 a.m.	5:00 p.m.	5:00 a.m.	10:00 p.m.
School Year Weekends	On	8:00 a.m.	8:00 a.m.	5:00 p.m.	5:00 p.m.
	Off	N/A	5:00 p.m.	8:00 a.m.	10:00 p.m.
Summer Break	On	8:00 a.m.	8:00 a.m.	5:00 p.m.	N/A
	Off	N/A	5:00 p.m.	8:00 a.m.	N/A
Winter Break	On	8:00 a.m.	8:00 a.m.	5:00 p.m.	N/A
	Off	N/A	5:00 p.m.	8:00 a.m.	N/A

The anticipated occupancy schedules per zone are as follows:

Zone	Morning Start	Occupied	Unoccupied	Evening Stop
Administration, Library, Gymnasium, & Cafeteria	6:00 a.m.	8:00 a.m.	5:00 p.m.	5:00 p.m.
Kitchen	4:30 a.m.	6:30 a.m.	1:30 p.m.	2:30 p.m.
Classrooms	6:30 a.m.	8:00 a.m.	3:30 p.m.	4:30 pm
All Other Areas	6:30 a.m.	8:00 a.m.	3:30 p.m.	4:30 pm

4.5 Setpoints

The setpoints outlined below have been developed by DGS and are in alignment with peer municipalities, institutions, and ASHRAE Standard 55-2020: Thermal Environmental Conditions for Human Occupancy. Note these standards only address temperature and relative humidity setpoints for terminal equipment serving various building zones and do not address ventilation requirements. Ventilation equipment is not intended to provide for local comfort changes.

4.5.1 Temperature and Humidity

Heating Season (Starting October 15):

- Occupied Mode:
 - Classrooms and offices shall heat to 70°F DB. Where terminal equipment and controls allow, a comfort band shall be established which provides local adjustments of +/- 2°F.
 - Gymnasiums and hallways shall be set to 68°F DB.
 - Relative humidity will not be controlled.
- Unoccupied Mode:
 - All spaces shall be set back to 55°F.

Cooling Season (Starting April 15):

- Occupied Mode:
 - All spaces shall cool to 75°F DB. Where terminal equipment and controls allow, a comfort band shall be established which provides local adjustment of +/- 2°F.
 - Gymnasiums and hallways shall be set to 72°F DB.
 - Relative Humidity shall be 50% +/- 10%.
- Unoccupied Mode:
 - All spaces shall be set back to 85°F DB.
 - Relative humidity will not be controlled.

4.6 HVAC Performance Requirements

4.6.1 WSHP units

WSHP and GHP unit's efficiency ratings (CoP and EER) shall meet or exceed values prescribed in ASHRAE Std. 90.1 Chapter 6 and latest adopted edition of International Energy Conservation Code (IECC).

4.6.2 Acoustics

Acoustics is a critical component of creating a successful, high-performance classroom environment. It is as critical that students are able to hear what their teachers are saying without the teacher straining their voice as it is to prevent distractions from noises that come from adjacent spaces, corridors, or equipment. Studies performed on DCPS occupied classroom conditions in non-modernized buildings regularly exceeded the industry benchmark standard AS/NZS recommended levels for acoustics and that even unoccupied conditions failed to meet the requirements for the United States Green Building Council (USGBC) LEED credit for Enhanced Acoustics. However, pre- and post-occupancy studies of DCPS schools have also shown that student and teacher satisfaction with acoustics in the modernized schools continues to remain low after renovation. This could be due to more active, contemporary learning styles that make for a more dynamic and louder learning environment. It is very important therefore to keep any additional background sound from HVAC equipment low, within the recommended dB values.

Acoustics of rooftop equipment should also be carefully considered at school sites located in tight residential communities. The highest level of internal, integral, sound attenuation available for the equipment shall be specified.

Whenever possible, it is DGS' preference for major HVAC equipment to be located within the building envelope, so as to reserve rooftop area for photovoltaic panels. However, if building size or other conditions do not allow this, the acoustical qualities of the proposed rooftop equipment will be carefully considered. Water source rooftop equipment is preferred by DGS. It is quieter and requires less sound isolation measures than air source units.

4.7 Indoor Environmental Quality (IEQ)

Over the past few years, wellness has become a common topic of concern and focus in public school modernizations. Recent research performed in conjunction with District of Columbia Public Schools suggests that the Indoor Environmental Quality (IEQ) of a learning space can have a large impact on student and teacher happiness and performance. Measurable components of IEQ include the amount of natural daylight, thermal comfort, acoustics, and air quality. This OPR will focus on two of these: Thermal Comfort and Air Quality

4.7.1 Thermal Comfort

Thermal discomfort can cause feelings of fatigue, irritability, and depression. Studies have shown that for every decrease of 1.8-degree F between 77-degree F and 68-degree F, students speed performance on tests was improved from 2-4% in all tasks (D.Wyon & P. Wargocki, "Indoor Environmental Effects On The Performance of School Work By Children," ASHRAE, 2007). In a study conducted by the Harvard TH Chan School of Public Health, they found that test scores increased by 4% when the temperature in the space did not exceed the upper acceptable thermal limit.

Learning environments shall be designed that promote thermal comfort and health of the students and faculty. The HVAC system design shall allow for this acceptable temperature range to be maintained, while at the same time being cognizant of the energy use of the building and allowing the spaces to drift in the unoccupied time when students are not present.

Access to natural daylight in the classroom can also have a significant impact on a student's concentration and general wellbeing. Proper daylighting should be studied to ensure that not only is there enough light getting into the space, but also to make sure that there's not too much light, which can lead to unnecessary heat gain within the space, as well as glare problems.

4.7.2 Air Quality

Fresh air is very important to the ability to affectively teach in the classroom settings, and on the cognitive learning of students, and on student attendance. There have been national studies on this affect as well as the independent study performed on modernized and non-modernized DCPS schools. the importance of good indoor air quality on the cognitive learning of students and student attendance.

The ASHRAE 62.1 requirements for ventilation stipulate a maximum CO₂ levels for schools at 1000 ppm. Ventilation designs should maintain levels in classrooms and education spaces below the threshold, while also balancing the operation and life cycle costs of required systems to make this an optimal learning environment.

Demand Control Ventilation (DCV)

Demand Control Ventilation (DCV) is an energy-saving control strategy that responds to the actual "demand" for ventilation in a zone by varying the rate at which outdoor air is delivered to that zone.

Per ASHRAE 90.1-2013 DCV is required for spaces larger than 500 sq. ft. and a design occupancy for ventilation higher than 25 people per 1,000 sq. ft. School classrooms, cafeterias, and auditoriums are all suited for this control strategy.

DCV should be incorporated into HVAC system design so that ventilation air amounts are distributed according to the actual occupant load. Classrooms and all high occupancy spaces shall include CO₂ sensors to regulate the amount of fresh air required.

4.8 Maintainability

4.8.1 Access / Equipment Locations

Ease of access is critical for ensuring that routine maintenance takes place, and that equipment continue to operate smoothly.

Water Source Heat Pumps: WSHP are preferred option to rooftop equipment as they are located within the building instead of on the roof. It is preferable that they be installed in closets, with filters located within reach. If floor area is at a premium, it is acceptable to install WSHP in the ceiling plenum. The ceiling should be acoustical ceiling tile to allow for easy access above the ceiling grid and provide acceptable level of noise attenuation from WSHP fans. Identification tags should be provided on acoustical ceiling grid.

Installation of WSHP above drywall ceilings is not preferred, but if necessary, access panels should be sized and located as necessary for maintenance access. Locations of access panels should be included on as-built documentation.

Rooftop Ductwork: The use of exposed duct work on the roof should be limited to the greatest extent possible, for maintenance, longevity, and to preserve as much rooftop area as possible for photovoltaic panels.

Unit Wall Heaters: The use of wall mounted unit heaters in stairwells should be avoided. They are prone to vandalism and large amounts of maintenance.

4.8.2 Identification

Equipment labels and tags shall be visibly located within the room.

4.8.3 Materials

The use of mechanical fittings for refrigerant piping is prohibited.

4.9 Operations and Maintenance Documentation

Refer to the Department of General Services Division 01 specifications for the projects Operation and Maintenance (O&M) documentation requirements.

4.10 Training

Refer to the Department of General Services Division 01 specifications for the project's requirements around training, and building turnover.

5. Enterprise Building Automation System (eBAS)

5.1 Remote Monitoring

The BAS system shall allow remote monitoring of all electrical, water, and gas meters and services, as well as allow DGS to remotely control all functional equipment.

The BAS system should be BACnet™ compatible and follow ASHRAE Standard 135 protocols, and be capable of connecting to the DGS enteliWEB® system.

5.2 Thermostatic Zoning Layout

The quantity and layout of a buildings HVAC thermostatic zones has a direct impact on meeting the Owner's energy saving goals, and should be carefully considered during the early design phases. It can also assist in increasing the longevity of the building's equipment by only turning on and off part of systems when occupancy demand needs them. A total of six (6) to twelve (12) zones are reasonable for the public schools depending on site orientation and envelope thermal gain / loss, physical layout of the rooms and program spaces, and occupancy schedule.

5.3 Point Naming Standards

5.3.1 Room Numbering

The Architect shall develop the room numbers and room naming standard in collaboration with the DCPS Design Manager and Project Coordinator during the Schematic Design phase of the project.

The following are the recommended room numbering protocol. This should be confirmed with DGS and DCPS on a project by project basis. Some unique situations may require adjustments to this system.

- The first number shall refer to the floor level (1, 2, 3, etc.). For basement levels, use the letter "B".
- If the school has been divided into zones by use (academic wing, athletic wing, etc.) the second position should be reserved for the letter representing that zone (A, B, C, etc.)
- The following 2 digits should refer to the room number (00, 01, 02, etc.). Rooms should be numbered sequentially in a movement around the building agreed to by DCPS and the school administration.
- Rooms within larger program suites should use the same number as the main room, with a letter suffix designation to differentiate it (A, B, C, etc.).

Once approved by DCPS, the approved room numbers shall be distributed to the design team for use in schedules, equipment and controls naming. The Architect shall be responsible for keeping the team updated on any changes to room names or numbers.

5.3.2 Point Naming and Tagging

DGS utilizes Project Haystack as its standard for point naming and tagging. Design teams should utilize the Project Haystack website at www.project-haystack.org. Project Haystack and all of its associated intellectual property is managed as an open source project using the Academic Free License (AFL) 3.0. Anyone is free to participate as long as contributed IP is licensed under the AFL.

5.3.3 Equipment and Controls Naming Standards

DGS utilizes the GSA Data Normalization standard as a basis for its equipment naming. Controls naming should follow the standards outlined in the DGS Unified Controls Specification.

The Controls contractor is required to get final approval and sign off on the equipment and controls naming from DGS Facilities and Maintenance Division and the DGS Sustainability & Energy Division during the submittal review process.

Refer to APPENDIX B and C at the end of this OPR for the referenced standards.

5.3.4 At Closeout

For projects incorporating enteliWEB®, a copy of the architectural floor plans with final building room names has been provided with the Controls Operation & Maintenance (O&M) manuals required for project closeout. Refer to DGS Division 01 specifications for all closeout requirements.

5.4 Emergency Notifications

Emergency notifications for critical systems shall be automatically generated and distributed via text message or other electronic message delivery service to the appropriate DGS and/or DCPS personnel. The following critical alarm notifications shall be provided:

Equipment:	Event:	Point of Contact:
Kitchen Walk-In Units	Power Failure	DGS First Team
Vaccination / Medication Refrigerators	Power Failure	DGS First Team
Sump Pumps	Power Failure	DGS First Team
Roof Leak Detection	Moisture detection	DGS First Team
Elevators	Power Failure	DGS First Team
Emergency Generator	Failure	DGS First Team

5.5 Local HVAC Control

Local HVAC controls for classrooms and offices need to contain easy to understand labels and/or graphics so teachers and staff can operate them without training. They also need to be durable, and mechanically attached to walls and partitions. Readout on the local control device must accurately match the conditions of the space they are connected to. (i.e. a temperature reading of 72 degrees F should match the physical condition of the air temperature in the space.). It is important that the Building Automation System (BAS) program range, and what the local control can do, should match.

The following spaces should always be controlled only by the BAS.

- Corridors
- Stairwells
- Gymnasium
- Cafeteria
- Natatorium

Corridors, Gymnasiums, Cafeterias, and Natatoriums may contain keyed or otherwise locked / protected override switches.

6. Electrical Systems

6.1 General

The District of Columbia is moving towards eliminating all fossil fuel use in public buildings. This means that there will be an ever-increasing demand on a building's electrical service to provide power for HVAC and water heating systems. It is also important that Design Teams check early in design that the available electrical service to the building is adequate to support all of the building's electrical needs.

If the electrical service to a site is not sized to support the building loads, PEPCO should be engaged immediately in order to discuss options for a service upgrade.

6.2 Power Monitoring

Metering in the public schools is essential to evaluate the performance of the systems, and to assist with Commissioning, and Net Zero Energy certification efforts. Proper metering also allows the Owner to ensure that billing for different utilities are being properly tracked and distributed to responsible parties.

All meters should be integrated with the eBAS.

6.2.1 Campus Level Metering

Campus Level Metering should be considered for project sites that will have multiple agencies or tenants using the premises, and separate utility billing is required.

Some site amenities, such as Electric Vehicle (EV) charging stations, or recreational pools and splash pads, require separate metering for use tracking and billing.

In some instances, running separate utility services to the site may be preferable to campus level metering. The Design Team should engage DGS during the Concept and Schematic Design phases to discuss the options and decide what makes the most sense for the Owner's billing and tracking needs.

6.2.2 Whole Building Meters

Whole Building Metering should be used for:

- Incoming Electrical Service
- Domestic Water Service
- Gas Service
- On-site Renewables
- Emergency Natural Gas Generators

On-Site Renewables: Metering of on-site renewables, such as photovoltaic panels and wind turbines, allows DGS to be able to compare the actual amount of power generation at each site against what is being billed. Metering of renewables should be compatible with the LOCUS software platform which connects via API to meters. On-site renewables that should be metered include:

Emergency Natural Gas Generators: Metering of emergency natural gas generators is a requirement of the net zero energy certification process, to allow for the separate tracking of gas use for emergency purposes versus general building use.

6.2.3 Single-Point Sub-meters

Single-Point Submeters are used by DGS to evaluate the efficiencies and performance trending of specific portions of, or equipment used in, the building's systems. Data from single-point meters should be able to be pulled in the Owner's enteliWEB® platform.

The following components should be sub-metered, with the specified tracking intervals:

- Central Plant Chillers – GPM (Gallons per minute), Supply / Return Water Temperature (Degrees F), BTU per hour at 15-minute interval
- Cooling Tower Make-up Water – GPM at 5-minute intervals and totalized gallons must be stored
- Cooling Tower Blow Down (as required by jurisdiction) – Totalized gallons must be stored
- Boilers – BTU per hour at 15-minute intervals
- Geothermal Well Field Generation – BTU per hour at 15-minute intervals
- Domestic Hot Water – Totalized Gallons per day
- Recirculation Pumps – GPM at 15-minute intervals

- Hose Bibs – GPM at 5-minute interval
 - Discuss the need for hose bib metering with DGS prior to including, as this is not typical, but may be required depending on site location and security.
- Site Water Features (make-up water) – GPM at 5-minute intervals and totalized gallons must be stored for at least a year.
- Interior Lighting – kWh used per day, week, month must be stored for at least a year.
- Exterior Lighting - kWh used per day, week, month must be stored for at least a year.
- Plug Loads - kWh used per day, week, month must be stored for at least a year.

6.2.4 Branch Circuit Submeters

Branch circuit sub-metering is required where the Owner desires to track the energy use and performance of either specific areas of the building, or systems across the entire building. The following branch circuit sub-meters should be included:

- Kitchen Electrical
- Building Plug Loads
- Interior Lighting
- Exterior Lighting - Single point sub-meters may be required by DGS to track security, parking, and athletic field lighting separately. Project Teams should coordinate needs with the DGS and DCPS project management teams.
- IT Loads (MDF/IDF)
- HVAC Loads
- Domestic Water Heating

6.3 Lighting

6.3.1 Lamps

All interior and exterior lighting should be LED.

6.3.2 Locations and Access

Lights in Gymnasiums, Natatoriums, Atriums, and over Auditorium fixed seating are hard to access and provide maintenance issues for DGS. Lifts to reach high bay areas in occupied schools are not always available, so light fixture access for occasional maintenance should be carefully considered in these situations. Whenever the option is available, remote drivers for high bay and difficult to reach lights should be used, with the drivers installed in readily accessible locations.

For pendent fixtures, the following mounting heights should be observed:

- Elementary Schools: minimum of 8'-6" AFF to bottom of light fixture
- Middle & High Schools: minimum of 9'-0" to bottom of light fixture

6.3.3 LED Temperature

Lights in the 5000K range are optimal for the majority of school related tasks requiring high levels of focus and concentration.

The ability to tune the color temperature in classrooms to specific tasks and activity can benefit the learning environment. Higher temperatures around 5500K can assist with concentration during testing, and when engaged in math and science activities. Lower temperatures in the 4000K range are recommended during group activities and classroom discussions. Even lower settings, around 3000K, help to calm students down after stimulating activities such as gym, lunch, and recess.

The design team should discuss the potential use of color tuning lighting with DGS and DCPS during the Concept and Schematic Design phases of the project, to determine which program areas could benefit the most from its use.

6.3.4 Lighting Levels

Required average maintained light levels for this project are listed below. For spaces not listed, the current IESNA light level recommendations shall be followed.

- Classrooms: 35 FC at desk level
- Offices: 35 FC at desk level
- Lobbies: 20 FC
- Corridors and means of egress: 20 FC while occupied. Gradual dimming to 10 FC allowed with input from daylight and occupancy sensors.
- Conference rooms: 35 to 50 FC
- Group Toilet Rooms and Locker Rooms: 30 FC
- Mechanical / Electrical Rooms: 35 FC
- Science Labs & Prep Rooms: 50 to 75 FC
- Art Rooms: 50 to 75 FC
- Instrumental Band Rooms: 50 to 75 FC
- Gymnasiums: Elementary / Middle School = 50 FC, High School = 80 FC
- Fitness Rooms: 20 to 30 FC
- Exterior lighting at building entrances, walkways, and parking lots: 2 to 5 FC.

6.3.5 Lighting Controls

Central lighting control systems should be universal and non-proprietary. The system should be BACnet compatible, and able to connect to DGS' enteliWEB® system. Cellular communication will not be accepted.

Local lighting control systems should be user friendly, with easy to understand words or symbols on the light switch faceplates.

6.3.6 Sequence of Operations – Local Lighting Controls:

Space Type:	Main Switch @ Primary Door:	Secondary	Occupancy Control	Specialty
Auditorium House Lights	ON / OFF RAISE/LOWER	N/A	Manual ON, Vacancy Sensor OFF	
Classroom	ON / OFF RAISE/LOWER	If 2nd door present, include ON / OFF	Manual ON, Vacancy Sensor OFF	Daylight Harvesting
Cafeteria	ON / OFF RAISE/LOWER	If 2nd door present, include ON / OFF	Manual ON, Vacancy Sensor OFF	Daylight Harvesting
Conference Rooms	ON / OFF RAISE/LOWER	If 2nd door present, include ON / OFF	Manual ON, Vacancy Sensor OFF	Daylight Harvesting
Gymnasiums **	ON / OFF	If 2nd door present, include ON / OFF	Manual ON, Vacancy Sensor OFF	Daylight Harvesting
Library	ON / OFF RAISE/LOWER	If 2nd door present, include ON / OFF	Manual ON, Vacancy Sensor OFF	Daylight Harvesting
Offices	At Door: ON / OFF RAISE/LOWER	N/A	Manual On / Vacancy Off 15 minutes	Daylight Harvesting
MEP Closets	ON / OFF	N/A	Manual ON, Vacancy Sensor OFF	N/A
Storage (General)	ON / OFF	N/A	Manual ON, Vacancy Sensor OFF	N/A

Toilets – Single User	ON / OFF	N/A	Manual ON, Vacancy Sensor OFF	N/A
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** Alternative – See Central Lighting Controls

6.3.7 Sequence of Operations – Central Lighting Controls

All interior lighting shall be turned off in any area that will be unoccupied for more than fifteen (15) minutes, except in corridors, stairwells, and exits as required by DCPS or the building code.

Space Type:	
Auditoriums	As the program requires.
Corridors	Control via time clock, with local key switch override located in corridor. Non-key switches allowed if located in a staff-controlled space (i.e. at Welcome Center desk). Lights should turn on with security alarm signal.
Exterior - Building	Controlled via astronomical time clock with photosensor override
Exterior – Fields	Controlled via time clock. Include remote control capabilities.
Exterior - Parking	Controlled via astronomical time clock with photosensor override.
Gymnasium	Control via time clock, with local key switch override located in gymnasium. Lighting for after-hours use and special event will have to be scheduled with the DGS. Alternative – see Local Control options.
Locker Rooms	Night Lights with Occupancy Override: Emergency lighting always on 24/7 to provide a minimum average lighting level of 15 FC. Occupancy sensor near entrance turns all lights on. Lights return to night light mode after 15 minutes of no activity.
Toilets – Group	Night Lights with Occupancy Override: Emergency lighting always on 24/7 to provide a minimum average lighting level of 15 FC. Occupancy sensor near entrance turns all lights on. Lights return to night light mode after 15 minutes of no activity.

Exterior decorative lighting is defined as lights that are not part of the building's security lighting at building entrances and exits, or illuminating the parking lots. It may be used to accent walkways or plazas, or for accenting landscape features. Decorative lighting should be circuited and programmed so whereas it may all come on at the same time via a time clock, it can be controlled and turned off separately depending on location.

6.4 Emergency Generator and UPS

The following equipment and systems are required to be connected to the emergency generator:

- All emergency lighting
- Classroom electrical lockdown hardware
- Security desk power and data

- Security panel
- Building Access panel
- All receptacles within IDF and MDF closets
- Cooling system for IDF and MDF closets
- MDF closet
- IDF closet (if possible)
- Elevator shaft lighting and receptacles
- Elevator car lighting and HVAC
- Sump pumps
- Kitchen Freezer (Lighting, heater, alarm, Blower coil, Compressor, and Glycol Racks)
- Kitchen Cooler (Lighting, heater, alarm, Blower coil, Compressor, and Glycol Racks)
- Health Suite Refrigerator(s)
- BAS Workstation
- Fire Pump (if needed)
- Main Fire Alarm Control Panel
- Generator components (battery heater, service receptacles / lighting, etc.)

6.5 Solar Power

6.5.1 Power Purchase Agreements

The District of Columbia's Net Zero Energy targets have made photovoltaic panels a necessity on all public buildings.

Typically, the cost of procuring and installing PV would be too high for most public school modernization budgets to support. In the District of Columbia photovoltaic panels are provided on DC Public School projects at no cost thanks to Power Purchase Agreements, or PPAs, between the District of Columbia and local utility providers. The design, procurement, and installation of the PV system is handled entirely by a third-party vendor.

6.5.2 3rd Party Photovoltaic Consultant

Since the design and installation of the PV is outside of the scope of the Design-Build team, it is important that the engineers engage with DGS' 3rd Party Photovoltaic Consultant early in the design process. The DGS consultant oversees the solicitation process and implementation of DGS' photovoltaic projects, and can assist teams in evaluating available rooftop area, assessing the efficiency of proposed panel layouts, and assist in calculating a system predicted energy production.

An energy model must be provided to DGS and their 3rd Party PV consultant at the time of the PPA procurement for their project, especially for any school modernizations that include a net zero energy certification mandate in the RFP.

6.5.3 Rooftop Coordination

There are many items that compete with PV panels for space on a roof, such as HVAC equipment, vent penetrations, drains, and fall arrest anchors. Roof top equipment and penetrations should be limited to the greatest extent possible. PV layout should be coordinated around roof drains so as not to impede the flow of water, but to also allow access to the drains for routine maintenance.

If an existing roof is to be reused, the structural engineer should evaluate the existing structure to determine if it can support the added weight of a ballasted PV system. If an existing roof is not capable of bearing the weight, or the total roof area is not adequate to meet the power production offset required, site mounted PV panels can be considered.

6.5.4 Project Responsibilities & Costs

The Design – Build team is required to provide dedicated space within the building for the future PV panels, transformers, and inverters, as well as provide the necessary conduit between the equipment and the PV locations. A dedicated breaker for the PV system should also be included in the main switch panel.

If site mounted photovoltaics are required, the design, engineering, and construction cost of the site structures or trellis' required to support the panels is the responsibility of the Design-Build team and must be accounted for in the project's budget. Similar for any secondary framing required to attached photovoltaic panels to building mounted canopy or sunshade structures. The Power Purchase Agreement only covers the cost and installation of the PV panels themselves.

6.6 Execution

6.6.1 Raceways

In all areas without ceilings and exposed to the structure above, all wire management shall be controlled through raceway trays.

6.6.2 Electrical and Network Labeling

All electrical outlets, including those in systems furniture, shall be labeled with corresponding electrical panel and breaker numbers

All network outlets, including those in systems furniture, shall be labeled with the corresponding closet, patch panel and termination location

6.6.3 Color Coding

HVAC controls cabling shall be yellow

Network cabling shall be blue

Wireless access point cabling shall be orange.

7. Plumbing Systems

7.1 Coordination with PV Systems

Although the procurement and installation of the PV system is not part of the project scope for school modernizations, the Design-Build team shall provide proposed photovoltaic panel layouts for review by the DGS 3rd Party Photovoltaic Consultant. The layouts should be carefully considered and coordinated so as not to inhibit the flow of stormwater to roof drains, nor to block maintenance access to main or overflow drains.

7.2 Domestic Water

7.2.1 Efficiency

All water fixtures shall be Water Sense Certified

7.2.2 Controls

The outlet temperatures on domestic-water heaters shall be monitored by the Building Automation System (BAS).

7.2.3 Plumbing Fixtures

Refer to APPENDIX A for Plumbing Fixture Basis of Design Schedule. Plumbing fixtures and accessories shall meet the District of Columbia's accessibility guidelines for public schools where required.

Lavatories

- Multi-station lavatory units are preferred in group toilet rooms over single wall hung units. Preferred number of stations per sink is three (3) whenever possible.

Sinks

- Undermount sinks are preferable. If set in sinks are used, countertop design should account for height of sink rim. ADA measurers height of sink from finished floor to sink rim, not countertop.

Faucets

- Battery powered automatic sink faucets are not acceptable to DGS. The batteries are hard to procure, and therefore do not get replaced frequently. Manual metered faucets eliminate the issue with the batteries, but can be difficult for some smaller children (and adults!) to push to operate. Whenever possible, hardwired automatic faucets should be used.

Water Closets

- Mounting Heights:
 - Pre-K3 and Pre-K4 on-suite toilets: floor mounted with top of seat located 13 inches AFF.
 - Kindergarten and 1st Grade toilets: wall mounted with top of seat located 15 inches AFF
 - All other locations other than ADA: Wall mounted with top of seat located 18 inches AFF
 - ADA toilets: per the ADA Guidelines

Urinals

- Waterless urinals shall not be allowed.
- Pint urinals shall not be allowed. The small amount of water utilized is not adequate to prevent buildup in the system, which leads to larger maintenance issues.

Showers

- Design Teams should avoid the use of pre-fabricated shower units and basins. Small-sized ceramic tiled shower basins set into recessed slabs (when possible) are preferred. Carefully coordinate drawings to ensure ADA clearances are met.
- Shower mixing valves shall be fully accessible from inside of the shower stall.

Drinking Fountains

- Drinking fountains should be provided at all major corridors. At ADA fountain locations, design should provide ADA apron below fountain or other acceptable construction that provides cane detection.
- All drinking fountains shall include a bottle filler.
- Bubblers should be located at all classroom sinks.

Mop Sinks

- Teams should avoid the use of prefabricated mop sinks whenever possible.

7.2.4 Toilet, Shower, and Custodial Accessories

Refer to APPENDIX A for DCPS approved toilet, shower, and custodial accessories.

7.3 Identification

7.3.1 Labels

Identification for equipment and valves shall be visibly located within the room.

7.3.2 Abbreviations

Refer to the APPENDIX for equipment and controls naming standards.

8. Project Closeout

Refer to the DGS Division 01 specifications for the full extent of all project closeout requirements and procedures.

8.1 Drawings

The following drawings should be provided in the designated DGS Office within each school:

- Laminated 8.5" x 11" MEP equipment schedules with all makes and models listed.
- Laminated 24" x 36" (minimum) MEP floorplans with accurate building room numbers that correspond to all equipment and control schedules.
- Laminated 8.5" x 11" valve schedules with corresponding valve locations
- Laminated 24" x 36" (Minimum) HVAC sequence of operations

---END of OPR---

9. APPENDIX A: Plumbing Fixture Schedule

Multi-station Lavatory Unit

- Basis of Design: Bradley Corporation, Verge LVL Series

Faucets

- Multi-User Restrooms
 - Basis of Design: American Standard Metering Faucets, Centerset Spout
- Single-User Restrooms
 - Basis of Design: Monterrey by American Standard, Two-Handle Centerset Lavatory Faucet

Mop Sinks

- Faucet
 - Basis of Design: Service Sink Faucet by T&S Brass and Bronze Works, with 4" Wrist Action

Toilets

- Pre-K3 and Pre-K4 on-suite toilets:
 - Basis of Design: Baby Devoro FloWise by American Standard, with round front
- Typical Toilet (all other grades/ages):
 - Basis of Design: American Standard Elongated Wall Hung Closet Fixture

Urinals

- Basis of Design: American Standard Washbrook Urinal

Flush Valves

- Pre-K3 and Pre-K4 on-suite toilets:
 - Basis of Design: Sloan Flushometer 111-1.28
- Typical Toilet (all other grades / ages):
 - Basis of Design: Sloan – Manual Exposed Flushometer
- Urinals
 - Basis of Design: Sloan Manual Exposed Flushometer

Drinking Fountains

- Interior Drinking Fountains:
 - Basis of Design: Elkay Enhanced EZH20 Bottle Filling Station & Versatile Bi-Level ADA Cooler
- Exterior Drinking Fountains
 - Basis of Design: Elkay Outdoor EZH20 Bottle Filling Station Bi-Level Wall mount LK4409BF, or Elkay Outdoor EZH20 Pedestal mount LK4420BF1U

Toilet, Shower and Custodial Accessories

Soap Dispenser

- Basis of Design: ClearVu Bulk Foam Soap Dispenser 9345

Toilet Paper Dispenser

- Must accommodate a 9 inch bulk roll (single or double)
- Basis of Design:

Paper Towel Dispenser for Pre-K3 and Pre-K4 on-suite restrooms, and classroom sinks only.

DGS Plumbing Fixture Schedule

- Must accommodate an 8 inch paper towel roll.
- Hand dryers shall be provided at all other locations other than the Kitchen.
- Basis of Design: Bobrick B-72860

Hand Dryers

- Located in all toilet rooms except the Pre-K3 and Pre-K4 on-suite restrooms.
- Basis of Design: Dyson Airblade V

Partition-Mounted Sanitary Napkin Disposal

- Double-sided serving two toilet compartments:
 - Basis of Design: Bobrick B-354
- Single-sided
 - Basis of Design: Bobrick B-254

Surface-Mounted Soap Dish

- Locate below all liquid soap dispenser to collect drips
- Basis of Design: Bobrick B-6807 (Satin-finish stainless steel)

Shower Curtain Rod

- Bobrick Extra-Heavy-Duty Shower Curtain Rod, B-6047

Grab Bars

- Basis of Design: Bobrick Stainless Steel Grab Bars with Snap Flange, B-6806

Shower Seat

- Basis of Design: Bobrick Bariatric Folding Shower Seat with Legs, B-918116 Series

Mop / Broom Holders

- Basis of Design: Bobrick Utility Shelf with Mop/Broom Holders and Rag Hooks, B-239

Mirrors in Toilet Rooms

- Basis of Design: Bobrick Glass Mirror with Stainless Steel Angle Frame, B-290

Baby Changing Stations

- Basis of Design: Koala Kare Horizontal Recessed Mounted Stainless Steel Station, KB110-SSRE

Napkin / Tampon Vendor

- Basis of Design: Bobrick Recessed or Semi-Recessed Napkin / Tampon Vendor, B-3706T (Token Operation)
- Due to changing District code requirements, Design Teams should confirm with DCPS at time of specifying if current DCPS standards require "Token" or "Free" operation,

10. APPENDIX B: Equipment & Controls Naming Standards

GSA Data Normalization for Building Automation Systems:

The Project Team should procure a copy of the current GSA Data Normalization document prior to beginning design. A copy may be provided here by DGS when available.

Project Haystack

Design teams should utilize the Project Haystack website at www.project-haystack.org. Project Haystack and all of its associated intellectual property is managed as an open source project using the Academic Free License (AFL) 3.0. Anyone is free to participate as long as contributed IP is licensed under the AFL.

11. APPENDIX C: Controls Naming Standards

DGS Unified Controls Specification

SECTION 06 2000

FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Cabinets with plastic laminate finish and related hardware.
 - 2. Counter and vanity tops fabricated from solid surfacing.
 - 3. Shelving.
 - 4. Standing and running trim, including bases, with field painted finish.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Division 09 Section PAINTING AND COATING for field applied painting systems.
- B. See Division 12 Section LABORATORY CASEWORK for manufactured casework.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for materials specified.
- B. Shop Drawings:
 - 1. Submit Shop Drawings of finish carpentry showing location of each item, dimensioned plans and elevations, large scale details and joints.
 - 2. Include hardware catalog cuts and schedule.
- C. Samples:
 - 1. Plastic laminate and solid surfacing: For colors not indicated on Finish Schedule on Drawings, submit manufacturer's full range of standard color and texture samples.

1.4 DEFINITIONS

- A. Exposed Surfaces: Surfaces visible when doors and drawers are closed; bottoms of casework more than 4'-0" (1200 mm) above finished floor, backs of hinged doors and edges of hinged doors exposed when opened.
- B. Semi-Exposed Surfaces: Surfaces that become visible when drawers and doors are opened, tops of cases 6'-6" (1950 mm) or more above finished floor.
- C. Concealed Surfaces: Surfaces not visible after installation.

1.5 SYSTEM REQUIREMENTS

- A. Fire Resistance Requirements: Treat those items required to be treated by authorities having jurisdiction over Work, and those items indicated as “Fire Retardant Treated Wood”.
- B. Interface with Other Systems:
 - 1. Coordinate Work with that of other trades affected by this installation.
 - 2. Coordinate with electrical, plumbing and other fixtures mounted within, or adjacent to woodwork and requiring access. Provide required openings using manufacturer’s templates and field measurements to verify actual installed locations and dimensions.

1.6 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications:
 - 1. Not less than 5 years documented, successful experience with work comparable to Work of this Project.
 - 2. Woodwork shall be installed by manufacturer.
- B. Reference Standards: Comply with applicable provisions and specified sections and grades of AWI “Architectural Woodwork Standards”.

1.7 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, at Contractor’s direction, meet at site and review installation procedures and coordination with other Work, especially verification of in-wall wood blocking/structural support systems at finish carpentry and cabinetry mounting locations.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver finish carpentry Work to building after concrete, masonry and other Work involving wet materials have been completed for at least 10 days, when areas are ready to receive Work, and only after temperature has been stabilized in installation areas at approximate level which will prevail in building when occupied.
- B. Protect finish carpentry Work against damage during handling, transit and storage.
- C. Store in dry, clean, well ventilated place, protected from dampness, moisture and weather.

1.9 PROJECT CONDITIONS

- A. Verify dimensions before proceeding and obtain measurements at job site for Work required to be accurately fitted to other construction.
 - 1. Measurements shall be accurate so that finished Work is precisely assembled and fitted.
 - 2. Verify locations of concealed blocking, nailers and furring that support finish carpentry, before partitions are enclosed.
 - 3. Record measurements on final Shop Drawings.
- B. Remedy unsatisfactory tolerances in adjoining Work.

- C. Proceed with finish carpentry Work only after substrate construction and penetrating Work have been completed.
- D. Environmental Requirements:
 - 1. Obtain temperature and humidity requirements for woodwork installation and storage areas from woodwork manufacturer.
 - 2. Do not install woodwork until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
 - 3. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork within 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Softwood Lumber:
 - 1. Concealed blocking for finished carpentry: Douglas fir “C Select”; or equivalent WWPA softwood or better.
 - 2. Exposed blocking or blocking within walls: No. 1 Common; Douglas fir or Southern pine.
 - 3. Provide kiln dried lumber with average moisture content of 6% to 11%.
- B. Panel Products:
 - 1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
 - 2. Plywood:: APA INT C-C.
 - 3. Core material for use under plastic laminate: Comply with ANSI A208.1.
 - a. Provide particleboard core for cabinet doors and for adjustable shelves.
- C. Plastic Laminate:
 - 1. Description: High pressure laminates, complying with NEMA LD3 and AWI 200-S-10. Provide the following grades:
 - a. Exposed vertical surfaces: High pressure GP-28 (0.028 inch nominal thickness).
 - b. Exposed horizontal surfaces: High pressure GP-50 (0.028 inch nominal thickness).
 - c. Thermoset decorative overlay (melamine).
 - 2. Finish: Matte.
 - 3. Color: As indicated on Finish Schedule on Drawings.
 - 4. Adhesive: Clear drying type recommended by laminate manufacturer.
- D. Solid Surfacing Material:
 - 1. Description: Homogenous, mineral-filled acrylic and polymer resin, complying with NEMA LD3 and with the following physical properties:
 - a. Tensile strength: Minimum 3900 psi (26.9 MPa), when tested in accordance with ASTM D638.
 - b. Hardness: Minimum 56 Barcol, when tested in accordance with ASTM D2583.
 - c. Water absorption: Maximum 0.04% for 3/4 inch (19 mm) thickness, when tested in accordance with ASTM D570.
 - 2. Colors and finishes: As indicated on Drawings.
 - 3. Thickness: 3/4 inch (19 mm), unless otherwise indicated.

4. Adhesive: Type as recommended by solid surfacing material manufacturer.
5. Acceptable products and manufacturers:
 - a. Corian Solid Surfaces by DuPont.

2.2 HARDWARE

A. Comply with ANSI/BHMA A156.9.

B. Hinges:

1. Concealed door hinges:
 - a. Concealed hinges for overlay doors, 110 deg opening with integral horizontal and vertical adjustment; self-closing; for full-overlay doors.
 - b. Finish: Manufacturer’s standard bright nickel.
 - c. Acceptable product and manufacturer: Equivalent to Duomatic Hinges by Häfele America Co by Häfele America Co.

2. Hinge quantity schedule:

Height (Max.)	Width (Max.)	No. of Hinges
30 inch (750 mm)	24 inch (600 mm)	2
30 inch (750 mm)	36 inch (900 mm)	3
36 inch (900 mm)	24 inch (600 mm)	3
36 inch (900 mm)	36 inch (900 mm)	3
48 inch (1200 mm)	24 inch (600 mm)	4

C. Drawer Slides:

1. Description: Ball bearing slides.
2. Mounting: Side.
3. Load capacity:
 - a. Desk drawers: 100 pounds (45 kg) per pair.
 - b. Bins and file drawers: 150 pounds (70 kg) per pair.
4. Extension:
 - a. Desk drawers: Three section, full extension.
 - b. Bins and file drawers: Three section, full extension.
5. Finish: Manufacturer’s standard electro-plated zinc.
6. Acceptable products and manufacturer:
 - a. Desk drawers: Equivalent to 3832 Slide Series by Accuride.
 - b. Bins and file drawers: Equivalent to 4034 by Accuride.

D. Pulls:

1. Description: As indicated on Drawings.
2. Finish: As indicated on Drawings.
3. Acceptable product and manufacturer: Equivalent to systemhandle No. 7842, by Systemhandle.

E. Shelf Support Pins:

1. Description: Nickel-plated spoon shaped pins for support for adjustable shelves, inserted into 1/4 inch (6 mm) diameter holes drilled at 3 inches (76 mm) on center in sides of cabinet.
2. Acceptable product and manufacturer: Equivalent to Metal Shelf Supports, Steel Ø1/4", Spoon-Shaped by Häfele America Co.

3.

F. Locks:

1. Description: Standard pin type or disc type (5 pins or discs) tumbler locks, keyed individually except as otherwise indicated.
2. Finish: As selected by Architect from the manufacturer's full range.
3. Locations: Provide for each door and each drawer.

G. Grommets:

1. Description: Plated steel cap fitting flush with top of work surface, seating into black oxide finish sleeve (liner) with concealed spring fastener; 3 inch (76 mm) diameter with two 2 slots.
2. Color: As selected by Architect from manufacturer's full standard range.
3. Acceptable product and manufacturer: Equivalent to PS-3C by Doug Mockett & Company, Inc.

H. Miscellaneous Hardware: Provide other required hardware as indicated and as required for complete and proper operation and installation of units.

2.3 ACCESSORIES

- A. Provide miscellaneous steel support angles and plates as required for complete installations.

2.4 FABRICATION

A. General:

1. Comply with referenced AWI standards.
2. Provide details and profiles indicated.
3. Field verify all conditions prior to fabricating finish carpentry.
4. Fabricate units rigid, neat, free from defects, warp or buckle in accordance with final Shop Drawings.
5. Provide factory cutouts for openings in units as required to receive associated Work.
6. Premachine units at factory to receive hardware using hardware manufacturer's templates.
7. Assemble units at factory and disassemble only as required for shipping to site. Accurately mark units for assembly at site.

B. Standing and Running Trim:

1. Comply with AWI, Premium Grade.
2. Fabricate from hardwood solid stock material for opaque finish as indicated.
3. Groove or kerf backs of flat trim. Do not let grooves and kerfs show on exposed ends of finished Work.

C. Cabinets:

1. Comply with AWI, Custom Grade.
2. Fabricate from solid stock material for opaque finish and panel material for plastic laminate finish.
3. Apply edge sheets prior to applying face sheets to doors., unless otherwise indicated.
4. Provide dust panels of 1/4 inch (6 mm) thick plywood or tempered hardboard above compartments and drawers, except where located directly under tops.

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5. Prepare units for hardware and install at factory where practical.

D. Countertops and Vanity Tops:

1. Solid surfacing tops:

- a. Form joints between components using manufacturer's standard joint adhesive; without conspicuous joints. Reinforce with 2 inch wide strip of solid surfacing material.
- b. Provide factory cutouts for fixtures and fittings as indicated on Drawings.
- c. Rout and finish component edges with clean, sharp returns. Rout cutouts, radii and contours to template. Smooth edges.

2.5 SHOP FINISHING

A. Shop Priming:

1. Apply sealer and first finish coat on surfaces requiring field finishing, except millwork requiring field fabrication.
2. Back paint concealed surfaces with one coat of oil base wood primer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A.** Examine substrates and adjoining construction, and conditions under which Work will be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Blocking and Furring:

1. Provide surface-mounted wood blocking, nailers, furring and grounds on partitions, located as required for wall-hung cabinetry and other wall-hung items, whether or not such blocking and similar items are indicated on Drawings.
2. See Division 06 Section ROUGH CARPENTRY for installation of blocking and furring within partitions, ie. below gypsum board.
3. Coordinate with Division 09 Section GYPSUM BOARD.

3.3 INSTALLATION

A. General:

1. Comply with AWI, Premium Grade.
2. Install in accordance with final Shop Drawings and manufacturer's instructions.
3. Install Work plumb, level, true, and straight with no distortions.
 - a. Shim using concealed shims.
 - b. Install to tolerance of 1/8 inch in 10 feet (3 mm in 3 m) for plumb and level.
4. Assemble and install Work without machine and tool marks.
5. Neatly fit and scribe Work to adjacent surfaces.

B. Standing and Running Trim:

1. Prime cut edges and ends of exterior standing and running trim, prior to installation.
2. Provide concealed blocking anchored securely to substrate.

3. Install in single lengths without splicing wherever possible, level, plumb and square.
4. Scarf running joints. Stagger joints in adjacent and related members.
5. Cope at returns and internal angles and miter at external angles.
6. Blind nail where possible with fine finishing nails. Set nails for putty stopping.
7. Draw trim tight against finished surfaces.

C. Cabinets:

1. Install with concealed fasteners, plumb and level.
2. Securely attach to supporting substrates and blocking and furring.
3. Coordinate with electrical requirements to provide openings at receptacles and switches.
4. Adjust doors and drawers to center in openings, and to equalize width of gaps between adjoining doors and drawers.

D. Countertops:

1. Install countertops straight, level and plumb.
2. Provide concealed blocking and anchor securely to walls.
3. Coordinate with electrical requirements to provide openings at receptacles and switches.

E. Shelving:

1. Install shelving straight, level and plumb.
2. Securely attach to blocking, using concealed fasteners to greatest extent possible.

F. Touch up shop primer as required after installation.

3.4 ADJUSTING AND REPAIR

- A. Before completion of Work, adjust hardware until components operate properly.
- B. Replace defective, damaged, missing or stolen hardware.
- C. Touch-up marred finishes, including shop primers to match adjacent surfaces.
- D. Remove and replace units which are warped, bowed, not properly fitted or finished or otherwise damaged.

3.5 CLEANING AND PROTECTION

- A. Clean Work upon completion.
- B. Protect units during construction so that they will be without any evidence of damage or use at time of acceptance.

END OF SECTION

SECTION 07 3110

SYNTHETIC SLATE SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
1. Synthetic slate roofing shingles
 2. Self-adhesive underlayment.
 3. Roofing felt underlayment.
 4. Flashing.
 5. Sealants and joint fillers.
 6. Accessories.
- B. Single Subcontract Responsibility: Retain a single firm or company, hereinafter referred to as "Slate Roofing Subcontractor" for providing and installing Work of this Section and related Sections so as to establish undivided responsibility for entire slate roofing system.
- C. Products Installed but Not Furnished under This Section:
1. Metal counterflashings and coping.
 2. Sealants and joint fillers in conjunction with above.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's current addition of specifications and installation instructions for each product. Include documentation showing compliance with all physical properties specified for the completed system, as well as individual components.
- B. Shop Drawings:
1. Submit Shop Drawings showing placement of materials in field of roofs.
 2. Show shingle pattern, for each location.
 3. Include details for edge terminations, flashing and typical penetrations.
 4. Reference each material, sequence of placement and penetrations application procedure.
- C. Samples:
1. Shingles:
 - a. Submit three sample sets for each type of shingle showing full range of color, texture and finish expected in completed Work.
 - b. Sample sets shall consist of minimum three samples in each set.
 - c. Samples shall be full size shingles.
 2. Snow guards: Submit full size samples of snow guard.
 3. Metal Valley Flashing: 12 inch square sample.
 4. Each type of accessory involving color selection.
- D. Certificate: Submit manufacturer's certification that roofing slate complies with specified requirements.

- E. Qualification Data: Submit Slate Roofing Subcontractor qualifications verifying years of experience; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.
- F. Quality Assurance data: Third party inspection & manufacturer site visit reports verifying conformance of installation.
- G. Quality Assurance data: Manufacturer's standard warranty.

1.3 SYSTEM REQUIREMENTS

- A. Synthetic Shingles - Fire-Resistance Characteristics: Provide synthetic shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Exterior fire-test exposure:
 - a. Class C; ASTM E108 or UL 790, for application and roof slopes indicated.
 - b. Comply with International Building Code Type IIIB Construction.
- B. Interface With Other Systems:
 - 1. Coordinate roofing Work with Work of other trades.
 - 2. Provide materials and accessories in timely manner so as not to delay Work.

1.4 QUALITY ASSURANCE

- A. Slate Roofing Subcontractor Qualifications:
 - 1. Firm or company which has specialized for a period of not less than 5 years in installation of work similar to major components of Work indicated and required for this Project.
 - 2. Slate Roofing Subcontractor must maintain full-time supervisor on job site during times that roofing Work is in progress. Supervisor must have minimum of five years' experience in roofing work similar in nature and scope to Work of this Project.

1.5 SAMPLE INSTALLATIONS

- A. Prior to commencing Work and preceding pre-installation conference, provide sample installation of each type of shingle roofing Work.
- B. Extent and Locations: Approximately 100 square feet, in location acceptable to Architect.
- C. Materials: Complete installations with complete system materials including underlayment, flashing, shingles, sealants and accessories.
- D. Architect's Review:
 - 1. Architect will review sample installations for visual acceptance of materials and workmanship.
 - 2. Obtain Architect's approval of sample installations before proceeding with subsequent Work.
- E. Maintain approved sample installations during construction as standard for subsequent Work.
- F. Properly finished and maintained sample installations may be incorporated into completed Work.

1.6 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at site and review installation procedures and coordination with other Work.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect products in accordance with manufacturer's instructions.
- B. Deliver materials in manufacturer's unopened containers or bundles, fully identified with brand, type, grade, class and all other qualifying information.
- C. Take necessary precautions to keep products clean, dry and free of damage.
- D. Store synthetic slates in locations with temperatures above 45 deg F.

1.8 COORDINATION AND SEQUENCING

- A. Sequence and coordinate preparation and installation of new roofing materials with Selective Structural Demolition Work and Work of other trades affected by Work of this Section.
- B. Do not proceed with new roofing materials until unsatisfactory conditions have been reported and corrected.

1.9 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Proceed with roofing Work only when existing and forecasted weather conditions will permit Work to be performed in accordance with manufacturer's specifications.
 - 2. Self-adhesive underlayment:
 - a. Apply materials only in fair weather, when ambient, roof deck and underlayment temperatures are 45 deg F or higher.
 - b. Do not apply underlayment to moist surfaces.

PART 2 - PRODUCTS**2.1 SYNTHETIC SLATE**

- A. Acceptable Products and Manufacturers:
 - 1. Design is based on Empire Slate by EcoStar to establish standard of quality.
 - 2. Equivalent products by other manufacturers may be acceptable, provided they comply with requirements of Contract Documents.
- B. Synthetic Slate Shingles:
 - 1. Description: Engineered polymer composite material simulating appearance of natural slate.
 - 2. Physical properties:
 - a. Wind resistance: Class F, for 6-inch through 8-inch exposure, when tested in accordance with ASTM D3161.
 - b. Impact resistance: Class 4 Classification, when tested in accordance with UL 2218.

3. Color: As selected by Architect from manufacturer's full range.
4. Shapes and Sizes: As indicated on Drawings.

2.2 ASSOCIATED MATERIALS

- A. Substrate: One of the following:
 1. Minimum 15/32" (12 mm) plywood or 7/16" (11 mm) OSB decking, properly gapped for expansion.
 2. Minimum 3/4" (19 mm) tongue and groove wood decking with end gaps not exceeding 1/4" (6 mm), and board widths not exceeding 6" (152 mm).
 4. Metal deck with nail base insulation
 5. Minimum slope of substrate: 3/12 (14°) for 9" (229 mm) exposure installation and a minimum of 6/12 (27°) for 10" (254 mm) exposure installation.
- B. Underlayment:
 1. Acceptable underlayment products:
 - a. Versashield by GAF.
 - b. Granular Surface 100 or Smooth Surface High Temperature 300 Glacier Guard by Eco Star.
 - c. Polyolefin coated with sheet by Aqua Guard.
- C. Transition Flashing: Design is based on RoofSeal/OneStep by Eternabond:
 1. Rolls: 36 inch wide.
 2. Color: White.
 - 3.
- D. Fasteners for Shingles: Provide manufacturer's recommended stainless steel ring shank roofing nails.
- E. Elastic Cement: Waterproof elastic slaters' cement colored to match slate, product as recommended by slate manufacturer.
- F. Snow Guards:
 1. Pad style:
 - a. Copper, half-round style to match design of existing snow guards; shop-fabricated for use on synthetic slate shingle roofs.
 - b. Dimensions: Manufacturer's standard.
 - c. Fasteners: Copper; shape and size as recommended by snow guard manufacturer as suitable for condition of substrate and application.
 - d. Acceptable product and manufacturer: PD10 Half Round Pad-Style Guard, by Alpine Snow Guards.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.
 1. Do not proceed with new roofing materials until unsatisfactory conditions have been reported and corrected.

3.2 INSTALLATION

- A. Install materials in accordance with final Shop Drawings and manufacturer's instructions.
- B. Substrate: Install in accordance with final Shop Drawings.
- C. Underlayment:
 - 1. Locations: Continuous on plywood sheathing including eaves and rake edges, ridges, valleys, hips, roof penetrations, and other changes in roof plane.
 - 2. Install underlayment on substrate, in accordance with underlayment manufacturer's instructions.
 - 3. Remove dust, dirt, loose nails and other protrusions from sheathing.
 - 4. Work up from low point of roof.
 - 5. Center underlayment sheets at valleys, ridges and hips. Apply membrane in valleys before application at eaves.
 - 6. Apply succeeding sheets with minimum 3-1/2 inch side laps and 6 inch end laps.
 - 7. Do not leave underlayment exposed for more than 48 hours, before covering with shingles.
- D. Flashing:
 - 1. Unless otherwise indicated, comply with the following:
 - a. Line valleys with 4 inch lap joints; turn edges and fasten with cleats.
 - b. At sides of vertical surfaces, extend flashing at least 6 inches up vertical surface and extend and lap flashing under shingles minimum 4 inches.
 - c. Terminations at vertical surfaces: Provide step flashing built into masonry Work.
 - d. Provide flashing at hips and gutters as indicated and as recommended by shingle manufacturer.
 - 2. Sequence flashing installation with slating.
- E. Slating:
 - 1. General: Install according to manufacturer's instructions.
 - a. Provide preformed starter course shingles at eaves.
 - b. Use integral spacer tabs in side edges of shingles to ensure proper 1/4 inch spacing between shingles. Clip tabs only from exposed edges; do not clip tabs between adjacent shingles.
 - 2. Do not install slates which are broken, cracked, chipped, dirty, stained or otherwise damaged. Replace damaged slates as required with sound materials.
 - 3. Install slate with projection at eaves and projection at gable ends of same dimensions as for existing slate shingles.
 - 4. Lay slates in horizontal courses with head lap of same dimension as for existing slate shingles.
 - 5. Offset joints in each course minimum 3 inches from preceding course, to match offset of existing slate shingles.
 - 6. Build in and place flashing as slating Work proceeds.
 - 7. Neatly fit slate around pipes, ventilators, or other vertical obstructions.
 - 8. Eaves or cornice lines:
 - a. Install 1/4 inch thick wood cant strip along edge.
 - b. Double slates using same thickness slate for under-eaves at first exposed course.
 - c. Under-eave slate shall be approximately 3 inches longer than exposure of first course.
 - 9. Ridges: Lay pre-fabricated ridge units.
 - 10. Valleys: Lay slates to form valley configuration matching that of existing slate shingles.

11. Fastening:
 - a. Drive nails in manner to avoid producing strain on slate.
 - b. Conceal nails, except where unavoidable at top courses.
 - c. Where slates overlap sheet metal, place nails to avoid puncturing metal.
 - d. Synthetic slates:
 - 1) Fasten by hand-nailing, or using pneumatic nail gun set to 100 psi. Do not allow end of nail gun to punch slates.
 - 2) Lay hip slates and ridge slates according to shingle manufacturer's instructions.
- F. Snow Guards:
1. General:
 - a. Locate each style of snow guard in locations indicated on Drawings.
 - b. Install snow guards in accordance with snow guard manufacturer's instructions.
 2. Pad style:
 - a. Install in locations indicated on Drawings.
 - b. Install snow guards as shingles are being installed. Fasten using copper nails through punched holes in strap, into sheathing.
 - c. Install in accordance with layout indicated on Drawings from a line no closer than 2 feet from eaves edge of roof; uniformly space snow guards in 3-row pattern approximately 24 inches on center centered on shingle joints, and every second course vertically, staggered in a uniform pattern from course to course.

3.3 CLEANING AND PROTECTION

- A. Clean shingles in accordance with manufacturer's recommendations.
- B. Upon completion, shingles must be sound, whole, clean and roof shall be left watertight and neat in every respect.
- C. Protect Work during construction so that it will be without evidence of damage at time of acceptance.

3.4 QUALITY CONTROL

- A. Schedule and conduct 3rd party inspections regularly at preparatory, initial and follow up stages to ensure conformance of installation with contract documents.
- B. Schedule manufacturer site visit at completion of installation for final acceptance and issuance of warranty.

END OF SECTION

SECTION 07 5400

THERMOPLASTIC MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Sections includes, but is not limited to, the following:
 - 1. Adhered thermoplastic membrane roofing system.
 - 2. Vapor retarder.
 - 3. Roof insulation.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 06 1000 ROUGH CARPENTRY for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
- B. See Section 07 6200 SHEET METAL FLASHING AND TRIM for metal roof flashings and counterflashings.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Provide project-specific Shop Drawings, drawn to scale, for roofing system. Include plans, elevations, sections, details, and attachments to other work, including:
 - 1. Base flashings and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Roof plan showing orientation of steel roof deck and orientation of roofing, fastening spacings, and patterns for mechanically fastened roofing.
 - 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
 - 1. Sheet roofing, of color required.
 - 2. Walkway pads or rolls, of color required.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.

DGS – CAPITAL CONSTRUCTION SERVICES [PROJECT NAME]

- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
- C. Product Test Reports: For components of roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- E. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Warranty.

1.7 PERFORMANCE REQUIREMENTS

- A. Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
 - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
 - 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Tested by a qualified testing agency to resist roof uplift pressures as indicated on Structural Drawings and in accordance with ASCE/SEI 7.
- D. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- E. Energy Performance: Roofing system shall have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested according to CRRC-1.
- F. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.8 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.9 **QUALITY ASSURANCE**

- A. **Manufacturer Qualifications:** A qualified manufacturer that is FM Global approved for roofing system identical to that used for this Project.
- B. **Installer Qualifications:** A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.10 **DELIVERY, STORAGE, AND HANDLING**

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.11 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.12 WARRANTY

- A. Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, substrate board, roofing accessories, roof pavers, and other components of roofing system.
 - 2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain components including roof insulation, fasteners, adhesives, flashings, and transition membranes for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 THERMOPLASTIC MEMBRANE ROOFING

2.3 [SELECT ONE TYPE FROM BELOW]

- A. Roof Membrane:
 - 1. PVC Ethylene-Interpolymer Alloy Sheet: ASTM D 4434/D 4434M, Type III, with felt or fabric backing.
 - 2. Thickness: 80 mils (1.5 mm), nominal.
 - 3. Exposed Face Color: White with acrylic coating.
 - 4. Acceptable Manufacturers:
 - a. Johns Manville.
 - b. FiberTite.
 - c. Carlisle Syntec Systems.
 - d. Sarnafil.

- B. Roof Membrane:
 - 1. KEE (ethylene interpolymer), fabric reinforced, 0.045 inch (1.5 mm) thick, complying with ASTM D 6754.
 - 2. Exposed face color: To be selected by Architect from manufacturer's full range.
 - 3. Acceptable product and manufacturer: Equivalent to 45 mil FiberTite-SM by FiberTite Roofing System.

2.4 AUXILIARY ROOFING MATERIALS

- A. Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.
- C. Bonding Adhesive: Manufacturer's standard, water based.
- D. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- E. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.5 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, Type X, 5/8 inch (16 mm) thick.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening substrate board to roof deck.

2.6 VAPOR RETARDER

- A. Polyethylene Film: ASTM D 4397, 6 mils (0.15 mm) thick, minimum, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).
 - 1. Adhesive: Manufacturer's standard lap adhesive, FM Global approved for vapor-retarder application.
- B. Laminated Sheet: Polyethylene laminate, two layers, reinforced with cord grid, with maximum permeance rating of 0.06 perm (3.5 ng/Pa x s x sq. m).
 - 1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.7 ROOF INSULATION

- A. Preformed roof insulation boards manufactured or approved by sheet membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.

- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.8 INSULATION ACCESSORIES

- A. Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 - 1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
- D. Cover Board: ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 inch (13 mm) thick.

2.9 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch (5 mm) thick and acceptable to roofing system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 5. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.4 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
 - 1. Fasten substrate board to top flanges of steel deck according to recommendations in FM Global's "RoofNav" and FM Global Loss Prevention Data Sheet 1-29 for specified Wind-storm Resistance Classification.

3.5 VAPOR-RETARDER INSTALLATION **[INCLUDE IF PART OF ROOF ASSEMBLY]**

- A. Polyethylene Film: Loosely lay polyethylene-film vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively. Continuously seal side and end laps with manufacturer's recommended tape or adhesive.
- B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.6 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- G. Insulation Installation on Steel Deck:
 - 1. Mechanically fasten each layer of insulation to steel deck.
 - 2. Use 1 insulation fastener and plate per 2 square feet (.186 meters square) of insulation, unless otherwise recommended by insulation and membrane manufacturers.
 - 3. Installation of non-tapered insulation:
 - a. Install insulation at right angles to deck ribs. Stagger end joints.
 - b. Offset joints in second layer from joints in first layer by at least 12 inches (300 mm) in each direction.
 - 4. Installation of tapered insulation and crickets: Install as indicated on final Shop Drawings, in proper sequence to achieve required slopes and configurations.
 - 5. Cut and neatly fit insulation at edges and penetrations. Leave 1/4 inch (6 mm) gap between insulation and vertical surfaces.
 - 6. Do not install more insulation than can be covered by roof membrane in one day.
- H. Insulation Installation on Concrete Deck:
 - 1. Install as indicated on final Shop Drawings, in proper sequence to achieve required slopes and configurations.
 - 2. Lay insulation directly on concrete deck. Cut and fit neatly with joints tightly butted and staggered.
 - a. Leave a 1/4 inch (6 mm) gap between insulation and vertical surfaces.
 - b. If ambient temperature is 40 deg F (4 deg C) or below during installation, do not butt joints tightly.
 - 3. Fastening:
 - a. For adhered system, use Alternate Insulation Attachment Method which specifies a flood coating of hot asphalt with a series of grid nailers. Insure that equivalent products do not require penetration of substrate for fastening of insulation or recovery board.
- I. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together and fasten to roof deck.
 - 1. Fasten cover boards according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.

3.7 ADHERED ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.
 - 1. Install sheet according to ASTM D 5036.
- B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

- C. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.
- E. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing. Follow manufacturer recommendations to ensure proper adherence of membrane & flashing to underlying substrates at corners, and edges. Also, at changes in vertical-horizontal plane along parapet, perimeter, interior walls, steps and curbs supporting mechanical equipment.
- F. Apply roofing with side laps shingled with slope of roof deck where possible.
- G. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
 - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.8 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.9 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

- B. Roof-Paver Walkways: Install walkway roof pavers according to manufacturer's written instructions in locations indicated, to form walkways. Leave 3 inches (75 mm) of space between adjacent roof pavers.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.
 - 1. Testing agency shall perform tests on abutting or overlapping smaller areas as necessary to cover each entire test area.
 - 2. Testing agency shall provide survey report indicating locations of discontinuities and leaks, if any. Include CAD drawings, photographic documentation, and a written report
- B. Embedded Leak Detection System:
 - 1. Coordinate installation of leak detection system with membrane roofing manufacturer.
 - 2. Measurement Grid: Install measurement on membrane substrate immediately under membrane and immediately prior to installation of membrane.
 - a. Verify that location of measurement grid fasteners does not interfere with or cause damage to membrane.
 - b. Fasten measurement grid in accordance with leak detection system manufacturer's requirements.
 - c. Do not place measurement grid where it will be in continuous direct contact with structural components.
 - d. Provide minimum 2 inch overlap where adjacent sheets meet, including side laps and end laps.
 - e. Cut measurement grid as close as possible to the perpendicular strand at both end and side edges
 - 3. Conductor Wire: Install conductor wire on top of membrane at spacing and layout indicated on approved shop drawings.
 - a. Secure conductor wire using method recommended by manufacturer.
 - 4. Installation Testing: Verify continuity and functioning of conductor wire and measurement grid upon completion of installation for fluid-applied protection membrane roofing and prior to installation of overburden.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.11 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

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- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 08 1113

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Interior steel doors.
 - 2. Exterior and interior steel frames.
 - 3. Steel frames for interior glazing.
 - 4. Door louvers.
 - 5. Glazed door (vision) panels.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 08 7100 DOOR HARDWARE for hardware requirements.
- B. See Section 08 8000 GLAZING for glass requirements.
- C. See Section 09 9000 PAINTING AND COATING for field applied finish.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for each component and finish.
- B. Shop Drawings - Door Schedule:
 - 1. Submit Shop Drawings for fabrication and installation of steel doors and frames.
 - 2. Include locations, configuration, details, elevations, conditions at openings, and fire rating for each door type.
 - 3. Include hardware locations (including security hardware), mounting details and anchorage.
 - 4. Details of conduit and preparations for power, signal & control systems.

1.4 SYSTEM REQUIREMENTS

- A. Fire Resistance Requirements:
 - 1. Comply with label requirements of NFPA and applicable local codes.
 - 2. Fabricate door and frame assemblies that comply with NFPA 80, are identical to door and frame assemblies tested per NFPA 252 and are labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 3. Fabricate borrowed-light frame assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9. Label each individual glazed lite.

4. Provide UL labels permanently fastened at factory on each door and frame within size limitations established by NFPA and UL for labeling.
5. Provide anchors for UL labeled frames required by authority having jurisdiction.
6. Provide labeled egress doors at stairs with maximum transmitted temperature end point of not more than 450 deg F (140 deg C) above ambient at the end of 30 minutes of standard fire test exposure.
7. For units exceeding sizes of tested assemblies, provide certification by testing agency acceptable to authorities having jurisdiction that doors conform to standard construction requirements of tested and labeled fire-rated door assemblies except for size.

B. Interface With Other Systems:

1. Coordinate with Work of other trades affected by Work of this Section.
2. Provide items, such as anchors or supports, in a timely manner so as not to delay job progress.
3. Place items, such as anchors or supports, accurately in relation to final locations.
4. Use Contractor's bench marks.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project.

B. Manufacturer Qualifications:

1. Company specializing in steel doors and frames for fire rated openings, having minimum of 5 years successful, documented experience with work comparable to that required for this Project; member of Steel Door Institute.
2. Company whose units are inspected, tested and listed by UL for single point hardware and astragal conditions for sizes and profiles indicated.

C. Reference Standards: Comply with applicable provisions of Steel Door Institute.

1.6 PRE-INSTALLATION CONFERENCE

A. Prior to commencing Work, meet at site and review installation procedures and coordination with other Work. Discuss at minimum the following:

1. Schedule for completion.
2. Submittals status.
3. Field verification of dimensions.
4. Coordination for efficient electronic/security hardware integration.

1.7 DELIVERY, STORAGE AND HANDLING

A. Protect units from damage during transit, storage and installation.

B. Tool marks, rust, blemishes and any other damage on exposed surfaces will not be acceptable.

C. Store units in dry location, off ground and in such manner as to prevent deterioration.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hot-Rolled Sheet Steel: ASTM A1011, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Sheet Steel: ASTM A1008, Commercial Steel (CS).
- C. Metallic-Coated Steel Sheets: ASTM A653, Commercial Steel (CS), Type B, with A40 zinc-iron-alloy (galvannealed) coating; stretcher-leveled standard of flatness.
- D. Prime Paint:
 - 1. Rust-inhibitive enamel or paint, compatible with finish paints as specified in Section 09 9000 PAINTING AND COATING.
 - 2. For metallic-coated steel: High zinc-dust content paint with dry film containing not less than 94 percent zinc dust by weight, complying with SSPC Paint 20.

2.2 ACCESSORIES

- A. Supports and Anchors: Fabricate from metallic-coated sheet steel, of thicknesses as follows.
 - 1. Frames for interior doors:
 - a. Doors to Shower Rooms: 0.064 inch thick.
 - b. Other interior doors: 0.052 inch thick.
 - 2. Frames for exterior doors: 0.064 inch thick.
- B. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items built into exterior walls.
- C. Jamb Anchors:
 - 1. Masonry and concrete substrates:
 - a. Tee shaped corrugated or perforated metal anchors built into adjoining construction.
 - b. Fabricate anchors from steel, same thickness as frame; 2-1/2 inches wide x 10 inches long (63 mm wide x 250 mm long).
 - c. Use adjustable anchors with friction fit for frames set in masonry; weld to frames set in concrete.
 - d. Provide 3 per jamb up to 7'-0" (2100 mm) high and 4 per jamb over 7'-0" (2100 mm) high.
 - e. Where concrete has been placed prior to setting of frames, anchor with 3/8 inch (9 mm) countersunk flat head bolts with expansion shields or inserts; minimum 4 per jamb. Dimple and reinforce frame face to set bolt heads slightly below face.
 - 2. Steel stud substrates:
 - a. Fabricate anchor clips from 0.0598 inch (1.5 mm) thick steel; width to match stud width.
 - b. Jamb anchors: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches in height.
 - 2) Four anchors per jamb from 60 up to 90 inches in height.
 - 3) Five anchors per jamb from 90 up to 96 inches in height.

- 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof more than 96 inches in height.
 - c. Head anchors:
 - 1) No anchors required for frame less than 42 inches wide.
 - 2) Two anchors for frames more than 42 inches wide but less than 48 inches wide.
 - 3) Reinforced frames for frames wider than 48 inches.
 3. At fire rated frames, comply with fire resistance requirements and provide UL rated anchors.
- D. Floor Anchors: Where floor fill or setting beds occur, provide 0.1046 inch (2.657 mm) thick adjustable clip angles, with pre-drilled holes, welded to frame for attachment to structural substrate.
- E. Vertical Bracing:
1. For frames supported on steel studs, if studs at jamb do not extend to structure above, provide vertical steel struts, 3/8 inch x 2 inches (9 mm x 50 mm), extended from top of frame at each jamb to supporting construction above.
 2. Bend top of struts at right angle and attach to supporting construction by bolting, welding or other suitable anchorage.
- F. Bituminous Coating for Doors at Swimming Pool Areas:
1. Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15 mil (0.4 mm) dry film thickness per coat.
 2. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 FABRICATION

- A. Fabrication Requirements:
1. Fabricate units rigid, neat, free from defects, warp or buckle. Shop fabricate units in largest units practicable.
 2. Reinforce units as required to prevent twisting or sagging.
 3. Form exposed surfaces with corners square, unless otherwise indicated. Form molded members straight and true, with joints coped or mitered. Dress welded joints smooth so they are invisible after finishing.
 4. Conceal fastenings, unless otherwise indicated. Countersink exposed screws using flat, Phillips head screws.
- B. Steel Doors:
1. Provide metal doors of types and styles indicated. Comply with ANSI A250.8 for materials and construction requirements.
 2. Fabricate exposed faces of doors and panels from cold-rolled steel sheets.
 3. Interior doors:: Provide Level 3, Model 2 doors with 0.053 inch (1.3 mm) thick face sheets, metallic-coated.
 4. Doors at Serveries or Kitchens: Fabricate door with solid metal sheet across the bottom of the door to prevent rodents from chewing door bottom.
- C. Steel Frames:

1. Provide metal frames of types and styles indicated. Comply with ANSI A250.8 for materials and construction requirements, except brake-form custom shapes as required to provide profiles and configurations indicated.
 - a. Fabricate from minimum 0.067 inch (1.7 mm) thick sheet steel, metallic-coated at exterior, prime painted at interior.
 2. For openings over 4'-0" (1200 mm) wide, increase thickness by at least 0.014 inch (0.4 mm).
 3. Provide heavier thicknesses as required for configuration indicated or as required to comply with regulatory or fire rating requirements.
 4. Welded frames:
 - a. Fully welded construction, including jamb and head stops, with welded, mitered and reinforced corner joints.
 - b. Welds on exposed faces shall be ground smooth and flush to provide smooth, seamless faces and edges.
 - c. Provide 0.0598 inch (1.5 mm) thick steel channel spreaders at bottom of frames to prevent distortion during shipment and installation.
 5. Mullions and transom bars: Closed or tubular construction to match indicated profiles.
- D. Hardware:
1. Prepare doors and frames to receive hardware. Coordinate with Hardware Schedule. Comply with SDI 107 and ANSI A115 "Specifications for Door and Frame Preparation".
 2. Mortise, reinforce, drill and tap units at factory to receive mortise type hardware.
 3. Reinforce, drill and tap units to receive surface-applied hardware.
 4. Use minimum thickness reinforcement for hardware recommended by SDI.
 5. Locate hardware as indicated on final 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."
 6. Provide metal plaster guards for mortise cut-outs.
 7. Prepare doors and frames to receive mortise and surface mounted security hardware.
- E. Louvers: Provide louvers for interior doors, where indicated, that comply with SDI 111C, with blades or baffles formed of 0.020 inch (0.5 mm) thick, cold-rolled steel sheet set into 0.032 inch (0.8 mm) thick steel frame.
1. Sightproof louvers: Stationary louvers constructed with inverted V-shaped or Y-shaped blades.
 2. Lightproof louvers: Stationary louvers constructed with baffles to prevent light from passing from one side to the other, any angle.
 3. Fire-rated automatic louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same testing and inspecting agency that established fire-resistance rating of door assembly.
- F. Glazed Frames:
1. Form glazed light frames profiles shown. Provide anchors at jambs same as for door frames. Provide closed mullion sections fabricated from minimum 0.0598 inch (1.5 mm) thick steel.
 2. Miter, fit and weld corners of frames. Provide non-removable panel moldings on the exterior. Secure removable moldings with not less than No.6 x 32 Phillips oval-head countersunk machine screws at 12 inches (300 mm) on center.

3. Provide continuous felt strips cemented in place, on bed and stop surfaces, so that glass does not touch metal.

G. Glazed Door (Vision) Panels:

1. Provide glazed panels; sizes and glass types as indicated. On Drawings.
2. Provide glazing frame assembly with fixed and removable moldings flush with face sheets.
3. Glaze with manufacturer's standard glazing materials, consistent with fire ratings.

H. Glazing Stops:

1. Minimum 0.0359 inch (0.9 mm) thick steel.
2. Provide non-removable stops on outside of exterior doors and on secure side of interior doors.

2.4 SHOP FINISH

A. Prime Finish:

1. Clean, pretreat, and apply manufacturer's standard primer
2. Shop primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
3. Provide minimum 2 coats of primer to reinforcement and attachment steel in contact with concrete or masonry.
4. Apply primer with even consistency with a uniformly finished surface.

B. Metallic-Coated Steel Sheet Finishes:

1. Clean surfaces to remove contaminants and apply conversion coating of type suited to organic coating applied.
2. Clean welds, mechanical connections and abraded areas and apply galvanizing repair paint to comply with ASTM A780.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install in accordance with final Shop Drawings and manufacturer's instructions.

B. Frame Installation:

1. Comply with provisions of ANSI A250.11. Heed installation tolerances for squareness, alignment, twist & plumbness, as specified therein.
2. Set frames accurately in position, plumbed, aligned and braced securely.
3. Coordinate installation of built-in anchors for wall partition construction.
4. Field apply bituminous coating to backs of frames that are filled with grout containing anti-freezing agents.

5. Terminate frames at indicated finished floor level. Where floor fill or setting beds occur, support frames with adjustable clip angles, anchored to structural substrate.
6. Anchor frames to concrete and existing masonry construction with bolts, spacers and masonry anchorage devices; fill depressions in frames with body putty and grind smooth.
7. After wall construction is complete, remove temporary braces and spreaders.
8. Leave surfaces smooth and undamaged.

C. Door Installation: Fit doors accurately in frames within clearances specified in ANSI A250.8, unless otherwise shown.

D. Install labeled fire doors and frames to meet requirements of cited references and NFPA Standard No. 80.

E. Install hardware in accordance with hardware manufacturer's instructions and as specified in Section 08 7100 DOOR HARDWARE. Adjust installation to provide uniform clearance at head and jambs and to contact stops uniformly.

3.3 ADJUSTING, REPAIR AND CLEANING

A. Adjusting:

1. Before completion of Work, adjust hardware until doors operate properly.
2. Adjust doors to provide uniform clearance at head and jambs and to contact stops uniformly.
3. Test security devices with operation of security system in Owner's presence.

B. Repair:

1. Remove and replace doors which are warped, bowed, not properly fitted to frames or otherwise damaged; and doors which do not swing or operate freely.
2. Sand smooth rusted or damaged areas of prime coat and touch-up with compatible air-drying primer.
3. Replace defective, damaged, missing or stolen hardware.
4. Repair damaged metallic coating in accordance with ASTM A780.

C. Cleaning: Clean doors and frames.

3.4 PROTECTION

A. Protect units during construction so that they will be without any evidence of damage or use at time of acceptance.

END OF SECTION

SECTION 08 2130

FRP AND ALUMINUM ENTRANCE DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Fiberglass reinforced polyester (FRP) flush doors with hollow metal or aluminum frames.
 - 2. Glass and glazing.
 - 3. Sealants, joint fillers and gaskets.
 - 4. Flashing, weeps and vents.
 - 5. Perimeter and integral anchors, reinforcing, inserts, bearings, expansion devices and fasteners.
 - 6. Finishing.
 - 7. System design and engineering.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Division 08 Section DOOR HARDWARE for entrance door hardware.
- B. See Division 08 Section GLAZING.

1.3 ACTION SUBMITTALS

- A. Combined Submittal:
 - 1. Submit items required in this Section as a combined submittal with requirements of Section 08 8000 GLAZING.
 - 2. Assemble submittals, including Product Data, Shop Drawings and Samples, of principal component parts into this submittal and prepare coordination details and erection diagrams for complete system.
 - 3. Show in this submittal that entrance door assemblies have received prior approval of Contractor, installer, and manufacturer or fabricator of each principal component including metal, glass, sealants and gasketing components.
- B. Product Data: Submit manufacturer's specifications and installation instructions for each component and finish.
- C. Shop Drawings:
 - 1. Submit Shop Drawings for interior and exterior entrance doors.
 - a. Show plans, elevations and typical details of each condition for every member, joint, anchorage and door system.
 - b. Show isometric joining and sealant details of all member intersection and corner conditions.
 - c. Include hardware details, locations and mounting heights.

- D. Samples:
1. Entrance door components:
 - a. Submit three sample sets for each type of finish showing full range (high, middle and low) of color, texture and finish expected in completed Work.
 - b. Prepare samples on specified alloy, temper and thickness of metal required for Work.
 - c. Sample sets: Minimum three samples in each set.
 - d. Samples size: Minimum 12 inch (300 mm) long for extrusions and 12 inch square (300 mm square) for sheet or plate.
 2. Samples for sealant adhesion and compatibility testing:
 - a. Submit to sealant manufacturer for pre-construction testing.
 - b. Size and quantity: As required by sealant manufacturer.

1.4 INFORMATIONAL SUBMITTALS

- A. Initial Submittal Requirements:
1. Qualification data: Submit installer and manufacturer qualifications verifying years of experience; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.
 2. List of suppliers: Submit complete listing of products, fabricators and sub-sub-contractors involved in entrance door Work.
- B. Calculations:
1. Submit, for information only, engineering calculations verifying that maximum deflections and stresses do not exceed specified performance requirements under full design loading.
- C. Design Modifications: Submit for review any proposed variations in details or substitutions in materials required to meet specified performance requirements and to coordinate Work.
- D. Test Reports:
1. Submit certified test reports performed by recognized testing laboratory verifying that systems submitted for use on this Project have been previously tested and meet or exceed specified performance requirements.
 2. Submit certified data verifying adhesion qualities of proposed aluminum finishes and sealants through adhesion and peel testing.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
1. Submit instructions which describe materials, devices and procedures to be followed in cleaning and maintaining systems.
 2. Include manufacturer's brochures describing the actual materials used in Work, including metal alloys, finishes, glass, sealants, gaskets and other major components.
 3. Include copy of submittal in Project information manual.
- B. Warranties: Submit signed and dated warranties.

1.6 SYSTEM REQUIREMENTS

- A. Design Requirements:
1. Drawings indicate design concept, size, shape and location of various components. Conform to design, specified performance requirements and material selections.
 2. Design modifications:
 3. May be proposed by manufacturer to satisfy performance requirements.
 4. Conform to design and specified durability and strength.
 5. Maintain profiles and alignments shown.
 6. Size glazing channels to provide adequate bite on glass, minimum edge clearances and adequate width for sealants, as recommended by manufacturers of entrance door systems, glass, and sealants.
- B. Structural Performance Requirements:
1. Comply with specified criteria, unless more stringent criteria is required by local authorities having jurisdiction.
 2. Design loads: As indicated on Structural Drawings.
 3. Glass Statistical Factor (Safety Factor): Refer to Division 08 Section GLAZING.
 4. Thermal movement:
 - a. Design, fabricate and install components to withstand thermal expansion and contraction forces resulting from an ambient temperature range of minus 5 deg F (minus 21 deg C) to plus 110 deg F (43 deg C) and surface temperature range of 5 deg F (minus 15 deg C) to 185 deg F (85 deg C) without causing buckling, undue stress on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance or other detrimental effects.
 5. Design factor of safety:
 - a. Design and fabricate structural components including members, glazing stops or gaskets, weldments, connection adhesives and sealants used as adhesives with factor of safety not less than 1.5 (i.e., failure of any structural component shall not occur at less than 1.5 times maximum “Design Wind Pressure” in accordance with ASTM E330).
 - b. Failure is defined as breakage, disengagement or permanent distortion.
- C. Air Leakage and Water Penetration Performance Requirements:
1. Design, fabricate and install systems, including joints between systems and other Work, to effectively prevent leakage of either water or air into building, both under specified test conditions and under any combination of specified performance requirements.
 2. Water penetration:
 - a. Definition: Appearance of uncontrolled water, other than condensation, on indoor face of any part of wall, including in concealed spaces adjacent to or below the entrance door system.
 - b. Design system of gutters and weeps to drain water to exterior face of wall.
 - c. Design system so no uncontrolled water penetration occurs when wall is tested in accordance with ASTM E331 with air pressure differential of 20 percent of inward design wind pressure, but not less than 3.75 psf.
 3. Air leakage:
 - a. Design system so that air infiltration does not exceed the following allowable infiltration rates when tested in accordance with ASTM E283 at static air pressure differential of 6.24 psf. (300 Pa).

b. Fixed units: .01 cfm per square foot (.05L/s per sq.m).

D. Thermal-Break or Thermally-Improved System Requirements:

1. Provide system tested to demonstrate resistance to thermal conductance and condensation, and tested to show adequate strength and security of glass retention.
2. Provide aluminum components with integrally concealed low conductance thermal barrier, located between exterior materials and window members exposed on interior, eliminating direct metal-to-metal contact.
3. If poured polyurethane thermal break systems are used, fabricate with mechanical interlock to prevent shrink back.

E. Sealant Compatibility Requirements: Verify adhesion qualities of intended finishes and coatings with sealants through adhesion and peel testing in conjunction with sealant manufacturer.

F. Visual Requirements:

1. Metal surfaces: Fabricate surfaces exposed to view from materials which are smooth and free of surface blemishes. Do not use materials which have stains and discolorations, including welds, exposed in completed Work.
2. Surface flatness and edges: Provide flat surfaces with machine cut edges and corners sharp and true to angle or curvature required.

1.7 QUALITY ASSURANCE

A. Installer/Manufacturer Qualifications:

1. Firm or company which has specialized for a period of not less than 5 consecutive years in successful design, fabrication and installation of work similar to major components of Work indicated and required for this Project.
2. Employ only experienced tradesmen with minimum 5 years successful experience in fabrication and installation of work.
3. System design and engineering: Performed under direct supervision of a Registered Professional Engineer, licensed in Project jurisdiction.

1.8 SAMPLE INSTALLATION

A. Prior to commencing Work and preceding pre-installation conference, provide sample installation of Work.

B. Size and Location: As indicated on Drawings.

C. Materials: Incorporate complete materials as required for finished Work.

D. Architect's Review:

1. Architect will review sample installation for visual acceptance of workmanship.
2. Obtain Architect's approval of sample installations before proceeding with subsequent Work.

E. Maintain accepted sample installation during construction as standard for subsequent Work.

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- F. Properly finished and maintained sample installation may be incorporated into completed Work.
- G. Dismantle unacceptable sample installation and remove from site.

1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, at Contractor's direction, meet at site and review installation procedures and coordination with other Work.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver fabricated units and component parts to site identified in accordance with erection diagrams prepared by manufacturer.
- B. Store in accordance with manufacturer's instructions, above grade on dunnage, properly protected from weather and construction activities.

1.11 PROJECT CONDITIONS

- A. Verify dimensions of supporting structure at site by accurate field measurements so that Work will be accurately designed, fabricated and fitted to structure. Tolerances for supporting structure are specified in other Sections.
- B. Fabrication and erection procedures shall take into account ambient temperature range at time of respective operations.

1.12 SEQUENCING AND SCHEDULING

- A. Coordinate entrance door Work with contiguous Work and provide components at proper time and sequence to avoid delays in overall Work.

1.13 WARRANTY

- A. Provide 5 year written warranty signed by Contractor, installer and manufacturers agreeing to repair or replace defective materials or workmanship, including any evidence of early deterioration, weathering or aging of Work, uncontrolled water penetration or air infiltration, glass breakage, deterioration of finishes, failure of operating parts to properly function and any other deterioration or failure of Work to conform to Contract Documents.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Products and Manufacturers:
 1. Design is based on doors listed below as manufactured by Special-Lite to establish a standard of quality.
 2. Equivalent systems by other manufacturers may be acceptable provided they can meet performance and finish requirements and design profile limitations, including certified

test reports showing compliance with referenced United States standards at time of submittal.

2.2 MATERIALS

- A. Aluminum Sheets and Plates:
 - 1. Sizes and minimum gages as indicated and as required to fulfill performance requirements.
 - 2. Suitable alloy for forming and fabrication requirements with adequate temper and structural characteristics and suitable for finishing as specified.
- B. Carbon Steel: High strength, low alloy products or structural steel as required to fulfill performance requirements.
- C. Glass and Glazing:
 - 1. Spacers, setting blocks, gaskets, and bond breakers: Manufacturer's standard permanent, nonmigrating types compatible with sealants and suitable for joint movement and system performance requirements.
 - 2. Glazing sealants and glass: See Division 08 Section GLAZING.

2.3 COMPONENTS

- A. Entrance Doors – Aluminum and FRP:
 - 1. Construction:
 - a. Door Thickness: 1-3/4 inches.
 - b. Stiles and Rails: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T6 alloy recovered from industrial processes, minimum of 2-5/16-inch depth.
 - c. Corners: Mitered.
 - d. Provide joinery of 3/8-inch diameter full-width tie rods through extruded splines top and bottom integral to standard tubular shaped stiles and rails reinforced to accept hardware as specified.
 - e. Securing Internal Door Extrusions: 3/16-inch angle blocks and locking hex nuts for joinery. Welds, glue, or other methods are not acceptable.
 - f. Furnish extruded stiles and rails with integral reglets to accept face sheets. Lock face sheets into place to permit flush appearance.
 - g. Rail caps or other face sheet capture methods are not acceptable.
 - h. Extrude top and bottom rail legs for interlocking continuous weather bar.
 - i. Meeting Stiles: Pile brush weatherseals. Extrude meeting stile to include integral pocket to accept pile brush weatherseals.
 - j. Bottom of Door: Install bottom weather bar with nylon brush weatherstripping into extruded interlocking edge of bottom rail.
 - 2. Face Sheet: Exterior grade UV resistant FRP, 0.120-inch thickness, finish color throughout.
 - 3. Core: Poured-in-place polyurethane foam.
 - 4. Cutouts: Manufacture doors with cutouts for required vision lites, louvers, and panels.
 - 5. Door glazing system: Manufacturer's standard system as required to fulfill performance requirements.

6. Finish hardware: Provide doors complete with operable hardware, and with door manufacturer's standard head, jamb, astragal, and sill weatherstripping.
7. Acceptable product and manufacturer: Equivalent to SL-20 FRP/Aluminum Hybrid Door by Special-Lite.

B. Doors at Swimming Pools:

1. Construction:
 - a. Door Thickness: 1-3/4 inches.
 - b. Construction: FRP, pultruded as one monolithic panel, with integral stiles.
 - c. Reinforcement: Solid FRP shapes chemically welded at factory. All structural members shall utilize a chemically resistant UV stabilized resin system.
 - d. Stile Edge: Seamless 9/16 inch thick solid FRP.
 - e. Top Rail: 6 inch pultruded tube profile designed to fit flush and be chemically welded inside the door.
 - f. Bottom Rail: Pultruded FRP inverted U channel designed to fit flush and be chemically welded inside the door, allowing doors to be field trimmed. Closed bottom rail to be supplied as an option.
2. Face Sheet: Pultruded FRP, 0.125-inch thickness.
3. Core: Polyurethane foam.
4. Cutouts: Manufacture doors with cutouts for required vision lites, louvers, and panels.
5. Hardware: Pre-machine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
6. Acceptable product and manufacturer: Equivalent to AF Pultruded Door AF-100 by Special-Lite.

C. Finish: Manufacturer's standard high-gloss two-part aliphatic polyurethane coating.

D. Miscellaneous Trim and Closures:

1. Form from brake formed or extruded aluminum, minimum 0.06 inch (1.5 mm) thick, to profiles and dimensions shown.
2. Form bends smooth and true.
3. Provide flush meeting edges without metal-to-metal laps at joints.

2.4 ACCESSORIES

A. Firestopping: See Division 07 Section FIRESTOPPING.

B. Perimeter Sealants and Joint Fillers: See Division 07 Section JOINT SEALANTS.

C. Fasteners:

1. Provide fasteners for attachment of components to structural supports and for connecting components as recommended by component manufacturers and selected to prevent galvanic action with components fastened.
2. For embedment in masonry or concrete, provide zinc plated fasteners, conforming to requirements of ASTM B633 for Class FE/ZN 8, service condition SC2 (moderate) with Type II finish meeting corrosion resistance requirements after 96 hour salt spray test, unless otherwise selected by manufacturer.
3. For attachment of aluminum components, provide AISI 300 series stainless steel.

4. Provide concealed fasteners, except where indicated or where shown and accepted on final Shop Drawings. Where exposed in finished surfaces, use oval-head countersunk Phillips heads with color to match adjacent surfaces.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30 mil thickness per coat.
- E. Reinforcing and Joining Materials:
1. Steel angles, plates, bars, rods and other steel accessories: Hot-dipped galvanized, or if galvanizing is not compatible with alloy of component parts, shop painted with manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 - a. Structural shapes, plates, and bars: ASTM A36.
 - b. Cold-rolled sheet and strip: ASTM A1008.
 - c. Hot-rolled sheet and strip: ASTM A1011.
 2. Aluminum angles, plates, bars and other aluminum accessories: Alloys as recommended by manufacturer or fabricator to develop required strength of assembly.
- F. Inserts: Galvanized steel or cast iron inserts of suitable design and adequate strength for condition of use.
- G. Concealed Flashing: Dead soft stainless steel 26 gage minimum.
- H. Slip and Separator Gaskets: Types and materials as recommended by manufacturer for joint condition.
- I. Galvanizing Repair Paint: High zinc-dust content paint with dry film containing not less than 94 percent zinc dust by weight, complying with SSPC Paint 20.

2.5 FABRICATION

- A. Fabricate in accordance with final Shop Drawings and component manufacturer's instructions.
- B. Fit and assemble Work in shop insofar as practicable. Mark and disassemble units which are too large for shipment to Project site, retaining units in sizes as large as possible for shipment and erection.
- C. Complete welding, cutting, drilling and fitting of joints prior to chemical treatment and application of finishes.
- D. Welding:
1. Weld with electrodes and by methods recommended by aluminum manufacturer and in accordance with applicable recommendations of AWS.
 2. Use only methods which will avoid distortion or discoloration of exposed faces.
 3. Grind weld areas smooth and restore finish before proceeding with other treatment.

- E. Reinforce members and joints with steel plates, bars, rods or angles as required for rigidity and strength and as needed to fulfill performance requirements. Use concealed stainless steel fasteners for jointing which cannot be welded.
- F. Separate dissimilar metals or alloys with heavy coating of bituminous coating or other suitable permanent separation as required to prevent galvanic action.
- G. Conceal fasteners unless otherwise indicated or otherwise shown and accepted on final Shop Drawings.
- H. Carefully fit and match Work with continuity of line and design, using rigidly secured joints with hairline contact unless otherwise shown.
- I. Entrance Doors:
 - 1. Check door frame dimensions before proceeding with fabrication of doors.
 - 2. Fabricate stile and rail doors with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or J-bolts. In addition, weld corners at concealed points of contact of stiles and rail webs.
 - 3. Provide rabbets and removable stops required for glazing. Miter or kerf stops to provide hairline joints at corners of glass and panels.

2.6 SHOP FINISHES

- A. FRP Doors and Frames: Manufacturer's standard high-gloss two-part aliphatic polyurethane coating.
- B. Aluminum Doors: 3-coat fluoropolymer finish, custom color.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with final Shop Drawings and manufacturer's instructions and recommendations for installation of Work.
 - 1. Do not install damaged components.
 - 2. Fit joints to produce hairline joints free of burrs and distortion.
 - 3. Rigidly secure nonmovement joints.
 - 4. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
 - 5. Seal joints watertight unless otherwise indicated.
 - 6.
 - 7.

B. Erection Tolerances:

1. Variations from plumb or any dimensioned angle shown: +/- 1/8 inch (+/- 3 mm) maximum in any story height or 10 foot (3 m) run, non-cumulative.
2. Variations from level: +/- 1/8 inch (+/- 3 mm) maximum in any column-to-column space or 20 foot (6 m) run, non-cumulative.
3. Variations from theoretical calculated position as located in plan or elevation in relation to established floor lines, column line and other fixed elements of the structure, including variations from plumb, level, straight and member size: 1/4 inch (6 mm) maximum variation in any column-to-column space or floor-to-floor height, or 20 feet (6 m).
4. Offsets in end-to-end or edge-to-edge alignment of consecutive members: 1/16 inch (1.5 mm).

C. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

D. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

E. Doors:

1. Securely anchor in place to straight, plumb and level conditions, without distortion.
2. Check hardware movement and weatherstripping contact, making final adjustments as necessary.

F. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section JOINT SEALANTS to produce weathertight installation.

G. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

H. Install glazing as specified in Division 08 Section GLAZING.

I. Repair damaged galvanized coating in accordance with ASTM A780.

J. Apply sealants in accordance with requirements of Division 07 Section JOINT SEALANTS.

3.3 PROTECTION AND CLEANING

A. In addition to specific protection and cleaning methods required for each component part and recommended by respective manufacturers, maintain entrance doors throughout construction period in clean and properly protected condition so that it will be without any indication of use or damage at time of acceptance.

B.

C.

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D. Carefully select and apply cleaning and maintenance methods so that finishes will not become uneven or otherwise impaired as result of unequal exposure to light and weathering conditions.

E. **ND OF SECTION**

SECTION 08 4113

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Aluminum framing for glass, panels, doors and other components.
 - 2. Aluminum framed storefront and openings.
 - 3. Aluminum sheet metal Work including aluminum trim and miscellaneous closures.
 - 4. Glass and glazing.
 - 5. Sealants, joint fillers and gaskets.
 - 6. Flashing, weeps and vents.
 - 7. Perimeter and integral anchors, reinforcing, inserts, bearings, expansion devices and fasteners.
 - 8. Finishing.
 - 9. System design and engineering.

- B. Single Subcontract Responsibility: Retain a single firm or company to design, fabricate and install Work of this Section and related Sections so as to establish undivided responsibility for entire window wall system.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 05 5000 METAL FABRICATIONS for window security screens.
- B. See Section 08 4114 FRP AND ALUMINUM FRAMED ENTRANCE DOORS for entrance doors to be incorporated into storefront.
- C. See Section 08 7100 DOOR HARDWARE for entrance door hardware.
- D. See Section 08 8000 GLAZING.
- E. See DIVISION 26 for wiring requirements for electrically operated hardware devices and electrical provisions for security system.

1.3 ACTION SUBMITTALS

- A. Combined Submittal:
 - 1. Submit items required in this Section as a combined submittal with requirements of Section 07 9200 JOINT SEALANTS, Section 082130 FRP AND ALUMINUM ENTRANCES and Section 08 8000 GLAZING.
 - 2. Assemble submittals, including Product Data, Shop Drawings and Samples, of principal component parts into this submittal and prepare coordination details and erection diagrams for complete system.

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3. Show in this submittal that window wall systems and metal wall panel systems have received prior approval of Contractor, installer Subcontractors, and manufacturer or fabricator of each principal component including metal, glass, sealants and gasketing components.
- B. Professional Certification: Provide Shop Drawings and engineering calculations signed and sealed by a Registered Professional Engineer, licensed in Project jurisdiction.
 1. Include certification by Registered Professional Engineer licensed in Project jurisdiction, that window wall systems and metal wall panel systems as designed meet or exceed specified performance requirements.
- C. Product Data: Submit manufacturer's specifications and installation instructions for each component and finish.
- D. Shop Drawings:
 1. Submit Shop Drawings for complete window wall system.
 - a. Show plans, elevations and typical details of each condition for every member, joint, anchorage and glazing system.
 - b. Show isometric joining and sealant details of all member intersection and corner conditions.
 - c. Include hardware details, locations and mounting heights, including rough-in of electronic accessories/fixtures.
- E. Hardware Schedule:
 1. Submit hardware schedule for each door and operable window opening.
 2. Include catalog cuts and templates.
 3. Include listing of Owner furnished and installed security devices with each applicable set.
 4. Obtain templates from Owner for security devices scheduled for mortised application; assemble and submit with hardware schedule for coordination for factory premachining and reinforcing of doors and frames.
- F. Samples:
 1. Storefront components:
 - a. Submit three sample sets for each type of finish showing full range (high, middle and low) of color, texture and finish expected in completed Work.
 - b. Prepare samples on specified alloy, temper and thickness of metal required for Work.
 - c. Sample sets: Minimum three samples in each set.
 - d. Samples size: Minimum 12 inch (300 mm) long for extrusions and 12 inch square (300 mm square) for sheet or plate.
 2. Samples for sealant adhesion and compatibility testing:
 - a. Submit to sealant manufacturer for pre-construction testing.
 - b. Size and quantity: As required by sealant manufacturer.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification data: Submit installer and manufacturer qualifications verifying years of experience; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.

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- B. Calculations:
 - 1. Submit, for information only, engineering calculations verifying that maximum deflections and stresses do not exceed specified performance requirements under full design loading.
 - 2. Submit certification by Registered Professional Engineer licensed in Project jurisdiction, that window wall systems and metal panel systems as designed meet or exceed specified performance requirements.
- C. Design Modifications: Submit for review any proposed variations in details or substitutions in materials required to meet specified performance requirements and to coordinate Work.
- D. Test Reports:
 - 1. Submit certified test reports performed by recognized testing laboratory verifying that systems submitted for use on this Project have been previously tested and meet or exceed specified performance requirements.
 - 2. Submit certified data verifying adhesion qualities of proposed aluminum finishes and sealants through adhesion and peel testing.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
 - 1. Submit instructions which describe materials, devices and procedures to be followed in cleaning and maintaining systems.
 - 2. Include manufacturer's brochures describing the actual materials used in Work, including metal alloys, finishes, glass, sealants, gaskets and other major components.
 - 3. Include copy of submittal in Project information manual.
- B. Warranties: Submit signed and dated warranties.

1.6 SYSTEM REQUIREMENTS

- A. Design Requirements:
 - 1. Drawings indicate design concept, size, shape and location of various components. Conform to design, specified performance requirements and material selections.
 - 2. Design modifications:
 - a. May be proposed by manufacturer to satisfy performance requirements.
 - b. Conform to design and specified durability and strength.
 - c. Maintain profiles and alignments shown.
 - 3. Size glazing channels to provide adequate bite on glass, minimum edge clearances and adequate width for sealants, as recommended by manufacturers of storefront systems, glass, and sealants.
- B. Structural Performance Requirements:
 - 1. Comply with specified criteria, unless more stringent criteria is required by local authorities having jurisdiction.
 - 2. Design loads:
 - a. Design, fabricate and install component parts so that completed systems, including glass, will withstand uniform positive and negative design wind pressures in accordance with ASTM E330, times design factor of safety.
 - b. Design wind pressures: As indicated on Structural Drawings.

- c. Seismic loads: As indicated on Structural Drawings.
3. Glass Statistical Factor (Safety Factor): Refer to Section 08 8000 GLAZING.
4. Thermal movement:
 - a. Design, fabricate and install components to withstand thermal expansion and contraction forces resulting from an ambient temperature range of minus 5 deg F (minus 21 deg C) to plus 110 deg F (43 deg C) and surface temperature range of 5 deg F (minus 15 deg C) to 185 deg F (85 deg C) without causing buckling, undue stress on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance or other detrimental effects.
 - b. Design operable doors and windows to function normally over this temperature range.
5. Deflection at full loading:
 - a. Limit deflection of each component part (other than glass) perpendicular to glass plane to the following values, of clear span (L) of component part, except for more stringent requirements specified herein. Measure deflection from gages located on framing members, and metal panels.
 - 1) For spans up to 13'-6" (4.1 m): $L/175$.
 - 2) For spans more than 13'-6" (4.1 m): $L/240 + 1/4$ inch (6 mm).
 - b. Limit deflections of framing at parapet and soffit conditions to $2L/175$, where L is length of cantilevered member, with maximum of one-half sealant joint depth between framing member and fixed building element, whichever is less.
 - c. Limit deflections of members parallel to glass plane, when carrying full dead load, to 1/8 inch (3 mm) or 25% of glass bite design dimension, whichever is less, between member and top of fixed component immediately below.
 - d. Limit deflection of glass-supporting members to 1/300 of glass length for distance glass is supported.
 - e. Limit deflection of members supporting structural glazing so that glazing adhesive will not be stressed beyond 20 percent of ultimate tensile strength.
 - f. Base deflection calculations upon combination of maximum direct loadings, building deflections, internal stresses and erection tolerances.
 - g. Provide minimum 1/16 inch (1.5 mm) clearance between members and operable components below.
 - h. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
6. Design factor of safety:
 - a. Design and fabricate structural components including members, glazing stops or gaskets, weldments, connection adhesives and sealants used as adhesives with factor of safety not less than 1.5 (i.e., failure of any structural component shall not occur at less than 1.5 times maximum "Design Wind Pressure" and "Design Loads" in accordance with ASTM E330).
 - b. Failure is defined as breakage, disengagement or permanent distortion.
7. Building movement:
 - a. Design systems to withstand building movements, including thermal movements, loading deflections, shrinkage and similar movements.
 - b. Architect will furnish specific data on anticipated building movements as may be requested by Contractor.
 - c.

- C. Air Leakage and Water Penetration Performance Requirements:
1. Design, fabricate and install systems, including joints between systems and other Work, to effectively prevent leakage of either water or air into building, both under specified test conditions and under any combination of specified performance requirements.
 2. Water penetration:
 - a. Definition: Appearance of uncontrolled water, other than condensation, on indoor face of any part of wall, including in concealed spaces adjacent to or below the storefront system.
 - b. Design system of gutters and weeps to drain water to exterior face of wall.
 - c. Design system so no uncontrolled water penetration occurs when wall is tested in accordance with ASTM E331 with air pressure differential of 20 percent of inward design wind pressure, but not less than 6.24 psf (300 Pa).
 - d. Design operable aluminum windows to meet water penetration requirements of ANSI/AAMA 101 for window types specified.
 3. Air leakage:
 - a. Design system so that air infiltration does not exceed the following allowable infiltration rates when tested in accordance with ASTM E283 at static air pressure differential of 6.24 psf. (300 Pa).
 - b. Fixed units: .01 cfm per square foot(.0015L/s per sq.m) 0.06 cfm per square foot (0.03 L/s per sq. m) for storefront on complete module or bay.
 - c. Operable units: 0.37 cfm per foot (0.19 L/s per sq. m) of crack length.
- D. Thermal-Break or Thermally-Improved System Requirements:
1. Provide system tested to demonstrate resistance to thermal conductance and condensation, and tested to show adequate strength and security of glass retention.
 2. Provide aluminum components with integrally concealed low conductance thermal barrier, located between exterior materials and window members exposed on interior, eliminating direct metal-to-metal contact.
 3. If poured polyurethane thermal break systems are used, fabricate with mechanical interlock to prevent shrink back.
- E. Entrance Door Performance Requirements:
1. Design and fabricate doors to withstand operating loads which result from heavy traffic conditions using selected hardware, without permanent measurable deflections.
 2. Limit elastic deflections to provide normal degree of rigidity required to avoid glass breakage, air leaks and other objectionable results of excessive flexibility.
 3. Provide tight joints to minimize air leaks and to provide for no uncontrolled water on interior of building.
- F. Sealant Compatibility Requirements: Verify adhesion qualities of intended finishes and coatings with sealants through adhesion and peel testing in conjunction with sealant manufacturer.
- G. Visual Requirements:
1. Metal surfaces: Fabricate surfaces exposed to view from materials which are smooth and free of surface blemishes. Do not use materials which have stains and discolorations, including welds, exposed in completed Work.
 2. Surface flatness and edges: Provide flat surfaces with machine cut edges and corners sharp and true to angle or curvature required.

1.7 QUALITY ASSURANCE

- A. Installer/Manufacturer Qualifications:
1. Firm or company which has specialized for a period of not less than 5 consecutive years in successful design, fabrication and installation of work similar to major components of Work indicated and required for this Project.
 2. Employ only experienced tradesmen with minimum 5 years successful experience in fabrication and installation of work.
 3. System design and engineering: Performed under direct supervision of a Registered Professional Engineer, licensed in Project jurisdiction.
- B. Preconstruction Sealant Testing: Perform sealant manufacturer's standard tests for compatibility and adhesion of sealants with each material that will come in contact with sealants and each condition required by curtainwall systems.
1. Test a minimum of five samples of each metal, glazing, and other material.
 2. Prepare samples using techniques and primers required for installed systems.
 3. Perform tests under environmental conditions that duplicate those under which systems will be installed.
 4. For materials that fail tests, determine corrective measures required to prepare each material to ensure compatibility with and adhesion of sealants, including, but not limited to, specially formulated primers. After performing these corrective measures on the minimum number of samples required for each material, retest materials.
- C. Regulatory Requirements:
1. Conform to applicable requirements of authorities having jurisdiction over Project.
 2. Electrically operated locking devices at egress openings: Connect devices, including security devices, to building fire and smoke/heat alarm system, so that when fire or smoke/heat devices are activated, the electric locking mechanisms will be disengaged and rendered inoperable allowing free, unrestricted egress through opening.
- D. Reference Standards: Except as may be modified by governing authorities or these Specifications, comply with applicable provisions and recommendations of the following:
1. AAMA "Aluminum Curtain Wall Design Guide Manual".
 2. NAAMM "Metal Finishes Manual".
 3. The Aluminum Association, Inc. "Specifications For Aluminum Structures".

1.8 SAMPLE INSTALLATION

- A. Prior to commencing Work and preceding pre-installation conference, provide sample installation of storefront system at locations to be determined based upon sequence of Work.
- B. Size and Location: As indicated on Drawings.
- C. Materials: Incorporate complete materials as required for finished Work.
- D. Architect's Review:
1. Architect will review sample installation for visual acceptance of workmanship.
 2. Obtain Architect's approval of in-place mock-ups before proceeding with subsequent Work.

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- E. Maintain accepted in-place mock-up during construction as standard for subsequent Work.
- F. Properly finished and maintained in-place mock-up may be incorporated into completed Work.
- G. Dismantle unacceptable in-place mock-up and remove from site.

1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, at Contractor's direction, meet at site and review installation procedures and coordination with other Work. Include detailed discussion on coordination of electronic hardware rough-in.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver fabricated units and component parts to site identified in accordance with erection diagrams prepared by manufacturer.
- B. Store in accordance with manufacturer's instructions, above grade on dunnage, properly protected from weather and construction activities.

1.11 PROJECT CONDITIONS

- A. Verify dimensions of supporting structure at site by accurate field measurements so that Work will be accurately designed, fabricated and fitted to structure. Tolerances for supporting structure are specified in other Sections.
- B. Fabrication and erection procedures shall take into account ambient temperature range at time of respective operations.

1.12 SEQUENCING AND SCHEDULING

- A. Coordinate storefront Work with contiguous Work and provide components at proper time and sequence to avoid delays in overall Work.

1.13 WARRANTY

- A. Provide 5 year written warranty signed by Contractor, Subcontractor(s), Installer and manufacturers agreeing to repair or replace defective materials or workmanship, including any evidence of early deterioration, weathering or aging of Work, uncontrolled water penetration or air infiltration, glass breakage, deterioration of finishes, failure of operating parts to properly function and any other deterioration or failure of Work to conform to Contract Documents.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

1. Acceptable Products and Manufacturers: Kawneer.
2. YKK.
3. EfcO.
4. SpecialLite.

- 5.
6. Equivalent systems by following manufacturers may be acceptable provided they can meet performance and finish requirements and design profile limitations, including certified test reports showing compliance with referenced United States standards at time of submittal.
 - a. VistaWall Architectural Products.
 - b. Wausau Window and Wall Systems.
 - c. YKK AP America, Inc.
 - d. OldCastle.

2.2 MATERIALS

- A. Aluminum Extrusions:
 1. Shapes and thicknesses as indicated and as required to fulfill performance requirements, but not less than 1/8 inch (3 mm) thick, unless otherwise indicated.
 2. Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Sheet and plate: ASTM B209.
 - b. Extruded bars, rods, profiles, and tubes: ASTM B221.
 - c. Extruded structural pipe and tubes: ASTM B429.
 - d. Structural profiles: ASTM B308.
 - e. Welding rods and bare electrodes: AWS A5.10.
- B. Aluminum Sheets and Plates:
 1. Sizes and minimum gages as indicated and as required to fulfill performance requirements.
 2. Suitable alloy for forming and fabrication requirements with adequate temper and structural characteristics and suitable for finishing as specified.
- C. Carbon Steel: High strength, low alloy products or structural steel as required to fulfill performance requirements.
- D. Glass and Glazing:
 1. Spacers, setting blocks, gaskets, and bond breakers: Manufacturer's standard permanent, nonmigrating types compatible with sealants and suitable for joint movement and system performance requirements.
 2. Glazing sealants and glass: See Section 08 8000 GLAZING.
 3. Core Learning Spaces Sound Transmission Class (STC): Provide glazed windows rated not less than 35 STC when tested for laboratory sound transmission loss in accordance with ASTM E90 and ASTM E413.

2.3 COMPONENTS

- A. Aluminum Framing System:
 1. Glazing channel: Minimum clearance for thickness and type of glass indicated in accordance with GANA requirements or manufacturer's recommendations.
 2. Provide outside glazing.
 3. Design to accommodate components indicated including operable doors.
 4. Design framing so panels can be removed from outside of building.
 5. Provide the following components:

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- a. Thermally-broken aluminum adapters as required to accommodate components indicated including operable doors.
- b. Fiberglass pressure plates for enhanced thermal performance, of profiles and dimensions as indicated on Drawings and as recommended by manufacturer.
6. Framing members:
 - a. Provide end caps for glazing members and receptor frames which are open-ended extrusions, to allow for continuous uninterrupted bond surface for perimeter sealants.
 - b. Mechanically-fasten end caps, and fully seal on back side of each end cap to adjacent framing member profile using silicone sealant; fill voids, screw bosses, and similar irregularities with sealant.
 - c. Steel reinforcement: As required by manufacturer.
7. Framing anchors:
 - a. Provide anchors that permit three way adjustment to accommodate fabrication and construction tolerances.
 - b. Use materials and protective coating recommended by manufacturer.
8. Flashing: Corrosion resistant, non-staining, non-bleeding and compatible with adjoining materials.

B. Miscellaneous Trim and Closures:

1. Form from brake formed or extruded aluminum, minimum 0.06 inch (1.5 mm) thick, to profiles and dimensions shown.
2. Form bends smooth and true.
3. Provide flush meeting edges without metal-to-metal laps at joints.

2.4 ACCESSORIES

A. Fasteners:

1. Provide fasteners for attachment of components to structural supports and for connecting components as recommended by component manufacturers and selected to prevent galvanic action with components fastened.
2. For embedment in masonry or concrete, provide zinc plated fasteners, conforming to requirements of ASTM B633 for Class FE/ZN 8, service condition SC2 (moderate) with Type II finish meeting corrosion resistance requirements after 96 hour salt spray test, unless otherwise selected by manufacturer.
3. For attachment of aluminum components, provide AISI 300 series stainless steel.
4. Provide concealed fasteners, except where indicated or where shown and accepted on final Shop Drawings. Where exposed in finished surfaces, use oval-head countersunk Phillips heads with color to match adjacent surfaces.

B. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30 mil thickness per coat.

C. Reinforcing and Joining Materials:

1. Steel angles, plates, bars, rods and other steel accessories: Hot-dipped galvanized, or if galvanizing is not compatible with alloy of component parts, shop painted with manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

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- a. Structural shapes, plates, and bars: ASTM A36.
 - b. Cold-rolled sheet and strip: ASTM A1008.
 - c. Hot-rolled sheet and strip: ASTM A1011.
2. Aluminum angles, plates, bars and other aluminum accessories: Alloys as recommended by manufacturer or fabricator to develop required strength of assembly.
- D. Inserts: Galvanized steel or cast iron inserts of suitable design and adequate strength for condition of use.
- E. Concealed Flashing: Dead soft stainless steel, 26 gage minimum (.5 mm minimum), or extruded aluminum (1.6 mm minimum thickness), of alloy and type selected by manufacturer.
- F. Slip and Separator Gaskets: Types and materials as recommended by manufacturer for joint condition.
- G. Galvanizing Repair Paint: High zinc-dust content paint with dry film containing not less than 94 percent zinc dust by weight, complying with SSPC Paint 20.

2.5 FABRICATION

- A. Fabricate in accordance with final Shop Drawings and component manufacturer's instructions.
- B. Fit and assemble Work in shop insofar as practicable. Mark and disassemble units which are too large for shipment to Project site, retaining units in sizes as large as possible for shipment and erection.
- C. Complete welding, cutting, drilling and fitting of joints prior to chemical treatment and application of finishes.
- D. Welding:
1. Weld with electrodes and by methods recommended by aluminum manufacturer and in accordance with applicable recommendations of AWS.
 2. Use only methods which will avoid distortion or discoloration of exposed faces.
 3. Grind weld areas smooth and restore finish before proceeding with other treatment.
- E. Reinforce members and joints with steel plates, bars, rods or angles as required for rigidity and strength and as needed to fulfill performance requirements. Use concealed stainless steel fasteners for jointing which cannot be welded.
- F. Separate dissimilar metals or alloys with heavy coating of bituminous coating or other suitable permanent separation as required to prevent galvanic action.
- G. Conceal fasteners unless otherwise indicated or otherwise shown and accepted on final Shop Drawings.
- H. Carefully fit and match Work with continuity of line and design, using rigidly secured joints with hairline contact unless otherwise shown.
- I. Finish Hardware:

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1. Premachine and reinforce members to receive finish hardware in accordance with final Hardware Schedule and hardware manufacturer's instructions using templates furnished by each manufacturer.
2. Premachine and reinforce doors and frames to receive concealed contacts (position switches) and concealed associated wiring, as indicated on hardware schedule; one contact per leaf. See DIVISION 28 for contacts and wiring.

2.6 SHOP FINISHES

- A. Fluoropolymer Resinous Coating: Manufacturer's standard fluoropolymer coating, custom color.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with final Shop Drawings and manufacturer's instructions and recommendations for installation of Work.
 1. For mullion covers (glazing caps) other than manufacturer's standard profiles, secure cover plates to pressure plate with field-applied stainless steel screws, in addition to snap-on attachment. Paint screw heads to match color of color plates.
 2. Do not install damaged components.
 3. Fit joints to produce hairline joints free of burrs and distortion.
 4. Rigidly secure nonmovement joints.
 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
 6. Seal joints watertight unless otherwise indicated.
- B. Erection Tolerances:
 1. Variations from plumb or any dimensioned angle shown: +/- 1/8 inch (+/- 3 mm) maximum in any story height or 10 foot (3 m) run, non-cumulative.
 2. Variations from level: +/- 1/8 inch (+/- 3 mm) maximum in any column-to-column space or 20 foot (6 m) run, non-cumulative.
 3. Variations from theoretical calculated position as located in plan or elevation in relation to established floor lines, column line and other fixed elements of the structure, including variations from plumb, level, straight and member size: 1/4 inch (6 mm) maximum variation in any column-to-column space or floor-to-floor height, or 20 feet (6 m).
 4. Offsets in end-to-end or edge-to-edge alignment of consecutive members: 1/16 inch (1.5 mm).
- C. Metal Protection:
 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.

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2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- D. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
- E. Set continuous sill members and flashing in full sealant bed to produce weathertight installation.
- F. Install components plumb and true in alignment with established lines and grades, and without warp or rack.
- G. Install glazing as specified in Section 08 8000 GLAZING.
- H. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
 1. Exterior doors: Install to produce weathertight enclosure and tight fit at weather stripping.
 2. Field-installed entrance door hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- I. Repair damaged galvanized coating in accordance with ASTM A780.
- J. Apply sealants in accordance with requirements of Section 07 9200 JOINT SEALANTS.

3.3 FIELD QUALITY CONTROL

- A. Perform tests in presence of Owner's independent testing agency.
- B. Coordinate testing requirements with Commissioning Agent.
- C. Water Penetration Tests:
 1. Contractor is responsible for costs of initial testing, and additional testing if required, including costs of architect and Owner's independent testing agency associated with witnessing additional testing.
 2. Static air pressure difference test: Conduct in accordance with ASTM E1105 at uniform static air pressure difference of 6.24 psf (300 Pa) on areas indicated on Drawings.
 3. Check weather stripping to ensure air infiltration is within tolerance as required by Commissioning Agent.
 4. Water spray test without air pressure difference:
 - a. Upon completion of installation of wall framing on lower two typical floors of building and with at least 75 lineal feet (23 meters) of area fully glazed (including nominal curing of sealant and glazing compounds), but before installation of interior finishes, check wall for water penetration in accordance with "Specifications for Field Check of Metal Curtain Wall for Water Leakage" AAMA Standard 501.2.
 - b. Architect will designate areas to be tested.
 - c. Test area: Two bays wide (but not less than 30 feet (9 m)) by two stories high.

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- D. Depending upon prevalence or absence of leakage in initial water penetration test, and upon measures adopted by Contractor to eliminate sources of leakage, Architect will determine necessity for (and scope of) additional tests.
- E. Correct units not meeting specified requirements, and re-test until units comply with specified requirements.

3.4 PROTECTION AND CLEANING

- A. In addition to specific protection and cleaning methods required for each component part and recommended by respective manufacturers, maintain window wall throughout construction period in clean and properly protected condition so that it will be without any indication of use or damage at time of acceptance.
- B. Carefully select and apply cleaning and maintenance methods so that finishes will not become uneven or otherwise impaired as result of unequal exposure to light and weathering conditions.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Finish hardware and related accessories.
 - 2. Security system hardware devices and coordination].

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 08 1113 HOLLOW METAL DOORS AND FRAMES for steel doors and frames.
- B. See Section 08 2130 FRP AND ALUMINUM ENTRANCE DOORS.
- C. See Section 08 4113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS for hardware for aluminum and glass doors and frames.
- D. See Division 26 for security system requirements.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit copies of manufacturer's specifications, maintenance and keying manuals, and installation instructions for each item of finish hardware.
 - 2. Include photographs, catalog cuts, marked templates and other data as may be required to show compliance with these Specifications.
- B. Samples:
 - 1. Submit full size hardware samples as requested by Architect.
 - 2. Samples will be returned to Contractor for use in Project.
- C. Door Hardware Schedule: Submit door hardware schedule covering complete identification of every item required for each opening.
 - 1. Schedule shall be vertical layout. Use double- spaced lines, with pages numbered and dated. Horizontal hardware schedules are not acceptable.
 - 2. For doors of different sizes or where hinges, locks or closers are different, a separate heading shall be used. No labeled opening shall be combined with non-labeled openings. Schedule not adhering to these parameters shall not be reviewed.
 - 3. Include the following:
 - a. Number, location, hand, fire rating and material of each door opening (hands and swings to be determined in relation to key side of opening).
 - b. Type, style, function, size and quantity of each hardware item.
 - c. Name and manufacturer of each item.
 - d. Fastening requirements.

- e. Explanation of abbreviations, symbols and codes contained in schedule.
 - f. Special mounting locations and instructions.
 - g. Wiring diagrams (after each corresponding opening).
 - h. Keying information.
4. Include separate schedule of key and master key system indicating the Owner's approved keying system with final submittal of schedule.
 5. Include listing of security devices with each applicable set.
 6. Architect's review of hardware schedule shall not be construed as complete check, nor shall it relieve Contractor of responsibility for errors, deviations or omissions from requirements to provide complete hardware for Project.

1.4 INFORMATIONAL SUBMITTALS

- A. Hardware Schedule Index: Furnish an index cross referencing door number, Architect's hardware group and supplier's hardware group.
- B. Wiring Diagrams: Furnish wiring diagrams showing point-to-point hook-up of all electrical hardware specified herein. Diagrams shall be complete by opening and shall include connections between all components affected.
- C. Qualification Data: Submit supplier and installer qualifications verifying years of experience; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.

1.5 SYSTEM REQUIREMENTS

- A. Detail Requirements:
 1. Assume sole responsibility for provision, coordination and function of finish hardware required for every opening, whether or not listed in hardware set schedule.
 2. Coordinate application of hardware items with door and frame details and with specified methods of fastening.
 3. Before ordering materials, carefully examine Shop Drawings of Work receiving hardware, and verify that products selected will properly fit.
 4. Adaptation of hardware items:
 - a. Where trim of one manufacturer is applied to another manufacturer's mortise lock or latch devices, modify and factory fabricate trim components, including spindles and other required attachment devices, as required to precisely fit specified mortise lock or latch components.
 - b. Make modifications to provide proper operation of lock or latch function.
 - c. Design, fabricate and install mechanism providing support and attachment of lever trim so that levers are, and will remain, completely horizontal and level in final installation.
- B. Templates:
 1. Make finish hardware to templates, with wood and/or machine screws applicable to door and frame details.
 2. Furnish templates and schedules to door and frame manufacturers and other trades requiring them, so that doors and frames can be cut, reinforced and prepared in the shop to receive finish hardware.

C. Security Devices:

1. At doors indicated to be “equipped with security devices”, coordinate with Owner’s Security System Vendor and assemble a package of templates for all door and frame mounted devices. Include these templates with package described above, to door and frame manufacturers and other trades.
2. It is the responsibility of this Contractor to ensure that doors and frames are factory prepared for all door and frame mounted security devices.

D. Regulatory Requirements:

1. Conform to applicable requirements of authorities having jurisdiction over Project.
2. Hardware at labeled openings:
 - a. Furnish hardware conforming to NFPA Standard No. 80 for fire-rated openings or openings designated to receive UL label.
 - b. In case of conflict between specified hardware and type required for fire protection, furnish type required by NFPA and UL, and as suitable for indicated door and frame construction.
 - c. Furnish UL-listed hardware for use with types and sizes of fire doors and frames required.
 - d. Arrange doors at fire-rated openings to remain in normally closed position (except where electro-magnetic closer/hold-opens or electro-magnetic releases are scheduled) by providing automatic closing device for each unit.
 - e. Furnish active latch bolts, of UL approved throw, that cannot be held in retracted position where required.
3. Electrically operated locking devices at egress openings: Connect devices to building fire and smoke/heat alarm system, so that when fire or smoke/heat devices are activated, the electric locking mechanisms will be disengaged and rendered inoperable allowing free, unrestricted egress through opening.

E. Existing Openings:

1. Where new hardware components are scheduled for application to existing construction or modifications to existing hardware are required, field verify and coordinate devices as required to suit opening conditions and to provide for proper operation of new installation.
2. Cut and patch existing Work as required.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to that required for this Project.

B. Supplier Qualifications:

1. Firm or company specializing in architectural finish hardware with not less than 5 years documented, successful experience with work comparable to that required for this Project.
2. Hardware supplier shall have within his organization competent hardware consultant who shall be member in good standing of American Society of Architectural Hardware Consultants. Consultant shall be available and subject to call for consultation and cooperation with Architect, Owner and Contractor throughout progress of construction.

C. Regulatory Requirements:

1. Conform to applicable requirements of authorities having jurisdiction over Project.

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2. Except as may be modified by governing authorities, comply with applicable requirements and provisions of the following:
 - a. CABO/ANSI A117.1 “Accessible and Usable Buildings and Facilities”.
 - b. Americans with Disabilities Act.

D. Reference Standards: Except as otherwise required by governing authorities or Contract Documents, comply with applicable provisions of Door and Hardware Institute.

1.7 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at site and review installation procedures and coordination with other Work. Ensure attendance by supplier/vendors and installers/subcontractors to ensure effective cross coordination between scopes. GC must ensure documentation is on file confirming all approved door-hardware submittals must have been shared between interfacing doors-frames-hardware vendors & subcontractors.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Delivery, Packing and Marking:
 1. Deliver hardware separately packaged, labeled with manufacturer's name, type, number and name of item.
 2. Tag each package with same number designated in approved hardware list.
 3. Include necessary screws, keys, instructions, and installation templates in each package.
- B. Storage and Handling: Inventory and store hardware in securely locked, dry and protected area.

1.9 OPERATION AND MAINTENANCE

- A. Furnish Owner with one complete set of installation instructions including manufacturers’ catalogs, special adjusting tools and maintenance instructions. One condensed catalog shall be furnished for each manufacturer listed in the approved hardware schedule.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Hinges:
 1. Listed product: Hager Companies.
 2. Other acceptable manufacturers:
 - a. Bommer.
 - b. Mckinney.
 - c. Stanley Hardware.
- B. Pivots:
 1. Listed product: Rixson- an ASSA ABLOY company.
 2. Other acceptable manufacturers:
 - a. Allegion-LCNs.
- C. Pocket Pivots:

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1. Listed product: Rixson- an ASSA ABLOY company. Other acceptable manufacturers:
 - a. McKinney.

- D. Cylinders, Locksets and Latchsets:
 1. Listed product: Allegion -Schlage Lock Co.
 2. Other acceptable manufacturers:
 - a. Corbin-Russwin Architectural Hardware.
 - b. Sargent Mfg. Co.
 - c. ASSA ABLOY Door Security Solutions.

- E. Electric Locks:
 1. Listed product: Security Door Controls.
 2. Substitutions will not be accepted.

- F. Electric Strikes:
 1. Listed product: HES (an ASSA ABLOY Group company).
 2. Other acceptable manufacturers:
 - a. Security Door Controls.
 - b. Allegion-Von Duprin.

- G. Closers:
 1. Listed product: Allegion-LCN Closers.
 2. Other acceptable manufacturers:
 - a. Corbin-Russwin Architectural Hardware.
 - b. ASSA ABLOY Door Security Solutions.

- H. Electromagnetic Releases:
 1. Listed product: Rixson- an ASSA ABLOY company.
 2. Other acceptable manufacturers:
 - a. Allegion-LCN.

- I. Automatic Flush Bolts, Coordinators:
 1. Listed product: Allegion - Ives.
 2. Other acceptable manufacturers:
 - a. Door Controls International.
 - b. Hager Companies.

- J. Stops, Manual Flush Bolts, Auxiliary Hardware:
 1. Listed product: Allegion - Ives.
 2. Other acceptable manufacturers:
 - a. Hager Companies.
 - b. Rockwood Mfg. Co.

- K. Overhead Stops/holders:
 1. Listed product: Allegion - Glynn Johnson.
 2. Other acceptable manufacturers:
 - a. Architectural Builders Hardware.
 - b. Rixson- an ASSA ABLOY company..

- L. Pulls, Flat Goods:

1. Listed product: Hager Companies.
2. Other acceptable manufacturers:
 - a. Builder's Brass Works.
 - b. Rockwood Mfg. Co.
 - c. Trimco.

M. Weatherstripping, Seals, Sweeps, Thresholds:

1. Listed product: Pemko, Inc.
2. Other acceptable manufacturers:
 - a. Hager Companies.
 - b. National Guard Products, Inc.
 - c. Reese Enterprises, Inc.
 - d. Zero International.

N. Sliding Door Hardware:

1. Listed product: Hetich.
2. Other acceptable manufacturers:
 - a. Hager Companies.
 - b. P.C. Henderson.

O. Key Lock Boxes:

1. Listed product: Knox Company.
2. Other acceptable manufacturers:
 - a. Supra Industries.

2.2 FINISH HARDWARE

A. Finishes:

1. Scheduled finishes are derived from ANSI A156.18. Provide finishes complying with this standard.
2. Base Metals:
 - a. Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy composition, temper and hardness, but in no case of lesser quality than specified or inferred by use of a particular manufacturer's number, style or grade or as established by appropriate referenced specification listed herein.
 - b. All exposed hardware except exit devices, closers, push-pulls and flat goods shall be satin Stainless Steel, ANSI 630 (US32D). Closers shall be painted to match satin chrome. Hinges shall be Satin Chrome Plated, ANSI 626 (US26D) where ferrous base metal is specified. Items not available in satin stainless shall be furnished in satin chrome.

B. Hinges:

1. Comply with ANSI/BHMA A156.1.
2. Pack hinges with machine or wood screws as required by door and frame construction.
3. Quantities per door leaf: Furnish two hinges for doors 60 inches (1.5 m) or less in height and one additional hinge for each additional 30 inches (750 mm) or fraction thereof.
4. Sizes:
 - a. Unless otherwise indicated, hinges for doors through 36 inches (900 mm) wide shall be 4-1/2 inch x 4-1/2 inch (113 mm x 113 mm). Hinges for doors over 36 inches

(900 mm) wide shall be 5 inch x 4-1/2 inch (125 mm x 113 mm). Hinges for labeled doors shall comply with requirements of NFPA 80.

- b. Where door jamb or trim projects to such an extent that width of leaf specified will not allow door to clear such frame or trim, furnish hinges with leaves of sufficient width to clear.
 5. Hinge knuckle design shall be the type and grade listed.
 6. Provide non-removable pins (NRP) for reverse bevel doors receiving keyed locks, rigid outside trim or “exit only” hardware.
 7. Fabricate hinges with holes in bottom plug to facilitate pin removal.
 8. Hinges with anti-friction bearings may be provided in lieu of ball bearings hinges except for doors over 36 inches (900 mm) wide. Fire doors shall comply with requirements of NFPA 80.
- C. Pocket Pivots:
1. Comply with ANSI A156.1.
 2. Quantities per door leaf: Provide two pocket pivots for doors 60 inches (1.5 m) or less in height and one additional pocket pivot for each additional 30 inches (750 mm) or fraction thereof except where continuous hinges are indicated.
 3. Pocket pivots for labeled doors shall comply with the requirements of NFPA 80.
- D. Mortise Locks and Latches:
1. Heavy-duty commercial mortise type, complying with ANSI/BHMA A156.13, Series 1000, Grade 1 Operational, at least Grade 3 Security.
 2. Furnish mortise type lock and latch sets with stainless steel anti-friction deadlocking latchbolts.
 3. Furnish complete with trim, extended spindles as required to suit door thickness, armor fronts and 6 pin cylinders.
 4. Provide knurling or abrasive coating to lever on corridor side of door, on side of lever facing door, for scheduled doors.
 5. For each lock and latchset provide strike box and square corner ASA strike with curved lips of sufficient length to protect frames.
 6. Mortise deadlocks: Furnish with same turnpiece and cylinder trim as furnished for lock sets.
 7. Electrified mortise locks shall draw a maximum of 250 milliamps of current at 24VDC.
 8. Function: Provide as scheduled.
- E. Cylinders:
1. Comply with ANSI A156.5.
 2. Provide cylinder length as required to suit door thickness, complete with collars and cams as required for complete installation.
 3. Provide threaded, 6 pin cylinders with .51 inch (13 mm) diameter brass plug with cams to suit lock functions.
 4. Provide 7-pin interchangeable-core cylinders with temporary inserts for construction period. Permanent cores shall be furnished directly to Owner by manufacturer.
 5. Provide cylinders and coordinate requirements with other assemblies requiring locks, including storefront and overhead coiling doors.
 6. anufacturer: Same as locksets.
 7. See “Keys and Keying” below for additional requirements.
- F. Electric Locks:

1. UL-listed, electric-controlled heavy-duty commercial mortise lock with 3/4 inch (19 mm) deadlocking latch bolt; fail-safe operation.
2. Provide with power booster (supply).
3. Fabricate with electric controller in frame, not requiring wiring through door.
4. Fabricate to work with scheduled mortise lock manufacturer's lockset, modified to work with controller. Furnish complete with trim, armor fronts, and 6 pin cylinders, extended spindles as required to suit door thickness
5. Conceal fastenings, washers and bushings.
6. Function: Provide as scheduled.
7. Trim: Match trim design for mortise locksets.

G. Electric Strikes:

1. Comply with BHMA 501, Grade 1
2. Provide heavy duty, cast construction strikes, function as indicated.
3. Electric strikes shall draw a maximum of 250 milliamps of current at 24VDC.
4. Units shall be solenoid-actuated and tamper-resistant, and listed by a testing agency acceptable to authorities having jurisdiction for both burglary protection device and fire door accessory.
5. Provide normally-locked application, with fail-secure operation so that doors remain locked in the event of a power failure.

H. Exit Devices:

1. Comply with ANSI/BHMA A156.3, Grade 1.
2. Furnish with provision for concealed mounting, throughbolts will not be acceptable.
3. Furnish complete with extended spindles as required to suit door thickness.
4. Furnish keyed devices less cylinders; provide cylinders keyed to building system.
5. Provide UL-labeled fire-exit hardware at fire-rated openings.
6. Provide keyed removable mullions, weatherstripped, and complete with stabilizers for a secure installation. Where indicated, factory prepare mullions for electric strike installation.
7. Electric latch retraction:
 - a. Provide with power booster (supply) and power transfer.
 - b. Operation:
 - 1) When security system is “on”, exit device shall automatically unlock upon receipt of valid signal from card reader or activation of infra-red sensor.
 - 2) When security system is “on”, exit device shall automatically unlock upon activation of fire and heat/smoke alarm system.
 - 3) Provide fail secure application so that when security system is “on”, doors remain locked in event of power failure.
 - c. Electric dogging:
 - 1) Provide electric dogging, to automatically dog (unlock) devices when security system turns “off” and to automatically undog (lock) devices when security system turns “on”, under normal operation of security system.
 - 2) Electric dogging is not permitted for fire-rated doors.
 - d. Coordinate with installation and operation of power door operators, security system and fire/smoke alarm system.
8. Function and trim:
 - a. Provide as scheduled.
 - b. Where lever handle trim is specified, levers shall match the design of levers specified for locksets and latchsets.

- I. Closers:
1. Comply with ANSI/BHMA A156.4, Grade 1.
 2. Closers shall be of heavy duty cast iron or cast aluminum construction. Arms shall be heavy-duty solid forged steel.
 3. Where factory sized closers are specified, sizes are to be determined by manufacturer's recommendations for door size, location and applicable accessibility requirements.
 4. Closers shall have full rack and pinion, independent closing speed and latch regulating valves, and adjustable backcheck.
 5. Furnish for 180 deg door opening where partition construction will permit.
 6. Provide regular arm or parallel arm closers as required to mount closer on least visible (to public) side of door.
 7. Covers: Metal. Plastic covers are not acceptable.
 8. Provide complete with accessory items and attachments, including special arms, soffit shoes, drop plates.
 - a. Corner bracket installations are not acceptable.
 - b. Closers, covers, brackets and other components shall not extend below bottom of top horizontal rail of door.
- J. Electro-Magnetic Releases:
1. Comply with ANSI/BHMA A156.15.
 2. Connect devices to fire or smoke/heat alarm system via dry contacts, so that when alarm devices are activated, or there is power loss in building, electro-magnetic releases will automatically release and closers will close doors.
 3. Utilize line voltage for power, not fire alarm system's low voltage power supply.
 4. Coordinate voltage requirements with Division 26.
- K. Power-Assist Operators:
1. Comply with ANSI A156.19.
 2. Description:
 - a. Combination manual door closer and electro-mechanical low-energy power door operator; switch activated; offset-pivot surface mounted.
 - b. Unit shall be designed to operate doors weighing up to 250 pounds.
 3. Operation:
 - a. MANUAL mode: Operator functions as manual door closer, complying with requirements for closers as specified above in this Section.
 - b. HANDICAP mode: Pressing switch automatically opens door leaf to 90 deg, operator then manually closes door after variable time delay expires.
 4. Provide manufacturer's wall-mounted stainless steel actuator plates, with face dimensions approximately 5 1/2-inches square.
 - a. Deboss or engrave Universal Accessibility Symbol on plate; fill with blue enamel paint.
 - b. Provide one interior switch and one exterior switch per operator.
 5. Control unit:
 - a. Micro-processor controlled.
 - b. Provide adjustable opening speed, adjustable backcheck speed, adjustable closing speed, and adjustable hold-open period.
 - c. Provide built-in 3-position switch for "OFF", "ON" and "HOLD-OPEN" operation and to deactivate exterior actuator switch.

- d. Provide safety-stop feature: If object or obstruction is encountered during opening and/or closing cycles, door operator stops and slowly returns to closed or open position respectively.
 - e. Provide with safety circuit so that if actuator switch is activated when door is latched or locked, power operator resets without solenoid or motor burn-out.
 - 6. Accessories:
 - a. Provide with continuous aluminum cover with an anodized ANSI 313 finish, full width of door.
 - b. Furnish complete with fastenings, fittings, and other accessories as required for a complete installation.
 - 7. Coordinate voltage requirements with Division 26.
- L. Flush Bolts, Dust Strikes, and Coordinators:
- 1. Comply with ANSI/BHMA A156.3 for automatic flush bolts, and ANSI/BHMA A156.16 for manual flush bolts and dust strikes.
 - 2. Provide products suitable for use with indicated door (wood veneer mineral core or hollow metal) and frame construction, and acceptable to door and frame manufacturers.
 - 3. Furnish in pairs (top and bottom of door).
 - 4. Furnish minimum length of 12 inches for rods. For doors higher than 7'-0", furnish top bolt in length sufficient to locate flush bolt operator no more than 6'-0" above finished floor.
 - 5. Comply with ANSI A115.4.
 - 6. Furnish standard strikes with wrought boxes for top bolts.
 - 7. Automatic flush bolts:
 - a. Top and bottom, self-latching devices, unlatched when active door leaf is opened.
 - b. Device shall be same manufacturer as coordinator.
 - 8. Dust strikes:
 - a. Provide dust strikes for each bottom flush bolt.
 - b. Provide strikes with plate for applications without threshold. unless otherwise scheduled.
 - c. Where used with automatic flush bolts, strike shall be same manufacturer as automatic flush bolt.
 - 9. Coordinators:
 - a. Comply with ANSI/BHMA A156.3.
 - b. Provide integral device mounted at head frame for full opening width.
 - c. Provide with closer brackets as required.
 - d. Manufacturer: Same as automatic flush bolt.
 - e. Finish: Primed for field painting.
- M. Wall and Floor Stops:
- 1. Comply with ANSI/BHMA A156.16.
 - 2. Provide attachment devices as suitable for substrates.
 - 3. Provide risers for floor stops as required to coordinate with undercuts, thresholds, carpet or other finish materials.
 - 4. Type:
 - a. Unless otherwise scheduled, provide wall stops equal to Ives WS402CVX wherever trim strikes wall.
 - b. Where wall stops are not suitable, provide floor stops equal to Ives FS436 (with removable riser).

- N. Overhead Stops/holders:
1. Comply with ANSI/BHMA A156.8, Grade 1.
 2. Holder sizes: As recommended by manufacturer for size of door and application in consideration of details indicated.
 3. Stops and holders shall be concealed or surface mounted as scheduled, non-handed with shock absorbing coil springs with rubber inserts. Arms and channels shall be made of extruded bronze.
 4. Where wall or floor stops are not suitable, provide concealed overhead stops equal to Allegion - Glynn-Johnson 410S.
- O. Flat Goods:
1. Comply with ANSI A156.6.
 2. Bevel kick plates, mop plates and armor plates 3 sides.
 3. Minimum thicknesses: 0.050 inch thick for stainless steel; 0.064 inch thick for bronze.
 4. Furnish flat good with Phillips undercut, countersunk screws per ANSI A156.6. Trusshead screws are not acceptable.
 5. Kick plates and armor plates: Unless otherwise indicated or where narrow bottom rails dictate a smaller size, kick plates shall be 10 inches high and armor plates 34-inches high (16-inches on labeled doors). Width shall be 1-1/2 inches less than door width on single doors and 1 inch less than door width on double doors.
 6. Push and pull plates:
 - a. Unless otherwise indicated, push and pull plates shall be 4 inches x 16 inches.
 - b. Cut plates for cylinders and turn pieces as required.
 7. Kick and armor plates shall be equal to Hager Companies series 194S.
- P. Silencers:
1. Comply with ANSI/BHMA A156.16.
 2. Fabricate silencers with projection to snap into punched holes in metal frames, and fit into drilled holes in wood frames. Adhesive-type silencers are not acceptable.
 3. Do not provide silencers where seals or weatherstripping are scheduled. Omit silencers at doors with aluminum frames.
 4. Provide 3 for single doors, and 2 for pair of doors.
 5. Acceptable products and manufacturer:
 - a. For metal frames: Ives SR64.
 - b. For wood frames: Ives SR65.
- Q. Seals and Weatherstripping:
1. Provide seals and weatherstripping as scheduled, continuous around door heads and jambs.
 2. Provide only units in which resilient or flexible seal strip is easily replaceable in field, and is readily available from stocks maintained by manufacturer.
 3. Metal components: Extruded aluminum; finish as scheduled.
 4. Resilient components: Neoprene, vinyl, or silicone, as scheduled.
 5. Positive pressure doors: At doors indicated to be “20-minute” in door schedule, provide head, jamb and astragal intumescent seals.
- R. Thresholds:
1. Fabricate from extruded aluminum, with continuous grooved top surface.
 2. Provide in handicapped-accessible profile not more than 1/2 inch high, with bevel on each long edge.
 3. Provide in lengths to suit door openings.

4. Furnish with continuous channel anchors for casting into slab or with expansion devices, and with countersunk flat head machine screws, for attachment to substrates.

S. Sliding Door Hardware:

1. Comply with ANSI A156.14.
2. Provide heavy duty units as scheduled including tracks, rollers, stops and all necessary appurtenances for complete assembly.

T. Key Cabinet:

1. Provide key cabinet equal to Lund Equipment Company “DeLuxe Line” with two tag key system. Cabinet shall have permanent loan register and hook capacity for each cylinder specified herein plus 100%.
2. Supplier shall set up the key cabinet with all change keys tagged and indexed with a cross index system.

U. Other Devices and Accessories:

1. Provide as scheduled and as required for complete installation.
2. Furnish necessary special tools (eg. spanner and socket wrenches, dogging keys, etc.) required to adjust and maintain hardware items.

V. Fasteners:

1. Furnish hardware items with appropriate type and length of screws or other fastenings suitable for permanent anchorage.
2. Provide concealed fastenings wherever possible.
3. Provide concealed fasteners for hardware items that are exposed when door is closed, except in application of flush mounted push and kick plates.
4. Through-bolts fastening is not acceptable. Coordinate with fire-rated wood door construction to eliminate through-bolts.
5. Provide countersunk Phillips oval head type screws where concealed fastening is not possible; match finish and color of hardware item being fastened. Provide flat head screws for hinges, and oval head screws for other items.

2.3 KEYS AND KEYING

A. Requirements:

1. Specific keying requirements are to be determined in consultation with Owner and Architect.
2. Construction Master key locks by means of special key in plug or construction cylinders. Construction Master key shall become inoperative at time of final acceptance.
3. Provide the type of system required (e.g. master, grand master, great grand master). Nomenclature and layout shall be consistent with DHI “Keying Systems and Terminology”.

B. Cylinders:

1. All cylinders shall be construction master keyed. Equip locks with manufacturer’s special pin tumbler cylinders which permit voiding construction keys without removal of the cylinder.
2. See “Cylinders” above for additional requirements.

C. Keys:

1. Material: Nickel silver.
 2. Stamp master and grand master keys “Do Not Duplicate”. Stamp change keys with the key change number.
 3. Furnish keys in following quantities: Five grand master keys, five master keys (per set), three change keys for each cylinder, and ten construction master keys.
- D. Delivery of Keys:
1. Supply Construction Master keys to Contractor when locks are delivered for use during construction.
 2. Hand-deliver permanent keys, including Grand Master keys, Master keys, change keys, and shut-out keys directly to Owner.
 3. Tag keys, and place keys on markers and hooks in key cabinet, as determined by final key schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install each hardware item in accordance with final Finish Hardware Schedule and manufacturer's instructions.
1. Set hardware level, plumb and true to line and location.
 2. Adjust and reinforce attachment substrate as required for proper installation and operation of hardware.
 3. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors uniformly, in accordance with industry standards.
- B. Hardware Mounting Heights:
1. Provide heights as indicated on Drawings, except as otherwise required to comply with governing regulations.
 2. Where heights are not indicated, comply with mounting requirements of DHI “Recommended Locations for Builder's Hardware” on custom steel doors and frames and CABO/ANSI A117.1 “Accessible and Usable Buildings and Facilities”.
- C. Hinges:
1. Install steel doors and wood doors to comply with reference standards, as specified in door sections.
 2. Where shimming is required to comply with tolerances, provide metal shims only.
- D. Closers:
1. Do not install parallel arm closers until after weatherstripping or seals have been installed on head frame (where weatherstripping or seals are scheduled).
 2. Do not cut weatherstripping or seals for attachment of closer brackets or shoes.
 3. Adjust closers to control door swing and to provide positive latching of doors.
 - a. Adjust closers not to exceed following manual opening forces:

- 1) Exterior doors: As required to close and latch each leaf.
 - 2) Interior doors (non-fire-rated): Maximum 5 pound opening force.
 - 3) Fire-rated doors: As required to close and latch each leaf.
 - b. After air handling system has been balanced, make final adjustment of all closers.
 - 1) Location of closers: Classroom doors and other locations indicated.
- E. Door Stops:
1. Install stops for maximum degree of door opening swing allowed by conditions of installation.
 2. Locate floor stops so as not to create a tripping hazard.
 3. Locate wall stops centered on spindle of lever handles.
- F. Door Plates: Install plates on push side of single-acting doors, with flat (non-beveled) side facing floor.
- G. Weatherstripping and Seals:
1. Install continuous around door heads and jambs, and meeting stiles of pairs of doors.
 2. Install bottom weatherstripping and automatic door bottoms for full width of door.
 3. Do not cut weatherstripping or seals for attachment of closer brackets or shoes.
- H. Thresholds:
1. Scribe and cut to fit profiles of door frames, with mitered corners and tight joints. File burrs smooth.
 2. Install exterior thresholds in full bed of butyl rubber sealant. Do not plug drain holes or block weeps. Remove excess sealant.
- I. Coordination with Adjacent Finishes:
1. If cutting and fitting are required to install hardware onto or into surfaces which are later painted or finished in another way, install each item completely and then remove and store in secure place during finish application.
 2. After completion of finishes, reinstall each item.
 3. Do not install surface mounted items until finishes are complete on substrate.
- J. Key Cabinet:
1. Deliver key cabinet to the Owner prior to building occupancy. Install in accordance with manufacturer's instructions in location as directed by Owner.
 2. Instruct Owner in use of key control system.
- 3.3 FINAL ADJUSTMENT
- A. When hardware installation is made more than 1 month prior to Substantial Completion of Project, make final adjustments during week immediately prior to Substantial Completion and after completion of testing and balancing of building mechanical system, unless otherwise directed by Architect.
1. Provide additional adjustments at the following intervals:
 - a. At occupancy
 - b. 90 days after occupancy
 - c. 180 days after occupancy.

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- B. Adjust and check each operating item of hardware and each door, to ensure proper operation of function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite-type if no other recommended).
- C. Test electro-magnetic hold-open devices in presence of Architect. Adjust devices and connections as required to provide proper operation.
- D. Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for application made. Also replace defective, damaged, missing or stolen hardware.
- E. Test security devices with operation of security system in presence of Owner. Adjust devices and connections as required to provide proper operation as acceptable to Owner.
- F. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finishes.
- G. Immediately before final completion of Work, carefully clean exposed hardware items by methods not injurious to their finish.
- H. Protect hardware from damage until final acceptance.

3.4 FIELD QUALITY CONTROL

- A. Construction team must perform regular QC inspections and submit reports for review by AE/QA personnel.
- B. Reports must include inspection details for door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted per operational configuration.

END OF SECTION

SECTION 08 8000

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - a. Windows.
 - b. Doors.
 - c. Glazed curtainwalls.
 - d. Storefront framing.
 - e. Glazed entrances.
 - f. Interior borrowed lites.
 - g. Unframed mirrors.
 - 2. Glazing materials and accessories.
- B. Single Subcontract Responsibility: Provide glass and glazing under single subcontract.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 08 1113 HOLLOW METAL DOORS AND FRAMES for hollow metal doors and hollow metal framing systems.
- B. See Section 08 4113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS for aluminum framing systems in conjunction with window wall and glazing system requirements for entrance doors.
- C. See Section 10 2813 TOILET ACCESSORIES for framed mirrors.

1.3 ACTION SUBMITTALS

- A. Combined Submittal: Submit the following as a combined submittal with Work specified in 08 4113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS and 084114 FRP ALUMINUM FRAMED ENTRANCE DOORS.
- B. Product Data: Submit manufacturer's specifications and installation instructions for each type of glass required.
 - 1. Submit SWRI Validation Certificate for each glazing sealant specified to be validated by SWRI's Sealant Validation Program.
 - 2. Provide glazing schedule.
 - a. List glass types and thicknesses for each site opening and location. Use same designation indicated on Drawings.
- C. Samples:
 - 1. Glass:

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- a. Submit 12 inch (300 mm) square samples of each type of glass (except clear single lite glass and mirror glass).
 - b. Samples shall be typical production run quality and, as applicable, shall be complete with required tint, reflective and low emissivity coatings, fritted coatings, laminating films, opacifiers and primary and secondary edge seals.
2. Submit samples of manufacturer's standard color selections for glazing sealant for Architect's color selection.
 3. Submit samples of glazing gaskets for Architect's approval of color.

1.4 INFORMATIONAL SUBMITTALS

- A. Calculations: Provide glass manufacturer's thermal stress analysis, for the most critical exterior application.
- B. Certificates:
 1. Submit certificate from glass manufacturer stating that manufacturer has reviewed glazing details including use of sealants and gaskets and each product provided is recommended for application indicated, and that materials are compatible and will adhere to specified finish.
 2. Submit certificate from glass manufacturer stating that manufacturer has reviewed application of heat absorbing or reflective glass for effects of partial or full shading (including locations and types of indicated interior window treatment) under expected service temperature ranges and that resulting thermal stresses will not reduce "Glass Statistical Factor" below 2.5.
 3. Submit certificate for glass materials at "Hazardous Locations" showing compliance with requirements of CPSC 16CFR, Part 1201.
 4. Submit certificate stating that glass units can withstand design loads.
 5. Submit glass manufacturer's review of Shop Drawings for window wall system, with recommendations and suggestions.
- C. Qualification Data: Submit manufacturer and installer qualifications verifying years of experience; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
 1. Submit cleaning and maintenance data for materials provided.
 2. Include copy of submittal in Project information manual.
- B. Warranties: Submit signed and dated warranties.

1.6 SYSTEM REQUIREMENTS

- A. Design Requirements:
 1. Glass thicknesses when indicated (except for ornamental applications) are for convenience of detailing only and are to be determined by Contractor or glass manufacturer as required to fulfill performance requirements.
 2. Glazing channel dimensions indicated are intended to provide necessary minimum bite on glass, minimum edge clearances and adequate sealant and/or gasket thickness within required tolerances.

3. Coordinate glazing systems with glazing channels to assure proper installation of systems.
- B. Performance Requirements:
1. Refer to the following Sections for performance criteria pertaining to design of glass, glazing systems and framing members for glazing applications.
 - a. Section 08 4113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS and 084114 FRP ALUMINUM-FRAMED ENTRANCE DOORS,
 2. Glass Statistical Factor (Safety Factor):
 - a. Provide glass of sufficient thicknesses that probability of breakage at “Design Wind Pressure” will not exceed 8 lites per 1000 lites (2.5 SF) at 60 second wind load.
 - b. For glass inclined more than 15 deg from vertical, including glass for skylights, provide glass of sufficient thicknesses that probability of breakage at “Design Loads” will not exceed 1 lite per 1000 lites (5.0 SF) unless glass manufacturer specifically recommends, in writing, a lower SF.
 - c. Provide glass manufacturer's data, on request, substantiating glass breakage data if such data is not otherwise available as manufacturer's published data.
 3. Compatibility and adhesion: Provide glazing sealants, gaskets, and glazing accessories which are compatible with each other and with glass and glass framing members, and which will adhere to joint surfaces.
 4. Preconstruction Adhesion & Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessories, and glass framing members for adhesion to and verify compatibility with elastomeric glazing sealants.
 - a. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
 - b. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 - c. Test three Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials
 5. Provide watertight and airtight installation of glass.
 6. Each installation must withstand specified performance requirements including normal temperature changes, wind loading and impact loading, without failure.
- C. Fire-Protection-Rated Glazing Labeling:
1. Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 deg F (250 deg C), and the fire-resistance rating in minutes.
 2. For fire-protection-rated glazing, provide products identical to those tested in accordance with the following, and labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Fire-resistant glazing products for door assemblies: NFPA 252.
 - b. Fire-resistant glazing products for window assemblies: NFPA 257.
- D. Interface with Other Systems: Provide primary and secondary seals on insulating units that are compatible with sealant used for structural sealant glazing.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Not less than 5 years documented successful experience in installation of work similar to Work of this Project, licensed or approved by glass manufacturer.
- B. Single Source Responsibility:
 - 1. Provide glass and glazing materials from one source for each type of glass.
 - 2. Use same glazing material in each joint system unless material manufacturer recommends otherwise.
- C. Manufacturer Qualifications:
 - 1. Not less than 5 years documented successful experience in production of work similar to Work of this Project, with sufficient capacity to supply glass in a timely fashion.
 - 2. Manufacturer of insulating glass units shall be a member of IGMA (Insulating Glass Manufacturers Alliance).
- D. Regulatory Requirements:
 - 1. Comply with applicable requirements of authorities having jurisdiction over Project.
 - 2. Safety glazing requirements:
 - a. Provide glass and glazing at “Hazardous Locations” complying with requirements of CPSC 16CFR, Part 1201, Consumer Product Safety Commission Standard on Architectural Glazing Materials, including required tests and labeling.
 - b. Permanently mark each lite of safety glazing material with certification label acceptable to authorities having jurisdiction.
- E. Reference Standards: Unless otherwise required to comply with regulatory requirements or otherwise recommended by fabricator to fulfill performance requirements, comply with the following:
 - 1. AAMA “TIR-A Glazing Guidelines”.
 - 2. GANA “Glazing Manual”.
 - 3. IGMA TM-3000 “Glazing Guidelines for Sealed Insulating Glass Units”.
 - 4. IGMA TB-3001 “IGMA Guidelines for Sloped Glazing”.

1.8 SAMPLE INSTALLATION

- A. Prior to commencing Work, glaze one bay of each type of glazing system in area as acceptable to Architect.
- B. Install sample installations to match final Work in every respect.
- C. Install sample installations in presence of glazing materials manufacturer and glass manufacturer representatives, not less than one week in advance of scheduled glazing Work.
- D. Architect's Review:
 - 1. Architect will review sample installation for visual acceptance of workmanship.
 - 2. Obtain Architect's approval of sample installation before proceeding with subsequent Work.
- E. Accepted sample installations may remain in completed Work.
- F. Dismantle unacceptable sample installations and remove from site.

1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, at Contractor's direction, meet at site and review installation procedures and coordination with other Work.
- B. Attendees: Glass manufacturer's representative, glazier and fabricator of framing or other supporting structure receiving glass.
- C. Agenda:
 - 1. Review glazing procedure, application of glazing materials and installation of removable stops.
 - 2. Evaluate suitability of specified compounds and sealants for anticipated weather conditions.
 - 3. Review coordination with other Work.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver glazing materials in manufacturer's unopened packaging.
- B. Glass shall bear manufacturer's labels indicating type and quality. Labels shall be left on glass until final cleaning, unless otherwise directed by Architect.
- C. Store in accordance with manufacturer's recommendations.
- D. Provide cushions at glass edges to prevent damage during handling or storage.

1.11 PROJECT CONDITIONS

- A. Environmental Conditions:
 - 1. Ensure that conditions of temperature, humidity and precipitation are as recommended by glass manufacturer.
 - 2. Do not proceed with glazing when ambient or substrate temperature conditions are below 40 deg F.
 - 3. Install glazing sealants only when temperatures are in middle third of manufacturer's recommended installation temperature range.
 - 4. Do not perform any glazing Work when framing members are wet or frosted.

1.12 WARRANTY

- A. Provide written 10 year warranties, made out to Owner and signed by glass manufacturer agreeing to furnish replacements for the following:
 - 1. In manufacturer's warranties, "initial purchaser" shall refer to Owner.
 - 2. Insulating glass units which have failed hermetic seal, fogging, reflective or low emissivity coating defects, breakage due to edge flaws (such as chips or gouges) or migration of edge spacers.
 - 3. Laminated glass units which show evidence of delamination, deterioration of laminating films, loss of transparency or other forms of deterioration including edge separation due to defective materials or lamination, or breakage due to edge flaws (such as chips or gouges).
 - 4. Coated or spandrel glass which show evidence of peeling, cracking or deterioration of coating or opacifier/scrim, or breakage due to edge flaws (such as chips or gouges).

5. Glass units with latent visual defects.
6. Mirrors which develop visible silver spoilage defects.

PART 2 - PRODUCTS

2.1 GLASS MATERIALS

A. Clear Float Glass:

1. ASTM C1036, Type I, Class 1, Quality q³.
2. Minimum thickness: 6 mm.
3. Low-iron glass:
 - a. Where indicated, provide ultra-clear (low-iron) glass, with minimum 91% visible light transmission and minimum solar heat gain coefficient of 0.87.
 - b. Acceptable products and manufacturers:
 - 1) Krystal Klear by AGC Flat Glass North America
 - 2) Optiwhite by Pilkington Building Products North America.
 - 3) Starphire by PPG Industries, Inc.
 - 4) Amiran Water White by Schott Corporation.

B. Heat-Treated Glass:

1. General:
 - a. Fabrication process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 - b. For uncoated glass, comply with requirements for Condition A.
 - c. For coated vision glass, comply with requirements for Condition C (other coated glass).
 - d. Adjust temperature settings of heat-treating ovens to suit specific glass coatings, so as to minimize distortion and discoloration of coatings.
2. Fully tempered glass:
 - a. ASTM C1048, Kind FT, of color and type indicated.
 - b. Provide fully tempered glass certified by SGCC or other recognized certification agency, acceptable to authorities having jurisdiction, as complying with requirements of CPSC 16CFR, Part 1201 for Category II materials.
 - c. Heat soak glass to comply with the following:
 - 1) Heat-soak test fully tempered glass in compliance with DIN 18516-4, BS EN 14179 or another recognized international standard acceptable to glass fabricator to convert nickel sulfide inclusions from the alpha phase to the beta phase, so that the glass will fracture in the test.
 - 2) Each pane of heat soak tested tempered glass shall be traceable to individual heat soak test batches, in order that, in the event of failure, it shall be possible to identify and locate all panels from that heat soaked test batch.
 - 3) Statistical analysis of partial heat soaking is not acceptable.
 - 4) Warranties against nickel sulfide inclusions in lieu of heat soaking will not be accepted.
 - d. Roller wave distortion: Limit roller wave distortion to 0.003 inches peak to valley.
 - e. Wherever possible, locate tong marks along edge which will be concealed in glazing system.
 - f. Permanently mark each unit of tempered glass with certification label acceptable to authorities having jurisdiction. Permanent marking is not required for tempered spandrel glass.

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- a. White polyester scrim-reinforced film, 4 mil thick, with pressure-sensitive acrylic adhesive, specifically designed as safety backing for mirrors. Application of film to mirrors shall provide compliance with CPSC 16CFR, Part 1201 for Category II materials.
- b. Provide in widths as required for a single sheet of film to cover full extent of each mirror.
- c. Provide with additional adhesives as recommended by film manufacturer.
- d. Acceptable product and manufacturer: Equivalent to No. 2MT, Category Two Mirror Safety Backing by C.R. Laurence Company, Inc.
- e.
- f.
- g.

G. Laminated Glass Units (LGU):

- 1. Locations:
 - a. Provide laminated glass at interior window areas up to 18 inches above finished floor and as required by code.
 - b. Provide laminated glass at interior glazing for classrooms, labs and learning spaces.
- 2. Provide laminated glass units certified by SGCC or other recognized certification agency, acceptable to authorities having jurisdiction, as complying with requirements of CPSC 16CFR, Part 1201 for Category II materials.
- 3. Provide laminated glass complying with requirements of ASTM C1172.
- 4. Provide physical attack-resistant glass complying with requirements of UL 972 5-aa1 rated for 6 minutes, for all exterior glass in ground-level or otherwise accessible locations.
 - a. Basis-of-Design product and manufacturer: Equivalent to SG4 School Guard Glass by LTI Smart Glass, Inc.
- 5. Interlayer for typical laminated units:
 - a. Polyvinyl butyral plastic (PVB) sheet, unless otherwise required to produce a successful lamination.
 - b. Ionomeric-extruded polymer.
 - 1) Thickness: 0.06 inches thick.
 - 2) Color: Clear.
 - 3) Interlayer shall be recommended by manufacturer for weather exposure at exposed edges of laminated glass units, and shall be compatible with silicone glazing sealants without deterioration.
 - c. Colors, patterns: Provide as scheduled.
- 6. Fabrication:
 - a. Laminate units at factory using manufacturer's standard heat-plus-pressure process.
 - b. Exclude dirt and other foreign materials from lamination.
 - c. Eliminate voids and delaminated surfaces from Work.
 - d. Cut units to proper size at factory. Do not cut laminated glass at Project site.
 - e. Cut and treat edges in accordance with glass manufacturer's recommendations.
 - f. Arrange each course of laminate in order specified and label exterior (or interior) face of each completed unit.
 - g. For laminated glass units with exposed edges, fabricate so that each layer of glass, and each interlayer, is flush at unit edges.
- 7. LGU schedule:
 - a. LGU-1: 3mm (1/8") clear tempered glass, clear PVB interlayer, 3 mm (1/8") clear tempered glass. Total thickness about 6 mm (1/4").

- b. LGU 2: same as LGU-1 but with translucent interlayer selected by Architect from manufacturer's standard selections.
- c. LGU-3: same as LGU-1 but with opaque interlayer selected by Architect from manufacturer's standard selections.
- d. LGU-4: same as LGU-1, but with physical attack-resistant PVB interlayer complying with requirements of UL 972 5-aa1. Basis of Design: Equivalent to SG4 School Guard Glass by LTI Smart Glass, Inc.
- e. LGU-5: 6mm (1/4") clear tempered glass, clear PVB interlayer, 6 mm (1/4") clear tempered glass. Total thickness about 12 mm (1/2").
 - 1) STC rating: 35
 - 2) Locations: Required at all interior classrooms and learning areas, where called for in IGU schedule, and as noted on the drawings.
 - 3)
 - 4)

H. Insulating Glass Units (IGU):

- 1. Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E2190, and complying with other requirements specified.
- 2. Fabricate units at factory with hermetic seals at edges with both primary and secondary elastomeric seals.
- 3. Make primary seals of polyisobutylene and secondary seals of neutral cure, 2-part silicone manufactured specifically for use in insulating glass units, unless otherwise recommended by manufacturer to fulfill performance criteria.
- 4. Spacer:
 - a. Rolled laser welded aluminum tube with soldered, brazed, welded or uncut bent corners.
 - b. Size: Not less than 3/4 inch smaller or more than 1 inch smaller than glass lights, centered to show equal margins top, bottom and both sides.
 - c. Finish and color: match color of glazing frame.
 - d. Fill void between spacer and glass edges completely with silicone secondary seal, devoid of trapped air bubbles.
- 5. Flatness tolerance: Manufacture units so that maximum out-of-plane concavity/convexity, at center of each lite, does not exceed the following when ambient temperature is 70 deg F and glass surface temperature is within +/-5 deg F of ambient temperature. Measure flatness with units in installed vertical position.
 - a. Units 20 square feet and larger in area: +/-1/16 inch maximum.
 - b. Units smaller than 20 square feet in area: +/-1/32 inch maximum.
 - c. If units are manufactured at a geodetic elevation higher or lower than that of the Project, take measures to assure that flatness tolerances are met. If filling or deflating is used at time of manufacture to compensate for elevation difference, it shall be done after full curing of glass edge seals.
- 6. IGU schedule:
 - a. IGU-1: Outer light (6mm (1/4") clear tempered glass with low emissivity coating on #2 surface); 12mm (1/2") argon gas filled space; Inner Light (LGU-1)
 - b. IGU-2: Same as IGU-1 but with LGU-2 interlayer
 - c. IGU-3: Same as IGU-1 but with LGU-3 interlayer
 - d. IGU-4: Same as IGU-1 but with LGU-4 interlayer. Required at all ground level window wall assemblies up to a height of at least 8 ft. or first horizontal mullion above 8 ft.

- 1) Acceptable product and manufacturer: Equivalent to School Guard Glass SG4 with SNX 62/27 by Guardian.

2.2 GLAZING MATERIALS

- A. General:
 1. Comply with manufacturer's recommendation for selection of hardness, depending on location of application, conditions at time of installation and performance requirements indicated.
 2. Provide materials, and variations or modifications that are compatible with surfaces contacted in installation.
 3. Color: Provide colors selected by Architect from manufacturer's standard colors.
- B. VOC Content: For sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Silicone Glazing (Weatherseal) Sealant:
 1. Medium-modulus, neutral-curing silicone sealant; complying with ASTM C920, Type M or S, Grade NS, Class 50.
 2. Sealant shall have a current validation certificate from the Sealant, Waterproofing and Restoration Institute (SWRI).
 3. Color: To be selected by Architect from manufacturer's standard colors.
 4. Acceptable products and manufacturers:
 - a. 795 by Dow Corning Corp.
 - b. SilPruf SCS2000 by Momentive Performance Materials, Inc.
 - c. 864 by Pecora.
 - d. Spectrem 3 by Tremco.
- D. Structural Silicone Glazing Sealant:
 1. Chemically curing silicone formulation complying with ASTM C1184, that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by structural sealant manufacturer for use in assemblies indicated.
 2. Sealant shall have a current validation certificate from the Sealant, Waterproofing and Restoration Institute (SWRI).
 3. Color: To be selected by Architect from manufacturer's standard colors.
 4. Acceptable products and manufacturers:
 - a. 995 by Dow Corning Corp.
 - b. Ultraglaze SSG 4000 by Momentive Performance Materials, Inc.
 - c. 895 by Pecora.
 - d. Spectrem 2 by Tremco.
- E. Glazing Sealant for Fire-Resistant Glazing Products: Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire-protection ratings indicated.
- F. Acrylic-Emulsion Glazing Sealant: Emulsion of acrylic, with or without latex rubber modification; compounded specifically for glazing; nonhardening, nonstaining and nonbleeding.
- G. Butyl Rubber Glazing Tape:

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1. Partly-vulcanized, self-adhesive, non-staining, elastomeric tape, 100% solids; complying with AAMA 800.
 2. Provide with or without spacer rod, as recommended by tape and glass manufacturers to suit applications indicated.
- H. Polyurethane Foam Glazing Tape:
1. High-density, closed-cell, flexible, non-extruding tape, adhesive backed one side only; recommended by manufacturer for exterior applications with nominal pressure in glazing channel.
 2. Acceptable manufacturer: Norton Company.
 3. Acceptable products: As recommended by manufacturer suitable for conditions of application and use.
 4. Acceptable product and manufacturer - structural sealant glazing systems: Thermalbond V-2100 by TBP Converting
- I. Molded Resilient Neoprene Gaskets: Continuous extruded neoprene gaskets complying with applicable ASTM standards for physical properties including durometer hardness and tensile strength recommended by framing manufacturer and tested to demonstrate conformance with Contract Documents.
- J. Glazing Felt: Treated wool felt, adhesive backed, non-wicking and non-staining.
- K. Mirror Mastic:
1. Adhesive setting compound, produced specifically for setting mirrored glass by spot application, certified by both mirrored glass manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrored glass will be installed
 2. Acceptable manufacturers:
 - a. Royal Adhesives.
 - b. Palmer Products Corp.
- L. Glazing Accessories:
1. Provide materials with proven record of compatibility with surfaces and other materials contacted in installation.
 2. Setting blocks: Neoprene or silicone, 70-90 Shore A durometer hardness.
 3. Spacers: Neoprene or silicone, 40-50 Shore A durometer hardness, adhesive backed one face only.
 4. Corner blocks: Closed cell neoprene wedge blocks designed to prevent lateral displacement of glass, as recommended by manufacturer and GANA Glazing Manual.
 5. Cleaners, primers, and sealers: As recommended by sealant or gasket manufacturer.
- 2.3 ACCESSORIES
- A. Mirror Edge Trim: Extruded aluminum J-channels formed with a return deep enough to produce a glazing channel to accommodate mirrored glass units of thickness indicated and in lengths required to cover bottom edge of each mirrored glass unit in a single piece; clear stain anodized finish.
1. Bottom trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch (9.5 and 22 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm)
 2. Top trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch (16 and 25 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).

2.4 FABRICATION

A. Cutting:

1. Obtain sizes from Shop Drawings or by field measurement.
2. Cut glass to fit openings with minimum edge clearances and bite on glass recommended by glass manufacturer. Do not nip glass edges.
3. Factory cut heavy heat absorbing glass (over 10 mm) and heavy float glass (over 13 mm).
4. Edges:
 - a. Concealed: Wheel cut or sawed and seamed.
 - b. Exposed: Square edge; ground smooth and polished.
5. Mirrors:
 - a. Seal edges after treatment to prevent chemical or atmospheric penetration of glass coating.
 - b. Perform edge treatment and sealing in shop immediately after cutting to final sizes.
6. If glass will be cut in field, fabricate glass 2 inches larger than required.
7. Provide required openings in tempered or heat-strengthened glass before heat-treating. Do not cut, seam, nip or abrade such glass after heat-treating.
8. When glass is pre-cut to sizes obtained from Shop Drawings, take field measurements of openings before glazing to verify adequate bite of glass and minimum edge clearance.
9. If openings do not comply with tolerances for which pre-cut glass was sized, use new glass specially cut to fit such openings.

B. Fire Department Labels:

1. Provide permanent labels as indicated on Drawings and as required to comply with requirements of authorities having jurisdiction over Work.
2. Prior to tempering, etch or sandblast label on #2 surface of insulating unit, unless otherwise required to fulfill performance criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, including framing and glazing channels, and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.
- B. Ensure that frame openings are plumb, level, true to line and otherwise properly installed.
- C. Inspect each piece of glass immediately before installation, and discard pieces which evidence damage or deterioration including edge damage or face imperfections.

3.2 PREPARATION

- A. Clean glazing channel and other framing members to receive glass immediately before glazing.
- B. Remove coatings not firmly bonded to substrate. Remove lacquer from metal surfaces abutting elastomeric sealants.
- C. Apply primer or sealer to joint surfaces where recommended by sealant manufacturer.

3.3 INSTALLATION

- A. Comply with combined recommendations of referenced standards, glass manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are indicated or specified, and except where manufacturer's technical representatives direct otherwise.
- B. Layout:
 - 1. Unify appearance of each series of lites by setting each piece to match others as nearly as possible.
 - 2. Inspect each piece and set with pattern, draw and bow oriented in same direction as other pieces.
- C. Setting Blocks:
 - 1. Install setting blocks at sill one-quarter in from each end of the glass, unless otherwise recommended by manufacturer.
 - 2. Use blocks of proper size to support glass.
- D. Spacers:
 - 1. Provide spacers for glass sizes larger than 50 united inches to separate glass from stops except where continuous glazing gaskets or felts are provided.
 - 2. Locate spacers no farther than 24 inches apart and no closer than 12 inches to corners.
 - 3. Place spacers opposite one another. Make bite of spacer on glass a nominal 1/4 inch or greater.
- E. End Blocks: Provide end blocks to comply with requirements of referenced glazing standards except where otherwise required by glass manufacturer.
- F. Backer Rods: Install compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers.
- G. Sealant Glazing:
 - 1. Force sealants into channel to eliminate voids and to ensure complete “wetting” or bond of sealant to glass and channel surfaces.
 - 2. Use masking tape to limit coverage of glazing materials to surfaces intended for sealants.
 - 3. Cure sealants for high early strength and durability.
 - 4. Tool exposed surfaces of glazing materials to provide slight wash away from glass.
- H. Gasket Glazing:
 - 1. Vulcanize joints of glazing gaskets in accordance with manufacturer's instructions to provide continuous watertight and airtight seal at corners and other locations where joints are required.
 - 2. Butt or lap ends of tape.
 - 3. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not “walk” out when subjected to movement.
 - 4. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead. Set gaskets in silicone sealant at corners.
 - 5. Install exposed tapes or gaskets with slight protrusion above stops in final compressed condition.

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- I. Insulating Glass:
 - 1. Set insulating units with void between edge of units and glazing channel except in cases where a heel bead is required to prevent water leakage.
 - 2. Conceal edge spacer and seal binding of units with glazing material.
- J. Fire-Resistant Glazing Products: Install in labeled fire doors, frames and windows to meet requirements of cited references and NFPA Standard No. 80.
- K. Mirror Adhesive Installation:
 - 1. Paint back of mirror with additional coat of moisture-resistant paint of type recommended by mirror manufacturer.
 - 2. Support mirror on setting blocks or continuous glazing gasket.
 - 3. Seal porous substrates as recommended by mastic manufacturer.
 - 4. Apply mirror mastic in spots in accordance with mastic manufacturer's instructions, and to allow air circulation between back of mirror and face of mounting surface.

3.4 CLEANING

- A. Clean excess sealant or compound from glass and framing members immediately after application.
- B. After installation and until final acceptance, clean glass as frequently as required, but not less than once per month, to remove build-up of dirt, scum, and other substances. Comply with glass manufacturer's recommendations for cleaning.
- C. Wash and polish glass on both faces not more than 4 days prior to final acceptance.
- D. Comply with glass manufacturer's recommendations for final cleaning.

3.5 PROTECTION

- A. Protect glass from breakage after installation. Do not apply markers to surfaces of glass.
- B. Remove non-permanent labels.
- C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged.

END OF SECTION

SECTION 09 5100

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Acoustical panels for lay-in application.
 - 2. Metal framing and suspension systems.
 - 3. Trim and accessories.
- B. Products Furnished but Not Installed Under This Section: Furnish inserts and anchors to other trades well in advance of time needed for coordination with other Work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Division 21 for sprinkler heads.
- B. See Division 23 for mechanical grilles and diffusers.
- C. See Division 26 for light fixtures, fire and smoke detectors and speakers.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for each component.
- B. Shop Drawings:
 - 1. Submit project-specific Shop Drawings, drawn to scale, showing details and reflected ceiling plans.
 - 2. Show location of items of Work requiring coordination with acoustical ceilings or supported by acoustical ceiling systems.
- C. Samples:
 - 1. Panels: Submit 12 inch x 12 inch (30 mm x 300 mm) samples of each type.
 - 2. Exposed framing members and moldings: Submit 12 inch (300 mm) lengths of each type, color and finish.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit installer qualifications verifying years of experience; include list of projects having similar scope of work identified by name, location, date, reference names and phone numbers.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finished ceilings to include in maintenance manuals.

1.6 SYSTEM REQUIREMENTS

- A. Interface with Other Systems: Coordinate layout and installation of acoustical ceiling units, suspension system components and accessories with other Work supported by, or penetrating through, ceilings, including but not limited to light fixtures, fire and smoke detection system components, HVAC equipment, fire-suppression system components and partition system.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project.

1.8 SAMPLE INSTALLATIONS

- A. Prior to commencing Work and preceding pre-installation conference, provide sample installations for suspended acoustical ceiling Work.
- B. Size: Minimum 10 feet square (3000 mm) in areas acceptable to Architect.
- C. Materials: Complete installations with materials in systems, including panels, suspension system, wall moldings, light fixtures and mechanical grilles and diffusers.
- D. Architect's Review:
 - 1. Architect will review sample installations for visual acceptance of materials and workmanship.
 - 2. Obtain Architect's approval of sample installations before proceeding with subsequent Work.
- E. Maintain approved sample installations during construction as standard for subsequent Work.
- F. Properly finished and maintained sample installations may be incorporated into completed Work.

1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at site to review materials, installation procedures and coordination with other Work.

1.10 SEQUENCING AND SCHEDULING

- A. Do not install interior acoustical ceilings until space is enclosed and weatherproof, wetwork in space is completed and nominally dry, and Work above ceilings is complete. Complete above ceiling close-in inspections including verification of conforming MEP rough-in, hangers and penetration sealing using acoustical sealant or firestopping.

1.11 PROJECT CONDITIONS

- A. Verify measurements and dimensions at site.

- B. Survey space to determine variation of floor slabs from level. Identify high and low points, and coordinate with Architect in field to establish datum for laying out each ceiling area.
- C. Environmental Requirements:
 - 1. Permit panels to reach room temperature and stabilized moisture content before installation.
 - 2. Do not install panels until ambient conditions of temperature and humidity in space will be continuously maintained at values near those indicated for final occupancy.
 - 3. Do not install if ambient temperature is less than 60 deg F (15 deg C).

1.12 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in manufacturer's unopened containers, clearly indicating manufacturer's name, brand, type, style, size, color, texture and other identifying information.
- B. Store materials in dry location, off ground and in manner to prevent damage or deterioration.
- C. Replace materials which have been damaged or are otherwise unfit for use, as directed.

1.13 EXTRA STOCK

- A. Deliver one unopened carton of panels for each 100 cartons (or fraction thereof) installed for each type, pattern and color.
- B. Store at Project site where directed. Ensure cartons are identified by manufacturer, product, pattern and color.

1.14 WARRANTY

- A. Provide written warranty for acoustical ceiling systems, signed by Contractor, manufacturer and installer, agreeing to repair or replace faulty materials or workmanship for 2 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Manufacturers - Acoustical Panels:
 - 1. Armstrong World Industries.
 - 2. CertainTeed, Inc.
 - 3. USG Interiors, Inc.

2.2 ACOUSTICAL PANELS

- A. Type ACT-A:
 - 1. Description: Fiberglass.
 - 2. Classification, per ASTM E1264: Type IV, Form 2, Pattern E.
 - 3. Size: 24 inch x 24 inch x 3/4 inch thick (610 mm x 610 mm x 19 mm thick).
 - 4. Edge profile: Square or tetrag edge lay-in, for 15/16 inch wide grid.

5. Finish: Factory applied washable vinyl latex paint.
6. Color: White.
7. Light reflectance: ASTM E1477, LR .90.
8. Flame spread: ASTM E1264, 0-25.
9. Noise-reduction coefficient (NRC): ASTM E1264, 0.95.
10. Ceiling attenuation class (CAC Range): ASTM E1264, 35 minimum.
11. Locations: Administrative, Academic, Cafeteria
12. Acceptable product and manufacturer: Equivalent to OPTIMA by Armstrong.

B. Type ACT-B:

1. Description: Mineral fiber with fine fissure texture.
2. Classification, per ASTM E1264: Type/Form IV, Pattern C.
3. Size: 24 inch x 24 inch x 5/8 inch thick (610 mm x 1220 mm x 16 mm thick).
4. Edge profile: Square lay-in.
5. Finish: Factory applied washable white paint.
6. Color: White.
7. Light reflectance: ASTM E1477, LR .80.
8. Flame spread: ASTM E1264, 0-25.
9. Noise-reduction coefficient (NRC), ASTM E1264: 0.70
10. Ceiling attenuation class (CAC Range): ASTM E1264, 35 minimum.
11. Locations: Back of House.
12. Acceptable product and manufacturer: Equivalent to Fissured No. 536 by Armstrong.

C. Type ACT-K:

1. Description: Mineral fiber composite.
2. Classification, per ASTM E1264: Type IV, Form 2, Pattern E.
3. Size: 24 inch x 24 inch x 3/4 inch thick (610 mm x 610 mm x 19 mm thick).
4. Edge profile: Square edge lay in, for 15/16 inch wide grid.
5. Finish: Factory applied washable vinyl latex paint.
6. Color: White.
7. Light reflectance: ASTM E1477, LR .80.
8. Flame spread: ASTM E1264, 0 25.
9. Noise reduction coefficient (NRC): ASTM E1264, 0.70.
10. Ceiling attenuation class (CAC Range): ASTM E1264, 35 minimum.
11. Locations: Kitchen, Health Room, Pools
12. Acceptable product and manufacturer: Equivalent to CALLA or ULTIMA by Armstrong.

D. Type ACT-L:

1. Description: Fiberglass.
2. Classification, per ASTM E1264: Type IV, Form 2, Pattern E.
3. Size: Large format tile, size as indicated on Drawings.
4. Edge profile: Square or tegular edge lay in, for 15/16 inch wide grid.
5. Finish: Factory applied washable vinyl latex paint.
6. Color: White.
7. Light reflectance: ASTM E1477, LR .90.
8. Flame spread: ASTM E1264, 0 25.
9. Noise reduction coefficient (NRC): ASTM E1264, 0.95.
10. Ceiling attenuation class (CAC Range): ASTM E1264, 35 minimum.
11. Locations: Large rooms that require large tile or where visual impact is desired.

12. Acceptable product and manufacturer: Equivalent to OPTIMA by Armstrong.

2.3 SUSPENSION SYSTEMS

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C635.
- B. Attachment Devices: Size for five times the design load indicated in ASTM C635, Table 1, "Direct Hung," unless otherwise indicated.
 - 1. Power-actuated fasteners in concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E1190, conducted by a qualified testing and inspecting agency.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-coated, carbon-steel wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Nickel-copper-alloy wire (at swimming pool ceilings): ASTM B 164, nickel-copper-alloy UNS No. N04400.
 - 3. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106 inch (2.69 mm) diameter wire.
- D. Impact Clips at Gymnasium Ceilings: Where indicated, provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.
- E. Exposed Suspension System:
 - 1. Description:
 - a. ASTM C635, intermediate duty, exposed T with 15/16 inch (24 mm) wide face; interlocking components.
 - b. End condition of cross runners: Butt-edge.
 - 2. Materials: Cold-rolled steel with hot-dipped galvanized coating.
 - 3. Finish and color: Manufacturer's standard factory finish; white.
 - 4. Provide corrosion resistant grid at Pools.
 - 5. Acceptable products and manufacturers:
 - a. Prelude XL by Armstrong.
 - b. Chicago Metallic 200 Snap Grid 15/16" Exposed by ROCKFON.
 - c. USG Donn Brand DX/DXL 15/16" Acoustical Suspension System by USG Interiors.

2.4 ACCESSORIES

- A. Trim:
 - 1. Manufacturer's standard trim and edge moldings to suit suspension system requirements; same finish as suspension system.
 - 2. Provide edge moldings to fit penetrations exactly, including circular penetrations.
 - 3. Expansion joints: Provide framing and closure trim.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction and conditions under which Work is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install materials and systems in accordance with final Shop Drawings, manufacturer's instructions and requirements of ASTM C636, and as required to comply with seismic requirements.
- B. Install system to support imposed loads with maximum deflection of 1/360 of span.
- C. Tolerances:
 - 1. Level completed assembly to tolerance of 1/8 inch in 10 feet (3 mm in 3000 mm).
 - 2. Variation from plumb of grid members caused by eccentric loads: 2 degrees maximum.
- D. Hangers:
 - 1. Coordinate location of hangers with other Work.
 - 2. Space not more than 6 inches (150 mm) from each end and not more than 4 feet (1200 mm) on center between ends of members to be supported.
 - 3. Provide additional hangers for support of fixtures, equipment, and other items supported by ceiling suspension system, in quantity as required to prevent eccentric deflection or rotating of supporting runners.
 - a. At each corner of ceiling suspension system around fixtures, equipment, and other items, provide at least 1 hanger for support of ceiling suspension system.
 - b. Hangers for fixtures, equipment, and other items shall be provided by trade that provides the fixture, equipment, or item.
 - 4. Hang system independent of walls, columns, ducts, pipes and conduit.
 - 5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 6. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
 - 7. Where spacing of structural members, width of ducts, or other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 8. Where ceilings are below steel deck without concrete fill, attach hangers directly to structural elements only; do not attach to steel deck. Loop hangers and wire-tie directly or provide anchors or inserts.
- E. Center suspension system on room axis leaving equal border units, unless otherwise indicated on Drawings. Adjust so that perimeter units are not less than one-half of panel width.

- F. Edge Molding Installation:
 - 1. Install edge moldings where ceilings abut walls, partitions or other penetration elements.
 - 2. Miter cut inside and outside corners to provide flush, tight, hairline joints.
 - 3. Secure moldings to building construction at 16 inches (400 mm) on center, and maximum 3 inches (75 mm) from each end of each molding.
 - 4. Do not use exposed fasteners, including pop rivets, on moldings and trim.

- G. Panel Installation:
 - 1. Install panels in place, level, in uniform plane and free from twist, warp and dents.
 - 2. Rest panel edges resting on flanges of tees.
 - 3. Support perimeters on wall moldings.
 - 4. Neatly scribe and cut panels for accurate fit at borders, interruptions, and penetrations by other Work.
 - 5. Lay directional patterned units one way with pattern parallel to longest room axis, unless otherwise indicated.

3.3 CLEANING AND PROTECTION

- A. Clean and repair exposed surfaces that have been stained, marred, or otherwise damaged.
- B. Remove and replace Work which cannot be successfully cleaned or repaired.
- C. Protect Work so that it will be without damage at time of acceptance.

END OF SECTION

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WOOD ATHLETIC FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
1. Wood athletic flooring system consisting of maple strip flooring on floating plywood subfloor.
 2. Supports, anchorage and attachment systems.
 3. Finishing.
 4. Playing lines.
 5. Accessories.
 6. Installation of gym flooring inserts.

1.2 ACTION SUBMITTALS

- A. Product Data:
1. Submit manufacturer's specifications and installation instructions for each component of athletic flooring system.
 2. Include data on handling, storage and protection for each component.
- B. Shop Drawings:
1. Submit detailed project-specific Shop Drawings, drawn to scale, for layout and installation of athletic flooring system, including locations of gym flooring inserts.
 2. Include large scale details of jointing provisions, conditions at perimeters and attachment, and expansion provisions and trim details.
 3. Include details of associated Work required in conjunction with flooring system, including gym flooring inserts.
 4. Include layout, colors, dimensions and details for playing lines.
 5. Details of concrete slab depressions.
 6. Locations of different grades of wood flooring.
- C. Samples:
1. Flooring surfaces:
 - a. 24 inch (600 mm) square x full depth finished sample for system, complete with accessories suitably mounted on plywood backing.
 - b. Leave edges unfinished so that floor assemblies can be viewed.
 2. Playing lines: Submit 12 inch (300 mm) wide x 24 inch (600 mm) long flooring samples finished with playing lines for each required color of lines.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit installer qualifications verifying years of experience and approval of manufacturer; include list of completed projects have similar scope of work identified by name, location, date, reference names and phone numbers.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data:

1. Submit manufacturer's written maintenance instructions which describe materials, devices and procedures to be followed in cleaning and maintaining flooring.
2. Include manufacturer's brochures describing actual materials, finishes and accessories used in Work.
3. Include copy of maintenance instructions in Project maintenance and information manual.
4. Submit manufacturer/installer warranty.
5. Submit pre-installation test/inspection reports documenting substrate testing for moisture content.

1.5 SYSTEM REQUIREMENTS

A. Design Requirements:

1. Drawings indicate design concept, overall sizes and layout of flooring and flooring assemblies and together with these specifications impose requirements applicable to Work.
2. Contractor is responsible for correct thickness of flooring materials, supports, assemblies and attachment details for conditions of support and use to fulfill specified performance requirements.

B. Playing Lines: Comply with Olympic and Pan American requirements for court layouts, playing lines and insert locations for the following sports: badminton, basketball and team volleyball.

C. Interface With Other Systems:

1. Coordinate Work with that of other trades affected by this installation.
2. Provide anchors and supports in timely manner so as not to delay job progress.
3. Coordinate with electrical and other fixtures or materials mounted within, or adjacent to flooring or requiring access.
4. Provide cut-outs as required using manufacturer's templates and field measurements to verify actual installed locations and dimensions.
5. Verify dimensions before proceeding and obtain measurements at job site for Work required to be accurately fitted to other construction. Be responsible for accuracy of such measurements and precise fitting and assembly of finished products.

1.6 QUALITY ASSURANCE

A. Single Source Responsibility: System components and accessories shall be as furnished or approved by flooring manufacturer.

B. Reference Standards:

1. Comply with applicable provisions of Maple Flooring Manufacturers Association (MFMA) for species, grade, cut and installation guidelines.
2. Deliver wood to site stamped with MFMA mark.

C. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project, approved by wood flooring manufacturer.

- D. Provide manufacturer/installer warranty.

1.7 SAMPLE INSTALLATION

- A. Prior to commencing Work and preceding pre-installation conference, provide sample installation of athletic flooring system.
- B. Size: Ten feet (3000 mm) square, in location as determined by Architect.
- C. Materials: Complete installation with materials in flooring system.
- D. Architect's Review:
 - 1. Architect will review sample installation for visual acceptance of materials and workmanship.
 - 2. Obtain Architect's approval of sample installations before proceeding with subsequent Work.
- E. Maintain approved sample installation during construction as standard for subsequent Work.
- F. Properly finished and maintained sample installation may be incorporated into completed Work.

1.8 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at Site and review installation procedures and coordination with other Work.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect products in accordance with manufacturer's instructions.
- B. Delivery:
 - 1. Deliver flooring in unopened bundles and store in dry place.
 - 2. Do not deliver material to building until wet Work is complete.
 - 3. Do not deliver flooring on a rainy day.
- C. Storage:
 - 1. Do not store flooring vertically.
 - 2. Store in protected, cool dry location, out of sunlight in manufacturer's unopened protective shipping packaging.
- D. Acclimate materials to building conditions for duration and using methods recommended by flooring manufacturer.

1.10 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Comply with manufacturer's instructions.
 - 2. Maintain relative humidity conditions within building that approximate relative humidity conditions which will prevail when building is occupied, for one week preceding flooring system, during installation, and for at least 24 hours after installation.

3. Maintain ambient air temperature of between 65 deg F (18 deg C) and 80 deg F (27 deg C) for one week preceding flooring system installation, during installation, and for at least 24 hours after installation and finishing.
- B. Substrate Requirements: Do not install flooring system until concrete substrate has cured at least 60 days, and tests an average moisture content of 8%.

1.11 SEQUENCING AND SCHEDULING

- A. Prior to commencement of installation, building must be enclosed and dry, with permanent heating and air conditioning systems, and lighting, installed and operating.
- B. Do not install flooring system until completion of all of following:
1. Masonry, plastering, tile and other wet Work.
 2. Finishing operations, including painting.
 3. Overhead Work, including mechanical, electrical and athletic equipment.
- C. Coordinate layout and installation of slab depressions to accommodate layout and height of wood athletic flooring assembly.
- D. Coordinate layout and installation of flooring with floor inserts for equipment as applicable.
- E. Coordinate installation of wood athletic flooring to ensure proper sequencing of the work to allow concrete structural slab to properly dry out so that moisture and vapor are not trapped in concrete slab by subsequent installation of moisture vapor emission control system, wood athletic flooring vapor retarder, and high-performance coatings.

1.12 WARRANTY

- A. Provide manufacturer's standard five year warranty for wood flooring.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Manufacturers:
1. Robbins Sports Surfaces, Inc.
 2. Connor Sports Flooring.
 3. Advantage Sport.
 4. Equivalent products by other manufacturers will be considered.

2.2 MATERIALS

- A. Plywood Subfloor:
1. Components:
 - a. Double layer plywood subfloor.
 - b. Cushioning pads.
 - c. Vapor barrier.
 2. Plywood:

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- a. Two layers, each 1/2 inch (13 mm) thick, Grade C/D Exterior Grade fir or Southern pine plywood.
 - b. Fabricate isolator profiles (impact isolator slots) as recommended by flooring manufacturer for load-distribution subfloor; equivalent to TBD Product and Manufacturer.
 3. Cushioning pads:
 - a. Flooring manufacturer's standard resilient pads; 3/4 inch (19 mm) high.
 - b. Acceptable product: Equivalent to Robbins EPDM Bio-Pad by Robbins.
 4. Vapor barrier: 6 mil (0.16 mm) polyethylene sheet.
 5. Accessories: Provide staples, fasteners, adhesives and other accessories as required for complete installation.
- B. Finish Flooring:
1. Wood strip flooring of Northern Hard maple, Second and Better Grade (MFMA), edge-grained .
 2. Dimensions: 33/32 inches (27 mm) thick x 2-1/4 inches (58 mm) wide x standard random lengths complying with MFMA First or Second Grade rules.
 3. Matching: Reverse profiled tongue-and-grooved and end-matched.
 4. Treat flooring with specified wood preservative.

2.3 FINISHES

- A. Preservative: Manufacturer's standard.
- B. Wood Flooring Finish: Wood flooring manufacturer's recommended polyurethane sealer and finish.
- C. Playing Lines:
1. Description: Flooring system manufacturer's playing line paint, compatible with flooring finish.
 2. Colors: To be selected by Architect from manufacturer's full range of standard color selections. Up to 4 colors may be required.

2.4 ACCESSORIES

- A. Perimeter Base:
1. Description: Flooring system manufacturer's standard vented rubber base, for use where flooring abuts wall or vertical obstruction.
 2. Size: 3 inches (76 mm) wide x 4 inches (102 mm) high with matching premolded outside corners.
 3. Color: Black.
- B. Perimeter Threshold:
1. Description: Rolled or extruded aluminum threshold/cover plate, for use where flooring abuts doors and other open areas.
 2. Size:
 - a. 4 inches (102 mm) wide x minimum 1/8 inch (3 mm) thick x maximum available lengths to suit applications.
 - b. Fabricate units with beveled or radiused edges.

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3. Finish: Smooth finish, with clear PVC coating for rolled units or clear anodized finish for extruded units.
 4. Provide with flathead screws and expansion shields suitable for concrete substrates.
 5. Acceptable product and manufacturer: 818 (Aluminum), by National Guard Products, Inc., Memphis, TN; or equivalent by Pemko, Reese or Zero.
- C. Inserts: Coordinate with DCPS for types and quantities of gym flooring inserts required for athletic equipment support, primarily volleyball nets.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Test for dryness of concrete substrate by methods recommended by flooring manufacturer.
- B. Grind high spots and fill low spots with leveling compound, as approved by flooring manufacturer, so that substrate is level to within tolerance of $\pm 1/4$ inch in 10 foot (6 mm in 3000 mm).
- C. Penetrations:
1. Install inserts for athletic equipment in accordance with insert manufacturer's directions, in locations directed by Owner and in conformance with Olympic and Pan American requirements.
 2. Verify that other sleeves and inserts for items penetrating flooring, such as electrical equipment, are installed and completed before starting athletic flooring system installation.
- D. Broom clean substrate.

3.3 INSTALLATION

- A. Comply with final Shop Drawings and flooring manufacturer's instructions and recommendations.
1. Provide 2 inch (50 mm) expansion space within flooring system and at walls and other obstructions and terminations of flooring.
 2. Sequence and install subfloor, finish flooring, perimeter bases and playing lines in accordance with manufacturer's instructions.
- B. Subfloor:
1. Install vapor barrier sheeting over concrete substrate; overlap edges 6 inches minimum.
 2. Fasten cushioning pads to lower layer of plywood subfloor, on side opposite isolator profiles. Space pads approximately 12 inches (300 mm) on center in both directions.

3. Install lower layer of plywood subfloor with isolator profiles facing upward. Stagger all joints; allow minimum 1/4 inch (6 mm) between plywood panel sides and ends, and minimum 2 inch expansion void at walls and vertical obstructions.
4. Install upper layer of plywood subfloor diagonally to lower subfloor panels, with isolator profiles facing downward.
 - a. Stagger all joints both within upper layer and with joints in lower layer, so that no joints coincide between layers; space adjoining sheets 1/4 inch (6 mm) apart.
 - b. Attach upper layer using both adhesive and mechanical fasteners as recommended by flooring manufacturer.

C. Finish Flooring:

1. Machine nail finish flooring with end joints properly driven up.
2. Size joints between flooring strips to allow for intermediate expansion, in accordance with anticipated ambient humidity conditions.
3. Stagger joints in flooring with joints in subfloor.

3.4 FINISHING

A. Sanding:

1. Sand wood flooring surfaces in accordance with finish manufacturer's instructions.
2. Rough sanding: Machine sand flooring using rough grade sandpaper to remove offsets and non-level conditions, ridges, cups and sanding machine marks which would be visually noticeable after finishing.
3. Second sanding: Sand again using medium grade sandpaper.
4. After second sanding, if any holes are noticeable, spot fill using broad knife and repair mixture.
5. Final sanding: Edge and sand floors using fine grade sandpaper. Hand sand edges to blend.

B. Vacuum clean and immediately apply finish.

C. Cover sanded floor with building paper to provide access for application of first finish coats.

D. Finishing:

1. Inspect entire area of floor to insure that surface is acceptable for finishing, completely free from sanding dust and perfectly clean.
2. System:
 - a. Provide 4-coat finish system, consisting of 2 coats of sealer and 2 coats of finish.
 - b. Apply sealer and finish coats according to manufacturer's instructions, to provide smooth surface free of overlaps and streaks.
 - c. Screen back or steel wool, and vacuum or tack clean flooring between each coat, after previous coat has dried.
3. Playing lines:
 - a. Apply playing lines after seal coats and before finish coats.
 - b. Lay out playing lines as indicated on Drawings, and to comply with referenced standards and manufacturer's recommendations.
 - c. Paint playing lines on wood flooring. Provide one or two coats as required for full, opaque coverage. Do not overlay game lines where they cross; stop secondary lines at edges of primary lines.
4. Apply finish coats after playing lines.

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5. Allow floor to dry thoroughly. Keep closed to all traffic for at least 72 hours and to heavy traffic for at least one week, after applying second coat of finish.
6. Apply decals as required by Owner.

3.5 BASES

- A. Install perimeter base and thresholds only after playing lines are complete.
- B. Perimeter Base: Fasten to walls and vertical obstructions using flooring manufacturer's recommended adhesive; do not fasten to wood flooring.
- C. Thresholds:
 1. Drill thresholds for countersunk flathead screws.
 2. Fasten only to concrete floor adjoining wood flooring system; do not fasten to wood flooring.

3.6 PROTECTION

- A. Protect completed wood flooring during remainder of construction period with heavy Kraft paper to prevent damage or deterioration.
- B. Clean flooring just prior to final inspections. Use materials and procedures recommended by flooring manufacturer.

END OF SECTION

SECTION 09 6500

RESILIENT FLOORING AND BASE

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Luxury vinyl tile.
 - 2. Studded rubber tile.
 - 3. Solid vinyl sheet.
 - 4. Resilient base.
 - 5. Rubber stair risers, stringers, landing tile, and treads.
 - 6. Reducer strips.
 - 7. Setting materials and accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for each material.
- B. Shop Drawings: If resilient flooring incorporates a graphic design, submit Shop Drawings, drawn to scale, of areas to receive resilient flooring, showing locations and colors of heat-welded seams.
 - 1. Submit templates for cut-in designs and patterns in flooring.
- C. Samples:
 - 1. Manufacturer's samples: Submit manufacturer's full range of standard pattern and color samples for each product for Architect's selection.

1.3 INFORMATIONAL SUBMITTALS

- A. Certificates: Submit manufacturer's certification attesting that resilient materials have been tested by an independent laboratory and comply with required fire resistance ratings.
- B. Qualification Data:
 - 1. Submit installer qualifications verifying years of experience and manufacturer's acceptance; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.
- C. Submit pre-installation test/inspection reports documenting substrate testing for moisture content adhesion and alkalinity.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
 - 1. Submit manufacturer's written maintenance instructions for resilient materials.

2. Include copy of submittal in Project information manual.

1.5 SYSTEM REQUIREMENTS

- A. Fire Resistance Ratings:
 1. Provide resilient materials which comply with following requirements determined by independent testing laboratory acceptable to authorities having jurisdiction.
 2. Critical radiant flux: 0.45 watts/cm² or more when tested in accordance with ASTM E648.
 3. Flame spread: 75 or less when tested in accordance with ASTM E84.
 4. Smoke obscuration: 450 or less when tested in accordance with ASTM E662.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications:
 1. Not less than 5 years documented, successful experience with work comparable to Work of this Project, approved by manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to job site in manufacturer's unopened containers clearly marked with manufacturer's name, brand, size, thickness, grade, color and design.
- B. Store materials in accordance with manufacturer's instructions.
 1. Store resilient sheet flooring 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. Store rolls upright.

1.8 PROJECT CONDITIONS

- A. Environmental Requirements:
 1. Maintain minimum temperature of 65 deg F (18 deg C) in spaces to receive materials for at least 48 hours prior to installation, during installation and for not less than 48 hours after installation.
 2. Store materials in spaces where they will be installed for at least 48 hours before beginning installation.
 3. After installation, maintain minimum temperature of 55 deg F (13 deg C) in areas where Work is completed.

1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at site to review materials, installation procedures and coordination with other Work.

1.10 SEQUENCING AND SCHEDULING

- A. Install resilient materials after other finishing operations, including painting, have been completed.

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- B. Do not install resilient materials over concrete slabs until they are cured and are sufficiently dry to achieve bond with adhesive as determined by resilient material manufacturer's recommended bond and moisture tests.

1.11 WARRANTY

- A. Provide Manufacturer/Installer warranty. Manufacturer's standard form in which manufacturer agrees to repair or replace resilient flooring that fails in materials or workmanship within specified warranty period.
 - a. Warranty Period: 10 years from date of Substantial Completion.

1.12 EXTRA STOCK

- A. Deliver one unopened box of resilient materials for each 100 boxes (or fraction thereof) installed of each type, pattern and color.
- B. Store at job site where directed.
- C. Ensure boxes are identified by manufacturer, pattern and color.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Manufacturers – Luxury Vinyl Tile:
 - 1. Armstrong.
 - 2. Karndean Designflooring.
 - 3. Porcelanosa.
- B. Acceptable Products and Manufacturers - Solid Vinyl Sheet:
 - 1. Medintech by Armstrong Commercial Flooring.
 - 2. Mipolam PVC Series by Mipolam Division, Dynamit Noble of America, Inc. Gerflor
 - 3. Optima and Mutiflor by Tarkett Inc.
- C. Acceptable Manufacturers - Resilient Base:
 - 1. BurkeMercer Flooring Products.
 - 2. Flexco.
 - 3. Johnsonite.
 - 4. Roppe Corp.
- D. Acceptable Products and Manufacturers - Reducer Strips:
 - 1. BurkeMercer
 - 2. Flexco.
 - 3. Johnsonite.
 - 4. Roppe Corp.
- E. Acceptable Manufacturers - Rubber Stair Components:
 - 1. BurkeMercer Flooring Products.
 - 2. Flexco.

3. Johnsonite.
4. Roppe Corp.

2.2 FLOORING

- A. Luxury Vinyl Tile:
1. Size: 12 inch x 12 inch x 1/8 thick (305 mm x 305 mm x 3 mm thick) unless otherwise indicated.
 2. Colors: To be selected by Architect from manufacturer's full range of standard colors.
- B. Rubber Tile:
1. ASTM F1344, Class I-A.
 2. Size: As indicated.
 3. Surface pattern: As scheduled.
 4. Colors: To be selected by Architect from manufacturer's full range of standard colors.
 5. Acceptable manufacturers:
 - a. Nora Flooring
 - b. Mondo Flooring.
 - c. Burke Flooring.
- C. Solid Vinyl Sheet:
1. Description: Non-layered, non-backed, solid vinyl sheet with homogeneous composition and pattern from face to back.
 2. Form: Minimum 6 foot (1829 mm) wide rolls, lengths as required to accommodate required installation with minimum seaming.
 3. Thickness: 0.080 inch (2 mm) minimum overall thickness.
 4. Static load limit: 125 psi (862 kPa) minimum.
 5. Colors: Selected by Architect from manufacturer's full range of standard colors.
- D. Resilient Base:
1. Description: ASTM F1861.
 - a. Type: TP (rubber, thermoplastic)
 - b. Group: 1 (solid, homogeneous).
 - c. Style: Style A (straight, toe-less) for carpet areas; Style B (cove) for other areas.
 2. Height: 4 inches unless otherwise scheduled.
 3. Thickness: 0.125 inch (3 mm).
 4. Furnish base in continuous coils. Individual lengths are not acceptable.
 5. Colors: As scheduled.
- E. Rubber Stair Components:
1. Provide stair components from a single manufacturer.
 2. Treads:
 - a. Description: ASTM F2169.
 - 1) Material; Type: TS (rubber, vulcanized thermoset).
 - 2) Surface design: Class 2, Pattern: Raised-disc design.
 - 3) Manufacturing method: Group 2, tread with contrasting color for the visually impaired.
 - b. Nosing style: Square, adjustable to cover angles between 60 and 90 degrees. Square.
 - c. Thickness: 1/4 inch (6 mm) and tapered to back edge.

- d. Size: Lengths and depths to fit each stair tread in one piece.
 - e. Colors: As scheduled.
 - 3. Risers:
 - a. Style: Full width and height of riser , toeless, height and length to cover risers.
 - b. Thickness: 1/8 inch (3 mm).
 - c. Surface pattern: Smooth.
 - d. Colors: Match treads.
 - 4. Stringers:
 - a. Of same thickness as risers, height and length after cutting to fit risers and treads and to cover stair stringers.
 - b. Colors: Match treads.
 - 5. Landing tile:
 - a. Size: Manufacturer's standard.
 - b. Surface pattern: Raised circular or radial design, high profile.
 - c. Thickness: 1/8 inch (3 mm), minimum.
 - d. Colors: Match treads.
- F. Reducer Strips:
- 1. Description: 1 inch (25 mm) wide (minimum) x thickness as required to abut flush to resilient tile, homogeneous vinyl or rubber composition, tapered or bullnose edge.
 - 2. Colors: To be selected by Architect from manufacturer's full range of standard colors.

2.3 ACCESSORIES

- A. Leveling and Patching Compounds: Latex-modified, portland cement-based or blended hydraulic-cement-based formulation provided or approved by resilient flooring manufacturer for applications indicated.
- B. Primers and Adhesives:
 - 1. Water-resistant products as recommended by manufacturer to suit resilient flooring and substrate conditions indicated.
 - 2. VOC limits: Provide cements with VOC content not more than 50g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).
- C. Detergents and Polish: Types recommended by flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Prepare substrates according to resilient flooring manufacturer's written instructions to ensure adhesion of resilient flooring.
- B. Concrete Substrates: Prepare according to ASTM F710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. 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.
 3. Alkalinity and adhesion testing: Perform tests recommended by resilient flooring manufacturer. Proceed with installation only after substrates pass testing.
 4. Moisture testing: Perform tests recommended by resilient flooring manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test according to ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate, within tolerance of 1/4 inch in 10'-0" (6 mm in 3000 mm).
- D. Do not install resilient flooring until materials are same temperature as space where they are to be installed.
 1. Move resilient flooring products and installation materials into spaces where they will be installed at least 72 hours in advance of installation.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient flooring products.

3.3 INSTALLATION

- A. Install resilient materials in accordance with manufacturer's instructions.
 1. Apply adhesive to provide continuous bond between resilient material and substrate. Do not allow adhesive to bleed through joints.
 2. Cut units to length; provide straight and tight butt joints.
 3. Fit materials tightly so each unit is in contact with surrounding units and joints in proper alignment.
 4. Scribe, cut, and fit exposed edges of units which adjoin other Work and neatly abut with tight joint.
- B. Resilient and Rubber Tile::
 1. Lay tile symmetrically about center line of room or space in a square pattern, unless otherwise indicated. Adjust so that perimeter units are not less than one-half of tile width.
 2. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged.
 3. Lay tile units with bottom surface securely bonded to substrate and top surface left smooth, clean and free of imperfections.
 4. Lay tile with graining running in one direction as directed by Architect.
 5. Align joints as indicated.
 6. Install resilient tile in recessed covers, such as access doors and cleanouts.

7. Extend resilient tile into closets and offsets, and under movable equipment, in rooms and spaces indicated to receive resilient tile, including recessed covers within those spaces. Extend unexposed edges of flooring under set-on bases and similar trim Work.
 8. Where resilient tile flooring meets thin-set ceramic tile or other similar hard surface flooring of higher elevation, install underlayment compound such that surfaces of both flooring materials are at same elevation.
- C. Resilient Sheet Flooring Installation:
1. Install resilient sheet in accordance with manufacturer's instructions.
 2. Lay sheet flooring to provide as few seams as possible, matching edges for color shading and pattern at seams.
 3. Adhesives:
 - a. Adhere using conventional full spread adhesive method.
 - b. Use conventional perimeter bonding adhesive procedures where recommended by flooring manufacturer.
 - c. Tightly cement flooring to subfloor without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks.
 - d. Hand roll flooring at perimeter and seams to assure adhesion.
 - e. Roll in accordance with flooring manufacturer's directions.
 4. Prepare seams in accordance with manufacturer's instructions for most inconspicuous appearance.
 5. Scribe, cut and fit exposed edges of flooring which adjoins other Work and neatly abut with tight joint.
 6. Extend flooring into closets and offsets and under movable equipment of rooms and spaces shown or scheduled to receive resilient flooring, including recessed covers within those spaces. Extend unexposed edges of flooring under set-on bases and similar trim Work.
- D. Resilient Base Installation:
1. Install in accordance with manufacturer's instructions.
 - a. Do not stretch base during installation.
 - b. Roll base firmly in place immediately after applying adhesive.
 2. At cove base corners, use corner grooving tool with sharp blades to cut groove in back of resilient base. Bending of cove base around corners without grooving back is not acceptable.
 3. Align tops of adjacent sections.
 4. Do not allow adhesive to ooze onto wall above base.
- E. Stair Components:
1. Landing tile:
 - a. Lay landing tiles symmetrically about center line of space in square pattern.
 - b. Align joints in both directions.
 - c. Terminate landing tile at centerline of door openings where adjacent floor finish is dissimilar.
 - d. Finish exposed edge with matching reducer strip.
 2. Stair treads and risers:
 - a. Provide continuous lengths and widths; no joints will be permitted.
 - b. Set nosing firmly against step; fill gap between stair riser and nosing of tread with epoxy nosing compound.

3. Stair stringers: Use longest lengths possible; pieces less than 24 inches (600 mm) long will not be permitted.

F. Reducer Strip:

1. Provide at unprotected or exposed edges of tile, unless otherwise indicated.
2. Center strip under door where flooring terminates at door openings.
3. Install in longest lengths practicable.
4. Fit joints tightly, scribe to adjacent surfaces.

3.4 CLEANING

- A. Immediately remove excess adhesive from surfaces.
- B. Sweep or vacuum thoroughly.
- C. Do not wash or scrub flooring for at least five days after installation, to prevent excess moisture from interfering with adhesive bond and/or seam treatments.
- D. After adhesive and/or seams have set up, clean flooring by damp-mopping with very dilute neutral detergent solution in accordance with flooring manufacturer's instructions.
- E. Near completion of Project and just prior to final acceptance, clean flooring once again.
 1. Follow flooring and polish manufacturers' instructions.

3.5 PROTECTION

- A. Prohibit traffic on floor finish for minimum of 48 hours after installation.
- B. Protect Work from damage during construction period so that it will be without any indication of use or damage at time of acceptance.

END OF SECTION

SECTION 09 6723

RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Epoxy resin flooring system.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 03 3000 CAST-IN-PLACE CONCRETE for concrete slab curing and finishing requirements.
- B. See Division 22 for pipe penetrations and floor drains.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for resinous flooring system.
- B. Samples:
 - 1. Submit manufacturer's full range of standard color samples of finish coating for selection by Architect.
 - 2. Following selection, submit 12 inch (300 mm) square samples of complete system, prepared on plywood or hardboard, for each color selected.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit installer qualifications verifying years of experience and current approval of manufacturer; include list of completed projects have similar scope of work identified by name, location, date, reference names and phone numbers.
- B. Certificates: Submit joint certification signed by resinous flooring manufacturer and concrete curing agent manufacturer stating that concrete curing agent is compatible with flooring system and that it will not interfere with flooring system adhesion.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
 - 1. Submit cleaning and maintenance data for materials provided.
 - 2. Include copy of submittal in Project information manual.
- B. Provide Manufacturer/Installer warranty.
- C. Submit pre-installation test/inspection reports documenting substrate testing for moisture content adhesion and alkalinity.

1.6 SYSTEM REQUIREMENTS

- A. Physical Performance Requirements: Final installed flooring system, including primer and sealers, shall comply with ASTM C722, Type A standard.
- B. Flooring system components shall be water-based and contain no hydrocarbon solvents.
 - 1. Flash point (unmixed material): Not combustible.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project, approved by resinous flooring manufacturer. Such approval shall be current as of the date of bid of this Project.
- B. Obtain resinous flooring materials, including fillers, primers, reinforcing membrane, body coats, and top coats from a single manufacturer and use only materials approved by the resinous flooring manufacturer for the required applications.

1.8 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at Site and review installation procedures and coordination with other Work.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect products in accordance with manufacturer's instructions.
- B. Store in protected, cool dry location, out of sunlight in manufacturer's unopened protective shipping packaging.
- C. Maintain temperatures of between 70 deg F (21 deg C) and 80 deg F (27 deg C).

1.10 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Comply with manufacturer's instructions.
 - 2. Ambient air temperature shall be between 70 deg F (21 deg C) and 80 deg F (27 deg C) during and for at least 24 hours after flooring installation.
 - 3. Do not use water or steam in vicinity of resinous floor application.
- B. Close spaces to traffic during resinous flooring application, and for not less than 24 hours after application unless manufacturer recommends a longer period.

1.11 WARRANTY

- A. Provide manufacturer's standard form in which manufacturer agrees to repair or replace resilient flooring that fails in materials or workmanship within specified warranty period.
- B. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Manufacturers:
1. Stonhard Inc.
 2. Crossfield Products Corp.
 3. Dudick, Inc.
 4. Equivalent products by other manufacturers will be considered.
 - 5.

2.2 MATERIALS

- A. Resinous Flooring:
1. Description: Resinous flooring system consisting of primer, trowel-applied body coats including epoxy resin, hardener, aggregates and colorants, and sealing or finish coats.
 2. Total system thickness: 1/4 inch (6 mm).
 3. Physical properties of cured flooring system:
 - a. Compressive strength: Minimum 10,000 psi (169 Mpa) at 7 days, when tested in accordance with ASTM C579.
 - b. Tensile strength: Minimum 1750 psi (12 MPa), when tested in accordance with ASTM C307.
 - c. Flexural strength: Minimum 4000 psi (27.6 MPa), when tested in accordance with ASTM C580.
 - d. Hardness: 85 - 90 Shore D, when tested in accordance with ASTM D2240.
 - e. Bond strength: More than 400 psi (2.8MPa), 100% concrete failure, when tested in accordance with ASTM D4541.
 - f. Water absorption: Maximum 0.2%, when tested in accordance with ASTM C413.
 - g. Flammability: Self-extinguishing, when tested in accordance with ASTM D635.
 4. Chemical resistance: Cured flooring system shall show no effect from occasional spills of the following reagents.
 - a. Organic solvents such as acetone, methanol, and alcohols.
 - b. Acids: Hydrochloric, nitric, sulfuric.
 5. Color and pattern: As selected by Architect from manufacturer's full range of colors and patterns.
 6. Wear surface: Textured for slip-resistance.
- B. Components:
1. Primer: Resinous flooring manufacturer's recommended epoxy primer, for concrete and concrete masonry.
 2. Flexible membrane: Resinous flooring manufacturer's flexible epoxy membrane, for use as crack suppression and embedding reinforcing membrane.
 3. Reinforcing membrane: Fiberglass scrim and other materials recommended by resinous flooring manufacturer for crack suppression and treatment of floor/base intersections.
 4. Aggregates: Manufacturer's standard graded aggregate.
 5. Sealing and finishing coats: Epoxy, 100% solids.
- C. Patching and Fill Material: Resinous mortar underlayment product acceptable to resinous flooring manufacturer for the application.

- D. Joint Sealants: Flexible, non-rigid sealant of type acceptable to resinous flooring manufacturer for type of service and joint conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.
- B. Verify the following substrate conditions before application of primer and waterproofing:
 - 1. That substrate condition is satisfactory and in accordance with manufacturer's instructions.
 - 2. That concrete surfaces are smooth, free of voids, spalled areas, loose aggregate, and sharp protrusions, and with no form match lines or coarse aggregate visible.
 - 3. That concrete is fully cured (minimum 28 days) and dry.
 - 4. That detrimental membrane-curing compound containing oil, wax or pigment has not been used on concrete.

3.2 PREPARATION

- A. Prepare and clean substrate according to resinous flooring manufacturer's written instructions. Provide clean, dry, and chemically neutral substrate for resinous flooring application.
- B. Protect adjacent surfaces not designated to receive resinous flooring.
- C. Substrate Preparation:
 - 1. Vacuum blast or shotblast surfaces to remove laitance and contaminants.
 - 2. Fill holes and depressions in substrate using patching and fill material.
 - 3. Treat cold joints, control joints, and non-moving substrate cracks to prevent joints and cracks from telegraphing through resinous flooring.
 - 4. Verify that elements penetrating through slab are secured against movement.
- D. Verify that moisture content of slab is within range acceptable to flooring manufacturer, using a calcium chloride test kit in accordance with ASTM F1869.
 - 1. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3 lbs of water/1000 sq. ft. (0.015 kg/square meter) in 24 hours.
 - 2. Perform plastic sheet test in accordance with ASTM D4263. Proceed with application only after testing indicates absence of moisture in substrates.
 - 3. Perform additional moisture tests as may be recommended by manufacturer. Proceed with application only after substrates pass testing.
- E. Verify that concrete substrates have neutral pH and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

3.3 APPLICATION

- A. Apply and cure resinous flooring system components in accordance with manufacturer's instructions, to provide uniform, monolithic wearing surface.
- B. Mix and prepare materials used in resinous flooring system in accordance with manufacturer's installation procedures and coverage rates.
- C. Primer:
 - 1. Apply primer over prepared substrates.
 - 2. Coordinate timing of primer application with application of troweled mortar to ensure optimum adhesion between resinous flooring materials and substrate.
 - 3.
- D. Detailing:
 - 1. Apply flexible membrane to substrate cracks, and up adjoining vertical surfaces, including integral cove bases, curbs, equipment pads and pipe sleeves.
 - 2. Embed reinforcing membrane in flexible membrane.
- E. Trowel apply body coats to provide smooth, closed, tight surface of required thickness. Smooth off laps, butts and joints in flooring.
- F. Cove Bases:
 - 1. Form integral cove bases up walls, to 4 inch (100 mm) height. Round internal and external corners.
 - 2. Apply bases according to resinous flooring manufacturer's instructions, including taping, priming, troweling, sanding, and topcoating.
- G. Finish Coats:
 - 1. Allow body coats to cure properly.
 - 2. Remove surface imperfections by lightly abrading and vacuuming flooring surface.
 - 3. Apply two coats of pigmented sealing and finish coating, including grout coat, of types recommended by resinous flooring manufacturer. Apply at spreading rate recommended by manufacturer.
 - 4. Follow manufacturer's recommended cure times before allowing foot traffic over flooring.
- H. Control Joints:
 - 1. Where flooring is installed over control joints, provide joint in resinous flooring by saw cutting flooring after the final coat and filling joint with flooring manufacturer's recommended epoxy caulking material.
 - 2. Do not permit joints or joining marks where one batch of material adjoins another.

3.4 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

- B. Clean resinous flooring just prior to final inspections. Use materials and procedures recommended by resinous flooring manufacturer.

END OF SECTION

SECTION 09 9000

PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work Included: Work of this Section includes, but is not limited to, the following:
 - 1. Field painting and finishing of exposed surfaces of items of architectural, structural, mechanical and electrical Work, interior and exterior, which require paint finish for protection or appearance as shown on Drawings or as specified.
 - 2. Surface preparation and priming of materials required to be painted, but not furnished under Work of other Sections as primed or prepared surfaces.
 - 3. Touch-up painting of prime coats which have become damaged or otherwise abraded or removed during construction.

- B. Description of Work Not Included: Certain items of Work shall not be included in Work of this Section unless specific reference is made to painting such items on Drawings or in Specifications. These items include:
 - 1. Shop finished items and materials with factory-applied or integral finish.
 - 2. Concealed surfaces in inaccessible areas such as foundation spaces, furred areas, utility tunnels, pipe spaces and shafts.
 - 3. Finished metal surfaces such as anodized aluminum, stainless steel, chromium plated metal, copper, bronze and other nonferrous metals, unless otherwise indicated.
 - 4. Operating parts of mechanical and electrical equipment including UL and rating labels, and equipment identification, name or nomenclature plates.
 - 5. UL and rating labels on doors, frames, and hardware.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 01 8113 SUSTAINABLE DESIGN REQUIREMENTS for sustainable design requirements and procedures.

- B. See Divisions 23 and 26 for additional requirements for painting mechanical and electrical equipment.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's specifications and installation instructions for each paint system and material.
 - 2. Include complete listing for each material by product name.
 - 3. Submit detailed paint schedule cross referencing specifications/drawings that conform with legend/abbreviations & nomenclature of all paint types and locations for application throughout building.

- B. Samples:

1. Submit samples for each color, texture and sheen prepared on 12 inch (300 mm) square hardboard as required to match Architect's Color Schedule.
2. Samples shall be stepped, to show progressively primers and top coats.

1.4 INFORMATIONAL SUBMITTALS

A. Certificates:

1. Where shop prime materials are by different manufacturer than finish coat materials, submit certificate signed by both prime and finish coat manufacturers verifying compatibility.

1.5 DEFINITIONS

- A. Paint: Coating systems materials, including paints, enamels, stains, varnishes, lacquers, sealers, fillers and other types of applied coating materials whether used as primers, intermediate or finish coats. Standard coating terms defined in ASTM D16 apply to this section.
- B. Exposed Surfaces: Surfaces or areas visible in finished Work.
- C. Paint Schedule: A guide to finishing various surfaces throughout the Project; not intended as definitive listing of Work.

1.6 SYSTEM REQUIREMENTS

A. Color Requirements:

1. Specified Paint Schedule lists basic painting systems.
2. Prior to beginning painting Work, Architect will prepare and furnish a Color Schedule accompanied by color chips.
3. Color Schedule shall list areas and surfaces to be painted together with colors, textures and

B. Interface with Other Work:

1. Shop primed items: Certain items of Work are specified under other Sections to be shop primed for field painting specified in this Section. Such items include, but are not limited to, the following:
 - a. Structural steel, including steel joists and metal deck.
 - b. Metal fabrications.
 - c. Ornamental metals.
 - d. Architectural woodwork (paint finish).
 - e. Steel doors and frames.
 - f. Wood doors (paint finish).
 - g. Access panels.
 - h. Coiling doors.
 - i. Fire extinguisher and valve cabinets.
 - j. Mechanical and electrical equipment and accessories.
2. Shop finished items: Certain items of Work are specified under other Sections to be shop finished and do not require finish painting in field. Such items include, but are not limited to, the following:
 - a. Site fencing and furnishings.
 - b. Structural steel.
 - c. Metal fabrications.

- d. Ornamental metals.
- e. Architectural woodwork (transparent finish).
- f. Roof accessories.
- g. Wood doors (transparent finish).
- h. Coiling doors.
- i. Aluminum entrances and window wall components.
- j. Skylights.
- k. Metal toilet compartments.
- l. Louvers and vents.
- m. Prefabricated specialties and accessories.
- n. Elevator hoistway doors and frames.
- o. Equipment including mechanical and electrical equipment.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project.
- B. B.Maintain records of substrate moisture verifications as required under Part 3: Execution

1.8 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at site and review installation procedures and coordination with other Work.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver paint to site factory-mixed, ready for application, in original, unopened containers, bearing manufacturer's labels, indicating the following information:
 - 1. Name of material.
 - 2. Manufacturer's stock number and date of manufacture.
 - 3. Contents by volume including major pigment and vehicle constituent.
 - 4. Thinning instructions.
 - 5. Recommended application instrument.
 - 6. VOC content and emissions.
 - 7. Color name and number.
- B. Storage:
 - 1. Store materials and equipment in dry storage area.
 - 2. Keep area neat and orderly.
 - 3. Protect storage area surfaces from paint spillage.
 - 4. Maintain paint containers in clean condition, free of foreign materials and residue, protected from freezing.
- C. Place paint or solvent soaked rags, waste or other materials which might constitute fire hazard in metal containers and remove from premises at close of each day's Work.

1.10 PROJECT CONDITIONS

- A. Environmental Requirements:

1. Apply paint to surfaces which are free of moisture.
2. Do not apply paint in rain, snow, fog or mist or when relative humidity exceeds 85%.
3. During periods of inclement weather, painting may be continued if areas and surfaces to be painted are enclosed and artificial heat is supplied, provided temperature and humidity conditions prescribed are maintained.
4. Do not start interior painting until exterior building openings are closed.
5. Temperature:
 - a. Exterior paint: Do not apply exterior paint when ambient temperature is below 50 deg F for water-thinned coatings and below 45 deg F (7 deg C) for other coatings, or when temperature is expected to drop to 32 deg F (0 deg C) within 24 hours of application.
 - b. Interior paint: Once interior painting is started, maintain constant temperature of 65 deg F (18 deg C) or above in area of Work.
 - c. Prevent variations in temperature which might result in condensation on freshly painted surfaces.
6. Where paint manufacturer's specifications or instructions differ from above, the more stringent requirements apply to this Work.
7. Paint fumes:
 - a. Take every precaution against potential hazards of paint fumes as necessary and as required by regulations, codes and laws.
 - b. Provide additional ventilation and protective equipment if necessary.

1.11 SEQUENCING AND SCHEDULING

- A. In locations to receive floor-mounted equipment, paint floors, equipment pads, and curbs prior installation of equipment.

1.12 EXTRA STOCK

- A. Deliver one unopened 5 gallon (19 L) container of paint for each top coat installed for each paint material, sheen and color.
- B. Store at Project site where directed. Ensure containers are identified by manufacturer, product, sheen and color.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Paint Manufacturers:
 1. Benjamin Moore & Co.
 2. Duro Inc.
 3. Sherwin-Williams Co.
- B. Acceptable Manufacturers for Epoxy and Polyurethane Coatings:
 1. Tnemec Company, Inc.
 2. Dupont.
 3. Carboline.

2.2 MATERIALS

- A. VOC Content of Field-Applied Interior Paints and Coatings: See Section 01 8113 SUSTAINABLE DESIGN REQUIREMENTS.
- B. Coatings:
 - 1. Provide “best quality grade” of various types of coatings as produced by acceptable paint manufacturers.
 - 2. Materials not displaying manufacturer's identification as standard “best-grade” product will not be acceptable.
- C. Thinners:
 - 1. Water-thinned systems: Clean, potable water.
 - 2. Solvent-thinned systems: Pure linseed oil, turpentine, shellac and other materials of highest quality with identifying labels intact and seals unbroken, as recommended by paint manufacturer as suitable for each type of paint.
- D. Primers and Undercoats: As recommended by paint manufacturer, suitable for substrate and compatible with finish coat requirements.
- E. Galvanizing Repair Paint: High zinc-dust content paint with dry film containing not less than 94 percent zinc dust by weight, complying with SSPC Paint 20.
- F. Exterior Paint: Non-chalking and mildew resistant.
- G. Interior Paint: Withstand washing with mild detergent solution, without loss of color, sheen or pigments.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (clay and CMU): 12 percent.
 - 3. Gypsum board: 12 percent.
 - 4. Plaster: 12 percent.
 - 5. Wood: 15 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Prepare surfaces in accordance with paint manufacturer's instructions.
- B. Make substrates clean, dry, smooth, free from dust and other foreign matter which would adversely affect adhesion or appearance.
- C. Remove or protect hardware, plates, trim, lighting fixtures and similar items placed prior to painting. Disconnect equipment and temporarily move, where necessary, to permit painting of wall surfaces. Replace removed items upon completion of painting.
- D. Touch-up of Prime Coats:
 1. Before applying succeeding coats, touch-up primers and undercoats and remove foreign matter from surface.
 2. Feather spot-priming or spot-coating into adjacent coating to produce smooth and level surface.
- E. Repair damaged galvanized coating in accordance with ASTM A780.
- F. Do not apply final coats until other trades, whose operations would be detrimental to finish painting, have completed their Work in areas to be painted.

3.3 PREPARATION OF NEW SURFACES

- A. Ferrous Metal - Typical Painting Systems:
 1. Clean and prime surfaces, which have not been shop primed, before surface is damaged by weather or other exposure.
 2. Shop-primed items: After installation is completed, touch-up heads of bolts, welded surfaces which are unpainted, and surfaces or areas where primer has been abraded or otherwise damaged.
 3. Prior to application of field coats, remove oil, grease, welding flux residues and other contaminants harmful to painting in accordance with SSPC-SP1 "Solvent Cleaning".
 4. After solvent cleaning, prepare bare metal surfaces by removing rust scale, loose mill scale or other detrimental deposits in accordance with SSPC-SP3 "Power Tool Cleaning".
- B. Ferrous Metal – High Performance Coating:
 1. Prepare surfaces in strict accordance with coating manufacturer's instructions.
 2. After completion of steel erection, power wash steel using tri-sodium phosphate detergent solution, with minimum pressure of 3000 psi (21 MPa). Rinse thoroughly with clean water and allow to dry completely.
 3. After cleaning, prepare rusted areas and abraded areas in accordance with SSPC-SP11 "Power Tool Cleaning to Bare Metal".
 4. After completion of power tool cleaning, spot prime areas that were power tool cleaned, using specified primer. Spot prime the same day that areas were power tool cleaned.
- C. Galvanized Steel – Typical Paint:
 1. Prepare steel for painting in accordance with ASTM D6386.

2. Remove passivation film and grease and oil residue from galvanized steel by chemical cleaning and etching, and mechanical methods, to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.
 - a. Chemically clean and etch using diluted solution of water-reducible phosphoric acid and detergent blend, and water. Dilute, apply, rinse with hot water, and force dry, in accordance with manufacturer's written instructions.
 - 1) Acceptable product and manufacturer: Equivalent to Clean 'n Etch by Great lakes Laboratories.
 - b. Mechanically abrade surface in accordance with SSPC-SP3 "Power Tool Cleaning".
 3. Test surfaces using one of the following methods:
 - a. Copper sulfate test: Apply one drop of a 10% copper sulfate solution to the treated/rinsed/dried surface. If a black spot develops within 5 seconds of contact, the surface is ready for painting. If a black spot does not develop within 5 seconds of contact, provide additional cleaning and etching, and re-test until a black spot does so develop.
 - b. Water break test: Spray water on the treated/rinsed/dried surface. If the water beads or breaks, the surface is not ready for paint; provide additional cleaning and etching, and re-test until water sheets over the surface. If the water sheets over the surface, it is a good signal that the passivation film and other oily soil has been removed, and the surface is ready for painting.
- D. Galvanized Steel – High Performance Coating:
1. Clean surfaces of oil, grease and other soluble contaminants in accordance with SSPC-SP1 "Solvent Cleaning".
 - a. Use solvent in hot 140 deg F (60 deg C) water, or as recommended by paint manufacturers, using power wash or rags. Change cleaning rags frequently so that contaminants are not re-deposited on steel.
 - b. Thoroughly rinse surfaces with clean water to remove solvent.
 2. After solvent cleaning, clean surfaces of rust and other insoluble contaminants in accordance with SSPC-SP2 "Hand Tool Cleaning" or SSPC-SP3 "Power Tool Cleaning".
 3. Test surfaces by wiping a clean white cloth across cleaned surfaces. If cloth remains clean, surfaces are ready for painting. If cloth becomes dirty, do not paint; provide additional cleaning and re-test until cloth remains clean.
- E. Concrete:
1. Remove release agents, curing compounds, efflorescence, and chalk.
 2. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- F. Clay Masonry:
1. Remove efflorescence and chalk.
 2. Do not paint surfaces if moisture content of surfaces or alkalinity of mortar joints to be painted exceed that permitted in manufacturer's written instructions.
- G. Concrete Masonry:
1. Remove efflorescence and chalk.
 2. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- H. Gypsum Board:

1. Repair surface defects including cracks, depressions or holes with gypsum board joint finishing compound as specified in Section 09 2900 GYPSUM BOARD.
2. Fill out flush and sand smooth.
3. Clean surfaces of dust dirt and other contaminants.
4. Do not begin paint application until finishing compound is dry.

I. Concrete Floors - Epoxy Finish:

1. Test slabs for moisture:
 - a. First test using polyethylene film test.
 - 1) Tape 12 inch (300 mm) square sheet of polyethylene vapor barrier to slab. Seal all edges with plastic moisture-resistant tape.
 - 2) If, after 24 hours of polyethylene film test, there is “clouding” or drops of moisture on underside of film, there is too much moisture in concrete substrate; do not apply paint. In such case, perform calcium chloride test.
 - b. Calcium chloride test
 - 1) Place quarter teaspoonful of dry (anhydrous) calcium chloride crystals inside 3 inch diameter putty ring on surface of concrete. Cover with a glass (embed edge of glass in putty), so that crystals are totally sealed off from air.
 - 2) If crystals dissolve within 12 hours, there is too much moisture in concrete substrate; do not apply paint.
 - c. Provide ventilation to reduce moisture content of concrete slabs to receive paint to not more than 3 pounds per 1000 square feet (1.46 kg per 100 square meters), before applying paint.
2. Shot-blast, mechanically abrade, or acid etch concrete floors to remove laitance, curing compounds, oil, grease, and other contaminants, and to provide surface texture to receive paint.

J. Wood:

1. Sand wood surfaces and edges smooth and even, before finishing or painting and between coats. Remove dust after each sanding.
2. Do not prime wood in building during erection of masonry.
3. Remove residue from knots, pitch streaks, cracks, open joints and sappy spots. On wood surfaces to be painted, apply shellac to knots, pitch and resinous sapwood before applying prime coat.
4. Countersink fasteners and fill fastener holes, cracks, open joints and other defects with tinted putty or wood filler after primer is dry and before second coat. Sand putty or wood filler smooth before painting.
5. Allow pressure-treated wood to weather for length of time recommended by paint manufacturer, before paint application.

3.4 PREPARATION OF EXISTING SURFACES

- A. Remove blistered, peeling and scaling paint or chalk deposits to sound substrates.
- B. Completely remove sealants or caulking.
- C. Dull glossy surfaces.
- D. Ferrous Metal:

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1. Clean surfaces of oil, grease and other soluble contaminants in accordance with SSPC-SP1 “Solvent Cleaning”.
 2. Clean surfaces of rust and other insoluble contaminants in accordance with SSPC-SP2 “Hand Tool Cleaning” or SSPC-SP3 “Power Tool Cleaning”.
 3. Sand clean and spot prime.
- E. Galvanized Steel:
1. Clean surfaces of oil, grease and other soluble contaminants in accordance with SSPC-SP1 “Solvent Cleaning”.
 2. Wire-brush or power wash weathered, unpainted surfaces to remove “white rust” deposits.
 3. Sand clean and spot prime.
- F. Ferrous Metal to Receive Electrostatically-Applied Paint:
1. Surfaces must be clean and dry, and free of dust, grease, oil, silicones, wax and rust.
 2. Sand glossy and chipped areas with 400-grit abrasive paper.
 3. Wipe clean using detergent solutions or high quality lacquer thinner as recommended by paint manufacturer.
- G. Masonry, Portland Cement Plaster (Stucco) and Concrete:
1. Fill cracks and voids.
 2. Remove mildew by scrubbing or power wash equipment using commercial mildew wash.
- H. Gypsum Board:
1. Sand to feather edges smooth with adjacent surfaces.
 2. Repair cracks and voids and spot prime.
 3. Provide solvent wash for areas with greasy marking.
 4. Provide detergent wash where required for adhesion of paint.
- I. Gypsum Plaster:
1. Sand to feather edges smooth with adjacent surfaces.
 2. Repair cracks and voids and spot prime.
 3. Provide solvent wash for areas with greasy marking.
 4. Provide detergent wash where required for adhesion of paint.
- J. Wood - Paint (Opaque) Finish:
1. Putty cracks, crevices and nail holes.
 2. Remove mildew by scrubbing or power wash equipment using commercial mildew wash.
 3. Spot prime bare wood prior to applying an overall coat of primer.
- K. Wood - Transparent Finish:
1. Remove existing paint to wood substrates by sanding and scraping. Do not damage existing profiles and surfaces.
 2. Use chemical removers only if recommended by paint manufacturer.
 3. Review cracks, crevices or fastener holes with Architect prior to filling to determine extent and technique.

3.5 APPLICATION

- A. Manufacturer's Instructions:

1. Follow paint manufacturer's instructions; do not exceed manufacturer's recommended application rate.
 2. Use application materials and equipment recommended by paint manufacturer.
 3. Stir materials before application to produce mixture of uniform density. Re-stir as required during application.
 4. Use thinners only if recommended by paint manufacturer.
 5. Provide total dry film thickness recommended by paint manufacturer for conditions of use. Owner reserves the right to verify mil thicknesses.
- B. Painting:
1. Number of coats specified are minimum number acceptable.
 2. Allow each coat of paint, varnish and enamel to dry thoroughly before applying succeeding coats.
 3. Use products of same manufacturer for succeeding coats.
 - a. Where shop primed materials are field painted, or prime coat materials are by different manufacturer than finish coat materials, confirm compatibility of materials and submit required certification.
 4. Make edges of paint adjoining other materials or colors sharp and clean, without overlapping.
 5. Make each coat of paint slightly different shade from preceding coat.
 6. Final colors shall match approved samples.
- C. Painting Mechanical and Electrical Items:
1. When covered and uncovered pipes, conduits, hangers and rods pass through finished room or space, paint with type of undercoat materials consistent with material to be painted and with same type and color of finish coat as used on immediately adjacent walls or ceiling surfaces, whichever surface is most appropriate to be matched, or color code as specified in Division 23.
 2. Give pumps, fans, heating and cooling units two coats of paint unless factory finished (or unless painting is specified under other Sections).
 3. Paint interior of ducts black behind grilles or registers exposed to view or which reflect light.
 4. Do not paint name plates or polished surfaces of equipment. Leave clean and free of paint.
- D. Painting Miscellaneous Items and Areas:
1. Paint shop-primed door hinges same color as door frames to which attached, unless a different color is selected. Do not paint door hardware which have plated finishes.
 2. Finish tops, bottoms and edges of doors same as faces of doors.
 3. Finish closets same as adjoining rooms, unless otherwise specified.
 4. Finish other surfaces not specifically mentioned same as adjoining surfaces.
 5. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
- E. Painting Existing Toilet Partitions and Elevator Hoistway Doors and Frames: Electrostatically repaint in place.
- F. Touch-up:
1. Touch-up and restore finish where damaged.

2. If stain, dirt or undercoats show through final coat of paint, correct defects and cover with additional coats until coating or paint film is of uniform finish, color, appearance and coverage.
3. Give special attention to edges, corners, crevices, welds, exposed fasteners and similar items to be sure these areas receive dry film thickness equivalent to flat surfaces.

3.6 CLEANING

- A. At completion of each day's Work, remove from premises rubbish and accumulated materials caused by this Work.
- B. Clean off paint spots, oil and other soiling from pre-finished surfaces and surfaces with integral finish. Use solvents which will not damage finished surface.

3.7 EXTERIOR PAINT SCHEDULE

- A. Exterior Ferrous Metal - Alkyd Finish:
 1. Primer: Rust inhibiting alkyd primer; touch up shop primed items.
 2. Second coat: Alkyd enamel, semi-gloss .
 3. Third coat: Same as second coat.
- B. Exterior Ferrous Metal - Polyurethane Finish:
 1. Primer: Moisture-cure organic zinc-rich urethane primer; 2.5 to 3.5 mils (0.064 to 0.089 mm) dry film thickness; touch up shop primed items.
 2. Second coat: Epoxy-polymide coating; 4.0 to 6.0 mils (0.102 to 0.152 mm) dry film thickness.
 3. Third coat: Acrylic polyurethane enamel, semi-gloss; 2.5 to 3.0 mils (0.064 to 0.076 mm) dry film thickness.
 4. Locations: Exposed structural steel
- C. Exterior Galvanized Metal - Alkyd Finish:
 1. Primer: Acrylic primer ; touch up shop primed items.
 2. Second coat: Alkyd enamel, semi-gloss .
 - a. Acceptable product and manufacturer: Equivalent to Super Spec HP UrethaneAlkyd
 3. Third coat: Same as second coat.
- D. Exterior Galvanized Metal - Polyurethane Finish:
 1. Primer: Epoxy-polymide coating; 4.0 to 6.0 mils (0.10 to 0.16 mm) dry film thickness. ; touch up shop primed items.
 2. Second coat: Acrylic polyurethane enamel, semi-gloss; 2.5 to 3.0 mils (0.064 to 0.076 mm) dry film thickness.
 3. Locations: Exposed structural steel.
- E. Exterior Concrete, Brick and Concrete Masonry Units - Vinyl Acrylic Finish - New Surfaces:
 1. First coat: Vinyl acrylic latex, low lustre.
 2. Second coat: Same as first coat.
- F. Exterior Concrete, Portland Cement Plaster (Stucco), Brick and Concrete Masonry Units - Vinyl Acrylic Finish - Existing Surfaces:
 1. Primer: Penetrating liquid surface conditioner.

2. Second coat: Vinyl acrylic latex, low lustre.
3. Third coat: Same as first coat.

G. Exterior Wood - Alkyd Finish:

1. Primer: Long oil alkyd enamel ; touch up shop primed items.
2. Second coat: Alkyd enamel, gloss.
3. Third coat: Same as second coat.

H. Exterior Wood - Opaque Stain Finish:

1. First coat: Vinyl acrylic latex, solid color stain.
2. Second coat: Same as first coat.

I. Exterior Wood - Semi-Transparent Stain Finish:

1. First coat: Linseed-alkyd semi-transparent stain.
2. Second coat: Same as first coat.

J. Exterior Wood Semi-Solid Stain Finish:

1. First coat: Linseed oil semi-solid stain.
2. Second coat: Same as first coat.

3.8 INTERIOR PAINT SCHEDULE

A. Interior Ferrous Metal - Acrylic-Latex Finish:

1. Primer: Acrylic primer ; touch up shop primed items.
2. Second coat: Low-VOC acrylic-latex interior paint; semi-gloss.
3. Third coat: Same as second coat.

B. Interior Concrete Walls and Structure - Acrylic-Latex Finish:

1. First coat: Low-VOC interior primer.
2. Second coat: Low-VOC acrylic-latex interior paint; eggshell.
3. Third coat: Same as second coat.

C. Interior Concrete Masonry Units - Acrylic-Latex Finish:

1. Primer: Vinyl acrylic latex block filler.
2. Second coat: Low-VOC acrylic-latex interior paint; eggshell.
3. Third coat: Same as second coat.

D. Interior Gypsum Board - Acrylic-Latex Finish - Semi-Gloss:

1. First coat: Low-VOC interior primer.
2. Second coat: Low-VOC acrylic-latex interior paint; semi-gloss.
3. Third coat: Same as second coat.
4. Locations: Walls in wet areas, including but not limited to restrooms, janitor closets, and trash rooms.

E. Interior Gypsum Board and Plaster - Acrylic-Latex Finish - Eggshell:

1. First coat: Low-VOC interior primer.
2. Second coat: Low-VOC acrylic-latex interior paint; eggshell.
3. Third coat: Same as second coat.
4. Locations: Walls other than to receive semi-gloss.

- F. Interior Gypsum Board and Plaster - Acrylic-Latex Finish - Flat:
1. First coat: Low-VOC interior primer.
 2. Second coat: Low-VOC acrylic-latex interior paint; flat.
 3. Third coat: Same as second coat.
 4. Locations: Ceilings and soffits.
- G. Interior Wood - Acrylic-Latex Finish:
1. First coat: Low-VOC interior primer.
 2. Second coat: Low-VOC acrylic-latex interior paint; semi-gloss.
 3. Third coat: Same as second coat.
- H. Interior Ferrous Metal - Polyurethane Finish:
1. Primer: Moisture-cure organic zinc-rich urethane primer; touch up shop primed items; 2.5 to 3.0 mils (0.064 to 0.076 mm) film thickness.
 2. Second coat: Epoxy-polyamide coating; 2.0 to 3.0 mils (0.051 to 0.076 mm) dry film thickness.
 3. Third coat: Acrylic polyurethane enamel, semi-gloss; 2.5 to 3.0 mils (0.064 to 0.076 mm) dry film thickness.
- I. Interior Ferrous Metal - Electrostatically-Applied Finish:
1. Primer: Universal primer, to act as barrier coat over shop primer.
 2. First coat: Alkyd enamel specifically blended for electrostatic application; semi-gloss enamel.
 - a. Acceptable product and manufacturer: Equivalent to Per-Ma-Lite Electrostatic Semi-Gloss Enamel by Budeke's.
 3. Second coat: Same as first coat.
 4. Locations: Toilet partitions. Elevator hoistway doors and frames.
- J. Interior Wood - Transparent Finish:
1. Filler: natural color paste wood filler; tint to match color of stain.
 2. First coat: Alkyd penetrating stain; color as required to match Architect's sample.
 3. Second coat: Clear polyurethane coating, gloss low; thin 1:4, mineral spirits to polyurethane.
 4. Third coat: Same as second coat, but apply as packaged with no thinning; sand lightly between finish coats.
 5. Fourth coat: Same as third coat; sand lightly between finish coats.
- K. Paint Locations:

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L.

	No Sheen (Flat)	Low Sheen (Eggshell or Satin)	High Sheen (Semi-Gloss)
Administrative offices and workrooms		x	
Classrooms, including Art and Science Labs		x	
Hallways above wainscot		x	
Group toilet rooms above wainscot			x
Single-user toilet rooms above wainscot			x
Locker Rooms			x
Student Dining		x	
Kitchen & Servery			x
Mechanical, Electrical, and IT rooms		x	
Storage rooms		x	
GWB ceilings and soffits	x	x	
Natatoriums		x	
Gymnasium, Fitness, and Weight Rooms		x	
Black-Box and Stage areas	Black		

M. END OF SECTION

SECTION 10 2113

TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Description of Work: Work of this Section includes, but is not necessarily limited to, the following:
 - 1. Floor anchored and ceiling hung, solid, high-density polyethylene (HDPE) toilet compartments.
 - 2. Urinal screens.
 - 3. Accessories.
 - 4. Interior light gage partition walls coordination.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 09 2110 GYPSUM BOARD ASSEMBLIES.
- B. See Section 10 2813 TOILET ACCESSORIES for partition mounted accessories.

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's specifications and installation instructions for components and finish.
 - 2. Include photographic catalog cuts for manufacturer's standard components, including hardware, anchors and fasteners.
- B. Shop Drawings: Submit plans, elevations and details of compartments, showing layout, dimensions and anchoring details to adjacent construction. Indicate vertical clearance AFF and horizontal clearances available for maneuvering near entryway doors and partitions
- C. Samples: Submit selection of samples for **[color and]** verification for each exposed product and for each color and texture specified. Submit large samples and not standard sample size.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
 - 1. Submit cleaning and maintenance data for materials provided.
 - 2. Include copy of submittal in Project information manual.
- B. Warranty: Submit signed and dated warranty.

1.6 SYSTEM REQUIREMENTS**A. Interface With Other Systems:**

1. Coordinate compartment Work with Work of other trades and provide items to be placed during installation of other Work at proper time so as to avoid delays in overall Work. Coordinate wood blocking locations during construction of interior gypsum board partition walls.
2. Place such items, including inserts and anchors, accurately in relation to final locations of compartment components.
3. Use Contractor's bench marks.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project.

B. Regulatory Requirements:

1. Conform to applicable requirements of authorities having jurisdiction over Project.
2. Except as may be modified by governing authorities, comply with applicable requirements and provisions of the following:
 - a. ANSI A117.1 "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People".
 - b. Americans with Disabilities Act.

1.8 PRE-INSTALLATION CONFERENCE

A. Prior to commencing Work, meet at site to review installation procedures and coordination with other Work.

1.9 DELIVERY, STORAGE AND HANDLING

- A.** Deliver, store, handle and protect products in accordance with manufacturer's instructions.
- B.** Store in protected and dry area in manufacturer's unopened protective shipping packaging.
- C.** Support as required to prevent damage to materials.

1.10 PROJECT CONDITIONS**A. Field Dimensions:**

1. Field verify dimensions of supporting structure and other adjoining elements before fabrication.
2. Provide for erection tolerances corresponding with specified tolerances for other Work where field measurements cannot be obtained.
3. Remedy unsatisfactory tolerances in adjoining Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Basis of design product is Eclipse Partitions by Scranton Products to establish standard of quality.
2. Equivalent products by the following may also be acceptable provided they meet the requirements of Contract Documents.
 - a. Rockville Partitions Incorporated.

2.2 MATERIALS

A. Door, Panel, and Pilaster Construction:

1. Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, no-sightline system, and with homogenous color and pattern throughout thickness of material.
2. Color and pattern: As indicated on Color Legend on Drawings.
3. Dimensions: Manufacturer's standard.

2.3 ACCESSORIES

A. Hardware:

1. Provide manufacturer's standard heavy-duty fastenings and fittings.
2. Door hardware:
 - a. Continuous self-closing stainless steel hinges. For out-swing doors, provide hinges with integral stop to limit door swing, so that bumper on outside of door is not necessary.
 - b. Latch and keeper:
 - 1) Surface mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper.
 - 2) Provide units that comply with accessibility requirements of authorities having jurisdiction.
 - c. Combination coat hook/bumper.
 - d. Door pulls. Provide pull on both faces of door for wheelchair-accessible compartments.
3. Material and finish: Manufacturer's standard.

B. Brackets and Fittings:

1. General: Provide as required for complete and rigid installations compatible with substrate conditions.
2. Brackets:
 - a. Stirrup type: Ear or U-brackets, stainless steel.
 - b. Full-height (continuous) type: Manufacturer's standard design and material.
3. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum strip fastened to exposed bottom edges of solid-polymer components to prevent burning.
4. Pilaster shoes and sleeves (caps): Manufacturer's standard.
5. Headrails: Continuous extruded aluminum, with anti-grip profile.
6. Support posts for urinal screens: Manufacturer's standard aluminum post with floor shoe for anchoring to floor construction.

- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match hardware, with theft-resistant-type heads. Provide hex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.

2.4 FABRICATION

- A. Shop fabricate units in accordance with field dimensions indicated on final Shop Drawings.
- B. Provide sizes indicated, adjusted to actual field measurements.
- C. Fabricate with flat, smooth surfaces, free of waves, warping, buckles, rough areas and voids.
- D. Provide concealed internal metal reinforcement for attachment of brackets, hardware, grab bars, accessories and anchoring devices. Provide concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to units.
- E. Provide cut-outs for Work indicated or required.
- F. Floor-Anchored Overhead-Braced Units:
 - 1. Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions.
 - 2. Make provisions for setting and securing continuous head rail at top of each pilaster.
 - 3. Provide shoes at pilasters to conceal supports and leveling mechanism.
- G. Door Widths: As indicated.
- H. Urinal-Screen Construction: Matching panels.
- I. Complete fabrication at factory, including drilling, tapping and assembly, to extent possible within delivery limitations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 ERECTION

- A. Installation:
 - 1. Install in accordance with final Shop Drawings and manufacturer's instructions.
- B. Avoid scratching or damage to finishes.
- C. Do not install units which are warped, bowed, deformed or otherwise damaged.
 - 1. Install compartments rigid, straight, plumb and level.
 - 2. Set units with not more than 1/2 inch between pilasters and panels, and not more than 1 inch clearances between panels and walls.

3. Floor-anchored overhead-braced units:
 - a. Secure pilasters to floor and level, plumb, and tighten.
 - b. Secure continuous head rail to each pilaster with not less than two fasteners.
 - c. Hang doors to align tops of doors with tops of panels and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
 4. Install wall-hung urinal screens on three (minimum) heavy wall brackets attached to panel with through-bolts. Provide devices for wall anchorage appropriate for supporting substrate construction.
- D. Hardware Adjustment:
1. Adjust and lubricate hardware for proper operation after installation.
 2. Set hinges on in-swing doors to hold doors open approximately 30° from closed position when unlatched.
 3. Set hinges on out-swing doors to return to fully closed position.

3.3 CLEANING AND ADJUSTMENTS

- A. Perform final adjustments to leveling devices, door hardware and other operating parts.
- B. Clean exposed surfaces and touch up minor finish imperfections using materials and methods recommended by compartment manufacturer.
- C. Replace damaged units which cannot be satisfactorily field repaired, as directed by Architect.

3.4 PROTECTION

- A. Protect compartments during construction so that they will be without evidence of damage or use at time of acceptance.

END OF SECTION

SECTION 10 2813

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Toilet accessories.
 - 2. Framed mirrors.
 - 3. Accessories.
 - 4. Coordinate accessory location with partition wall framing.
- B. Products Furnished But Not Installed: Furnish inserts and anchors which must be set in concrete or built into masonry; coordinate delivery with other Work to avoid delay.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 09 2110 GYPSUM BOARD ASSEMBLIES.
- B. See Section 10 2113 TOILET COMPARTMENTS for compartment construction.
- C. See Division 26 for electrical connection requirements for hand dryers.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's specifications and installation instructions for each component and finish detailed under Part 2 of this specification: Toilet and Bath Accessory Schedule.
 - 2. Include photographic catalog cuts for manufacturer's standard components, including hardware, anchors and fasteners. Include schematic details showing elevations and layout, dimensions and anchoring details to adjacent construction. Indicate vertical clearance AFF and horizontal clearances available for maneuvering near entryway doors and partitions.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data: Submit cleaning and maintenance data for materials provided.
- B. Warranty: Submit signed and dated warranty.

1.5 SYSTEM REQUIREMENTS

- A. Interface With Other Systems:
 - 1. Coordinate toilet accessory Work with Work of other trades and provide items to be placed during installation of other Work at proper time so as to avoid delays in overall Work. Especially coordinate wood blocking locations during construction of interior gypsum board partition walls.

2. Place such items, including inserts and anchors, accurately in relation to final locations of cabinet components.
3. Use Contractor's bench marks.

1.6 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain accessory items from one manufacturer except where otherwise indicated.
- B. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project.
- C. Regulatory Requirements:
 1. Conform to applicable requirements of authorities having jurisdiction over Project.
 2. Except as may be modified by governing authorities, comply with applicable requirements and provisions of the following:
 - a. ANSI A117.1 "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People".
 - b. Americans with Disabilities Act.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application

1.7 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at site to review installation procedures and coordination with other Work.

1.8 PROJECT CONDITIONS

- A. Field Dimensions:
 1. Field verify dimensions of supporting structure and other adjoining elements before fabrication.
 2. Provide for erection tolerances corresponding with specified tolerances for other Work where field measurements cannot be obtained.
 3. Remedy unsatisfactory tolerances in adjoining Work.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect products in accordance with manufacturer's instructions.
- B. Store in protected and dry area in manufacturer's unopened protective shipping crates or packaging.
- C. Protect factory applied protective face coverings from damage.
- D. Support as required to prevent any damage to materials.

1.10 WARRANTY

- A. Provide written 10 year warranty for replacement of mirror units which develop visible silver spoilage defects within warranty period.
- B. Provide manufacturer's written warranty for hand dryers, warranting to repair or replace defective parts or workmanship as follows:
 - 1. Motor brushes: 3 years from Substantial Completion.
 - 2. All other parts: 10 years from Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Products and Manufacturers:
 - 1. Products scheduled on Drawings establish standard of quality and are manufactured by Bobrick Washroom Equipment, Inc.
 - 2. Equivalent products by following are acceptable:
 - a. Bradley Corp.

2.2 MATERIALS

- A. Stainless Steel:
 - 1. Type 304, manufacturer's standard thickness, unless otherwise indicated.
 - 2. Finish: No. 4 bright directional polish, unless otherwise noted.
- B. Mirror Glass:
 - 1. ASTM C1503, Mirror Select Quality; with silvering, electro-plated copper coating, and protective organic coating.
 - 2. Minimum thickness: 1/4 inch (6 mm).

2.3 TOILET AND BATH ACCESSORY SCHEDULE

- A. Accessory types scheduled below correspond to types indicated on Drawings.
- B. Hand Dryer:
 - 1. Low voltage polycarbonate housing with ABS plastic mounting plate.
 - 2. Antimicrobial sprayed nickel paint coating.
 - 3. Double-life HEPA filter.
 - 4. Touch-free sensor to activate.
 - 5. Operating airflow: Up to 7.39 gal/sec and up to 59.3 cfm.
 - 6. Acceptable product: Airblade V by Dyson.
- C. Paper Towel Dispenser:
 - 1. Description: Roll paper towel capacity with translucent dark grey plastic housing.
 - 2. Mounting: Surface.
 - 3. Acceptable product and manufacturer: Equivalent to 72860 by Bobrick.
- D. Toilet Tissue Dispensers:

DGS – CAPITAL CONSTRUCTION SERVICES [PROJECT NAME]

1. Description: Double roll capacity with shelf.
 2. Mounting: Surface.
 3. Acceptable product and manufacturer: Equivalent to B-2840 by Bobrick.
- E. Feminine Napkin Dispensers:
1. Description:
 - a. Capacity for 30 napkins and 27 tampons.
 - b. Fabricate with seamless beveled flange.
 2. Operation: Token operation, with handles complying with operating requirements of ADA and ANSI A117.1.
 3. Mounting: Recessed.
 4. Acceptable product and manufacturer: Equivalent to Classic Series B-3706T by Bobrick.
- F. Feminine Napkin Disposals:
1. Description: Removable keyed receptacle with self-closing access doors on both sides, and 1.2 gallon (4.5 L) leakproof rigid polyethylene receptacle..
 2. Mounting: Compartment.
 3. Acceptable product and manufacturer: Equivalent to Classic Series B-354 by Bobrick for single sided and B354 for double sided.
- G. Soap Dispensers:
1. Description: Bulk foam soap dispenser with large push bar.
 2. Mounting: Wall.
 3. Acceptable product and manufacturer: Equivalent to ClearVu Bulk Foam Soap Dispenser by Impact Products, LLC.
- H. Grab Bars:
1. Description:
 - a. 1-1/2 inch (38 mm) diameter x 0.05 inch (1.3 mm) thick, satin finish; with mounting flange welded to grab bar, and snap-on flanges for concealed attachment. Concealed set-screw mounting is not acceptable. Exposed mounting is not acceptable.
 - b. Provide with manufacturer's concealed anchor plates to suit wall and toilet compartment construction.
 2. Configurations and lengths: Straight; ?? inches (?? mm long).
 3. Mounting: Surface.
 4. Installed grab bars shall have 1-1/2 inch (38 mm) projection from walls, and withstand minimum 250 pound (1112 N) force.
 5. Acceptable products and manufacturer: Equivalent to B-6806 Series by Bobrick.
- I. Framed Mirrors:
1. Description:
 - a. Stainless steel framed mirror with concealed theft-resistant wall hangers.
 - b. Fabricate frames of stainless steel angle, with corners heliarc welded and ground and polished smooth.
 - c. Mirror back of minimum 0.040 inch (1.0 mm) thick galvanized steel, fastened to frame with concealed screws.
 2. Sizes: As indicated on Drawings.
 3. Mounting: Surface.

4. Acceptable product and manufacturer: Equivalent to B-290 by Bobrick.

J. Janitorial Utility Shelf:

1. Description: Stainless steel utility shelf with support brackets welded to shelf, with 3 mop/broom holders of spring-loaded serrated rubber cams with plated steel brackets, 4 rag hooks, and continuous rag bar.
2. Length: 34 inches.
3. Mounting: Surface.
4. Acceptable product and manufacturer: Equivalent to B-239 by Bobrick.

K. Shower Rods:

1. Stainless steel, extra-heavy duty, 1-1/4 inch (32 mm) diameter, 0.05 inch (1.3 mm) thick with slide-on stainless steel flanges and countersunk screws.
2. Provide in lengths to suit showers, as indicated.
3. Acceptable products:
 - a. Equivalent to Classic Series B-6047.

L. Soap Dishes:

1. Description: Stainless steel, bright polished; drawn, one-piece ribbed dish welded to support arm and flange; drain holes.
2. Mounting: Surface.
3. Acceptable product and manufacturer: Equivalent to Classic Series B-6807 by Bobrick.

M. Bariatric Shower Seats:

1. Description: Folding shower seat with “L”-shaped slatted seat.
 - a. Seat: Plastic laminate, consisting of matte-finish ivory melamine surfaces integrally bonded to black phenolic-resin core; nominal 18 inch (457 mm) wide x 16 inch (406 mm) deep x 5/16 inch (8 mm) thick.
 - b. Frame: Stainless steel framing with self-locking mechanism.
2. Mounting: Surface.
3. Installed seats shall withstand minimum 1100 pound force.
4. Acceptable product and manufacturer: Equivalent to B-918116 by Bobrick.

N. Diaper Changing Stations:

1. Description:
 - a. Hinged fold-down diaper changing table fabricated of molded polyethylene over foam plastic core, with nylon straps to secure baby on table, and purse hooks.
 - b. Bed section hinges to back plate with concealed, full-length stainless steel hinge rod; controlled opening and closing via pneumatic cylinder.
 - c. Color of plastic: Manufacturer’s standard cream or gray.
2. Installed table shall support minimum 250 pound static force.
3. Operable with one hand, with not more than 5 pounds (22.2 N) force.
4. Mounting: Surface.
5. Acceptable product and manufacturer: Equivalent to Koala-Kare KB100-SSRE by Bobrick.

2.4 ACCESSORIES

A. Inserts, Anchors and Fasteners:

1. Provide concealed fastenings wherever possible. Where exposed fastenings are required, match finish of fastenings to finish of accessories fastened thereby.
2. Provide fasteners recommended by accessory manufacturer, appropriate for proper attachment to supporting substrates.
3. Provide theft-resistant fasteners for exposed mountings.

B. Keys: Furnish minimum of 6 universal keys to Owner, for access to toilet accessory units requiring internal access for servicing or resupply.

2.5 FABRICATION

- A. Fabricate units with tight seams and joints, and exposed edges rolled.
- B. Exposed welds will not be accepted. Exposed weld spots will not be accepted.
- C. Hang doors and access panels with full-length, continuous hinges.
- D. Equip units for concealed anchorage and with corrosion-resistant backing plates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install only after completion of contiguous Work.
- C. Set Work accurately, measured from established building lines and levels, plumb and in true alignment with previously completed Work.
- D. Anchor securely to supporting construction, using concealed fasteners wherever possible.

3.3 CLEANING, ADJUSTMENT AND REPAIR

- A. Adjust components to operate properly and verify that mechanisms function properly and smoothly.
- B. Remove protective coverings only when danger of damage from other Work is passed.
- C. Clean and polish exposed surfaces prior to final acceptance.
- D. Repair and/or replace damaged units.

3.4 PROTECTION

- A. Protect Work during construction so that it will be without any evidence of damage or use at time of acceptance.

END OF SECTION

SECTION 12 2400
WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Manually-operated window shades.
 - 2. Electrically-operated shades for exterior windows as indicated on Drawings.
 - 3. Accessories.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 09 2900 GYPSUM BOARD for ceiling pocket construction.
- B. See Division 26 for electrical and wiring requirements.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit for each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
 - 1. Motorized shade operators: Include operating instructions.
 - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- B. Shop Drawings: Provide project-specific Shop Drawings, drawn to scale.
 - 1. Show location and extent of roller shades.
 - a. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other work, operational clearances, and relationship to adjoining work.
 - b. Include reflected ceiling plans showing ceiling suspension system members and attachment to building structure.
 - 2. Motorized shade operators:
 - a. Show size and location of access to shade operator, motor, and adjustable components.
 - b. Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
 - c. Include wiring diagrams showing power, system, and control wiring.
 - 3. Include field-measured dimensions of each opening to receive shades.
 - 4. Number each shade on Shop Drawing to correspond to identification number given each shade and applied on an unexposed face of shade unit.
- C. Samples:
 - 1. Manufacturer's samples: Submit manufacturer's full range of standard pattern and color samples for each type of shade fabric, for Architect's selection.

2. After selection, submit shade fabric samples for each type of shade fabric, 12 inches square, in selected colors and patterns.

1.4 INFORMATIONAL SUBMITTALS

- A. Window Treatment Schedule: For roller shades. Use same designations indicated on Drawings.
- B. Qualification Data: Submit installer qualifications verifying experience; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
 1. Include the following:
 - a. Methods for maintaining roller shades and finishes.
 - b. Precautions about cleaning materials and methods that could be detrimental to shadecloth, finishes, and performance.
 - c. Operating hardware.
 - d. Motorized shade operator.
 2. Include copy of submittal in Project information manual.
- B. Warranties: Submit signed and dated warranties.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain shades for windows through one source from a single manufacturer.
- B. Installer Qualifications: Approved by shade manufacturer for warranted installation of shades.
- C. Fire-Test-Response Characteristics: Provide roller shade band materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 1. Flame-Resistance Ratings: Passes NFPA 701.
- D. 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.
- E. Product Standard: Provide shades complying with WCMA 100.1.

1.7 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, at Contractor's direction, meet at site and review installation procedures and coordination with other Work.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect products in accordance with manufacturer's instructions; in factory packages, marked with manufacturer and product name, and location of installation using same designations indicated on Drawings and in a window treatment schedule.
- B. Store in protected and dry area in manufacturer's unopened protective shipping packaging.
- C. Support as required to prevent damage to materials.

1.9 PROJECT CONDITIONS

- A. Field measure dimensions of each opening to receive shades, before fabrication.
- B. Environmental Requirements: Do not install roller shades until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.10 SEQUENCING AND SCHEDULING

- A. Do not install shades until wet Work and finishing operations, including painting, are complete and dry.

1.11 WARRANTIES

- A. Provide manufacturer's standard warranties in which manufacturer agrees to repair or replace components of roller shades that fail in materials or workmanship within specified warranty period.
 - 1. Manual operating components: Installation shall remain operational, without fault; including all operating parts excepting bead chain.
 - 2. Motors and electrical components: Installation shall remain operational, without fault; including motors, electrical controls, and override circuits.
 - 3. Shadecloth: Shadecloth shall not deteriorate, sag or warp; and shall not be unfit for use intended.
 - 4. Warranty periods: As follows, from date of Substantial Completion.
 - a. Manual operating components: Ten years.
 - b. Motors and electrical components: Two years.
 - c. Shadecloth: Ten years.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURER

- A. Acceptable Products and Manufacturer:
 - 1. Listed products establish standard of quality and are manufactured by MechoShade Systems, Inc
 - 2. Equivalent products by the following manufacturers are acceptable provided they comply with requirements of Contract Documents.
 - a. Draper Inc.

- b. Nysan Solar Control.

2.2 SHADE TYPES

- A. Shade Types: See Drawings for locations of each shade type.

2.3 SHADECLOTH

- A. Sunscreen Shadecloth: Non-PVC shadecloth.
 - 1. Material: TPO (thermoplastic olefin) filaments with TPO coating.
 - 2. Pattern: Basketweave.
 - 3. Color:
 - 4. **[Architect to provide].**
 - 5. Openness factor: **[Architect to provide].**
- B. Room Darkening Shadecloth:
 - 1. Material: 53% fiberglass, 45% acrylic, 2% poly finish.
 - 2. Pattern: Solid opaque.
 - 3. Color: **[Architect to provide].**
 - 4. .
 - 5. Openness factor: Zero.

2.4 SHADES

- A. Descriptions:
 - 1. Manually-operated window shades: Manually-operated window shade systems, consisting of shade fabric, chain-and-sprocket mechanism for operable units, mounting hardware and other accessories as required for complete installation.
 - 2. Electrically-operated window shades: Motorized window shade system consisting of shade fabric, electric motor system, electrical switching and control systems, hardware and other accessories as required for complete installation.
- B. Rollers:
 - 1. Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the weight and width of shade band material without sagging; designed to be easily removable from support brackets; with removable spline fitting integral channel in tube for attaching shade material.
 - 2. Provide capacity for one roller shade band(s) per roller.
- C. Direction of Roll: Regular, from back of roller.
- D. Mounting Brackets and Devices: Provide manufacturer's mounting brackets as applicable to conditions of installation, as follows.
 - 1. Pocket-mounted shades: Extruded aluminum pocket with removable extruded aluminum closure strip in size recommended by shade manufacturer for conditions of installation.
 - a. Drill holes or slots in top of housings, to provide minimum free area of 1 square inch (645 sq. mm) of ventilation per foot of glass width, for venting of air space between shade and glass when shade is down.

- E. Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length as indicated on Drawings; removable design for access.
- F. Bottom Bar: Steel or extruded aluminum.
 - 1. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
 - 2. Heat-seal shade cloth on top and sides around bottom bar with straight seams, so that bottom bar is fully enclosed on all sides.
- G. Room Darkening Shades: Designed for eliminating all visible light gaps when shades are fully closed; fabricated from blackout shade band material with fascia and bottom bar extended and formed for light-tight joints among shade components and between shade components and adjacent construction.
- H. Mounting: As indicated on Drawings, mounting permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
- I. Manual Shade Operation: Continuous-loop bead-chain, clutch, and cord tensioner and bracket lift operator.
 - 1. Position of clutch operator: Right side of roller, as determined by hand of user facing shade from inside, unless otherwise indicated on Drawings.
 - 2. Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
 - 3. Lift-assist mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
 - 4. Loop length: Length required to make operation convenient from floor level.
 - 5. Bead chain: Nickel-plated metal.
 - 6. Operating function: Stop and hold shade at any position in ascending or descending travel.
- J. Electrical Shade Operation: Motorized operator, switch operated.

2.5 ROLLER SHADE FABRICATION

- A. Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.
- B. Concealed Components:
 - 1. Noncorrodible or corrosion-resistant-coated materials.
 - 2. Lifting mechanism: With permanently lubricated moving parts.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F:
 - 1. Shade units installed outside jambs: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

- D. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting fascia, headbox, roller, and operating hardware and for hardware position and shade mounting method indicated.
- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.
- F. Color-Coated Finish:
 - 1. For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
 - 2. Colors of metal and plastic components exposed to view: As selected by Architect from manufacturer's full range, unless otherwise indicated.

2.6 MOTORIZED ROLLER SHADE OPERATORS

- A. Description:
 - 1. Provide factory-assembled motorized shade operation systems designed for lifting shades of type, size, weight, construction, use, and operation frequency indicated.
 - 2. Provide operation systems of size and capacity and with features, characteristics, and accessories suitable for Project conditions and recommended by shade manufacturer, complete with electric motors and factory-rewired motor controls, remote-control stations, remote-control devices, power disconnect switches, enclosures protecting controls and all operating parts, and accessories required for reliable operation without malfunction.
 - 3. Include wiring from motor controls to motors.
 - 4. Coordinate operator wiring requirements and electrical characteristics with the building electrical system.
 - 5. Total hanging weight of shade band shall not exceed 80 percent of the rated lifting capacity of the shade motor and tube assembly.
- B. Comply with NFPA 70.
- C. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6 with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.
- D. Electric Motors: UL-approved or -recognized, totally enclosed, insulated motor, complying with NEMA MG 1, with thermal-overload protection, brake, permanently lubricated bearings, and limit switches; sized by shade manufacturer to start and operate size and weight of shade considering service factor or considering Project's service conditions without exceeding nameplate ratings.
 - 1. Service factor: According to NEMA MG 1, unless otherwise indicated.
 - 2. Motor characteristics: Single phase; 24 V, 60 Hz, or 110 V, 60 Hz, as standard with manufacturer.
 - 3. Motor mounting: Within manufacturer's standard roller enclosure.
- E. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop shade at fully raised and fully lowered positions.

- F. Operating Features
 - 1. Backup gear and crank operator for manual operation during power failures with detachable handle, length required to make operation convenient from floor level.

2.7 ACCESSORIES

- A. Miscellaneous Accessories: Provide anchors, fasteners and other accessories required for complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions, and located so shade band is not closer than 2 inches to interior face of glass.
- B. Connections: Connect motorized operators to building electrical system.
- C. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.3 CLEANING AND REPAIR

- A. Clean shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain roller shades.

END OF SECTION

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WOOD LABORATORY CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood laboratory casework.
 - 2. Laboratory countertops.
 - 3. Tables.
 - 4. Shelves.
 - 5. Laboratory sinks.
 - 6. Laboratory accessories.
 - 7. Water, laboratory gas, and electrical service fittings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Division 21 for plumbing requirements.
- B. See Division 23 for HVAC requirements.
- C. See Division 26 for electrical requirements.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For laboratory casework.
 - 1. Include plans, elevations, sections, and attachments to other work including blocking and reinforcements required for installation.
 - 2. Indicate types and sizes of casework.
 - 3. Indicate manufacturer's catalog numbers for casework.
 - 4. Show fabrication details, including types and locations of hardware.
 - 5. Indicate locations and types of service fittings.
 - 6. Include details of support framing system.
 - 7. Include details of exposed conduits, if required, for service fittings.
 - 8. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and laboratory equipment.
 - 9. Include coordinated dimensions for laboratory equipment specified in other Sections.
- C. Keying Schedule: Include schematic keying diagram, and index each key set to unique designations that are coordinated with the Contract Documents.
- D. Samples: For casework finishes and materials requiring color selection.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Test Reports:
 - 1. Casework: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework with requirements of specified product standard.
 - 2. Countertop Surface Material: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory countertop surface material with requirements specified for chemical and physical resistance.

1.5 DEFINITIONS

- A. Concealed Surfaces of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.
- B. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches (1200 mm) above floor, and visible surfaces in open cabinets or behind glass doors.
- C. Semiexposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interiors, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cases 78 inches (1980 mm) or more above floor and bottoms of cabinets more than 24 inches (600 mm) but less than 48 inches (1200 mm) above floor are defined as "semiexposed."

1.6 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.7 COORDINATION

- A. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.
- B. Coordinate installation of laboratory casework with installation of laboratory equipment.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA 8 W.

1.9 PERFORMANCE REQUIREMENTS

- A. System Structural Performance: Laboratory casework and support framing system shall withstand the effects of the following gravity loads and stresses without permanent deformation, excessive deflection, or binding of drawers and doors:
 - 1. Support Framing System: 600 lb/ft. (900 kg/m).
 - 2. Suspended Base Cabinets (Internal Load): 160 lb/ft. (240 kg/m).
 - 3. Work Surfaces (Including Tops of Suspended Base Cabinets): 160 lb/ft. (240 kg/m).
 - 4. Wall Cabinets (Upper Cabinets): 160 lb/ft. (240 kg/m).

- 5. Shelves: 40 lb/sq. ft. (200 kg/sq. m).

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet-work are complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Established Dimensions: Where laboratory casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- C. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before enclosing them, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Products and Manufacturers:
 - 1. Basis of design manufacturer is Leonard Peterson to establish standard of quality.
 - 2. Equivalent products by other manufacturers may also be acceptable provided they meet the requirements of Contract Documents and are approved by the Architect.
- B. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.

2.2 CASEWORK, GENERAL

- A. Casework Product Standard: Comply with SEFA 8 W, "Laboratory Grade Wood Casework."
- B. Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide units that are listed and labeled as complying with requirements in NFPA 30 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 WOOD CASEWORK

- A. Wood Laboratory Casework :
 - 1. Design: Reveal overlay with square edges, unless otherwise indicated.
 - 2. Provide 1/8-inch (3.2-mm) reveals between doors and drawers that are adjacent.

3. Wood Species and Finish: As indicated on Drawings.
4. Grain Direction:
 - a. Doors: Vertical with continuous vertical matching.
 - b. Drawer Fronts: Vertical with continuous vertical matching.
 - c. Face Frame Members: Lengthwise.
 - d. End Panels: Vertical.
 - e. Bottoms and Tops of Units: Side to side.
 - f. Knee Space Panels: Vertical.
 - g. Aprons: Horizontal.
5. Acceptable product and manufacturer: As indicated on Drawings.

B. Exposed Materials:

1. Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
2. Plywood: Hardwood plywood, either veneer core or particleboard core with face veneer of species indicated. Grade A exposed faces, at least 1/50 inch (0.5 mm) thick, and Grade J crossbands. Provide backs of same species as faces.
3. Solid Wood: Clear hardwood lumber of species indicated.
4. Edgebanding: Manufacturer's standard PVC.

C. Semiexposed Materials:

1. Wood: Provide solid wood or hardwood plywood for semiexposed surfaces unless otherwise indicated.

D. Concealed Materials:

1. Solid Wood: With no defects affecting strength or utility.
2. Plywood: Hardwood plywood. Provide backs of same species as faces.
3. Particleboard.
4. MDF.
5. Hardboard.

E. Wood Cabinet Materials:

1. General: Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
2. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.
3. MDF: Medium-density fiberboard, ANSI A208.2, Grade 130.
4. Particleboard: ANSI A208.1, Grade M-2.
5. Straw-Based Particleboard: ANSI A208.1, Grade M-2, except for density.
6. Hardboard: ANSI A135.4, Class 1 tempered.
7. PVC Edgebanding for Wood: Rigid PVC extrusions, through color with satin finish, 3.0 mm thick at doors and drawer fronts, 1.0 mm thick elsewhere.

2.4 AUXILIARY CABINET MATERIALS

- A. Acid Storage-Cabinet Lining: 1/4-inch- (6-mm-) thick, polyethylene, polypropylene, epoxy, or phenolic-composite lining material.

2.5 CABINET HARDWARE

- A. Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.

2.6 COUNTERTOP AND SINK MATERIALS

- A. Epoxy Resin (ERC):
 - 1. Description: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.
 - 2. Physical Properties:
 - a. Flexural Strength: Not less than 10,000 psi (70 MPa).
 - b. Modulus of Elasticity: Not less than 2,000,000 psi (1400 MPa).
 - c. Hardness (Rockwell M): Not less than 100.
 - d. Water Absorption (24 Hours): Not more than 0.02 percent.
 - e. Heat Distortion Point: Not less than 260 deg F (127 deg C).
 - 3. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
 - b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
 - 4. Color: As indicated on Drawings.
 - 5. Acceptable product: Equivalent to Kemresin by Kewaunee.

2.7 WOOD CABINET FABRICATION

- A. Construction: Provide wood-faced laboratory casework complying with SEFA 8 W.
 - 1. General: Comply with dimensions on shop drawings.
 - 2. Bottoms of Base Cabinets and Tall Cabinets: 3/4-inch- (19-mm-) thick, hardwood plywood.
 - 3. Tops and Bottoms of Wall Cabinets and Tops of Tall Cabinets: 1-inch- (25-mm-) thick, veneer-core hardwood plywood.
 - 4. Ends of Cabinets: 3/4-inch- (19-mm-) thick, hardwood plywood.
 - 5. Shelves: 1-inch- (25-mm-) thick, veneer-core hardwood plywood.
- B. Tables: Solid-hardwood legs, not less than 2 inches (50 mm) square with solid-hardwood stretchers as needed to comply with product standard. Bolt stretchers to legs and cross-stretchers, and bolt legs to table aprons. Provide leveling device at bottom of each leg.
 - 1. Leg Shoes: Black vinyl or rubber, open-bottom, slip-on type.
- C. Removable Backs: Provide backs that can be removed from within cabinets at utility spaces.
- D. Filler and Closure Panels: Provide where indicated and as needed to close spaces between casework and walls, ceilings, and equipment. Fabricate from same material and with same finish as adjacent exposed casework surfaces unless otherwise indicated.

2.8 WOOD FINISH

- A. Preparation: Sand lumber and plywood before assembling. Sand edges of doors, drawer fronts, and molded shapes with profile-edge sander. Sand after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.
- B. Staining: Remove fibers and dust and apply stain to exposed and semiexposed surfaces as necessary to match approved Samples. Apply stain to produce a consistent appearance. Apply wash-coat sealer before applying stain to closed-grain wood species.
- C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard three-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
 - 1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8 W. Acceptance level for chemical spot test shall be no more than for Level 3 conditions.

2.9 COUNTERTOPS AND SINKS

- A. Countertops:
 - 1. Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch (25 mm).
 - 2. Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.
- B. Sinks: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
 - 1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2 (DN 40), unless otherwise indicated.
 - 2. Overflows: Where indicated, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches (50 mm) less than sink depth. Provide in same material as strainer.

2.10 LABORATORY ACCESSORIES

- A. Reagent Shelves: Provide as indicated, fabricated from same material as adjacent countertop unless otherwise indicated.
- B. Burette Rods: Aluminum or stainless steel rods, 1/2 inch (13 mm) in diameter and 18 inches (450 mm) long, threaded on one end to fit tapered plug adapter for flush socket receptacle. Provide with tapered plug adapter and receptacle.
- C. Upright Rod Assembly and Metal Crossbar: Aluminum or stainless steel. Two vertical rods and one horizontal crossbar, 3/4 inch (19 mm) in diameter and 36 inches (900 mm) long unless otherwise indicated; two flush socket receptacles and two crossbar clamps. Ends of vertical rods are tapered to fit receptacles; other rod ends are rounded.

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- D. Greenlaw Arm Assembly: Aluminum or stainless steel vertical rod, tapered on one end to fit flush socket receptacle. Adjustable crossbar of hardwood with black, acid-resistant finish, secured to upright with adjustable clamp. Provide with receptacle.
- E. Lattice Assembly: Aluminum or stainless steel, vertical and horizontal rod lattice assembly with 3/4-inch- (19-mm-) diameter rods at approximately 12 inches (300 mm) o.c. with two flush socket receptacles for mounting.
 - 1. Size: **[36 inches (900 mm)] [48 inches (1200 mm)]** wide by **[24 inches (600 mm)] [36 inches (900 mm)]** high.
- F. Pegboards: Polypropylene, epoxy, or phenolic-composite pegboards with removable polypropylene pegs and stainless steel drip troughs with drain outlet.

2.11 WATER AND LABORATORY GAS SERVICE FITTINGS

- A. Service Fittings: Provide units that comply with SEFA 7, "Recommended Practices for Fixtures." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
 - 1. Provide units that comply with "Vandal-Resistant Faucets and Fixtures" recommendations in SEFA 7.
- B. Materials: Fabricated from cast or forged red brass unless otherwise indicated.
- C. Finish: As selected by Architect from manufacturer's full range.
- D. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig (550 kPa).
- E. Ball Valves: Chrome-plated ball and PTFE seals. Handle requires no more than 5 lbf (22 N) to operate. Provide units designed for working pressure up to 75 psig (520 kPa), with serrated outlets.
- F. Ground-Key Cocks: Tapered core and handle of one-piece forged brass, ground and lapped, and held in place under constant spring pressure. Provide units designed for working pressure up to 40 psig (280 kPa), with serrated outlets.
- G. Steam Valves: Stainless steel seat and PTFE seat disc. Provide units designed for steam working pressure up to 20 psig (140 kPa), with serrated outlets.
- H. Needle Valves: Provide units with renewable, self-centering, floating cones and renewable seats of stainless steel or Monel metal, with removable serrated outlets.
- I. Hand of Fittings: Furnish right-hand fittings unless fitting designation is followed by "L."
- J. Remote-Control Valves: Provide needle valves, straight-through or angle type as indicated for fume hoods and where indicated.
- K. Handles: As selected by Architect; meeting the requirements of ADA.

- L. Service-Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service-fitting handle to be tamper resistant. Comply with SEFA 7 for colors and embossed identification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CASEWORK

- A. Comply with installation requirements in SEFA 2. Install level, plumb, and true in line; shim as required using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
 - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet (1.5 mm in 3 m).
 - 2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch in 10 feet (3 mm in 3 m).
 - 3. Variation of Faces of Casework from a True Plane: 1/8 inch in 10 feet (3 mm in 3 m).
 - 4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch (0.8 mm).
 - 5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch (1.5 mm).
- B. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.
- C. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions, with fasteners spaced not more than 16 inches (400 mm) o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.
 - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches (600 mm) o.c. and at sides of cabinets with not less than two fasteners per side.
- D. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 16 inches (400 mm) o.c.
- E. Install hardware uniformly and precisely.
- F. Adjust operating hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF COUNTERTOPS

- A. Comply with installation requirements in SEFA 2. Abut top and edge surfaces true in plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints where indicated on Shop Drawings.

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- B. Field Jointing: Where possible, make in same manner as shop-made joints, using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Shop prepare edges for field-made joints.
 - 1. Countertops: Secure field-made joints using concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a uniform heavy pressure at joints.
 - C. Fastening:
 - 1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
 - 2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches (1200 mm) o.c.
 - 3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch (3 mm) and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
 - D. Provide holes and cutouts required for service fittings.
 - E. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
 - F. Dress joints smooth, remove surface scratches, and clean entire surface.
- 3.4 INSTALLATION OF SINKS
- A. Comply with installation requirements in SEFA 2.
 - B. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive, and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement. Remove excess sealant or adhesive while still wet and finish joint for neat appearance.
- 3.5 INSTALLATION OF LABORATORY ACCESSORIES
- A. Install accessories according to Shop Drawings, installation requirements in SEFA 2, and manufacturer's written instructions.
 - B. Securely fasten adjustable shelving supports, stainless steel shelves, and pegboards to partition framing, wood blocking, or reinforcements in partitions.
 - C. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.
 - D.

3.6 INSTALLATION OF SERVICE FITTINGS

- A. Comply with requirements in other Sections for installing water and laboratory gas service fittings and electrical devices.
- B. Install fittings according to Shop Drawings, installation requirements in SEFA 2, and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.

3.7 CLEANING AND PROTECTING

- A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil (0.15-mm) plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches (1200 mm) o.c.

END OF SECTION

SECTION 14 2100**ELECTRIC TRACTION ELEVATORS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Machine room-less electric traction elevator systems.
- B. Coordination Requirement: Elevator controls, signals, signage and cab finishes shall be the same for all elevators within the Project.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Division 05 Section METAL FABRICATIONS for sill support angles, hoisting beam, and pit ladder.
- B. See Division 26 for communications and alarm systems for fire and life safety systems and electrical provisions, including fused disconnect switches for elevator system, service to control panels, hoistway outlets, pit outlets, lights and electric service.

1.3 ACTION SUBMITTALS

- A. Professional Certification: Provide Shop Drawings and engineering calculations prepared and sealed by elevator manufacturer as the elevator designer of record.
- B. Professional Certification: Provide Shop Drawings and engineering calculations prepared and sealed by elevator manufacturer as the elevator designer of record.
- C. Product Data:
 - 1. Submit for elevator system, including capacities, sizes, performances, operations, safety features, finishes and similar information.
 - 2. List and describe features of control systems.
 - 3. Include environmental limitations for each item or component part.
 - 4. Include catalog cuts for manufacturer's standard signal and operating fixtures, operating panels, indicators and other similar components.
 - 5. Submit manufacturer's specifications and installation instructions for acoustic isolation pads, including load and deflection curves.
- D. Shop Drawings:
 - 1. Submit Shop Drawings showing plans, elevations, sections and details of elevator system.
 - 2. Include reference to Work of related trades and details at adjacent construction.
 - 3. Indicate:
 - a. Sections of elevator shaft.
 - b. Plan of elevator machine showing location and sizes of equipment and required clearances.

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- c. Locations of equipment, including safety guards.
 - d. Complete wiring and single line diagrams of system circuits and controls, showing electrical connections, functions, components, and sequence of operation of all apparatus connected with elevator system.
 - e. Detailed drawings of elevator cab and hoistway entrances, including elevations, floor plans, reflected ceiling plans and complete details of doors, frames, controls, fixtures and accessory equipment.
 - f. Rail bracket spacing and maximum loads on guide rails.
 - g. Reactions at points of support.
 - h. Weights of principal components.
 - i. Loads on hoisting beams.
 - j. Expected heat dissipation of elevator equipment.
 - k. Power configuration data, including horsepower, voltage and amperage requirements, starting current, full load running current and demand factor for applicable motors. Include maximum and average power demands.
 - l. Variations from specified requirements.
4. Include details of access control system provisions.

E. Samples:

1. Manufacturer's samples: Submit full range of standard color, texture and finish samples for final selection by Architect.
2. Sample sets:
 - a. Following selections, submit samples for each type of exposed cab, hoistway entrance and signal finish showing color, texture and finish expected in completed Work.
 - b. Samples shall be minimum 12 inch long for running trim and 12 inch square for sheet or panels.

1.4 INFORMATIONAL SUBMITTALS

A. Certificates:

1. Submit manufacturer's certification that elevator system provided is compatible with requirements of Final Contract Documents in the following respects:
 - a. Hoistway, pit and machine dimensions and clearances are adequate.
 - b. Electrical service and emergency generator as designed are suitable for elevator equipment provided.
2. Submit certification of fire retardant treatment for wood materials within elevator cabs stating name of fire retardant salts used, compliance with requirements of authorities having jurisdiction, compliance with AWPA standards, and stating that fire retardant treatment will not bleed through or otherwise adversely affect specified finish.
3. Submit inspection certificates and operating permits required by governing authorities.

- B. Qualification Data: Submit installer qualifications verifying years of experience and approval of manufacturer; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Submit operation, cleaning and maintenance data for materials and systems provided.

2. Include description of elevator system method of operation and control, including door operation, signals, fire fighter's service, emergency power operation, and other special or non-standard features provided.
3. Provide parts catalogs with complete list of equipment replacement parts with equipment description and identifying numbers.
4. Provide legible schematic wiring diagrams covering electrical equipment installed, including changes made in final Work, with symbols listed corresponding to identity or markings on both machine and hoistway apparatus.
5. Provide following maintenance details:
 - a. Lubrication chart.
 - b. Trouble shooting procedures.
 - c. Adjustment techniques.
 - d. Operating checks.
6. Include copy of submittal in Project information manual.

1.6 DEFINITIONS

- A. Terms used within specification Sections related to elevators are defined in ASME A17.1.

1.7 SYSTEM REQUIREMENTS

A. Design Requirements:

1. Contract Documents are intended to cover complete installation of elevator systems and to broadly outline performance requirements, features, equipment, material selections, fabrication methods and installation procedures.
2. Contractor is responsible for design, engineering and detailing of systems as required to fulfill performance criteria and comply with requirements of authorities having jurisdiction.

B. Performance Requirements:

1. Speed: $\pm 5\%$ under loading conditions.
2. Leveling: $\pm 1/4$ inch under any loading condition.

C. Fire Resistance Requirements:

1. Protect wiring with flame retardant and moisture proof outer covering, and run in conduit, tubing or electrical wireways.
2. Treat wood components of elevator cabs with fire retardant treatment conforming to requirements of authorities having jurisdiction and AWWA Standards C20 for lumber and C27 for plywood for pressure impregnation with fire retardant chemicals to achieve flame spread rating of 25 or less in accordance with ASTM E84.

D. Electric Wiring Requirements:

1. Wiring and electrical interconnections shall comply with governing codes.
2. Provide wiring and required raceways between components furnished for elevator Work.

E. Acoustic Requirements: Mount rotating and vibrating elevator equipment and components on vibration-absorption mounts, designed to effectively prevent transmission of vibrations to structure and minimize noise from elevator system.

F. Interface With Other Systems:

1. Coordinate elevator Work with Work of other trades and provide items to be placed during installation of other Work at proper time so as to avoid delays in overall Work.
2. Place such items, including inserts and anchors, accurately in relation to final locations of elevator components.
3. Use Contractor's bench marks.
4. Access control system:
 - a. Coordinate elevator systems with requirements of Owner's separate security system contractor.
 - b. Provide necessary installation provisions, including materials and assistance, as required for coordination and proper operation of completed systems.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 5 years documented, successful experience with work comparable to Work of this Project; either elevator manufacturer or licensee of manufacturer.
- B. Maintenance Personnel Qualifications: Employees of elevator installer.
- C. Regulatory Requirements:
 1. Comply with requirements of local authority having jurisdiction and any authority which may govern requirements for elevators.
 2. Except as may be modified by governing authorities, comply with applicable requirements and provisions of the following:
 - a. ASME A17.1 "Safety Code for Elevators and Escalators".
 - b. ANSI A117.1 "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People".
 - c. Uniform Federal Accessibility Standard (UFAS).

1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, at Contractor's direction, meet at site and review installation procedures and coordination with other Work.

1.10 PROJECT CONDITIONS

- A. Verify dimensions of supporting structure at site by accurate field measurements so that elevator Work will be accurately fabricated and fitted to structure and that clearances and alignments are proper for installation of Work.
- B. Provide for erection tolerances corresponding with specified tolerances for other Work where field measurements cannot be obtained.
- C. Remedy unsatisfactory tolerances in adjoining Work.

1.11 MAINTENANCE SERVICE

- A. Temporary Interim Service:
 1. When elevators have been installed to stage near completion and declared ready for service prior to completion and final acceptance of complete elevator system (start of

maintenance and warranty periods), Owner may accept elevator for building use on interim basis.

2. During period prior to final acceptance, Owner will pay mutually agreed amount for each day for each unit for maintenance of elevator accepted for interim use.
3. During interim service period, user shall provide protection of cab, entrances and fixture to prevent damage.

B. Initial Maintenance Service:

1. Maintain service of equipment for period of 12 months after date of final acceptance.
2. Examine monthly; clean, adjust, and lubricate equipment.
3. Repair or replace parts whenever required. Use parts produced by manufacturer of original equipment.
4. Perform work without removing cars from service during peak traffic periods.
5. Provide emergency call back service 24 hours a day, seven days a week.
6. Locally maintain adequate stock of parts for replacement or emergency purposes and have qualified installation personnel available to ensure fulfillment of this maintenance service without unreasonable loss of time.
7. Maintenance service shall not be assigned or transferred to another agent or subcontractor without prior written consent of Owner.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Products and Manufacturers: Design is based on Rail Mounted Machine by MEI Total Elevator Solutions to establish standard of quality.
1. Equivalent systems by other manufacturers may be acceptable provided they comply with requirements of Contract Documents:

2.2 ELEVATOR SCHEDULE

A. Elevator:

1. Rated load:[**Architect to provide**].
2. Rated speed: 150 fpm.
3. Floors served: \As indicated on Drawings.
4. Stops and openings: As indicated on Drawings..
5. Power supply: 480 volt, 3 phase, 60 hertz.
6. Machine type and location:
 - a. Gearless traction machine, for machine room-less system.
 - b. Controller location: To be located with fire alarm panel in nearest electrical room.
7. Operation: Selective collective Automatic.
8. Hoistway entrances: As indicated on Drawings.
9. Cab size (inside dimensions): As indicated on Drawings.
10. Cab height: 8'-0 to canopy with 7'-4" clear at ceiling.
11. Cab doors: Same size as hoistway doors, single-speed center opening.
12. Home landing/Fire Floor: First Floor, unless otherwise required by Fire Marshall.
13. Additional features:
 - a. Audible signals at landings and in cab.
 - b. Anti-nuisance device to sound buzzer when door is propped open.

- c. Service cabinet.
- d. Intercom system.
- e. Access control service (key switch/card access).

2.3 EQUIPMENT

- A. Motors, Controller, Controls, Buttons, Wiring, Devices, and Indicators: UL approved.
- B. Guide Rails, Ropes, Cables, Counterweights, Sheaves, Buffers, Attachment Brackets and Supports, and Anchors: Designed and sized according to code with applicable safety factors.
- C. Controllers:
 - 1. Provide microprocessor-based control system with software suitable for intended building occupancy to perform car operational control and hardware necessary to connect, transfer and interrupt power and protect motor against overloading.
 - 2. Properly shield controller cabinet containing memory equipment from line pollution.
 - 3. Design and test controller for electromagnetic interference (EMI) immunity.
 - 4. Equip controller with the following filters and gaskets to reduce EMI emissions to levels that comply with EN 12015 “EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 1 – Emission”:
 - 1) Current harmonic filter.
 - 2) Anti-pollution device.
 - 3) Single phase filter.
 - 4) Current controlled choke
 - 5) Conductive fabric over foam gaskets.
 - 5. Design microprocessor system to accept re-programming with minimum down time.
- D. Elevator Machines:
 - 1. Gearless traction machine: AC gearless machine, with synchronous permanent-magnet motor, dual solenoid service and emergency disc brakes, mounted at the top of the hoistway.
 - 2. Governor: Tension-type governor.
 - 3. Variable-voltage, variable-frequency AC-type hoisting machine.
 - a. Reversible motor with high starting torque and low starting current designed to withstand severe loads encountered in elevator service; rated for 30 minutes, conforming to NEMA standards.
 - b. Provide Class A insulation for 50 deg C rise.
 - c. Provide sufficient capacity to operate with contract load at contract speed.
 - d. Provide motor starting controls such that under no circumstances shall motor starting current exceed 3.0 times motor full load current.
 - e. Voltage control:
 - 1) Provide elevator manufacturer's solid-state power converters.
 - 2) Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.
- E. Coated Steel Belts: Polyurethane coated belts with high-tensile-grade, zinc-plated steel cords.

2.4 COMPONENTS

- A. Car:

1. Frame and platform:
 - a. Construct frame of structural or formed steel members.
 - b. Construct platform of steel reinforcing with steel plate.
 - c. Mount platform on resilient pads.
 - d. Finish flooring: **ARCHITECT TO PROVIDE**
2. Shells:
 - a. Fabricate from manufacturer's standard gage sheet steel for walls and canopy, suitably reinforced for rigidity and cut out for accessories and panels.
 - b. Make joints between panels vertical, flush, even and light tight.
 - c. Provide vents at bottom of panels.
 - d. Provide sound deadening at backs of panels.
 - e. Provide black finish on panel recesses and corner straps.
 - f. Reinforce canopy/ceiling construction as necessary to maintain loads applied during car top inspection.
 - g. Provide car top emergency and inspection hatches as required by code.
 - h. Provide side emergency access panels as required by code.
 - i. Provide car top railings as required by code.
3. Finish Cab Panels and Ceiling
 - a. Cab wall panels: Plastic laminate panels. Cab ceiling to be #4 stainless steel panels with recessed LED downlights.
 - b. Cab railing to be stainless steel.
4. Door panels:
 - a. Flush hollow metal construction, minimum 16 gage sheet steel, sound deadened, minimum 1 inch thickness; stainless steel clad finish.
 - b. Reinforce by continuous vertical reinforcing as required for adequate support and surface flatness for configurations indicated.
 - c. Provide each door panel with 2 accurately machined guides of design that will permit replacement without removal of doors.
5. Return panels:
 - a. Front return walls: 16 gage stainless steel, satin finish.
 - b. Fixed configuration, suitably reinforced as required for surface flatness and support of equipment cutouts.
 - c. Incorporate operating controls, control panel, signals, required signage, certificate holder, telephone cabinets and other features as required, indicated or specified.
 - d. Finish: Stainless steel.
6. Sills: Extruded aluminum.
7. Ventilation:
 - a. Provide exhaust unit with 2-speed operation.
 - b. Furnish suitable isolation mountings and sound insulation to provide quiet operation.
8. Emergency lighting: Furnish one emergency light in cab; manufacturer's standard, unless otherwise indicated.
9. Telephone and cabinet:
 - a. Provide cabinet for cab; in front return.
 - b. Provide phone for emergency communications, connected to Owner's security vendor's office for 24-hour monitoring, as required to comply with authorities having jurisdiction and with requirements of UFAS. Provide telephone with the following features:
 - 1) Battery back-up system.

- 2) Internal speaker and microphone, for use without handset. Mount speaker button 4'-0" maximum above car floor.
- 3) Emergency communication system shall not require voice communication. At a minimum, provide both audio and visual indication that call has been answered.
- 4) Field-programmable auto-dial memory and location identification signal device, activated by push button which illuminates when call is answered.
- 5) Raised tactile lettering in panel, reading "EMERGENCY USE ONLY", and providing instructions for use in both English and Braille.

B. Hoistway Entrances:

1. Fire rating:
 - a. Fabricate assemblies as tested and approved by Underwriters' Laboratories or other nationally recognized testing agency approved by authorities having jurisdiction.
 - b. Comply with requirements of NFPA 80.
 - c. Comply with requirements of ASTM E152, NFPA 252m or UL 10B.
2. Identify each assembly with factory applied label indicating applicable fire rating.
3. Doors:
 - a. Fabricate doors of flush hollow metal construction, minimum 16 gage sheet steel; minimum 1-1/4 inch thick, stainless steel clad.
 - b. Reinforce by continuous vertical reinforcing as required for adequate support and surface flatness for configurations indicated.
 - c. Provide sight guards formed of minimum 16 gauge steel, finish to match exposed door finish.
 - d. Provide hoistway access escutcheons or devices on all hoistway doors.
4. Frames:
 - a. Fabricate frames of hollow metal construction, minimum 14 gage sheet steel with sound deadening material applied to back surface, clad frames with stainless steel.
 - b. Provide sizes and profiles indicated on Drawings.
5. Sills: Extruded nickel silver; manufacturer's standard profile.

C. Hoistway and Cab Door Operators:

1. General:
 - a. Provide adjustable heavy-duty electric operators designed to smoothly open and close cab and hoistway doors simultaneously.
 - b. Standing time:
 - 1) Normal time doors remain open after stopping for demand: Separately adjustable for car calls and landing calls, and capable of adjustment from minimum of 3 seconds to 30 seconds after doors reach fully open position.
 - 2) Initial adjustment: Set to minimum time equal to distance/1.5 feet per second for car call and 5.0 seconds for landing call.
2. Door safety devices:
 - a. Provide safety device with uniform array of 36 or more microprocessor-controlled infrared light beams projecting across car entrance. Interruption of one or more beams shall cause doors to stop and re-open.
 - b. Include audible warning signal and nudging feature which will slowly close doors held open for extended period of time.

D. Electrical Components:

1. Fittings: Steel compression type for electrical metallic tubing; fittings with set screws are acceptable only when separate grounding conductor is installed across joint.
2. Do not parallel conductors to increase current carrying capacity unless individually fused.
3. Do not use armored flexible metal conduit as grounding conductor.
4. Provide additional disconnect switches and wiring to suit machine layout.
5. Include wiring and connections to elevator devices remote from hoistway.

2.5 MATERIALS

- A. Carbon Steel: ASTM A1008, cold rolled, commercial quality sheet steel, free from scale, pitting or other defects; matte finish and stretcher leveled.
- B. Stainless Steel:
 1. Plate, sheet and strip: ASTM A666.
 2. Bars and shapes: ASTM A276.
 3. Tubing: ASTM A269.
 4. Castings: ASTM A297, iron-chromium-nickel.
 5. Provide Type 304, unless otherwise recommended by fabricator for conditions of application or required to match Architect's sample.
- C. Panel Materials:
 1. Plastic laminate: High pressure laminates, complying with NEMA LD3 and AWS Ed. 2, Section 4 Sheet Products. Provide the following grades:
 - a. Exposed vertical surfaces: VGS, nominal 0.028 inch (.71 mm) thick.
 2. Panel core material:
 - a. Mat-formed wood particleboard, medium density, complying with AWI 200-G-3.
 - b. Fire retardant treat panel cores as specified under "Fire Resistance Requirements" above.
- D. Protection Pads and Buttons: Provide at all elevators:
 1. Type: Flame resistant fabric and filling with sufficient stitching to prevent sagging of filling.
 2. Attachment devices: Manufacturer's standard stainless steel buttons and grommets.
 3. Cutouts: Provide cutouts for control stations and other signal devices.

2.6 SHOP FINISHES

- A. Carbon Steel:
 1. Finish: Manufacturer's standard factory baked enamel finish.
 2. Color: To be selected by Architect from manufacturer's full standard color range.
- B. Stainless Steel:
 1. Mechanical finishes are designated with NAAMM nomenclature.
 2. Finish: No. 4, satin, directional polish.
 3. Apply directional finishes in long direction of each component.

2.7 FINISH SCHEDULE

- A. Hoistway Entrances:
 1. Doors and Frames: Stainless Steel.

- B. Cab:
1. Doors: Stainless steel.
 2. Return panels: Stainless steel cladding.
 3. Side panels: Plastic laminate.
 4. Rear panels: Plastic laminate
 5. Canopy: Brushed stainless steel panels with recessed LED downlights.
 6. Base: Brushed stainless steel.
 7. Flooring: As noted on Drawings.
 8. Handrails:
 - a. Stainless steel; 1-1/2 x 1 inch, with closed ends.
 - b. Provide for both side walls.

2.8 CONTROLS, SIGNALS AND SIGNAGE

- A. Cab Controls and Signals:
1. Car operating panel in front return:
 - a. Incorporate car operating controls, control panel, signals, signage, certificate holder, telephone cabinets, and other features.
 - b. Provide one operating panel, in front return.
 - c. Buttons:
 - 1) Flush stainless steel buttons of vandal-resistant design, of minimum 3/4 inch diameter, corresponding to each landing served, "door open" and "door close", with illuminated center plastic bezel.
 - 2) When pressed, buttons illuminate and remain illuminated until call is answered.
 - d. Additional controls: Emergency call buttons, stop switch, fire department keyed switch, and independent service switch.
 - e. Provide raised markings and Grade 2 braille to left of each button, in compliance with UFAS; markings and braille shall be black on stainless steel plate of same finish as front return panels.
 - f. Conceal the following items in panel:
 - 1) Run/stop key switch, lighting, top-of-car inspection, and fan.
 - 2) GFI outlet.
 - g. Provide connected handset for fire communication equipment in one telephone cabinet.
 - h. Provide fully connected phone for emergency communications equipment in other telephone cabinet.
 2. Car position indicators:
 - a. Digital LED type, with minimum 1/2 inch high numerals.
 - b. Mount over car operating panel.
 - c. As car passes each floor and as car stops at a floor, the corresponding numerals shall illuminate and an audible signal shall sound. Audible signal in car shall sound minimum of 5 seconds before doors open.
- B. Hall Buttons:
1. At each terminal landing, provide single push button.
 2. At each intermediate landing, provide button fixture containing "UP" and "DOWN" push buttons.
 3. Provide one hall button panel on each floor.
 4. Buttons:

- a. Flush stainless steel buttons of vandal-resistant design, of minimum 3/4 inch diameter, with illuminated center plastic bezel.
 - b. When pressed, buttons illuminate and remain illuminated until call is answered.
 5. Provide raised markings and Grade 2 braille to left of each button, in compliance with ANSI and UFAS; markings and braille shall be black on stainless steel plate of same finish as call button plate.
 6. Configuration and finish:
 - a. Mount in manufacturer's standard satin finish stainless steel plate.
 - b. Incorporate key switch as specified above under "Fire Emergency Operation", and card readers as specified below under "Access Control Operations".
- C. Hall Lanterns:
 1. Direction lantern of vandal-resistant design, illuminating white for up and white for down, over each hoistway entrance. Secure using tamper-resistant screws.
 2. Lantern illuminates indicating direction of travel.
 3. Audible signal:
 - a. Provide lantern with gong sound approximately four seconds before car door opening; once for up direction, twice for down direction.
 - b. Equip gong with adjustable volume.
 - c. Permit gong to sound in response to hall calls but not in response to car calls.
 4. Faceplate material: Manufacturer's standard satin stainless steel.
- D. Hall Car Position Indicators:
 1. Integral digital or LED read-out type position indicator of vandal-resistant design, at First Floor only. Secure using tamper-resistant screws.
 2. Provide floor designations and direction arrows.
 3. Faceplate material: Manufacturer's standard satin stainless steel.
 4. Provide separate vandal-resistant lantern with lights and chimes, in accordance with "Hall Lanterns" in paragraph above.
- E. Emergency and Braille/Number Signage:
 1. General: Provide as required by authorities having jurisdiction.
 2. Emergency signage:
 - a. Cabs: Text shall be engraved in stainless steel front return panel, with etched letters infilled with black enamel.
 - b. Halls: Text shall be etched in satin stainless steel plate below hall buttons, with etched letters infilled with black enamel.
 3. Cab braille/number signage: As specified above under "Cab Controls".
 4. Hall braille/number signage: As specified above under "Hall Buttons".
 5. Hoistway jamb braille/number plates:
 - a. Provide combination braille/number plates on both sides of each hoistway entrance, to identify floor. Characters shall be at least 2 inches high.
 - b. Permanently mount plates using adhesive, centered in frame width and 5'-0" to center of jamb plate above finish floor. Exposed fasteners are not acceptable.

2.9 FABRICATION

- A. Fabricate and assemble various parts in shop to minimize field assembly.

- B. Trial assemble parts which cannot be shop assembled and which require close field fit; mark for field erection.
- C. Do not permit name plates or logos identifying manufacturer to be visible to general public.
- D. Provide concealed fasteners on surfaces exposed to public view.
- E. Factory finish components concealed from public view with manufacturer's standard finish systems.

2.10 ELEVATOR OPERATIONS

- A. Fire Emergency Operation:
 - 1. Provide in accordance with requirements of local authorities and ASME A17.1.
 - 2. Connect elevator to auxiliary (isolated) contacts of smoke and heat sensing devices. When smoke is detected by elevator lobby devices or others, registered calls for elevator are canceled and car automatically returns to designated Fire Floor. If smoke is detected on Fire Floor, cars stop on floor above Fire Floor.
 - 3. Fire Floor: Unless otherwise determined by Fire Marshall, provide as scheduled above.
 - 4. Cab provisions: Provide three-position keyed switch in cab control panel to provide for fireman's access.
 - 5. Hoistway entrance provisions:
 - a. Provide three-position key switch at designated Fire Floor.
 - b. Incorporate key switch into hall call button faceplate, unless otherwise required by Fire Marshall.
 - c. Provide with manufacturer's standard, surface mounted key box (for key required to call or operate elevators); mount where directed by Fire Marshall.
 - d. Match finish of key box with finish of hall call button plate. Engrave faceplate to read "EMERGENCY ONLY", and incorporate pictographs into faceplate.
 - 6. Fire emergency control and operation must be approved by Fire Marshall prior to fabrication.
- B. Emergency Power Operation:
 - 1. Provide emergency power of same characteristics as normal power supply (by connection to building emergency generator system) capable of providing power for operation of car after loss of normal power.
 - 2. Coordinate with emergency generator requirements, to verify that emergency generator has adequate capacity to handle emergency startup power.
 - 3. Provide emergency power operation to satisfy requirements of fire emergency control under emergency power conditions.
- C. Access Control System Operation - Card Reader Operation:
 - 1. Location of card reader: Inside of elevator.
 - 2. General: As part of elevator operation and control, provide equipment and labor necessary to coordinate elevator control system with Owner's access control system. This elevator Work shall include, but not be limited to, the following:
 - a. Provide shielded signal cabling and wiring from access control system termination strip cabinet to hall call buttons, and to car as required for operation of access control system via traveling cable.

- 1) Provide quantity and gage of shielded cables and wires as required by Owner, including those required for supervision of signal lines.
- 2) Provide access control system termination strip as part of elevator Work.
- b. Make provisions for installation of card reader in car operating panel. Provide faceplate cutouts in accordance with Owner-furnished templates. Card reader will be furnished and installed by Owner.
3. Operation: Owner's access control system will provide for automatic controlled use of elevator, on a 24 hour a day basis.

2.11 CONTROL/INDICATOR PANELS

A. Supervisory Control Panel:

1. Provide manufacturer's standard panel located in electrical control room.
2. Provide keyed override switch in electrical control room, to override access control system in the event of access control system failure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting structure and conditions under which elevator Work will be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Verify that hoistway, pit, and equipment room comply with applicable standards and requirements of Contract Documents.
- C. Review and approve structural tolerances, location of structural supports, miscellaneous metal fabrications, pit ladders, hoistway construction, heating, ventilating and air conditioning of equipment rooms; ventilating of hoistways; and electrical power, lighting and outlets required for elevator Work.
- D. Verify that sill support angles are properly installed.

3.2 INSTALLATION

- A. Install components of elevator system in accordance with final Shop Drawings, manufacturer's written instructions and requirements of ASME A17.1.
- B. Install hoistway and control room components. Connect equipment to building utilities.
- C. Provide conduit, boxes, wiring and accessories within control room, hoistway and signal outlets.
- D. Welded Construction:
 1. Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts.
 2. Comply with AWS standards for workmanship and for qualifications of welding operators.

- E. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to minimize transmission of vibrations to structure and thereby minimize structure-borne noise from elevator system.
- F. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.
- G. Alignment:
 - 1. Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car.
 - 2. Where possible, delay final adjustment of sills and doors until car is operable in shaft.
 - 3. Reduce clearances to minimum, safe, workable dimension at each landing.
- H. Leveling Tolerance: 1/8 inch up or down, regardless of load and direction of travel.
- I. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.
- J. Locate hall signal equipment for elevators as follows, unless otherwise indicated:
 - 1. Place hall lanterns beside each hoistway entrance.
 - 2. Mount hall lanterns at a minimum of 72 inches above finished floor.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing:
 - 1. On completion of elevator installation and before permitting use (either temporary or permanent) of elevator, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.
 - 2. Test security system and devices for proper operation.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on elevators.
- C. Test Results: In test conditions, ensure speed and performance times specified be met, leveling accuracy maintained without releveling, and general riding quality is acceptable to Owner.
- D. Performance Adjustments:
 - 1. Should tests uncover defects or poor workmanship, variance or noncompliance with requirements of specified codes and ordinances or variance or noncompliance with specified requirements, complete following Work and repairs at no additional expense to Owner.
 - 2. Replace equipment that does not meet ASME A17.1 or specified requirements.
 - 3. Perform Work and furnish materials and equipment necessary to complete specified operation and performance.
 - 4. Perform retesting required by governing authority and Owner to verify specified operation or performance.

3.4 ADJUSTING

- A. Balance car to equalize pressure of roller guide shoes on rails.

- B. Adjust motors, pumps, valves, generators, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, safety devices and other components to achieve required performance levels.
- C. Adjust car movement on aligned guide rails to provide smooth movement, with no perceptible lateral or oscillating movement or vibration.

3.5 CLEANING

- A. Keep Work areas orderly and free from debris.
- B. Remove loose materials and filings resulting from Work within hoistways.
- C. Prior to field quality control testing and inspection:
 - 1. Clean equipment and surrounding areas of dirt, oil and grease.
 - 2. Remove temporary protection and clean pit, hoistway, car, cab enclosures and finishes, entrances and landing sills, hatch, operating and signal fixtures, and trim to remove dirt, oil, grease and finger marks.

3.6 DEMONSTRATION

- A. Instruct Owner's personnel in proper use, operation and daily maintenance of elevators.
 - 1. Review emergency provisions, including access and procedures to be followed in identifying sources of operational failures or malfunctions.
 - 2. Confer with Owner on requirements for a complete elevator maintenance program.
 - 3. Demonstrate coordination between elevator and emergency generator operations.
 - 4. Demonstrate operation of elevator access control system.
- B. Check each elevator operation, with Owner's personnel present just prior to time of Substantial Completion. Determine that control system, operating components, and safety devices are functioning properly.

3.7 PROTECTION

- A. At time of substantial completion of elevator Work, provide suitable protective coverings, barriers, devices, signs or such other methods or procedures to protect elevator Work from damage or deterioration.
- B. Maintain protective measures throughout remainder of construction period so that elevator systems and components will be without evidence of damage or use at time of acceptance.

END OF SECTION

SECTION 32 1800

ATHLETIC AND RECREATIONAL SURFACING

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Exterior resilient monolithic athletic surfacing.
 - 2. Accessories.
 - 3. Line markings.

1.2 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for athletic surfacing.
- B. Shop Drawings: Submit project-specific Shop Drawings, drawn to scale, of areas to receive athletic surfacing, showing overall dimensions, line marking layouts, and colors of surfacing and lines.
- C. Samples: Submit 12 inch square (300 mm square) samples of athletic surfacing in selected colors.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data:
 - 1. Submit cleaning and maintenance data for tiles.
 - 2. Include copy of submittal in Project information manual.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project, acceptable to athletic surfacing manufacturer.
- B. Regulatory Requirements: Comply with applicable provisions of Americans with Disabilities Act.

1.5 PRE-INSTALLATION CONFERENCE

- A. Prior to commencing Work, meet at Site and review installation procedures and coordination with other Work.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect products in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Acceptable Products and Manufacturers:
 - 1. Dynaflex Sports Surfacing by Neyra Industries Inc., Cincinnati, OH.
 - 2. CourtMaster by SealMaster, Inc., Sandusky, OH.

2.2 PRODUCTS

- A. Resilient Athletic Surfacing System:
 - 1. Description: Poured and troweled athletic surfacing system.
 - 2. Components:
 - a. Resurfacer: Lead-free Asphalt emulsion compound to fill and repair minor defects and depressions in asphalt concrete substrate.
 - b. Cushion: Liquid-applied, polymer emulsion manufactured with rubber particles and fillers.
 - c. Color coating:
 - 1) Acrylic color coating, asbestos-free, with ultraviolet-stabilizers against fading and bleaching.
 - 2) Mix with fine sand or mineral aggregate as recommended by manufacturer, and accepted by Architect, for conditions of use.
 - 3) Provide in colors indicated on Drawings.
 - d. Striping paint:
 - 1) Acrylic line-striping paint, asbestos-free, with UV-stabilizers against fading and bleaching; quick drying and nonbleeding.
 - 2) Provide in colors indicated on Drawings.

2.3 ACCESSORIES

- A. Provide manufacturer's recommended primers and other miscellaneous accessories as suitable for conditions of application and as required for complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Prepare and clean substrate to remove deleterious substances which would impair Work.

3.3 INSTALLATION

- A. Install system in accordance with manufacturer's recommendations and final Shop Drawings.

- B. Athletic Surfacing System:
 - 1. Patch depressions in substrate.
 - 2. Apply 1 or 2 coats of resurfacer as required by porosity of substrate, to provide smooth, uniform surface.
 - 3. Apply resilient cushion coat.
 - 4. Color coating:
 - a. Apply at least 2 coats of color coating to provide uniform, even-textured surface suitable for conditions of use.
 - b. Apply in locations and colors indicated on Drawings.
 - 5. Line striping:
 - a. Paint athletic line markings for basketball and volleyball, in layouts and colors indicated on Drawings.
 - b. Paint markings with straight, sharply defined parallel edges.
 - c. Apply number of coats as required to produce opaque markings, so that color coating does not show through.

3.4 PROTECTION

- A. Prohibit traffic on surfacing until system has cured and painted markings have set and hardened.
- B. Protect Work from damage during construction period so that it will be without any indication of use or damage at time of acceptance.

END OF SECTION

SECTION 32 3100

FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Exterior steel fence and gates at perimeter of property.
 - 2. Accessories.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 32 3126 PLAYGROUND FENCING.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each component.
- B. Shop Drawings:
 - 1. Submit project-specific Shop Drawings, drawn to scale, indicating construction and layout of fence and gate.
 - 2. Include locations, elevations, and anchoring conditions.
 - 3. Provide description and details of hardware for gates.
 - 4. Indicate finishes.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. Submit operation, cleaning and maintenance data for materials and systems provided.
 - 2. Include list of replacement parts and sources.
 - 3. Include copy of submittal in Project information manual.

1.5 QUALITY ASSURANCE

- A. Contractor Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for fences and gates shown on Drawings, in relation to structures in vicinity of fences and gates.
 - 1. Verify dimensions by field measurements.
 - 2. If field measurements can not be taken prior to fabricating fences and gates, no additional compensation will be allowed on account of differences between actual measurements and dimensions on Drawings.

1.7 WARRANTY

- A. Warrant fence components for a period of 10 years. Cover defects in material finish, including cracking, peeling, chipping, blistering or corroding.

PART 2 - PRODUCTS

2.1 FENCE

A. Materials:

1. Fence

- a. Steel plate for cold-forming: ASTM A283, grade selected by fabricator to suit Project conditions.
- b. Steel tubing: Cold formed, ASTM A500, grade selected by fabricator to suit Project conditions; or hot rolled, ASTM A501.
- c. Steel bars: ASTM A108, ASTM 29, ASTM A575 or ASTM A576, type and grade selected by fabricator to suit Project conditions.
- d. Steel sheet, galvanized: ASTM A653, grade as required for design loading; G60 coating.
- e. Brackets, flanges and anchors: Cut or formed metal of same material and finish as supported units, unless otherwise indicated.
- f. Provide G60 galvanized coating for steel components.
- g. Galvanizing repair paint: SSPC Paint 20.
- h. Fence pickets and rails: Dimensions as indicated, spaced as indicated. Punch holes in rail tops to allow pickets to pass through.
- i. Provide high quality PVC grommets to seal pickt-to-rail intersections.
- j. Fence posts: Size, spacing and configuration as indicated..

B. Gates:

- 1. Single or double gate of size indicated with hinges made from stainless steel and stainless steel vertical rod drop latch.
 - a. Provide self-closing hinges tested to minimum of 500,000 cycles and capable of closing gate up to maximum weight of 260 lbs with weight load capacity of 1500 lbs.
- 2. Provide posts to support each gate leaf and 1-1/2 inch square (1000 mm square) ends.
- 3. Include 2'-0" solid panel in gate to receive panic hardware.

C. Fittings and Accessories: As recommended by fence manufacturer. Tamper resistant.

D. Finish: See Section 09 9000 PAINTING AND FINISHING.

E. Fabrication:

- 1. Conform to dimensions and details indicated on Drawings.
- 2. Forming:
 - a. Form exposed Work true to line and level with accurate angles and surfaces and straight sharp edges.
 - b. Ease exposed edges to radius of approximately 1/32 inch (.8 mm) unless otherwise indicated.

- c. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible.
- F. Shop Finishing Galvanized Metal: Clean galvanized metal surfaces designated to be field painted in accordance with SSPC-SP1 "Solvent Cleaning", followed by SSPC-SP2 "Hand Tool Cleaning" or SSPC-SP3 "Power Tool Cleaning".

2.2 MISCELLANEOUS MATERIALS

- A. Concrete: Provide concrete in accordance with Section 03 3000 CAST-IN-PLACE CONCRETE, modified as follows:
 - 1. Aggregate: 1 inch (25 mm) maximum size.
 - 2. Compressive strength: 2500 psi (17200 kPa) minimum at 28 days.
 - 3. Cement factor: Not less than 4 bags of cement per cubic yard (.76 cubic meters) of concrete.
 - 4. Slump: 3 inches (75 mm) maximum.
 - 5. Entrained air content: 2 percent to 4 percent entrained air.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Posts:
 - 1. Drill or hand excavate with post hole digger holes for posts to spacings indicated, in firm, undisturbed or compacted soil.
 - 2. Place concrete immediately after mixing. Fill excavation with concrete in one pour. See Section 03 3000 CAST-IN-PLACE CONCRETE for general mixing, placing and curing requirements.
- B. Install fencing in accordance with manufacturer's instructions and final Shop Drawings.
- C. Install fencing so that clear space between ground and gate is less than 4 inches.

3.3 ADJUSTING AND CLEANING

- A. Upon completion of installation, test gate operation to demonstrate satisfactory operation acceptable to Owner.
- B. Adjust as required.

END OF SECTION

SECTION 32 3126

PLAYGROUND FENCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Description of Work: Work of this Section includes, but is not limited to, the following:
 - 1. Chain link fences and gates.
 - 2. Accessories.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. See Section 03 3000 CAST-IN-PLACE CONCRETE for general concrete requirements.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each component.
- B. Shop Drawings:
 - 1. Submit Shop Drawings indicating construction and layout of each type of fence and gate.
 - 2. Include locations, elevations, and anchoring conditions.
 - 3. Include wiring diagrams for electric gate operators.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. Submit operation, cleaning and maintenance data for materials and systems provided.
 - 2. Include list of replacement parts and sources.
 - 3. Include copy of submittal in Project information manual.

1.5 SYSTEM REQUIREMENTS

- A. Interface With Other Systems:
 - 1. Furnish inserts and anchoring devices which must be set in concrete for installation of units.
 - 2. Coordinate templates and anchorage devices with adjoining Work.

1.6 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of fence and gate, including accessories, mounting and other installation components, from a single source.
- B. Contractor Qualifications: Not less than 5 years documented, successful experience with work comparable to Work of this Project.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for fences and gates shown on Drawings, in relation to structures in vicinity of fences and gates.
 - 1. Verify dimensions by field measurements.
 - 2. If field measurements can not be taken prior to fabricating fences and gates, no additional compensation will be allowed on account of differences between actual measurements and dimensions on Drawings.

PART 2 - PRODUCTS

2.1 CHAIN LINK FENCES AND GATES

- A. Fabric:
 - 1. Fabricate to comply with Chain Link Fence Manufacturers Institute (CLFMI) "Product Manual" and with requirements indicated below.
 - 2. Type: Polyvinyl chloride (PVC)-coated galvanized steel wire, complying with ASTM F668, Class 2b (PVC coating fused and adhered to primer that is cured onto galvanized steel core wire).
 - a. Core wire: 9 gage (0.148 inch diameter) (3.8 mm) galvanized steel core wire, galvanized in accordance with ASTM A641, with minimum 0.30 oz/sf (90 g/sq. m/Z90) zinc coating.
 - b. PVC coating: Black, complying with ASTM F934.
 - 3. Fabric size:
 - a. 2 inch (50 mm) diamond mesh, helically wound and woven to fence heights shown on Drawings.
 - b. Fabricate in 1-piece widths.
 - 4. Selvages:
 - a. Knuckle at both selvages, for fence heights of less than 72 inches (1.8 m).
 - b. Knuckle at bottom selvage and twist at top selvage, for fence heights of 72 inches (1.8 m) and higher.
- B. Fence Framing:
 - 1. Polyvinyl chloride (PVC)-coated galvanized round steel pipe.
 - a. Standard weight (Schedule 40) hot-dipped galvanized round steel pipe complying with ASTM F1083, according to heavy industrial requirements of ASTM F669, Group IA, with minimum yield strength of 25,000 psi (172400 kPa).
 - b. Zinc coating: Not less than 1.8 oz/sf (600 g/sq. m/Z600), for both inside and outside of pipe, complying with ASTM F1234, Type A.
 - c. PVC coating: In addition to zinc coating, apply supplemental color coating of PVC to exterior surfaces of pipe, thermally fused to pipe; complying with ASTM F1234; minimum 10 mils (.25 mm) thick; color, black to match color of chain link fabric.
 - 2. Posts:
 - a. End, corner and pull posts: Type I round pipe, 2.875 inch (73 mm) outside diameter.
 - b. Intermediate posts: Type I round pipe, 2.375 inch (73 mm) outside diameter.
 - 3. Top rails:
 - a. Continuous top rails in manufacturer's longest lengths, with swaged-end or expansion-type coupling, for joining rail lengths.

- b. Provide rail ends or other means for attaching top rail to each end, corner, pull, and gate post.
 - c. Size: Type I round pipe, 1.66 inch (42 mm) outside diameter.
- C. Gates:
- 1. Materials:
 - a. Polyvinyl chloride (PVC)-coated galvanized steel, complying with ASTM F900.
 - b. Fabric and framing for gates shall be of same types as for fences.
 - 2. Posts: Provide posts to support each gate leaf.
 - a. Gate posts: Type I round pipe, 2.875 inch (73 mm) outside diameter.
 - b. Gate frames: Type I round pipe, 1.90 inch (48 mm) outside diameter.
 - c. Provide hook connectors and tension rods for attaching fabric to gate frame.
 - 3. Gate hardware: Provide galvanized hardware and accessories. Provide vinyl coating for field coating of movable fittings.
 - a. Hinges: Non-liftoff type, offset to permit 180° gate opening. Provide 1-1/2 pair of hinges for each gate leaf; size hinges to suit gate size.
 - b. Latch: Forked type or plunger-bar type, to permit operation from each side of gate. Fabricate with padlock eye as integral part of latch.
 - c. Keeper: For vehicle gates, provide keeper that automatically engages gate leaf and holds it in open position, until manually released.
 - d. Gate stops:
 - 1) For double gates, provide mushroom-type flush plate with anchors for setting into paving, designed to engage center drop rod or plunger bar.
 - 2) Provide locking device and padlock eye as integral part of latch, permitting both gate leaves to be locked with single padlock.
 - e. Padlocks:
 - 1) Maximum-security, 5-pin tumbler rekeyable padlocks with removable cylinder; provide 1 padlock per gate.
 - 2) Rust-resistant body with triple-plated copper-nickel-chrome finish, and replaceable case-hardened alloy steel shackle.
- D. Fittings and Accessories:
- 1. Polyvinyl chloride (PVC)-coated hot-dipped galvanized steel or iron.
 - a. Comply with ASTM F626.
 - b. Zinc coating: Not less than 1.2 oz/sf (350 g/sq. m/Z350).
 - c. PVC coating: In addition to zinc coating, apply supplemental color coating of PVC to exterior surfaces of pipe, thermally fused to members; 6 to 15 mils (.15 to .38 mm) thick; color, black to match color of chain link fabric.
 - 2. Post and line caps: Provide weathertight closure cap for each post. Fabricate line post caps with loop to receive top rail.
 - 3. Brace rails (post brace):
 - a. Manufacturer's standard adjustable brace rail, between each terminal post and next adjacent line post. Provide with manufacturer's standard cap for each end.
 - b. Provide with minimum 5/16 inch (8 mm) diameter truss rod and adjustable tightener.
 - c. Size: Type I round pipe, 1.66 inch (42 mm) outside diameter.
 - 4. Tension (stretcher) bars:
 - a. Tension bars not less than 3/4 wide x 3/16 inch thick (19 wide x 5 mm thick) x minimum length of 2 inches (50 mm) less than full height of fabric.
 - b. Provide 1 tension bar for each gate post and end post, and 2 tension bars for each corner post and pull post.

5. Tie wire: Vinyl-coated steel tie wire, minimum 13 gage (2.3 mm), with minimum 0.80 oz/sf (275 g/sq. m/Z275) zinc coating complying with ASTM A641, Class 3.; for attaching fabric to framing.
6. Tension and brace bands:
 - a. Tension bands: Minimum 3/4 inch (20 mm) wide x 14 gage (2 mm) thick.
 - b. Brace bands: Minimum 3/4 inch (20 mm) wide x 12 gage (2.8 mm) thick.
 - c. Attachment bolts: Galvanized carriage bolts 5/16 inch (8 mm) diameter x 1-1/2 inch (38 mm) long, with galvanized nuts. Paint bolts and nuts black to match color of PVC coating.

2.2 MISCELLANEOUS MATERIALS

- A. Concrete: Provide concrete in accordance with Section 03 3000 CAST-IN-PLACE CONCRETE, modified as follows:
 1. Aggregate: 1 inch (25 mm) maximum size.
 2. Compressive strength: 2500 psi (17200 kPa) minimum at 28 days.
 3. Cement factor: Not less than 4 bags of cement per cubic yard (.77 cubic meter) of concrete.
 4. Slump: 3 inches (75 mm) maximum.
 5. Entrained air content: 2 percent to 4 percent entrained air.

2.3 ACCESSORIES

- A. Provide brackets, anchors, threaded anchor bolts, fasteners, sleeves and other accessories as recommended by manufacturer and as required for complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction, and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Do not begin installation and erection before final grading is completed.
 1. Drill or hand excavate with post hole digger holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
 - a. Excavate holes for each post to minimum diameter recommended by fence manufacturer but not less than 4 times largest cross-section of post.
 - b. Excavate hole depths approximately 3 inches (75 mm) lower than post bottom, with bottom of posts set not less than 3 times outside diameter of post below finish grade surface.
 2. Center and align posts in holes 3 inches (75 mm) above bottom of holes.
 - a. Plumb and level each post for vertical and top alignment, and hold in position during placement and finishing operations.
 - b. Protect portion of posts above ground from concrete spatter.
 3. Place concrete immediately after mixing. Fill excavation with concrete in one pour. See Section 03 3000 CAST-IN-PLACE CONCRETE for general mixing, placing and curing requirements.

- a. Place concrete around posts and vibrate or tamp for consolidation.
 - b. Extend concrete footings 2 inches (50 mm) above grade and trowel to a crown to shed water.
 4. After concrete has cured, assemble other components to posts.
 5. Install fencing in accordance with manufacturer's instructions and final Shop Drawings.
- B. Chain Link Fences and Gates:
1. Install to comply with ASTM F567.
 2. Top rails:
 - a. Run top rails continuously through line post caps, and at other posts terminating into rail end attached to post caps fabricated to receive rail.
 - b. Provide expansion couplings as recommended by manufacturer.
 3. Braces:
 - a. Install braces at end posts, gate posts, and at both sides of corner posts and pull posts.
 - b. Locate horizontal braces at midheight of fabric.
 - c. Install braces so that posts are plumb when diagonal rod is under proper tension.
 4. Fabric:
 - a. Install fabric on security (outside) side of fence, anchored to framing so that fabric remains under tension after pulling force is released.
 - b. Leave approximately 2 inches (50 millimeters) gap between finish grade and bottom selvage.
 - c. Pull fabric taut and tie to posts and rails with tie wire. Bend ends of wire to minimize hazard to persons or clothing. Tie fabric to line posts at no more than 12 inches (300 mm) on center, and to rails and braces at no more than 24 inches (600 mm) on center.
 5. Thread tension bars through fabric and secure to end, corner, pull, and gate posts at no more than 15 inches (375 mm) on center.
 6. Install bolts for tension bands so that nuts are on side of fence opposite to fabric side. Peen ends of bolts to prevent removal of nuts.
 7. Gates:
 - a. Install gates plumb, level and secure for full opening without interference. Install gates so that there is a maximum gap of 4 inches between bottom of gate and grade.
 - b. Install ground-set items in paving for anchorage.
 - c. Adjust hardware for smooth operation and lubricate where necessary.
 - d. Field coat movable fittings with vinyl coating.

3.3 ADJUSTING AND CLEANING

- A. Upon completion of installation, test operation to demonstrate satisfactory operation acceptable to Architect.
- B. Adjust as required.
- C. Clean surfaces and lubricate joints and bearings in accordance with manufacturer's instructions.

END OF SECTION

Exhibit 2
(Form of Contract)

DESIGN-BUILD AGREEMENT
FOR
AITON ELEMENTARY SCHOOL
BY AND BETWEEN
THE DEPARTMENT OF GENERAL SERVICES
AND
[NAME OF CONTRACTOR]
CONTRACT NUMBER: DCAM-21-CS-RFP-0017

PROJECT INFORMATION

A. PROJECT SUMMARY

1.	Project Name:	Design-Build Services for Aiton Elementary School
2.	Project Address:	533 48th Place NE, Washington, DC
3.	Agreement Type:	Design-Build with Guaranteed Maximum Price
4.	Client Agency:	District of Columbia Public Schools (“DCPS” or “Client Agency”)
5.	Design-Builder:	[INSERT DESIGN-BUILDER]
6.	Agreement Amounts:	
i.	Initial NTE:	[INSERT NTE AMOUNT]
ii.	Project Budget:	\$44 Million
7.	Design-Builder Compensation:	
i.	Design Fee:	
ii.	Design-Build Fee:	
iii.	Base Design-Build Fee (60% of the Design-Build Fee):	
iv.	At Risk Portion of the Design-Build Fee (40% of the Design-Build Fee):	
v.	Preconstruction Fee (15% of the Base Design-Build Fee):	
vi.	Maximum Cost of General Conditions:	
vii.	Owner Directed Allowances:	To be determined at GMP
viii.	Preconstruction Fee	

ix.	Contingency:	To be determined at GMP
8.	Liquidated Damages:	
i.	Failure to Submit Deliverables:	\$5,000, plus \$500 per day per deliverable
ii.	Delay in Substantial Completion:	\$500 per day
9.	GMP Amendment to be Executed By:	GMP Approval: September 2022
10.	Substantial Completion Date:	July 15, 2024
11.	Final Completion Date:	July 15, 2025
12.	Administrative Term Expiration Date:	March 15, 2026
13.	Letter Contract:	
i.	Period of Performance	From [INSERT] (date of execution of Letter Contract) through [INSERT]
ii.	NTE Amount:	[INSERT NTE AMOUNT]
14.	GMP Basis Project Documents	Design Development Project Documents
15.	Key Personnel Replacement:	\$25,000 per replacement

DESIGN-BUILD AGREEMENT
AITON ELEMENTARY SCHOOL
DCAM-21-CS-RFP-0017

THIS AGREEMENT (“Agreement” or “Contract”) is made by and between the DISTRICT OF COLUMBIA GOVERNMENT (the “District”), acting by and through its **DEPARTMENT OF GENERAL SERVICES** (the “Department” or “DGS”), and [NAME OF CONTRACTOR] (the “Contractor” or “Design-Builder”), a company duly organized under the laws of the District of Columbia, and with a place of business at [Address] (collectively, the “Parties”).

RECITALS

WHEREAS, the Department issued a Request for Proposals dated October 19, 2021 (the “RFP”) to engage a design-builder to prepare a design for and to complete work at Aiton Elementary School located at 533 48th Place NE, Washington, DC (the “Project”);

WHEREAS, the Department intends to implement the Project through a design-build approach. The scope of work for the Project will be divided into two phases: (i) the design/preconstruction phase; and (ii) the construction phase;

WHEREAS, the Department desires that the Project be completed no later than July 15, 2024 (“Substantial Completion Date”);

WHEREAS, the Design-Builder submitted a proposal entitled Design-Build Services for Aiton Elementary School dated [Date] to provide design-build services for the Project;

WHEREAS, the Department wishes to retain the Design-Builder to provide design-build services for the Project, which is to include design, preconstruction and construction services for the modernization of Aiton Elementary School;

WHEREAS, the Design-Builder wishes to provide the architectural, engineering, construction and related services necessary to complete the Project, subject to the terms and conditions set forth in this Agreement;

WHEREAS, the Department has retained the services of a program manager (the “Program Manager”) to advise it concerning the Project;

WHEREAS, the Department has established a budget and the Design-Builder will conduct its work in accordance with an underlying budget for the Project, which includes but is not limited to all design fees, hard and soft construction costs, loose furnishings, and fees, general conditions of the Design-Builder and an allowance for the maintenance of the school and grounds per the maintenance and operations plan for up to six (6) months following Substantial Completion (such budget, the “Project Budget”); and

WHEREAS, the Department and the Design-Builder entered into a letter contract dated [Date] (the “Letter Contract”) pursuant to which the Design-Builder was authorized to proceed with certain design, preconstruction, abatement, and demolition services in furtherance of the Project.

NOW, THEREFORE, the Department and Design-Builder, for the consideration set forth herein, mutually agree as follows.

Article 1 - DEFINITIONS

Section 1.1. Administrative Term.

The Agreement shall have an administrative term (the “Administrative Term”) that runs from the effective date of the Notice to Proceed to the Administrative Term Date set forth in the Project Information Section above. In addition, within this time the Design-Builder shall execute and submit a Final Release of Liens and Claims in a form and format required by a Contracting Officer (“CO”), inclusive of providing the Department with a complete set of any product manuals (“O&M”) and training videos, if applicable. The Administrative Term is established for the sole purpose of permitting the Department’s Office of the Chief Financial Officer to process payments in the event any payments become due. Notwithstanding the foregoing, nothing herein shall be construed to: extend the Substantial Completion Date; extend the Final Completion Date; or, limit the Department’s ability to assess liquidated damages thereon.

Section 1.2. Agreement.

The terms “Agreement” or “Contract” shall mean this entire, integrated agreement between the Department and the Design-Builder with respect to the Project, consisting of this document and the Exhibits thereto, including but not limited to the Standard Contract Provisions (Construction Contracts and Architectural/Engineering Services Contracts), the Construction Documents released for the Design-Builder’s use and any Change Orders, Contract Modifications or Change Directives that have been executed by the Department.

Section 1.3. Client Agency.

The governmental or quasi-governmental entity, represented by the Department, requesting the Project.

Section 1.4. Construction Documents.

The final Drawings and Specifications, as prepared, sealed by the Architect’s design professional in accordance with the law, and issued by the Design-Builder for the purpose of obtaining bids from potential trade subcontractors and material suppliers for use in constructing the Project.

Section 1.5. Construction Phase Services.

Services provided throughout the construction phase during which the Design-Builder shall carry out the bulk of the construction and manage the completion of the design for the Project.

Section 1.6. Cost of General Conditions.

The Cost of General Conditions shall have the meaning set forth in Section 8.2 of this Agreement.

Section 1.7. Contract Project Documents.

The term “Contract Project Document(s)” refers one or more component of the Project documents that comprise the Agreement between the Department and the Design-Builder, including any modifications or changes thereof, the Drawings and Specifications, and any addenda issued thereto.

Section 1.8. Design/Preconstruction Phase Services.

The services to be provided under Article 3 constituting the design & preconstruction phase services to be performed by the Design-Builder.

Section 1.9. Drawings.

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

Section 1.10. Final Completion.

The point at which Substantial Completion has been achieved, all punch list items noted at Substantial Completion have been completed and all Project documents the Design-Builder is required to deliver to the Department as a condition to receiving final payment have been delivered.

Section 1.11. Final Completion Date.

The date established in the Agreement by which the Design-Builder shall achieve Final Completion. The Final Completion Date may be modified only by Change Order or Change Directive in accordance with the Agreement.

Section 1.12. Fully Complete.

To undertake all of the Work necessary to fully construct and complete the Project and execute all tasks necessary to obtain the final certificate of occupancy for the Project from the District of Columbia; submit final lien releases from the Design-Builder and Subcontractors and material suppliers; complete all punch list items to the Department's approval and sign-off; and cause all representations, warranties and guarantees to be honored and otherwise fulfill all of the requirements set forth in the Agreement.

Section 1.13. Guaranteed Maximum Price or GMP.

The maximum amount, including, but not limited to, the Design-Build Fee and the Cost of the Work, that will be paid the Design-Builder to Fully Complete the Project as set forth in Article 4. The Guaranteed Maximum Price ("GMP") may be modified only by Change Order, Contract Modification or Change Directive in accordance with the Agreement. The GMP shall be established in the GMP Amendment.

Section 1.14. Hazardous Material.

Hazardous Material includes, but is not limited to, any toxic substance or hazardous chemical defined or regulated pursuant to federal, state or local laws relating to pollution, treatment, storage or disposal of waste, or protection of human health or the environment. Such laws include, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act, the Clean Water Act, the Clean Air Act and laws relating to emission, spills, leaks, discharges, releases or threatened releases of toxic material. The term Hazardous Materials shall also include petroleum and petroleum bi-products.

Section 1.15. Notice to Proceed.

A written notice to proceed, signed by the Department, directing the Design-Builder to proceed with the Project or any portion of the Project ("Notice to Proceed" or "NTP").

Section 1.16. Project Schedule.

The schedule for the Project agreed to by the Department and the Design-Builder. Such schedule shall include a baseline schedule as updated periodically by the Design-Builder,

approved by the Department. The Project Schedule shall not be changed except by a Change Order or Change Directive issued by the Department. The Project Schedule shall be in a form and contain such detail as may be agreed upon by the Parties.

Section 1.17. Self-Performed Work.

The parties hereby agree that “Self-Performed Work” means and shall encompass trade work performed by employees of: (1) the Design-Builder; (2) any entity that is a partner or member of the entity comprising the Design-Builder; (3) any entity that controls, is controlled by, or is under common control with the Design-Builder; or (4) any entity that controls, is controlled by, or is under common control with any entity that is part of the Design-Builder. Self-Performed Work is distinguished from trade work performed by Subcontractors unaffiliated with the Design-Builder or the entities of which the Design-Builder is comprised.

Section 1.18. Services.

The services to be provided pursuant to the Agreement which shall include the Design & Preconstruction Phase Services and the Construction Phase Services necessary to deliver the Project.

Section 1.19. Specifications.

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

Section 1.20. Standard Contract Provisions.

The District of Columbia Department of General Services Standard Contract Provisions, General Provisions (Construction Contracts and Architectural/Engineering Services Contracts), as amended, are attached hereto as **Exhibit J** and incorporated herein.

Section 1.21. Subcontractor.

Any person, natural or legal, to whom the Design-Builder delegates performance of any portion of the Work required by the Agreement. The term “Subcontractor,” used without a qualifier, shall mean a subcontractor and subconsultant in direct privity with the Design-Builder at all tiers” to include, but not limited to, those Subcontractors performing Work pursuant to sub-subcontracts, and so on. “Subcontractors” shall include both those who are retained to perform labor only and those who are retained both to perform labor and to supply material or equipment. “Subcontractors” shall also include design professionals who are not the Design-Builder’s employees and to whom the Design-Builder delegates any part of its responsibilities under the Agreement, except that references to “trade Subcontractors” shall exclude design professionals.

Section 1.22. Substantial Completion.

Substantial Completion shall mean that all of the following have occurred: (1) the construction and installation work have been completed with only minor punch list items remaining to be completed; (2) a temporary certificate of occupancy and all other required permits or approvals have been obtained; (3) draft copies of all operating and maintenance manuals, training videotapes and warranties required by the Agreement have been delivered to the Department and the Client Agency; (4) any supplemental training session required by the Agreement for operating or maintenance personnel have been scheduled; (5) all clean-up required by the Agreement has been completed; (6) the Project is ready for the Department and Client Agency to use it for its intended purpose; and (7) all equipment, supplies, materials and items to be installed have been installed in accordance with the manufacturer’s specifications and industry standards and have undergone and passed the requisite testing and inspections.

“Minor punch list items” are defined for this purpose as items that, in the aggregate, can be completed within thirty (30) days without interfering with the Department or Client Agency’s normal use of the Project.

Section 1.23. Substantial Completion Date.

The date established herein by which the Design-Builder shall achieve Substantial Completion. The Substantial Completion Date may be modified only by Change Order, Contract Modification or Change Directive in accordance with the Agreement.

Section 1.24. Work.

The term “Work” refers to any and all work done in performance of the Services necessary, at any and all phases of the Agreement, to Fully Complete the Project.

Section 1.25. RFP Documents

The documents included in this RFP consist of this RFP in all of its parts, all addenda, attachments and exhibits contained or identified in the RFP’s sections (Collectively the “RFP Documents”).

Article 2 - GENERAL PROVISIONS

Section 2.1. Letter Contract

The Parties acknowledge that certain of the investigation, abatement, demolition, design and preconstruction activities described in Article 3 of this Agreement were performed pursuant to the Letter Contract between the Parties dated [DATE]. Pursuant to the terms of the Letter Contract, upon execution of this Agreement by the Department (the “Agreement Effective Date”), the Letter Contract shall automatically terminate and shall merge into and be superseded by this Agreement. The Parties agree that any services provided or work performed pursuant to the merged Letter Contract, and prior to the Agreement effective Date, shall be governed by the terms and conditions of this Agreement.

Section 2.2. Term and Termination

The period of performance under this Agreement shall commence from the date of execution of the Letter Contract by the Department and shall terminate upon the expiration of the Administrative Term or upon termination by the Department pursuant to Articles 5 and 6 of the Standard Contract Provisions (Construction Contracts) and Article 8 of the Standard Contract Provisions (Architectural & Engineering Services Contract).

Section 2.3. Relationship of Parties.

The Design-Builder accepts the relationship of trust and confidence established with the Department by this Agreement, and covenants with the Department to furnish the Design-Builder’s reasonable skill and judgment and to cooperate with the Program Manager in furthering the interests of the Department. The Design-Builder shall use its best efforts to perform the Work and complete the Project in an expeditious and economical manner consistent with the interests of the Department. The Department shall endeavor to promote harmony and cooperation among the Department, Design-Builder, Program Manager, and other persons or entities employed by the Department for the Project. In performing its duties under this Agreement, the Design-Builder shall at all times use the standard of care used by Design-Builders that construct projects similar to the Project in type, size and scope in large, urban areas. Whenever the term “competent” is used herein to describe the Design-Builder’s actions or duties, that term shall refer to the level of competence customarily possessed by those Design-Builders that construct projects similar to the Project in type, size and scope in

large, urban areas.

Section 2.4. Confidentiality of Information

The Design-Builder shall assure and keep all information and data obtained throughout the performance of the Project whether related to the Agreement, the Work in all of its aspects, the Department and the Department's employees confidential, during and following the term of the Agreement, and shall not use the information in connection with any other matters; nor shall it disclose any such information to any other person, firm or corporation, unless disclosure is required pursuant to court order, subpoena or other regulatory authority. The Design-Builder shall not be divulged of confidential information without the individual's and the Department's written consent and only in accordance with the District's or Federal's laws, codes and regulations. The Design-Builder and any Subcontractors who utilize, access, or store personally identifiable information as part of the performance of this Agreement are required to safeguard this information and immediately notify the Department of any breach or suspected breach in the security of such information. The Design-Builder and all Subcontractors shall allow the Department to both participate in the investigation of incidents and exercise control over decisions regarding external reporting. The Design-Builder, Subcontractors and their respective employees working on this Project may be required to sign a confidentiality statement.

Section 2.5. Project Description.

The Design-Builder shall provide Design Build Services required for the modernization of Aiton Elementary School located at 533 48th Place NE, Washington, DC (the "Work").

The Project includes the complete renovation of the existing building, and new construction additions to create approximately 74,000 gross square feet of modernized learning space (collectively the "Work") to bring it in line with the District of Columbia Public Schools ("DCPS") Educational Specifications ("Ed Spec(s)" or "Educational Specifications") as set forth in **Attachment B**.

Generally, the Design-Builder's responsibilities shall include, but will not be limited to, the following:

- a) To confirm the design and construction of the Project in accordance with the RFP Documents.
- b) To provide all design services and construction management services necessary to implement the goals of the Project inclusive of, but not limited to, the following: civil, architectural, electrical, structural, and mechanical design services as required for the Project; construction management services inclusive of budgeting, value engineering ("Value Engineering"), scheduling, project phasing, project administration, management and coordination of subcontractors.
- c) To conduct subsurface investigation work if and as required for the Project.
- d) To furnish and provide all materials, management, personnel, equipment, hazardous material abatement, supervision, labor and other services necessary to complete the Project.
- e) To provide the necessary design, consultants and documentation for all permitting, zoning, historic preservation and US Commission of Fine Arts approvals.
- f) To provide move coordination and logistics support for the Project.

The Design-Builder shall provide the Department with a GMP based on the Design Development Documents. The Department anticipates an Early Start Agreement ("ESA") and subsequent one GMP package.

During the Construction Phase, the Design-Builder shall construct the Project. During the Construction Phase, the Design-Builder shall be required to cause the Work to be completed in a manner consistent with the design documents and phasing plan approved by the Department and shall provide all labor, materials, insurance, bonds and equipment necessary to fully complete the Project in accordance with the drawings, specifications, schedule and budget that are issued for the Project. The Design-Builder shall be responsible for paying for and obtaining all necessary permits and to pay all necessary fees for utility connections and the like.

Section 2.6. Program Manager.

The Department has engaged a Program Manager to provide certain program management functions. Such Program Manager shall, at all times, be acting solely for the benefit of the Department, not the Design-Builder. **The Design-Builder hereby acknowledges and agrees that only a duly authorized and designated Contracting Officer shall have the authority to issue Change Orders, Contract Modifications or Change Directives on the Department's behalf. As of the date that this Agreement is executed, the Department's duly authorizing Contracting Officers are set forth in Exhibit I.**

Section 2.7. General Description of Design-Builder's Duties.

Generally, the Design-Builder shall perform the Services in a professional workmanlike manner. The Design-Builder shall supply and furnish at the location where the Work is to be performed all design service, labor, materials, equipment, tools, services, and supervision, and shall bear all items of expense, necessary to complete and satisfactorily perform this Agreement, except such items that the Department, in this Agreement, specifically agrees to supply or furnish to or for the use of Design-Builder. Any labor, materials, equipment, tools, services or supervision not specifically described in this Agreement, but which may be fairly implied as required thereby or necessary to properly complete the Work, shall be deemed within the Scope of the Work and shall be provided by the Design-Builder at Design-Builder's sole expense.

The Design-Builder will be required to work with the Department and the Project stakeholders through a collaborative design process to develop a concept design for the Project in accordance with the available budget. The Design-Builder will be required to engage in extensive pre-design and preconstruction efforts to ensure that the design is developed in a manner consistent with the Department's goals for the Project (e.g., programmatic, budgetary, schedule and quality); to solicit competitive trade bids for the construction work and to develop an acceptable guaranteed maximum price and corresponding scope and schedule for the work; and to implement the requisite construction and other work necessary no later than the Substantial Completion Date. The Design-Builder shall be responsible for all items of cost except for those items set forth in Section 9.7 of this Agreement and will be required to provide a "turn-key" Project ready for occupancy by DCPS.

Section 2.8. Warranties and Representations

2.8.1. All disclosures, representations, warranties, and certifications the Design-Builder makes in its proposal in response to the RFP shall remain binding and in effect throughout the term of the Agreement. The Design-Builder reaffirms that all such disclosures, representations, warranties, and certifications are true and correct.

2.8.2. If any disclosure, representation, warranty or certification the Design-Builder has made or makes pursuant to the RFP or the Agreement,

including, without limitation, representations concerning the Design-Builder's construction or design experience and qualifications, claims or litigation history or financial condition, is materially inaccurate, that shall constitute a material breach of the Agreement, entitling the Department to any and all available remedies.

2.8.3. The terms and conditions of this Section 2.8 shall apply during both the Design & Preconstruction and Construction Phases.

Section 2.9. Responsibility for Agents and Contractors.

At all times and during both the Design & Preconstruction and Construction Phases, the Design-Builder shall be responsible to the Department for any and all acts and omissions of the Design-Builder's agents, employees, Subcontractors, Sub-Subcontractors, material suppliers, and laborers, and the agents and employees of the Subcontractors, Sub-Subcontractors, material suppliers, and laborers performing or supplying Work in connection with the Project.

Section 2.10 Building Information Modeling (BIM). BIM is required to be used throughout the lifecycle of the Project, including all Project phases from project planning and concept design through construction, as-built and into facilities management. The BIM requirements are provided as **Exhibit U**. It is expected by the Department that all team members are to be committed to the use of BIM in the Project, share their ideas of BIM expertise with the team, provide BIM data as requested by other team members, look for cost savings and schedule improvements during the entire Project duration, and endeavor to leave as a legacy a fully updated, as built, facility management ready building information model.

Article 3 - DESIGN-BUILDER'S DESIGN & PRECONSTRUCTION SERVICES

Section 3.1. Preconstruction Services.

During the Preconstruction Phase, the Design-Builder, in consultation with the Department, shall (i) develop conceptual plan and cost estimates; (ii) develop a draft final conceptual site plan/response and cost estimate; (iii) prepare and submit hard and soft copies of the complete set of 35% Schematic Design Documents; (iv) prepare and submit soft and hard copies of the complete set of 60% Design Development Documents, Specifications and Design-Builder's cost estimate and schedule; (v) prepare soft and hard copies of the complete set of 95% Construction Documents, Specifications and Contractor's cost estimate and schedule; (vi) review existing condition assessment and recommendation; and (vii) obtain all necessary building permits to support the project schedule. Without limiting the generality of the foregoing, during the Preconstruction Phase, the Design-Builder shall: (i) work with its Architect and any design consultants to advance the design for the Project in consultation with the Client Agency, the Department and its Program Manager; (ii) obtain bids from trade subcontractors to perform the work described in the Design Development Documents and provide bid tabulations to the Department; (iii) engage in any value engineering and scoping exercises necessary to return the cost of the work to the Project Budget; (iv) engage in preconstruction activities, including identifying any long-lead items; (v) develop the early releases packages and the GMP proposal for the Project; and (vi) enter into a GMP for the Project. Throughout the Design & Preconstruction Phase, the Design-Builder shall schedule and attend regular meetings with the Department, the Program Manager and the Architect

Section 3.1.1 Additional Preconstruction Services. In addition to those items enumerated above, the Design-Builder shall provide such preconstruction services as are

necessary to properly advance the Project. These services shall include, but are not limited to, scheduling, estimating, shop-drawings, the ordering of long-lead materials, condition assessments, conservator studies, archeological studies, recommended testing, additional geotechnical testing, and monitoring of historic assets.

Section 3.1.2 Design and Preconstruction Phase Initial Deliverables

Section 3.1.2.1 Building System Assessment. If requested by the Department, within fourteen (14) days after the Preconstruction NTP is issued, the Design-Builder shall conduct an assessment report of the building systems and submit a written report to the Department that assesses whether the existing building systems can be repaired or whether such systems should be replaced. Such report shall take into consideration the nature of this Project and the proposed Educational Specifications. This report shall assess all of the buildings' key systems, including, but not limited to HVAC, kitchens, roof, windows, electrical, lighting, Audio Visual Equipment, intercom, fire alarms, and plumbing.

Section 3.1.2.2 Baseline Schedule. Within ten (10) days after the Preconstruction NTP is issued, the Design-Builder shall prepare and submit a Baseline Schedule for the Project (the "Baseline Schedule"). The Baseline Schedule shall be subject to review and approval by the Department and the Design-Builder shall incorporate such adjustments to the Baseline Schedule as may be requested by the Department. The Baseline Schedule shall be prepared in a critical path method ("CPM") in a sufficient level of detail to permit the Department and the Design-Builder and any other affected parties to properly plan the Project. The Baseline Schedule shall show: (i) key design milestones and bid packages; (ii) release dates for long lead items; (iii) release dates for key subcontractors; and (iv) Substantial and Final Completion Dates. The Baseline Schedule shall include durations and logic ties for those building systems that the Design-Builder is recommending for replacement. The Baseline Schedule must also be submitted in Primavera 6 native format and shall be updated by the Design-Builder, at a minimum, on a bi-weekly basis. In addition to the bi-weekly project schedule a weekly 3-week look ahead schedule shall be required.

The Project schedule is attached hereto as **Exhibit B**.

Section 3.1.2.3 Concept Design. No later than 12 weeks after the Preconstruction NTP is issued, the Design-Builder shall prepare and submit a proposed concept design for the Ed Spec. As part of the concept design phase the Department requests three (3) concept options or alternatives. Each of the concept design shall contain at least the level of detail contemplated in industry best practices for a concept design. The design submittal shall specifically identify any deviations from the Educational Specifications and shall explain the rationale and cost implications associated with such deviation. The Department shall have the right to disapprove the concept design submittal for any reason. The Design-Builder shall include a cost estimate and value Engineering Analysis and Detailed Recommendation for project savings (even if the project is not over budget). Following review of the concept design submissions by DCPS and the Department, the Department shall approve a final concept design. The Design-Builder shall make revisions to the concept design submission as necessary to incorporate comments, feedback and other direction provided by DCPS and the Department. The Design-Builder's pricing shall assume that such revisions will be required, and such revisions shall not entitle the Design-Builder to additional compensation. The concept design submittal shall include, but not limited to, the following:

- a) Historic resources survey.

- b) A minimum of three (3) conceptual floor plans and site plans incorporating the requirements of the Education Specifications and site plan and showing proposed location of any building additions.
- c) Hazardous materials survey of affected spaces. It is understood that the Design-Builder and/or its design component shall be required to engage the services of industrial hygienist that is acceptable to the Department to perform such survey.
- d) Education specifications update and verification; and an overall Plan-to-Program comparison.
- e) Summary of agency review meetings, including but not limited to: Office of Planning (“OP”), Commission of Fine Arts (“CFA”), Historic Preservation Office (“HPO”), and National Capital Planning Commission (“NCPC”).
- f) Summary of utility coordination and review meetings with PEPCO, Washington Gas, and DC Water.
- g) Summary of meetings with The District Department of Transportation (“DDOT”) Public Space Regulation Administration.
- h) Summary of meetings with Department of Energy and Environment (“DDOE”) Storm Water Management.
- i) Summary of meetings with District of Columbia Department of Consumer and Regulatory Affairs (“DCRA”) focused on code review and green building review.
- j) Attend a minimum of three (3) community meetings.
- k) Begin the process for DCRA Environmental Impact Screening Form.
- l) Zoning Analysis.
- m) Cost Estimate.
- n) Value Engineering analysis and detailed recommendation for project savings (even if the project is not over budget).
- o) Net Zero Energy Report that includes all recommended strategies applicable to achieving a Net Zero Energy ready building.

Section 3.1.2.4 Preliminary Budget Estimate. Concurrently with the delivery of the concept design, the Design-Builder shall submit a detailed cost estimate of the proposed design (such estimate, the “Preliminary Budget Estimate”). With regard to building systems (i.e. roofs, doors, HVAC, security, IT, etc.), the Preliminary Budget Estimate shall be prepared on a “system” basis that identifies the key building systems or functions and allocates an estimated cost for each such system. The Design-Build Fee, the cost of general conditions, and contingencies shall be broken out in separate line items. The primary purpose of the Preliminary Budget Estimate is to aid the Department and the Client Agency in understanding the costs associated with key elements of the Project to better prioritize and manage the use of the funding allocated to this Project.

Section 3.1.2.5 Construction Management Plan. The Design-Builder shall submit a draft of its construction management and project phasing plan (“Construction Management Plan”) within fourteen (14) days after the Preconstruction NTP is issued to include, but is not limited to, noise control, hours for construction and deliveries, truck routes, trash and debris removal plan, traffic and parking control, communications procedures, emergency procedures, quality control procedures, dust control, public street cleaning and repair, planned occupancy of public ways, erosion control, tree protection plan, vibration monitoring, existing and adjacent building surveys plan, temporary fire protection measures, project signage, pest control, construction staging plan, and construction logistics plan.

Section 3.1.2.6 Baseline Budget and Program. The Department shall provide the Design-Builder with a baseline budget and program and comments on the concept design. Such

approval shall be provided (or signed by) the Department's Deputy Director for Capital Construction (the "Deputy Director"). In the event the Design-Builder does not receive such approval within fourteen (14) days after submitting the preliminary budget estimate, it shall so advise the Program Manager ("PM"), the Deputy Director and the CO in writing of such failure and request direction. If the Design-Builder fails to provide such notice, the Design-Builder will be proceeding at its own risk and will be responsible for any redesign costs associated with budget revisions.

Section 3.1.2.7 Deliverables Liquidated Damages. The Design-Builder acknowledges that the Department is engaging the Design-Builder to provide an extensive level of preconstruction support services to minimize the potential for cost overruns, schedule delays or the need for extensive Value Engineering/re-design late in the Project and that the deliverables required under this **Section 3.1.2** are key to identify the value of such services. In the event the Design-Builder fails to deliver any of the deliverables required in **Section 3.1.2** (and unless such failure is the result of any event of Force Majeure), the Design-Builder shall be subject to liquidated damages in an amount of Five Thousand Dollars (\$5,000) plus Five Hundred Dollars (\$500) per day after receiving written notice from the CO of failure to submit such deliverables.

Section 3.1.3 Design Services; Design Reviews.

The Design-Builder shall meet with the representatives of the Department and Client Agency throughout the Design & Preconstruction Phase as the design progresses in order that these and other stakeholders can have input in and approve the design direction at appropriate times. The Design-Builder shall ensure that the design is developed in a manner consistent with the Department's budget for the Project, *i.e.*, designed-to-budget, as well as the programmatic requirements set forth and attached hereto as **Exhibit A** and the Department's other requirements for the Project. The Project shall be designed in such a way so as to achieve, at a minimum, LEED for SCHOOLS – GOLD principles. All design Project documents shall be prepared by the Design-Builder's duly licensed architects and engineers. The GMP Basis Project Documents and all interim design submissions shall be subject to review and approval by the Department, and the Design-Builder shall be required to revise these Project documents to address concerns raised by the Department and/or other project stakeholders and such revisions shall not entitle the Design-Builder to an increase in the Design Fee.

Section 3.1.3.1 Design Management. Between the time the Preconstruction NTP is issued and the time the GMP is accepted by the Department, the Design-Builder shall use commercially reasonable best efforts to ensure that: (i) the design evolves in a manner that is consistent with the Department's budget and programmatic requirements, as the same were defined and established by the Department at the end of the concept design; (ii) the design work is properly coordinated; and (iii) the required design deliverables are produced on or before the dates contemplated in the Project schedule. As part of this undertaking, the Design-Builder shall provide the following:

Section 3.1.3.1.1 Schematic Design. The Design-Builder shall prepare a schematic design that is a logical development of the approved concept design and is consistent with the Department's schedule, budget and programmatic requirements. The schematic design shall contain at least the level of detail contemplated in a schematic design under industry best practices. The design submittal shall specifically identify any deviations from the approved concept design and shall explain the rationale, cost and time implications associated with such deviation. The Department shall have the

right to disapprove the schematic design submittal for any reason. The Design-Builder shall provide maintenance and repair cost services for major design components and MEP systems selected at the schematic design phase, which includes conducting a 40-year life cycle cost analysis, which includes a detailed list of replacement costs, maintenance costs, an estimate of repair costs, anticipated energy costs, and a list of other relevant life cycle costs.

The Design-Builder shall submit a Maintenance and Operations Plan, which, at a minimum, shall include the following:

- i) Standard Operating Procedures (SOP) for all building systems, including, but not limited to, electrical, mechanical, roof, green roof, geothermal, solar, plumbing, security, outdoor fields, irrigation, landscaping and lighting;
- ii) List of equipment that must be kept on site to maintain all building systems;
- iii) List of chemicals that must be kept on site to maintain all building systems, including storage requirements;
- iv) Certifications and licenses either required or recommended to maintain all building systems;
- v) Confined space procedures and personal protective equipment that must be used;
- vi) Permits and regular inspections that are required to operate the equipment;
- vii) List of hardware, software and software licenses that must be purchased and maintained;
- viii) Recurring trainings on building systems and safety that are necessary to maintain the building;
- ix) The estimated initial and monthly costs for the successful maintenance and operations of the facility.

Following review of the schematic design submission by the Client Agency and the Department, the Design-Builder shall make revisions to the schematic design submission as necessary to incorporate comments, feedback and other direction provided by the Client Agency and the Department. The Design-Builder's pricing shall assume that such revisions will be required, and such revisions shall not entitle the Design-Builder to additional compensation.

In general, the Design-Builder shall be required to undertake the following tasks during this phase:

- a. Further develop plans and incorporate design changes.
- b. Prepare necessary presentation materials (renderings) to communicate design and obtain approval of design direction.
- c. Participate in meetings with DCPS Staff.
- d. Conduct DOEE, DCRA, DDOT and DC Water preliminary design review meetings.
- e. Engage in no fewer than three (3) community feedback sessions during this phase.
- f. Coordination and of identification of Public Art locations that will be constructed and installed as part of the construction phases.
- g. Continued coordination with Public Utility Companies: PEPCO, Washington Gas, and Verizon. In addition to coordination, scope shall include submitted load letters for new or upgraded services.
- h. Continued coordination with HPO and CFA.
- i. Report and schedule on process to obtain any zoning approvals, if necessary.
- j. The schematic design submittal shall generally follow the deliverables and in addition shall

include at least the following:

- i. Digital site and floor plans (including adjacencies and room locations);
- ii. Preliminary building elevations and sections;
- iii. Preliminary selection of building materials;
- iv. Conceptual renderings produced for approval of design direction.
- v. Plan-to-Program comparison;
- vi. Preliminary LEED Scorecard;
- vii. Design narrative; and
- viii. A preliminary description of proposed building system upgrades (i.e. HVAC, roofs, windows, kitchen equipment, low voltage/IT/AV etc.). With regard to any proposed building system upgrade, the package shall include a narrative description of the proposed system and an estimated line item cost.
- ix. Cost Estimate.
- x. Project savings (even if the Project is not over budget) .
- xi. Preliminary furniture design.
- xii. 3D rendering images as needed, include (4) four at a minimum.
- xiii. Life cycle cost analysis (“LCCA” or “Life Cycle Cost Analysis”).
- xiv. Net Zero Energy Report that includes all recommended strategies applicable to achieving a Net Zero Energy ready building.
- xv. Maintenance and Operations Plan

Section 3.1.3.1.2 Schematic Budget Estimate Update. Concurrent with submission of the schematic design, the Design-Builder shall submit a budget update. The budget update shall be submitted in the same format as the preliminary budget estimate and shall show variations from preliminary budget estimate. The Design-Builder shall include a cost estimate and value engineering analysis and a detailed recommendation for project savings (even if the project is not over budget). To the extent the budget update shows an overrun from the approved budget, the Design-Builder shall submit Value Engineering (not scope reductions, but true Value Engineering that allows the design to meet all Project requirements within budget) suggestions that would return the Project to budget. Only the Department shall have the authority to increase the Project Budget, and absent such direction, the Design-Builder shall proceed on the assumption that the budget remains as originally directed by the Department.

Section 3.1.3.1.3 Constructability/Sole Source/Long-Lead Time Memorandum.

Concurrently with the Schematic Design Budget Estimate, the Design-Builder shall prepare a memorandum identifying key construction concerns related to the Project. Such memorandum shall: (i) assess the constructability issues related to the Project, including site logistics; (ii) identify any items where the design is predicated on a single manufacturer and, if so, identify at least two (2) comparable products; and (iii) identify any long-lead delivery items that could adversely affect the schedule contemplated in this Agreement. To the extent any such long-lead items are identified, the memorandum shall make recommendations for addressing such items.

Section 3.1.3.1.4 Entitlements. The Design-Builder shall prepare such materials, submit pertinent information, make such presentations, and provide accurate and complete responses as are necessary to obtain the required land use and entitlement

approvals. Approvals may be required from (i) the Office of Zoning, (ii) OP, and (iii) the CFA. Given the nature of the Work, it is not envisioned that such approvals will require extensive hearings or submissions.

Section 3.1.4 Design Development Phase & Early Release Packages.

The Design-Builder shall prepare a set of design development documents (“Design Development Documents”) that is a logical development of the approved schematic design and is consistent with the Department’s schedule, budget and programmatic requirements. The Design Development Documents shall contain at least the level of detail contemplated in industry best practices for design development documents. The design submittal shall specifically identify any deviations from the approved schematic design and shall explain the rationale and cost implications associated with such deviation. The Design-Builder shall include a cost estimate and value engineering analysis and detailed recommendation for project savings (even if the project is not over budget). The Design-Builder shall provide maintenance and repair cost services, which includes conducting a 40-year life cycle cost analysis, which includes a detailed list of replacement costs, maintenance costs, an estimate of repair costs, anticipated energy costs, and a list of other relevant life cycle costs. The Design-Builder shall further refine and expand upon the Maintenance and Operations Plan that was submitted in the Schematic Submission. The Department shall have the right to disapprove the Design Development Documents submittal for any reason.

Section 3.1.4.1 Design Development Submission. The Design-Builder shall prepare the design development submission for review and comment by the Client Agencies and the Department. Such design development submission shall include the elements and information listed below:

The design development submittal shall include at least, but not limited to, the following:

- a) Detailed and dimensioned plans, wall sections, building section, and schedules;
- b) Draft specifications for materials, systems, equipment;
- c) Complete code compliance analysis and drawing;
- d) Space-by-space equipment layouts for key spaces. As part of the design development phase, the Design-Builder and/or the Design-Builder’s architect and any of its design consultants shall confer with representatives from DCPS and the Department regarding these layouts to confirm that they are acceptable to DCPS;
- e) A final lay-out for furniture, fixtures, and equipment;
- f) An interior finishes schedule;
- g) Preliminary designs for all building system upgrades, including low voltage/AV/IT. With regard to HVAC systems, the submission should include: (i) a detailed description of the proposed mechanical systems; (ii) their general layout, including ‘Single- Line Diagrams’ (aka ‘Riser Diagrams’); and (iii) any required load calculations. The HVAC design solution would also include preliminary layouts of other major components of the HVAC system, including the type and location of energy recovery units (ERUs), variable air volume (“VAV”) boxes, condensing units, and any related system appurtenances;

- h) Updated LEED scorecard;
- i) Present the design to CFA, OP, HPO, and other regulatory agencies as required;
- j) Register the project with the U.S. Green Building Council (“USGBC”) to obtain LEED certification and pay all registration fees;
- k) Participate in SIT Meetings, and community meetings as required by DGS/DCPS;
- l) Coordinate with the DC HPO and other agencies, commissions, groups, etc. as required to assess and determine historic and/or archeological significance and requirements. Attend meetings and hearings if necessary;
- m) Respond in writing to all DCPS comments on plans;
- n) Prepare a presentation and provide a minimum of three (3) presentation boards for each community meeting and present/display onsite. Presentation boards shall be in full color and include at least four (4) 3-D renderings; Presentations shall also include a digital slide presentation;
- o) Coordinate final utility plans as required;
- p) Act as scribe for all design related meetings. Distribute meeting minutes to all attendees;
- q) Baseline Schedule bi-weekly update in the format set forth in the RFP; and
- r) Prepare and submit three (3) hard-copy sets, and one (1) electronic copy in PDF of Design Development Documents including detailed specifications, cost estimate and schedule to the Department and DCPS for review and approval. (60% plan review). Components to include, but are not limited to:
 - i. Site plans, paving layouts, traffic circulation, lighting, signage and utilities.
 - ii. Floor plans, Structural, Civil, Architectural, mechanical, electrical and plumbing (“MEP”), Fire Protection and landscaping.
 - iii. Exterior elevations, rendering and color palette.
 - iv. Building sections and details as required.
 - v. Interior elevations, casework and millwork elevations as required.
 - vi. Playground equipment, if applicable.
 - vii. Stormwater management.
 - viii. Food service or other equipment as required.
 - ix. LEED Information as appropriate.
 - x. Final Draft of the “Percent for Art” Public Art Package to be used as the scope for the Artists’ RFP
 - xi. Cost Estimate
 - xii. Value Engineering Analysis and Detailed Recommendation for project savings (even if the project is not over budget)
 - xiii. Life cycle cost analysis (LCCA)
 - xiv. Net Zero Energy Report that includes all recommended strategies applicable to achieving a Net Zero Energy ready building
 - xv. Maintenance and Operations Plan

Section 3.1.4.2 Early Release Packages/ Long Lead Materials/Abatement & Demolition.

Section 3.1.4.2.1 Abatement & Selective Demolition. Once the schematic design has been approved, the Department may release the Design-Builder to commence hazardous material abatement and interior demolition, or other early

activities, as applicable. It is envisioned that this work may be released in advance of the GMP.

Section 3.1.4.2.2 Long Lead Materials. The Department will release funding for long-lead items once the Design Development Documents have been approved. If the Design-Builder believes an earlier release is required in order to meet the Project schedule, it shall advise the Department and make a recommendation as to the requested release date. Any decision to authorize an early funding release shall be made by the Department in its sole and absolute discretion.

Section 3.1.4.2.3 Permits. The Design-Builder shall be responsible for preparing and submitting all of the required permit applications that are necessary to complete the Project. The Design-Builder shall develop a list of the required permits and shall track the progress of all such permits through the review process. The Design-Builder shall update the Department with the status of each permit that is required for the Project. The Design-Builder shall engage such permit expeditors as the Design-Builder deems necessary or appropriate in light of the Project's schedule.

Article 4 - FORMATION OF GMP PROPOSAL

Section 4.1. General.

The Design-Builder shall provide the Department with a GMP based on the Design Development Drawings. The District anticipates an early start agreement ("ESA") and subsequent one GMP package.

During the Design & Preconstruction Phase, the Design-Builder shall cause the Architect to prepare the GMP Basis Project Documents. Based upon the GMP Basis Project Documents, the Design-Builder shall propose a GMP (referred to as the "GMP Proposal") which shall be submitted in accordance with this Article. The Design-Builder acknowledges and understands that the GMP Basis Project Documents will be incomplete at the time it submits its GMP Proposal. Although complete construction Project Documents will not be available and many details will not be shown on GMP Basis Project Documents or will otherwise need to be adjusted, the GMP proposed in the Design-Builder's GMP Proposal shall be intended to represent the Design-Builder's offer for the Final Completion of the Project. If the Design-Builder's GMP Proposal is acceptable to the Department, it shall be memorialized in form of an amendment to this Agreement such amendment, the "GMP Amendment". Such amendment shall be in the form of **Exhibit L** attached hereto.

As part of the GMP Amendment, the Design-Builder shall certify that the GMP established thereby (i) contains sufficient amounts to perform all Work necessary for the Final Completion of the Project; and (ii) contains sufficient amounts to provide and construct any items or facilities that are not contained in the GMP Basis Project Documents, but which are necessary for a fully functioning facility that meets the programmatic requirements established for the Project. The Design-Builder will further covenant and agree in the GMP Amendment that it will perform all of the construction work necessary for the Final Completion of the Project, including, without limitation, aspects of the Work that are not shown on the GMP Basis Project Documents, but which are a logical development of the design intent reflected in the GMP Basis Project Documents, for an amount not to exceed the Guaranteed Maximum Price.

4.2 Review of GMP Basis Project Documents.

The Department has selected the Design-Builder, in large part, because of its special expertise in constructing similar projects. Before submitting its Guaranteed Maximum Price, the Design-Builder shall review the GMP Basis Project Documents for accuracy, constructability and completeness and shall bring such deficiencies to the attention of the Department and shall cause its Architect to address any such deficiencies. To the extent that any such deficiencies in the GMP Basis Project Documents could have been identified by such review by a competent Design-Builder, such deficiencies shall not be the basis for a change in the GMP or delaying the Project Schedule.

4.3 Contingency.

The Cost of the Work shall include a contingency, which shall be a sum established by the Department and the Design-Builder to cover, among other things costs necessary to address scope expansion that is a logical development of the design, issues arising from or as a result of deficiencies in the GMP Basis Project Documents and other costs which are properly reimbursable as Cost of the Work but not the basis for a Change Order, such as costs that were not reasonably foreseeable as of the effective date of this Agreement, including such items as emergencies, unforeseeable changes in market conditions for materials or labor, or subsurface, soils or site conditions that were neither known nor reasonably discoverable as of the effective date of the Agreement (the "Contingency"). During the Construction Phase, the Design-Builder shall provide a list of contingency draws, keep the Program Manager informed as to the status of the Contingency, and shall, at a minimum: (i) advise the Program Manager of any significant draws (over 3% of the contingency) upon the Contingency in a timely manner; and (ii) provide the Program Manager with running status of the Contingency balance at least once every two (2) weeks.

4.4 Trade Bids.

4.4.1 Subcontractors and Suppliers; Bidding Procedures. During the Design & Preconstruction Phase, the Design-Builder shall seek to develop subcontractor interest in the Project. Within fifteen (15) days after the completion of the schematic design, the Design-Builder shall provide to the Department for its review and approval a written submission on the proposed bidding procedures. Such procedures shall include: (i) a list of proposed trades packages; (ii) a list of trade subcontractors that will be invited to bid on each such package; and (iii) a narrative description of the process. At least three (3) potential subcontractors shall be identified for each trade package. A copy of this deliverable must be submitted to both the Program Manager and the Contracting Officer. In the event the Department does not approve the proposed bidding procedures within fifteen (15) days after its receipt, such procedures shall be deemed approved unless the Department advises that such is still under review.

4.4.2 Bidding. Following the Department's approval of the design development Project documents, the Design-Builder shall manage the trade bidding process in accordance with the approved bidding procedures and shall use commercially reasonable best efforts to solicit at least three (3) qualified and bona fide bids for each trade package that has an expected value in excess of One Hundred Thousand Dollars (\$100,000). Trade packages shall not be parceled, split or divided to avoid the \$100,000 threshold. In addition to the information normally required in such bids, the Design-Builder shall also require subcontractors to provide an estimate of the percentage of labor hours performed in completing the subcontracted work which will be performed

by District residents. The Design-Builder shall carefully document its procedures for making available bid packages to potential bidders, the contents of each bid package, discussions with bidders at any pre-bid meetings, bidders' compliance with bid requirements, all bids received, the Design-Builder's evaluations of all bids, and the basis for the Design-Builder's recommendation as to which bidders should be chosen. The Department shall be afforded access to all such records at all reasonable times so that, among other things, it may independently confirm the Design-Builder's adherence to all requirements set forth in the Agreement, including, without limitation, affirmative action requirements and subcontracting requirements.

4.4.3 Bid Tab. As part of the negotiations leading up to the GMP, the Design-Builder shall provide to the Department tabulations of the trade bids solicited and copies of all trade bids. In general, the bid tab shall be presented in tabular format that compares the bids received and any other relevant information (i.e. exclusions, past performance history, etc.). The bid tabulation shall include scope assessments and identify required leveling of the trade submitted. To the extent that the Design-Builder's award recommendation is based on scoping adjustments, the Design-Builder shall clearly identify the scoping adjustment and the need for such adjustments. Such bid tabulation shall include LSDBE utilization information in addition to price and other information. Such bid tabulations as well as copies of the bids shall be submitted to the Department's Program Manager. The Design-Builder represents and warrants that the bid tabs so submitted shall fairly represent the results of the subcontractor bidding process and that the Design-Builder shall not misrepresent any such data to the Department or its Program Manager.

4.5 Value Engineering.

Based on the trade bids received, the Design-Builder shall prepare a written report of suggested value engineering strategies necessary to reconcile the costs of constructing the Project budget, if necessary. The Design-Builder shall meet with the Department's representatives to discuss any value engineering and changes in scope necessary to ensure that the Department's schedule and programmatic requirements are met and that the budget is not exceeded. The Design-Builder shall cause the Architect to implement and price any approved value engineering strategies.

4.6 Basis of Guaranteed Maximum Price.

The Design-Builder shall include with the GMP Proposal a written statement of its basis, which shall include:

4.6.1 GMP Basis Project Documents which shall include a list of the Drawings and Specifications, including all addenda thereto, and General, Supplementary and other Conditions which were used in preparation of the GMP Proposal and on which the GMP is based.

4.6.2 A list of Unit Prices and Allowance Items and a statement of their basis; provided, however, that only such allowances as are agreed to by the Department shall be included.

4.6.3 A list of the clarifications and assumptions made by the Design-Builder in the preparation of the GMP Proposal to supplement the information contained in the Drawings and Specifications, noting in particular any exclusions. The assumptions and clarifications shall take precedence over the Drawings and Specifications. The Design-Builder shall prepare a separate memorandum that highlights any differences between

the then approved drawings and the modifications made in the assumptions and clarifications. Such memorandum shall specifically address any changes in the Project's aesthetics, functionality or performance.

4.6.4 The proposed GMP, including a statement of the detailed cost estimate organized by trade categories, allowances, Contingency, and other items and the fee that comprise the GMP.

4.6.5 An update to the Project's schedule to which the Design-Builder will agree to be bound. This update shall be prepared in the same level of detail and in the same manner as the Baseline Schedule.

4.6.6 A subcontracting plan setting forth the names and estimated dollar volume of the work that will be performed by local, small, and disadvantaged business enterprises, as certified by the Department of Small and Local Business Development, upon which the GMP is based.

4.6.7 A summary of Capital Cost vs. Operating Cost Eligibility.

4.6.8 A list of Additive Alternates or Deductive Alternates with defined executable dates, if any.

4.6.9 An allowance for the maintenance of the school and grounds per the Maintenance and Operations plan for up to six (6) months following Substantial Completion. The allowance shall be based upon at least three (3) estimates provided by firms that have either (i) demonstrated previous experience maintaining schools in the District of Columbia or (ii) demonstrated experience in maintaining equivalent facilities. The Department shall have the right to reject one of the firms and their estimate and request the Design-Builder to submit an alternate. The Design-Builder shall include up to one (1) employee as reimbursable under this allowance. The allowance shall be sufficient to include up to five percent (5%) markup on all maintenance and employee costs.

4.6.10 GMP and any Council Package cost estimate summary shall be broken down into three categories as applicable: New Construction, Renovation, and Sitework.

4.7 Department Review of GMP Proposal.

The Design-Builder shall meet with the Department to review the GMP Proposal and the written statement of its basis. In the event that the Department discovers any inconsistencies or inaccuracies in the information presented, the Department shall promptly notify the Design-Builder, who shall make appropriate adjustments to the GMP Proposal, its basis or both.

4.8 Department Acceptance of GMP Proposal.

The Department and the Design-Builder shall meet to negotiate the terms of the GMP Proposal. If the GMP Proposal is acceptable to the Department, the Department shall submit the resulting GMP Amendment for review and approval by the Council for the District of Columbia (the "Council") in the event it exceeds the previously approved not-to-exceed limit established in the Agreement by more than \$1 million. In such event, the GMP shall not be

effective until so approved and executed by the Parties.

4.9 GMP Amendment.

In the event an acceptable GMP Proposal is not developed and a GMP Amendment is not executed, the Agreement will be terminated. In the event that the parties cannot agree on the GMP or the Agreement is terminated pursuant to this Section, the Department shall be free to use any of the Project documents and information developed through the date of termination to retain a new contractor to complete the Project. In such an event, the Design-Builder shall only be entitled to Fifty percent (50%) of the Preconstruction Fee.

4.10 Assignment Upon Failure to Reach GMP.

In the event that the Department and the Design-Builder are unable to agree upon a GMP, the Department shall have the right to terminate this Agreement, and if requested by the Department, the Design-Builder shall assign any trade Subcontracts and its agreement with the Architect to the Department upon such terms and conditions and at the time requested by the Department. In such event, the Design-Builder shall forfeit fifty percent (50%) of the Preconstruction Fee.

4.11 Certification.

As part of the GMP Proposal submitted in accordance with this Article, the Design-Builder agrees to specifically acknowledge and declare that the Contract Project documents are sufficiently complete to have enabled the Design-Builder to determine the Cost of the Work therein in order to enter into the GMP Amendment and to enable the Design-Builder to agree to construct the Work outlined therein in accordance with applicable laws, statutes, building codes and regulations to the best of Design-Builder's knowledge, and otherwise to fulfill all its obligations hereunder. The Design-Builder shall further acknowledge that it has visited the site, examined all conditions affecting the Work, is fully familiar with all of the conditions thereon and affecting the same, and, has carefully examined all drawings and specifications provided to it.

4.12 Unsafe Materials and Hazardous Materials

4.12.1 The Design-Builder shall not bring, spill or release onto the site asbestos, PCBs, or any other Hazardous Material that is not customarily used in a facility of the type and similar to the Project, and shall bring to the Department's attention any specification of such Hazardous Materials in the design Project documents. If the Design-Builder believes that anything in the Agreement would require that it use or bring onto the site asbestos, PCBs, or any Hazardous Material that is not customarily used in a facility of the type and similar to the Project, it shall immediately inform the Department and seek direction before proceeding.

4.12.2 The Design-Builder shall abate and remove Hazardous Materials on or within the site as necessary to complete the Work contemplated by this Agreement. The Design-Builder shall comply with all laws, including, without limitation, the requirements of the Environmental Protection Agency ("EPA") and all jurisdictional agencies as well as all laws relating to safety, health welfare, and protection of the environment, in removing, treating, encapsulating, passivating, and/or disposing of Hazardous Materials, including, but not limited to, removal, treatment, encapsulation, passivation, and/or disposal of the Hazardous Materials. If any notices to governmental authorities are required, the Design-Builder shall also give those notices at the appropriate times. The Design-Builder shall ensure abatement subcontractors and disposal sites are appropriately licensed and qualified.

4.12.3 The Design-Builder shall be entitled to submit a Change Request in accordance with Article 4 of the Standard Contract Provisions (Construction Contracts) in the event the Design-Builder encounters Hazardous Materials beyond those contemplated in the Contract Project documents.

4.13.4 The Design-Builder shall keep detailed records documenting Work done so that the Department may independently verify compliance with all laws, the number of units actually removed, treated, and/or disposed of, and the appropriate unit price(s) applicable to the Work.

Article 5 - CONSTRUCTION PHASE

5.1 General.

The Construction Phase shall not commence until the Department issues a Notice to Proceed for Construction Phase Services. The Design-Builder shall, through Subcontractors or, with the written consent of the Department, with its own forces, perform all of the Work necessary to construct the Project so that it is complete, safe, and properly built in strict accordance with the approved Construction Project documents and the other requirements of this Agreement. Without limitation, the Design-Builder shall provide all of the labor, materials, tools, equipment, temporary services, and facilities necessary to complete the Project in accordance with the drawings, specifications, schedule, and budget that are issued for the Project. The Design-Builder shall be responsible for paying for and obtaining all necessary permits and to pay all necessary fees for utility connections. The Work shall be carried out in a good and workmanlike, first-class manner, and in a timely fashion. All materials and equipment to be incorporated into the Project shall be new and previously unused, unless otherwise specified, and shall be free of manufacturing or other defects.

The Work shall be accomplished in accordance with the following:

- a. Manage all aspects of the renovation and construction of the Project.
- b. Manage bi-weekly progress meetings. Site visits are included in base Design-Build Fee.
- c. Review and process shop drawing submissions, RFI's, etc.
- d. Prepare meeting notes and records of decisions/changes made.
- e. Conduct pre-closeout inspections.
- f. Review closeout documents for completeness, such as As-Built Drawings based on the Contractor's red line drawings and/or coordinated set developed during the subcontractor coordination process. As-Built Drawings should be transmitted to DGS in hard copy, PDF, and CAD formats.

5.1.1 Unrenovated Portions of the Structure. In constructing the Project, the Design-Builder shall ensure that unrenovated portions of existing structures, if any, including, but not limited to, the mechanical, plumbing, electrical systems, and other building systems are not adversely affected. All unrenovated portions of the structures should function, at a minimum, at the level of functionality that existed immediately prior to the construction of the Project. If any unrenovated portion of the Project functions at a lower level of functionality as a result of the Design-Builder's Work, the Design-Builder shall be back-charged the costs incurred by the Department in addressing the decreased functionality.

5.2 Design Completion.

5.2.1 Mid-Point Construction Project Document Review. Based on the approved Design Development Documents and any approved Value Engineering, the Design-Builder shall prepare a set of Construction Documents. It is contemplated that the Construction Documents will be issued in several different sets (i.e. architectural, electrical, mechanical, structural, etc.). As each such set reaches a point where it is approximately Fifty percent (50%) complete, the Design-Builder shall prepare and submit a progress printing to the Department for its review and comment.

5.2.2 Construction Project Document Review & Coordination. The Design-Builder shall complete each of the Construction Documents packages in a manner that addresses the concerns raised by the Department during the review contemplated in Section 5.2.1 for such package. The Design-Builder shall issue one or more set of permit documents to the Department for its review and approval (“Permit Set”). With regard to each such set, the Design-Builder shall highlight (or bubble) any aspect of the design that represents a material deviation from the approved Design Development Documents and shall address in a narrative format the impact, if any, such departure shall have on the Project’s aesthetics, functionality or performance. The Department shall have the right to disapprove the Construction Documents for any reason. If the Department disapproves the Construction Documents, the Design-Builder will not be entitled to any additional compensation. If, however, the Department disapproves a Construction Document that is a logical extension of the approved Design Development Documents, the Design-Builder will be entitled to an adjustment to the GMP and/or the Agreement schedule unless such a package departs from the Scope of Work fairly reflected in the GMP Drawings and Specifications and in such event the Design-Builder shall be required to prepare a revised design that complies with the GMP drawings and specifications (“Drawings and Specifications”) and without any entitlement to an increase in the GMP or an adjustment of the Agreement schedule. In the event the Department does not approve a document within fourteen (14) days after issuance, such document shall be deemed approved unless the Department advises that such document is still under review.

5.2.3. Code Review. The Design-Builder shall submit the Permit Set to the Department of Consumer and Regulatory Affairs in order to obtain the necessary building permits for the Project. The Design-Builder shall monitor the permit process and shall incorporate any changes or adjustments required by the Code Official. The Design-Builder shall also issue any such changes to the Department for its review and approval. In this submittal, the Architect shall highlight (or bubble) any aspect of the design that represents a material deviation from the permit set Project documents and shall address in a narrative format the impact, if any, such departure shall have on the Project’s aesthetics, functionality or performance. Subsequent to obtaining the necessary building permits, the Design-Builder shall prepare one or more sets of “issued for construction Project documents” (the “IFC Set(s)”).

5.2.4. Design Changes. If it should become necessary to amend any of the approved IFC Set(s), the Design-Builder shall prepare an amendment to the drawings and shall submit such amendment to the Department for its review and approval. In this submittal, the Design-Builder shall highlight (or bubble) any aspect of the design that represents a material deviation from the permit set documents and shall address in a narrative format the impact, if any, such departure shall have on the Project’s aesthetics, functionality or performance. In the event the Department does not approve such document within ten (10) business days after issuance, unless otherwise denied, such document shall be deemed approved, provided however that the Department has not advised that such document is still under review.

5.2.5 Third Party Contractors. The Department will hire third party contractors for plan review and for testing and material inspections. The Design-Builder shall coordinate and work with the Program Manager and third-party plan reviewer during the building permit process.

5.2.6 Final Maintenance and Operations Plan. The Design-Builder shall submit, for the Department's review, a final Maintenance and Operations Plan. The Maintenance and Operations Plan shall be based on the final IFC Set(s). The approved Maintenance and Operations Plan shall form the basis of the Design-Builder's maintenance of the building following Substantial Completion.

5.3 Subcontracting and Administration

5.3.1 It is contemplated that all or substantially all of the construction of the Project will be carried out by trade Subcontractors and that those trade subcontracts will be awarded through the competitive bid process contemplated in **Section 4.4**. The Design-Builder shall enter into a written agreement with each subcontractor. The trade subcontractors will be under written contract with the Design-Builder. All subcontracts and agreements for the supply of equipment or materials awarded for the Project shall be fixed-price contracts unless otherwise expressly authorized by the Department, in writing. It is understood and agreed, however, that certain trade packages (such as the mechanical and electrical packages) may be awarded on a design-assist or design-build basis and that such trade packages may be awarded on such other basis subject to the Department's consent as to the bidding procedures and economic structure with regard to those packages. The Design-Builder and its affiliates may not carry out trade work with its own forces without the Department's written permission, which permission may be withheld or conditioned by the Department in its sole and absolute judgment.

5.3.2 In addition to the open book reporting requirements set forth in 5.10, the Design-Builder shall provide to the Department a copy of all quotes or proposals submitted by potential subcontractors.

5.3.3 The Design-Builder shall develop a purchasing strategy to address the expedited schedule and conditions of this Project and shall include appropriate provisions in the subcontracts to minimize the cost impact associated with such conditions. Such strategies may include, but are not limited to (i) obtaining from subcontractors unit price quotes for typical coordination items; (ii) setting aside allowances for coordination work; and (iii) such other techniques as may be employed by the Design-Builder.

5.3.4 The Design-Builder shall carefully document its procedures for making available bid packages to potential bidders, the contents of each bid package, discussions with bidders at any pre-bid meetings, bidders' compliance with bid requirements, all bids received, the Design-Builder's evaluations of all bids, and the basis for the Design-Builder's recommendation as to which bidders should be chosen. The Department shall be afforded access to all such records at all reasonable times so that, among other things, it may independently confirm the Design-Builder's adherence to all requirements set forth in the Agreement including, without limitation, affirmative action requirements and subcontracting requirements.

5.3.5 The Department may, in its sole discretion, reject any or all bids and proposals received for any bid package, and may require the Design-Builder to obtain new or revised bids or proposals.

5.3.6 The Department may, in its sole discretion, direct the Design-Builder to accept a bid from a qualified bidder other than the bidder to whom the Design-Builder recommends award of a subcontract or supply agreement. If the Department chooses this option, it shall issue a Change Order to the Design-Builder for any difference between the cost of the subcontract or supply agreement awarded and the bid price of the Subcontractor or supplier recommended by the Design-Builder, but without any adjustment to the Design-Build Fee.

5.3.7 The Department must approve all Subcontractors and suppliers. The Department may elect to review the form of any subcontract or agreement with a material supplier to ensure that such contract incorporates the contractual provisions required by this Agreement.

5.3.8 The Design-Builder must contract for provision of all services and materials for the Project (other than Self-Performed Work which must be authorized in advance and in writing by the Department) via written subcontracts or, for contracts requiring provision of materials or equipment only, and not labor, via written supply agreements. All subcontracts and supply agreements shall include the following provisions:

5.3.8.1 that, to the extent of the work or supply within the agreement's scope, the Subcontractor or supplier is bound to the Design-Builder for the performance of all obligations which the Design-Builder owes the Department under the Agreement;

5.3.8.2 that the Subcontractor or supplier is not in privity with the Department and shall not seek compensation directly from the Department on any third-party beneficiary, quantum meruit, or unjust enrichment claim, or otherwise, except as may be permitted by any applicable mechanic's lien law;

5.3.8.3 that the Department is a third-party beneficiary of the subcontract or supply agreement, entitled to enforce any rights thereunder for its benefit;

5.3.8.4 that the Subcontractor or supplier consents to assignment of its agreement to the Department, at the Department's sole option, if the Design-Builder is terminated for default;

5.3.8.5 that the Subcontractor or supplier shall comply immediately with a written order from the Department to the Design-Builder to suspend or stop work;

5.3.8.6 that the Subcontractor or supplier shall maintain records of all Work it is requested or authorized to do on a time and material or cost-plus basis, or with respect to claims that it has asserted on a time and materials or cost-plus basis, during the Project and for a period of time specified in the General Conditions and requiring the Subcontractor or supplier to make those records available for review or audit by the Department during that time;

5.3.8.7 that the Subcontractor shall obtain and maintain, throughout the Project, workers' compensation insurance in accordance with the laws of the District of Columbia (This provision is not applicable to supply agreements);

5.3.8.8 that, if the Department terminates the Agreement for convenience, the Design-Builder may similarly terminate the subcontract or supply agreement for convenience, and that the Subcontractor or supplier shall, in such a case, be entitled

only to the costs set forth in Article 6 of the Standard Contract Provisions (Construction Contracts);

5.3.8.9 that the Department shall have the right to enter into a contract with the Subcontractor or supplier for the same price as its subcontract or supply agreement price less amounts already paid, if the Design-Builder files a voluntary petition in bankruptcy or has an involuntary petition in bankruptcy filed against it;

5.3.8.10 that the Subcontractor or supplier shall not be entitled to payment for defective or non-conforming work, materials or equipment, and shall be obligated promptly to repair or replace non-conforming work, materials or equipment at its own cost;

5.3.8.11 a provision requiring that Subcontractors and suppliers promptly pay Subcontractors and suppliers at lower tiers, imposing upon the Subcontractors and suppliers a duty to pay interest on late payments, and barring reimbursement for interest paid to lower tier Subcontractors or suppliers due to a Subcontractor's or supplier's failure to pay them in timely fashion;

5.3.8.12 a provision requiring that all Subcontractors at all tiers comply with the provisions of Article 13 (Economic Inclusion Goals); provided, however, that the Design-Builder may, in its reasonable discretion impose a different LSDBE subcontracting goal on some or all of its Subcontractors; provided, further, however, that nothing in this provision shall be deemed to excuse the Design-Builder from using its best efforts to achieve the LSDBE subcontracting goal on an aggregate basis for the Project;

5.3.8.13 a provision which allows the Design-Builder to withhold payment from the Subcontractor if the Subcontractor does not meet the requirements of the Subcontract;

5.3.8.14 lien and claim release and waiver provisions substantially identical to those in this Agreement.

5.3.9 Upon receiving any payment from the Department that includes amounts attributable to Work performed or materials or equipment supplied by a Subcontractor or supplier, the Design-Builder shall either pay the Subcontractor or supplier for its proportionate share of the amount paid to the Design-Builder for the Subcontractor's or supplier's Work or materials or equipment, or notify the Department and the Subcontractor or supplier, in writing, of the Design-Builder's intention to withhold all or part of the payment and state the reason for the withholding. All monies paid to the Design-Builder under the Agreement shall be used first to pay amounts due to Subcontractors or suppliers supplying labor or materials for the Project and only money remaining after such payments are made may be used for other items such as the Design-Build Fee. Monies paid by joint check shall be deemed to have been paid fully to the Subcontractor or supplier named as a joint payee, unless the Department agrees otherwise in writing. Any interest paid to Subcontractors or suppliers because the Design-Builder has failed to pay them in timely fashion shall not be reimbursable as part of the Cost of the Work.

5.3.10 The Design-Builder shall not enter into any profit sharing, rebate, or similar arrangement with any Subcontractor or supplier at any tier with respect to the Project or the Work to be carried out for the Project.

5.3.11 The Design-Builder shall not substitute or replace any subcontractor or supplier approved by the Department without the Department's Contracting Officer and DSLBD prior written consent.

5.3.12 The Department has the right to contact Subcontractors or suppliers at all tiers, or material or equipment suppliers directly to confirm amounts due and owing to them or amounts paid to them for Work on the Project, and to ascertain from the Subcontractors or suppliers at all tiers their projections of the cost to complete their work or to supply their material or equipment, or the existence of any claims or disputes. In doing so the Department shall not issue any directions to Subcontractors or Suppliers at any tier.

5.3.13 If it comes to the Department's attention that a Subcontractor or supplier has not been paid in timely fashion (other than for disputed amounts), and if the Design-Builder fails to cure the problem within five (5) calendar days after the Department gives it written notice of the failure to pay, the Department may make payments to the Subcontractor or supplier and Design-Builder by joint check. If the payment was already made to the contractor, the joint check will be for future payments.

5.3.14 The Design-Builder shall be required to provide an evaluation of each of its subcontractors' performance by completing and submitting to the Department the Subcontractor Performance Evaluation Form set forth as **Exhibit O**, as follows:

- (a) Within ninety (90) days of initiating the Construction Phase; and
- (b) Within thirty (30) days after Final Completion of the Project.

5.3.15 The Design-Builder shall be required to provide a certificate of insurance for each subcontractor before such subcontractor begins work.

5.4 Weekly Progress Meetings & Schedule Updates.

The Design-Builder shall schedule and conduct, at a minimum, weekly progress meetings following the Design-Builder's generated agenda at which the Department, the Architect, the Program Manager, the Design-Builder and appropriate Subcontractors can discuss the status of the Work. The Design-Builder shall prepare and promptly distribute meeting minutes. In addition, the Design-Builder shall submit bi-weekly Schedule updates which shall reflect actual conditions of Project progress as of the date of the update. The update shall reflect the actual progress of construction, identify any developing delays, regardless of their cause, and reflect the Design-Builder's best projection of the actual date by which Substantial Completion and Final Completion of the Project will be achieved. Via a narrative statement (not merely a critical path method schedule), the Design-Builder shall identify the causes of any potential delay and state what, in the Design-Builder's judgment, must be done to avoid or reduce that delay. The Design-Builder shall point out, in its narrative, changes that have occurred since the last update, including those related to major changes in the scope of work, activities modified since the last update, revised projections of durations, progress and completion, revisions to the schedule logic or assumptions, and other relevant changes. Any significant variance from the previous schedule or update shall also be identified in a narrative, together with the reasons for the variance and its impact on Project completion. All Schedule updates shall be in a native format reasonably acceptable to the Department (e.g., Primavera). The Department may make reasonable requests during the Project for changes to the format or for further explanation of information provided. Submission of updates showing that Substantial Completion or Final Completion of the Project will be achieved later than the applicable scheduled completion date shall not constitute requests for extension of time and

shall not operate to change the scheduled completion date(s). The Department's receipt of, and lack of objection to, any schedule update showing Substantial Completion or Final Completion later than the dates agreed upon in the Project Schedule shall not be regarded as the Department's agreement that the Design-Builder may have an extension of time, or as a waiver of any of the Department's rights, but merely as the Design-Builder's representation that, as a matter of fact, Substantial Completion or Final Completion of the Project may not be completed by the agreed upon date in the Project Schedule. Changes to the scheduled completion dates may be made only in the circumstances and only by the methods set forth in this Agreement.

5.5 Written Reports.

The Design-Builder shall provide written reports to the Department on the progress of the entire Work at least monthly from Preconstruction Notice to Proceed until Final Completion of the Project. The monthly report shall include: (i) an updated schedule analysis, including any plans to correct defective or deficient work or recover delays; (ii) an updated cost report; (iii) a monthly review of cash flow; (iv) a quality control report; and (v) progress photos. Such written report Such written report shall including the following elements:

5.5.1 Construction Progress Update. Each monthly update shall contain a narrative description of the Project progress and a critical path method schedule in Primavera format, including any plans to correct defective or deficient work or for time lost due to delays.

5.5.2 Cost Update. The monthly update shall reflect, by Guaranteed Maximum Price line item, the original line item amount, approved, pending, and projected Change Order amounts, the cost incurred to date, the projected cost to complete the Work of the line item, and any variance between the actually approved budgeted balance of the line item and the projected cost to complete. A clear distinction must be made between approved Change Orders and those merely requested or anticipated. The report shall explain all variances including "buy-outs" or final actual costs including those below their respective Guaranteed Maximum Price line item. In addition, the report must disclose any instances in which the Design-Builder has transferred amounts from one line item to another, or from the Contingency to any other line item. Neither submission of, nor the Department's failure to reject an update reflecting that the projected cost to complete the Project exceeding the Guaranteed Maximum Price will operate to increase the Guaranteed Maximum Price or waive the Department's right to enforce the Guaranteed Maximum Price. If the report reflects budget overruns, it must also include a recovery plan.

5.5.3 Economic Inclusion Report. The monthly report shall include a detailed summary of the Design-Builder's efforts and results with respect to the economic inclusion goals set forth in this Agreement. Such report shall be in a format acceptable to the Department and shall include, at a minimum: (i) the Design-Builder's overall performance with respect to the goals; (ii) a listing of subcontracts and agreements with material suppliers during the month and the percentage of those subcontracts and agreements with material suppliers awarded to LSDBEs; (iii) a listing of subcontracts during the month and the estimated percentage of the labor hours to be worked by District of Columbia residents pursuant to those subcontracts; and (iv) a description of the major subcontracting and supply opportunities that will be solicited during the next three (3) months and the actions being taken to meet the subcontracting goals.

5.5.4 Cash Flow Update. If there have been any changes to the anticipated cash flow for the Project, such changes shall be disclosed and explained in the monthly report. If there are no such changes, the report shall so state.

5.5.5 Quality Assurance Report. The monthly report shall include a detailed summary of the steps that are being employed to ensure quality construction and workmanship. Each report shall specifically address issues that were raised by the Department and/or its Program Manager during the prior month and outline the steps that are being taken to address such issues.

5.5.6 Progress Photos. The monthly report shall include updated progress photos that shall detail changes in the Work during the month. The Design-Builder shall also maintain a daily log containing a record of weather, Subcontractors working on the site, number of workers, major equipment on the site, Work accomplished, problems encountered and other similar relevant data as the Department may reasonably require. The log shall be available to the Department, the Architect and the Program Manager, and on a monthly basis a copy of the log shall be submitted to the Department.

5.6 Cost Control System.

The Design-Builder shall use a system of cost control for the Work in a format consistent with the GMP Drawings & Specifications and approved by the Department, which shall include, without limitation, regular monitoring of actual costs for activities in progress and estimates for uncompleted tasks and proposed changes. Design-Builder shall identify variances between actual and estimated costs and report the variances to the Department, the Architect and the Program Manager at regular intervals.

5.7 Key Personnel.

5.7.1 To carry out its duties, the Design-Builder shall provide at least the key personnel identified in **Exhibit F** to this Agreement (“Key Personnel”), who shall carry out the functions identified in **Exhibit F**. Among other things, the Key Personnel shall include:

A - Key Personnel of the Prime Contractor:

- i. Project Manager
- ii. Superintendent
- iii. Project Executive

B - Key Personnel of the Architect/Engineer

- i. Project Manager
- ii. Project Architect
- iii. Principal in Charge
- iv. Lead Mechanical Engineer
- v. Lead Structural Engineer
- vi. Lead Envelope Consultant

It is contemplated that these Key personnel will work from the design stage, purchasing and throughout the bulk of the field work. The Design-Builder’s obligation to provide adequate staffing is not limited to providing the Key Personnel, but is determined by the needs of the Project. The Design-Builder shall not replace any of the Key Personnel without the Department’s prior written approval. If any of the Key Personnel become unavailable to perform services in connection with the Agreement due to death, disability or separation from the employment of the Design-Builder or any affiliate of the Design-Builder, then the Design-Builder shall promptly notify the Department’s Contracting Officer and propose a replacement acceptable to the Department. The Department shall

be entitled to complete information before approving such replacement, including, but not limited to, a current resume of the proposed replacement to include qualifications and experience.

5.7.2 Certain members of the Design-Builder's Key Personnel shall be subject to a replacement fee for their removal or reassignment by the Design-Builder. Those members of the Design-Builder's Key Personnel subject to a replacement fee shall be identified in **Exhibit F** as subject to the replacement fee provisions. In the event there is no delineation in **Exhibit F** of those members of the Design-Builder's Key Personnel subject to the replacement fee provisions of this Agreement, then all of the Key Personnel shall be subject to the replacement fee provisions of this Agreement.

5.7.2.1 Removal or Replacement of Key Personnel. Subject to the terms of Section 5.7.1, if the Design-Builder replaces one of the key personnel listed in **Exhibit F** as being subject to a replacement fee, without the prior written consent of the Department, then the Design-Builder shall pay to the Department the amount set forth in the Project Information Section of this Agreement as replacement fee and not a penalty, to reimburse the Department for its administrative costs arising from the Design-Builder's failure to provide the Key Personnel. The foregoing replacement fee amount shall not bar recovery of any other damages, costs or expenses other than the Department's internal administrative costs.

5.7.2.2 In addition, the Department shall have the right, to be exercised in its sole discretion, to remove, replace or to reduce the scope of services of the Design-Builder in the event that a member of the Key Personnel has been removed or replaced by the Design-Builder without the prior written consent of the Department. In the event the Department exercises the right to remove, replace or to reduce the scope of services of the Design-Builder, the Department shall have the right to enforce the terms of this Agreement and to keep-in-place those members of the Design-Builder's team not removed or replaced and the remaining members shall complete the services required under this Agreement in conjunction with the new members of the Design-Builder's team approved by the Department.

5.8 Qualified Personnel/Cooperation.

The Design-Builder shall employ on the Project only those employees and Subcontractors who will work together in harmony and who will cooperate with one another on the Project. The Design-Builder shall enforce strict discipline, good order and harmony among its employees and its Subcontractors and shall remove from the site any person who is unfit for the work or fails to conduct herself or himself in a proper and cooperative manner. If the Department requests removal of any person as unfit or as having behaved inappropriately, the Design-Builder shall promptly comply.

5.9 Warranty.

The Design-Builder warrants to the Department that materials and equipment furnished under the Contract Project documents will be of good quality and new unless otherwise required or permitted by the Contract Project documents, that for the one (1) year period following the Substantial Completion Date the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Project documents. The Design-Builder's warranty excludes remedies for damage or

defect caused by abuse, modifications not executed by the Design-Builder, improper or insufficient maintenance, improper operation, or normal wear and tear from normal usage. The Design-Builder shall use commercially reasonable efforts to schedule a joint inspection of the Project during the eleventh month after Substantial Completion is achieved. During such inspection, the Design-Builder and a representative of the Department shall walk the Project to identify any necessary warranty work

5.10 Open Book Reporting.

The Design-Builder shall maintain an open book reporting system with the Department, allowing the Department or its consultants access to the Design-Builder's Subcontractors and material suppliers, invoices, purchase orders, Change Order estimates, records for Self-Performed Work, and other relevant Project documentation and sources of information concerning the Work or costs. The Department shall not use its access to the Subcontractors to give instructions or directions to them. All instructions or directions shall be given only to the Design-Builder.

5.11 Claims for Additional Time.

5.11.1 Time is of the essence of this Agreement. The Project must be Substantially Complete no later than the Substantial Completion Date set forth within the Project Information Section above.

5.11.2 The Design-Builder will perform the Work so that it shall achieve Substantial Completion by the Substantial Completion Date. Unless the failure to achieve Substantial Completion by the Substantial Completion Date is a result of an Excusable Delay, as defined in Section 4.11.3, the delay shall be deemed Non-Excusable and the Design-Builder shall not be entitled to an extension of time. Without limiting the generality of the foregoing, delays for the following reasons shall be regarded as Non-Excusable and shall not entitle the Design-Builder to an extension of time:

5.11.2.1 Delays due to job site labor disputes, work stoppages, or suspensions of work;

5.11.2.2 Delays due to adverse weather, unless the Design-Builder establishes that the adverse weather was of a nature and duration in excess of averages established by data from the U.S. Department of Commerce, National Oceanic and Atmospheric Administration for the Project locale for the ten (10) years preceding the effective date of the Agreement. For purposes of this clause, weather shall only be deemed "adverse" if the weather in question was more severe than that encountered at the Project site over the last ten (10) years for the month in question. Such determinations shall be made based on the number of rain/snow days or the cumulative precipitation total for the month in question. Notwithstanding the foregoing, named storms shall conclusively be deemed "adverse";

5.11.2.3 Delays due to the failure of the Design-Builder or Subcontractors or material suppliers at any tier to perform in timely or proper fashion, without regard to concepts of negligence or fault; or

5.11.2.4 Delays due to Site Conditions whether known or unknown as of the effective date of the Agreement, foreseeable or unforeseeable at that time, naturally occurring or man-made; provided, however, that delays due to differing Site Conditions

as permitted by Article 4, Section A of the Standard Contract Provisions (Construction Contracts) or Hazardous Materials Remediation shall be deemed an Excusable Delay.

5.11.3 The Design-Builder shall be entitled to an adjustment in the Substantial Completion Date due to an Excusable Delay. The term “Excusable Delay” shall mean:

5.11.3.1 Delays due to adverse weather other than those that are classified as a Non-Excusable delay in accordance with Section 5.11.2.2 of this Agreement;

5.11.3.2 Delays due to acts of God, war, unavoidable casualties, civil unrest, and other similar causes of delay that are beyond the control of the Design-Builder; provided, however, that in no event shall a Non-Excusable Delay or the action or inaction of the Design-Builder, or any of its employees, agents, Subcontractors or material suppliers be deemed an Excusable Delay; or

5.11.3.3 Delays caused by differing Site Conditions as permitted by Article 4, Section A of the Standard Contract Provisions (Construction Contracts) or Hazardous Materials Remediation as contemplated in Section 5.11.2.4 of this Agreement;

5.11.3.4 Delays due to suspensions of work;

5.11.3.5 Delays caused by the Client Agency or separate contractors of the Client Agency to the extent such delays are not concurrent with delays caused by the Design-Builder or any of its employees, agents, subcontractors or material suppliers; or

In addition to the forgoing, a delay shall be deemed to be an Excusable Delay only to the extent that such delay (i) warrants an extension in the Substantial or Final Completion Date; (ii) has not been caused by the Design-Builder or any of its employees, agents, Subcontractors or material suppliers; (iii) is on Project’s critical path; and (iv) is in addition to any time contingency periods set forth in the critical path.

5.11.4 If the Design-Builder wishes to make a claim for an adjustment in time allotted per the Project Schedule, written notice as provided herein shall be given. The Design-Builder’s claim shall include an estimate of the cost and of the probable effect of delay on the progress of the Work. In the case of continuing delay, only one claim is necessary.

5.11.5 In no event shall the Design-Builder be entitled to an increase in the GMP or the Design-Build Fee as a result of either an Excusable or Non-Excusable Delay; provided, however, that to the extent that a delay is: (i) an Excusable Delay; (ii) of unreasonable duration; (iii) caused solely by the Department; and (iv) not concurrent with any other delay, then the Design-Builder shall be entitled to receive its actual costs, including all direct and indirect costs, bonds and insurances resulting from such extended duration. It is understood that the Design-Builder shall not be entitled to any profit or home office overhead, including, but not limited to, an increase in the Design-Build Fee, on any amounts to which the Design-Builder may be entitled pursuant to the preceding sentence.

5.12 Site Safety and Clean-Up.

5.12.1 The Design-Builder will be required to provide a safe and efficient site, with controlled access. As part of this obligation, the Design-Builder shall be responsible for

initiating, maintaining and supervising all safety precautions and programs in connection with the Project, and shall comply with the requirements set forth in Article 16, Section F of the Standard Contract Provisions (Construction Contracts).

5.12.2 Safety Plan. Prior to the start of construction activities, the Design-Builder shall prepare a safety plan for the construction phase conforming to OSHA 29 CFR 1926 (such plan, the “Safety Plan”). Pursuant to OSHA 29 CFR 1926, the Design-Builder shall provide all employees with the necessary Personal Protective Equipment (“PPE”) to comply with all COVID-19 regulations, and shall additionally require anyone on site to comply with any PPE requirements. This Safety Plan developed by the Design-Builder shall describe the proposed separation and the specific nature of the safety measures to be taken including fences and barriers that will be used as well as the site security details. The Safety Plan will be submitted to the Department and Client Agency for their review and approval prior to the commencement of construction. Once the Safety Plan has been approved, the Design-Builder shall comply with it at all times during construction. The Design-Builder shall be required to revise the Safety Plan as may be requested by the Department or Client Agency at any time, including, but not limited to, as necessary to address any new national or local COVID-19 regulations, recommendations, or restrictions. The cost of revising and complying with the plan shall not entitle the Design-Builder to an increase in the GMP. In the event the Design-Builder fails to provide the Safety Plan, the Design-Builder will not be permitted to commence the Construction Phase until the Safety Plan is submitted and in no event shall any resulting delay constitute an Excusable Delay. Additionally, the Design-Builder shall comply with the requirements of Article 27, Section A of the Standard Contract Provisions (Construction Contracts).

5.12.3 Safety Barriers/Fences. As part of its responsibility for Project safety, the Design-Builder shall install such fences and barriers as may be necessary to separate the construction areas of the site from those areas that are then being used by Client Agency for educational purposes. The Design-Builder shall describe in the Safety Plan the proposed separation and the specific nature of the fences and barriers that will be used.

5.12.4 Site Security. The Design-Builder shall be responsible for site security and shall be required to provide such watchmen as are necessary to protect the site from unwanted intrusion. Site Security shall be included in the Design-Builder’s General Conditions Cost.

5.12.5 Exculpation. The right of the Department and Client Agency to comment on the Safety Plan and the nature and location of the required fences and barriers shall in no way absolve the Design-Builder from the obligation to maintain a safe site.

5.12.6 Site Cleanliness. During the Agreement performance and/or as directed by the Department’s Program Manager, as the installation is completed, the Design-Builder shall ensure that the site is clear of all extraneous materials, rubbish, or debris.

5.13 Workhours, Site Office, and Coordination with Client Agency and Community

5.13.1 Workhours. The Design-Builder shall comply with the Noise Ordinance and neither it nor its subcontractors shall undertake work on the Project site other than at the times and sound level permitted by the Noise Ordinance.

5.13.2 Site Office. Throughout the Project, the Design-Builder shall provide and maintain a fully-equipped construction office for the Project site.

5.13.3 Parking. The Design-Builder shall organize its work in such a manner so as to minimize the impact of its operations on the surrounding community. To the extent that the number of workers on the site is likely to have an adverse impact on neighborhood parking, the Design-Builder shall develop a parking plan for those individuals working on the site that is reasonably acceptable to the Department.

5.13.4 Wheel Washing Stations. The Design-Builder shall provide wheel washing stations on site so as to prevent the accumulation of dirt and other refuse on the streets surrounding the Project site.

5.13.5 Outreach Plan. The Design-Builder shall keep the Department informed of the construction activities and their potential impact on the community and shall develop a community outreach plan (the "Outreach Plan"). The Design-Builder shall submit the Outreach Plan to the Department prior to its implementation which shall be subject to the Department's review and approval.

5.13.6 Supervision. Throughout the Work, the construction office shall be managed by personnel competent to oversee the Work at all times while construction is underway. Such personnel shall maintain full-time, on-site construction supervision and provide daily inspections, quality control, monitoring, coordination of various trades, record drawings, and daily work log.

5.14 Close-out & FF&E.

5.14.1 A detailed list of FF&E requirements will be developed during the design & Preconstruction Phase and attached hereto as Exhibit N.

5.14.2 Punchlist. Promptly before Substantial Completion, the Design-Builder shall cause the Architect to develop a punchlist. Once the punchlist is prepared, the Design-Builder shall inspect the work along with representatives from the Department. The punchlist shall be revised to reflect additional work items that are discovered during such inspection. The Design-Builder shall correct all punchlist items no later than ninety (30) days after Substantial Completion is achieved.

5.14.3 Warranties & Manuals. Prior to Substantial Completion and no later than fifteen (15) days following Substantial Completion, the Design-Builder shall prepare and submit the following Project documentation: (i) a complete set of product manuals ("O&M"), training videos, warranties, etc.; (ii) attic stock; (iii) an equipment schedule; (iv) a proposed schedule of maintenance for the new building; (v) environmental, health and safety Project documents for the renovated building; and (vi) all applicable inspection certificates/permits (boiler, elevator, emergency evacuation plans, health inspection, etc.) for the new building. No later than thirty (30) days following Substantial Completion, the Design-Builder shall prepare and submit: (i) a complete set of its Project files; and (ii) a set of record drawings, including BIM models.

5.14.4 Support for Initial Heating & Cooling Season. The Design-Builder and its mechanical subcontractor shall provide support to the Client Agency and the Department during system start-up and in initial operation for the first heating and cooling season after Substantial Completion is achieved.

5.14.5 Training. The Design-Builder shall provide training to Client Agency staff on all of the building systems. The Design-Builder shall be required to schedule such training

sessions and shall use commercially reasonable efforts to ensure all such training occurs prior to Final Completion. All training shall be electronically recorded and turned over to the Department for future use.

5.14.6 The Design-Builder shall assist Client Agency in relocating FF&E and other items as necessary within the renovated building, as well as for cleaning and other move-in services as directed by the Department. The GMP shall include an allowance and scope of work for these activities. This allowance is in addition to cleaning services that would otherwise be required by the Design-Builder, including, but not limited to, the obligation to deliver a broom clean building at the end of construction.

5.15 Salvaged and Stored Items. The Design-Builder shall be responsible for salvaging and storing all items as identified by the Department, and to the benefit of the Department, in accordance with all applicable District laws and regulations, after notifying the Department and receiving the Department's permission to proceed.

5.16 Protection of Existing Elements. The Design-Builder shall protect all existing features, public utilities, and other existing structures during construction. The Design-Builder shall protect existing, site improvements, trees and shrubs from damage during construction. Protection extends to the root systems of existing vegetation. The Design-Builder shall not store materials or equipment, or drive machinery, within drip line of existing trees and shrubs.

5.17 Sediment and Erosion Control. The Design-Builder shall be responsible for installing sediment and erosion control measures in accordance with DOEE guidelines, inclusive of, but not limited to: silt fencing, inlet protection, stabilized construction entrances, and other control measures. The Design-Builder shall be responsible for scheduling and coordination of DOEE Kick-Off Meeting.

5.18 Quality Control.

5.18.1 General Obligation. The Design-Builder shall be responsible for all activities necessary to execute, manage, control, and document work for ensuring compliance with the contract documents. The Design-Builder's responsibility includes ensuring adequate quality control services are provided by the Design-Builder's employees, its subcontractors, vendors & suppliers at all levels from concept to completion including site assessment-investigations/discovery, schematic design development, pre-construction, construction and closeout phases. All contract related work activities and their implementation procedures described within this quality control plan shall also address safety, measures to ensure regulatory permit & code compliance, submittal management, change document processing/incorporation, reporting, and all other functions necessary to achieve highest levels of quality during design and construction efforts.

5.18.2 Quality Control Plan. Within forty-five (45) days after the Design Development Documents are approved, the Design-Builder shall develop a quality control plan for the Project (the "Quality Control Plan"). A draft of the Quality Control Plan shall be submitted to the Department and shall be subject to the Department's review and approval. This draft shall comply with the guidelines and include at a minimum, the necessary components for Quality Control Plan development described within the Department's Quality Control Master Program. The Quality Control Plan shall be tailored to the specific products/type of construction activities contemplated in the Design Development

Documents, and in general, shall include a table of contents, quality control team organization and hierarchical arrangement detailing ongoing, regular interaction/coordination between design & construction teams, duties/responsibilities of quality control personnel, submittal procedures, schedule of specified inspection & testing requirements, deficiency correction procedures, issues & conflicts resolution, RFI documentation process, change management, as-built record keeping of contract documents and a listing of customized quality control procedures that will be required to ensure key elements of the Work are executed in conformance with design documents. Examples of a few key elements that necessitate focused attention and involvement of competent agencies include MEP-Energy systems startup/commissioning, Security systems integration and building envelope multi-trade coordination. Mockup construction requirements must be incorporated into the plan, in order to establish a minimum standard of acceptance by the Department, for the project's most visible and critical structural-architectural building elements like CIP concrete and exterior facades. The Quality Control plan must clearly describe requirements addressing involvement of qualified personnel for critical building elements and any delegated design features that require engineered solutions, backed by supporting analysis data.

The Quality Control Plan must clearly describe quality control measures recommended to be undertaken by both design & construction teams. Prior to construction phase commencing, the Design-Build team must advise the Department regarding the status of their drawing & specification documents, from a percentage completion standpoint. For that matter, the Design Phase quality control effort shall provide metrics to gauge whether the design documents –drawings & specifications –are as complete as possible, prior to contractor's groundbreaking. Similarly, the Quality Control Plan must describe in detail the quality control mechanisms proposed to be implemented by the Design-Builder for ensuring adherence with design documents by way of minimal rework and maintaining the highest standards of construction. The Quality Control Plan must detail description of any 3rd parties suggested to be hired by the Department such as Building Envelope consultants and Commissioning agent.

5.18.3 Implementation. During the Construction Phase, the Design-Builder shall perform regular quality control inspections and create reports based on such inspections pursuant to the Quality Control Plan. These quality control reports shall be provided to the Department electronically on a monthly basis. The Design-Builder shall incorporate a quality control section in the progress meetings to discuss outstanding deficiencies, testing/inspections, and upcoming Work. The monthly report shall include a detailed summary of the steps that are being employed to provide quality construction and workmanship. The monthly report should specifically address issues raised during the month and outline the steps that are being used to address such issues. Following are the components that must at a minimum be included within the monthly Quality Control report submitted to DGS. All components must be updated regularly, and current versions included with monthly submissions to the department.

- a. A written narrative of Quality Control activities for the month supported by embedded, cross referenced photos.
- b. CPM updates and analysis reflecting status of critical submittals affecting work progress, elaborated further within the descriptive work narrative accompanying CPM baseline schedule and subsequent, regular updates' submissions to the Department.
- c. Deficiency tracking log.

- d. Test & Inspections log recording all related activities for the month and cumulative for the project. This must correspond and cross reference the project's testing & inspections schedule described above with **Section 5.18.2**.
- e. Submittal Schedule detailing status of all project submittals.

5.19 Acceleration.

Subject to the terms of this Section, the Department shall have the right to direct the Design-Builder to accelerate the Work if, in the reasonable judgment of Department: (i) the Design-Builder fails to supply a sufficiency of workers or to deliver the materials or equipment with such promptness as to prevent the delay in the progress of the Work; or (ii) the progress of the Work otherwise materially falls behind the projections contained in the then currently approved Project Schedule. In the event that the Department or its Program Manager determine that either of the events specified in the preceding sentence have occurred, the Department shall provide the Design-Builder with written notice of such event and the Design-Builder shall be required to provide the Department with a schedule recovery plan ("Recovery Plan") that is reasonably designed to address the concerns raised in such notice within three (3) days after receipt of such notice. If the Department and the Design-Builder are unable to agree on the terms of the Recovery Plan within five (5) days after the issuance of the notice (i.e. within forty eight (48) hours after the receipt of the proposed Recovery Plan), the Department shall have the right to direct such acceleration as the Department, in its reasonable judgment, deems necessary. Provided Department complies with the notice provisions of this Section, the cost of any acceleration directed under this Section shall not justify an adjustment to the GMP on the Substantial Completion Date.

Given the nature of the Project and the fact that there is a fixed date upon which the Client Agency plans to occupy the building, the Design-Builder hereby: (i) acknowledges that this provision is a material inducement upon which the Department has relied in entering into this Agreement; and (ii) represents and warrants that it has included sufficient funding in the GMP in order to comply with the requirements of this Section.

5.20 Corrective Action Plan.

Subject to the terms of this Section, the Department shall have the right direct the Design-Builder to revise the provisions of the Quality Control Plan if, in the reasonable judgment of the Department, the craftsmanship of the Work being installed fails to comply with generally applicable industry standards, requirements set forth in the Specifications that are reasonably related to the quality of craftsmanship quality, or any provisions set forth in this Agreement (each a "Quality Control Event"). In the event that the Department or its Program Manager determine that a Quality Control Event has occurred, the Department shall provide the Design-Builder with written notice of the occurrence of such Quality Control Event and the Design-Builder shall be required to provide the Department with a corrective action plan that is reasonably designed to address the concerns raised in such notice within three (3) days after receipt of such notice (each instance, a "Corrective Action Plan"). If the Department and the Design-Builder are unable to agree on the terms of the Corrective Action Plan within five (5) days after the issuance of the notice (i.e. within forty eight (48) hours after the receipt of the proposed corrective action plan), the Department shall have the right to direct such corrective action measures as the Department, in its reasonable judgment, deems necessary. Such directive may include adjustments to the procedural provisions set forth in the Quality Control Plan and/or may impose additional requirements on the manner in which Work is being performed. Provided the Department complies with the notice provisions of this Section, the

cost of any such corrective action directed under this Section shall not justify an adjustment to the GMP on the Substantial Completion Date.

5.21

- a. **Use of Department's Electronic Project Management Information System (ProjectTeam).** The Design-Builder shall utilize the Department's ProjectTeam system to create, manage and/or submit any and all documentation required to be provided by the vendor during the course of the Project, including, but not limited to: (i) requests for information; (ii) submittals; (iii) potential change orders; (iv) meeting minutes; (v) pencil copy invoices; (vi) drawings and specifications; (vii) punchlist; and (viii) other documents as may be designated by the Department.

Electronic storage and transmission of information via ProjectTeam system shall be compliant with the provisions of the Document Security section of these General Requirements.

- b. **Invoice Submittal.** The Design- Builder shall create and submit payment requests in an electronic format through the DC Vendor Portal, <https://vendorportal.dc.gov>. The Design- Builder shall submit proper invoices on a monthly basis. To constitute a proper invoice, the Contractor shall enter all required information into the Portal after selecting the applicable purchase order number which is listed on the Design- Builder's profile.

5.22 Conformance with Laws.

It shall be the responsibility of the Design-Builder to perform under the Agreement in conformance with the Department's Procurement Regulations and all applicable statutes, laws, codes, ordinances, regulations, rules, requirements, orders, and policies of governmental bodies, including, without limitation, the U.S. Government and the District of Columbia government; and it is the sole responsibility of the Design-Builder to determine the Procurement Regulations, statutes, laws, codes, ordinances, regulations, rules, requirements and orders that apply and their effect on the Design-Builder's obligations thereunder. Given the requirements for the Project, the Department may, at its sole discretion, (i) apply for variance to the requirement of adhering to the Green Building Act on the Project and (ii) consider deferring the scope of work associated with storm water management to a later phase of the Project.

5.23 Licensing, Accreditation and Registration

The Design-Builder and all of its subcontractors and subconsultants (regardless of tier) shall comply with all applicable District of Columbia, state, and federal licensing, accreditation, and registration requirements and standards necessary for the performance of the Agreement. Without limiting the generality of the foregoing, all drawings shall be signed and sealed by a professional architect or engineer licensed in the District of Columbia.

5.24 Construction Phase Deliverables.

The deliverables set forth on **Exhibit C** are required during the Construction Phase.

5.25 Close-Out Deliverables.

The deliverables set forth in **Exhibit N** are required during the Project's Close-Out and prior to Final Payment, as set forth in Section 10.12 and below:

- a) complete set of the Design-Builder's Project files.
- b) A complete set of product manuals (O&M), training videos, warranties, etc.
- c) As built record drawings.
- d) Attic stock and schedule.
- e) Equipment schedule.
- f) Proposed schedule of maintenance.
- g) Environmental, health & safety documents.
- h) LEED – Preliminary Construction Review.
- i) All applicable inspection certificates/permits (boiler, elevator, emergency evacuation plans, health inspection, etc.).
- j) Final Maintenance and Operations Plan.
- k) All other deliverables as required in **Exhibit S** DGS Division One Specifications; and **Exhibit T** DGS Close Out Manual

Article 6 - DESIGNATED REPRESENTATIVES

6.1 Department's Designated Representative.

The Department designates the individual(s) identified in **Exhibit I** as its representative with express authority to bind the Department with respect to all matters requiring the Department's approval or authorization. Subject to the limitations on their authority specified in **Exhibit I**, these representative(s) shall have the exclusive authority to make decisions on behalf of the Department concerning estimates and schedules, construction budgets, changes in the Work, and execution of Change Orders, Contract Modifications or Change Directives, and shall render such decisions promptly and furnish information expeditiously, so as to avoid unreasonable delay in the services or performance of the Work of the Design-Builder. In order for the Department to effectively manage the Project and assure that the Design-Builder does not receive conflicting instructions regarding the Work, the Design-Builder shall promptly notify the Department's representative upon receiving any instructions or other communication in connection with the Design-Builder's Work from any employee of the Department or other purported agent of the Department other than the Department's designated representative.

6.2 Design-Builder's Designated Representative.

The Design-Builder designates the individual(s) identified in **Exhibit H** as its representative with express authority to bind the Design-Builder with respect to all matters requiring the Design-Builder's approval or authorization. In addition, the Department retains the right to approve candidates to serve as on-site personnel in accordance with each candidate's experience with similar projects and local marketplace conditions. Once approved, individuals cannot be changed without the Department's prior approval. During the entire term, it is agreed that the Design-Builder's designated representative will devote his or her time exclusively to the Project, unless the Department consents to a reduction in time. All services provided by the Design-Builder shall be performed in accordance with the highest professional standards recognized and adhered to by design-builders that build first-class state-of-the-art buildings and projects that are similar to the Project in large urban areas.

Article 7 - COMPENSATION AND PAYMENTS FOR DESIGN & PRECONSTRUCTION PHASE SERVICES

7.1 Compensation

7.1.1 The Department shall compensate and make payments to the Design-Builder for Design & Preconstruction Services in accordance with this Article 7 and Article 10. For Preconstruction Services, the Design-Builder's compensation shall be as set forth in the Project Information Section of this Agreement (the "Preconstruction Fee"). The Preconstruction Fee shall be the Design-Builder's sole compensation for Preconstruction Phase Services. The Preconstruction Fee shall include, but not be limited to, amounts necessary to compensate the Design-Builder for:

- Profit
- Home Office Overhead
- Fringe Benefits associated with staff costs
- Payroll taxes associated with staff costs
- Staff costs associated with obtaining permits and approvals during the Design & Preconstruction Phase
- Out-of-house consultants
- Travel, Living and Relocation expenses
- Job vehicles
- Office equipment including but not limited to:
 - Computer hardware and software
 - Fax machines
 - Copying machines
- Office supplies
- Telephone
- Local delivery and overnight delivery costs

7.1.2 The Department shall compensate and make payments to the Design-Builder for design services in accordance with this Article 7 and Article 10. For design services, the Design-Builder's compensation shall not exceed the amount set forth in the Project Information Section of this Agreement (the "Design Fee").

7.2 Payments

7.2.1 Payments for Design & Preconstruction Phase Services shall be made monthly over the anticipated duration of the Design & Preconstruction Phase following presentation and acceptance of the Design-Builder's invoice and shall be in proportion to services performed. In no event, however, will the aggregate of the Design-Builder's monthly invoices for Design & Preconstruction Phase Services exceed the Preconstruction Fee plus the Design Fee.

7.2.2 Payments are due and payable in accordance with Article 10 of this Agreement. Amounts unpaid after the date of which payments due shall bear interest in accordance with the Quick Payment Act.

Article 8 - COMPENSATION FOR CONSTRUCTION PHASE SERVICES

8.1 Compensation.

The Department shall compensate and make payments to the Design-Builder for Construction Phase Services in accordance with this Article 8 and Article 10. For the Construction Phase Services, the Design-Builder's total compensation shall be as set forth in the Project Information Section of this Agreement (the "Design-Build Fee"). The Design-Builder acknowledges and agrees that the percentage of the total amount of the Design-Build Fee set forth in the Project Information Section of this Agreement is at risk (the "At Risk Portion"), and the Design-Builder shall only be entitled to the At Risk Portion as set forth below. Unless and until the Design-Builder's entitlement to any subset of the At Risk Portion is determined by the Department, the Design-Builder shall only be entitled to bill for the portion of the Design-Build Fee that is not at risk (the "Base Design-Build Fee"). The Design-Build Fee shall be billed in accordance with Article 10, to be paid in equal monthly installments over the anticipated duration of the Construction Phase. To the extent that the duration of the Agreement is extended, the then remaining amounts of the Design-Build Fee will be re-allocated such that the then existing portion of the Design-Build Fee shall be evenly spread over the then remaining duration of the Construction Phase.

8.1.1 Award Fee Pool. The At Risk Portion shall be used to establish and fund an award fee pool ("the Award Fee Pool"). Within sixty (60) days after approval and fully execution of this Agreement, the Department shall appoint a committee that will determine entitlement to those portions of the Award Fee Pool so designated below (such committee, the "Award Fee Evaluation Committee"). The Award Fee Evaluation Committee will consist of: (i) the Department's Deputy Director for Capital Construction; (ii) a senior representative from Client Agency; and (iii) a senior member of the Program Management team that is not involved in the day-to-day management of this Project that is acceptable to both Parties.

8.1.2 The Design-Builder may earn the At Risk Portion of the Design Build Fee in accordance with **Exhibit R**.

8.2 Maximum Cost of General Conditions.

The Design-Builder shall not be entitled to recover more than the amount set forth in the Project Information Section of this Agreement for the Cost of General Conditions (such amount, the "Maximum Cost of General Conditions"). If, as a result of any Change Order(s) or Change Directive(s): (i) the Project durations extends 30 days or more beyond the Substantial Completion Date; and (ii) the Design-Builder can demonstrate to the satisfaction of the Department that such additional Costs of General Conditions are reasonable and not due to any fault of the Design-Builder, its Subcontractors, material men, consultants or anyone making claims thereunder, the Design-Builder may request a Change Order to adjust the Maximum Cost of General Conditions. To the extent the Design-Builder incurs Costs of General Conditions in excess of the Maximum Cost of General Conditions, the Design-Builder shall not be entitled to reimbursement for such amounts unless the Department authorizes, in writing, an increase to the Maximum Cost of General Conditions. Nonetheless, in such an event, the Design-Builder exceeds the Maximum Cost of General Conditions, the Design-Builder shall continue to be required to adequately staff the Project.

8.3 Initial Not-to-Exceed Amount.

Unless and until the GMP Amendment is executed and approved by the Council for the District of Columbia, this Agreement shall have an initial not-to-exceed amount as set forth in the Project Information Section of this Agreement (the “Initial NTE”). In no event shall the Design-Builder be entitled to recover more than the Initial NTE unless the Design-Builder is authorized to exceed the Initial NTE by the Department in advance and in writing. Prior to expending or committing any portion of the Initial NTE, the Design-Builder shall obtain the Department’s written approval of such expenditure or commitment, as well as a determination as to whether the work will qualify as a “capital” expense under the Department’s financial guidelines to the extent capital money is to be expended. In making such a request, the Design-Builder shall submit an itemized breakdown of the work that the Design-Builder seeks to release using funds from the Initial NTE as well as the associated costs of such work

8.4 Project Budget.

The Department has established a budget for the Project as set forth in the Information Section of this Agreement (such budget, the “Project Budget”). When the GMP is established, such GMP shall not exceed the Project Budget, and such GMP shall include any and all amounts which may be due to the Design-Builder pursuant to this Agreement. In no event shall the Design-Builder be entitled to recover more than the GMP unless the Design-Builder is authorized to exceed the GMP by the Department in advance and in writing. The Design-Builder shall inform the Department’s Contracting Officer at least fifteen (15) calendar days in advance, if the Design-Builder encounters any foreseen or unforeseen project-related events, which might reasonably affect (i) existing Project Budget; or (ii) D.C. council-authorized appropriations.

8.5 No Adjustments to Fee.

It is the Department’s intent to engage the Design-Builder to develop a GMP that meets the programmatic requirements set forth in Exhibit A by the Client Agency and the Project Budget as set forth herein (*i.e.* designed to budget), to allow for Substantial Completion of the Work to be achieved no later than the Substantial Completion Date. The Design-Builder shall be entitled to an adjustment to the Design-Build Fee at the time the GMP is established to the extent, and only to the extent, that: (i) the Department makes additions to the scope that, when measured relative to the program, cause the GMP to exceed the Design-Builder’s original concept estimate by more than five percent (5%); or (ii) the Department makes additions to the scope provided for herein which (other than for punchlist or warranty work) which requires the Design-Builder’s services at the Project to extend 30 days or more beyond the Substantial Completion Date.

8.6 Reserved

8.7 Direct Cost of Work

“Direct Cost of the Work” shall mean labor, material and other costs reasonably and necessarily incurred in the proper performance of the Work as approved by the Department and shall include, but not be limited to:

8.7.1 Labor. Payment will be made for direct labor cost plus indirect labor cost such as insurance, taxes, fringe benefits and welfare provided such costs are considered reasonable. Indirect costs shall be itemized and verified by receipted invoices. If verification is not possible, up to eighteen percent (18%) of direct labor costs may be allowed.

8.7.2 Rented Equipment. Payment for required equipment rented from an outside company that is neither an affiliate of, nor a subsidiary of, the Design-Builder will be based on receipted invoices which shall not exceed rates given in the current edition of the Rental Rate Blue Book for Construction Equipment published by Data Quest. If actual rental rates exceed manual rates, written justification shall be furnished to the Contracting Officer for consideration. No additional allowance will be made for overhead and profit. The Design-Builder shall submit written certification to the Contracting Officer that any required rented equipment is neither owned by nor rented from the Design-Builder or an affiliate of or subsidiary of the Design-Builder.

8.7.3 Design-Builder's Equipment. Payment for required equipment owned by the Design-Builder or an affiliate of the Design-Builder will be based solely on an hourly rate derived by dividing the current appropriate monthly rate by 176 hours. No payment will be made under any circumstances for repair costs, freight and transportation charges, fuel, lubricants, insurance, any other costs and expenses, or overhead and profit. Payment for such equipment made idle by delays attributable to the Government will be based on one-half the derived hourly rate under this subsection.

8.7.4 Materials. Incorporated and unincorporated materials as permitted under Section 9.1.

8.7.5 Direct Cost of the Work does not, however, include home office overhead, field supervision, general conditions or profit of either the Subcontractor or the Design-Builder. No personnel above the level of a working foreman shall be considered a Direct Cost of the Work.

9 Article 9 - COST OF THE WORK FOR CONSTRUCTION PHASE

9.1 Cost of the Work.

The term "Cost of the Work" shall mean the costs necessarily incurred by the Design-Builder in the proper performance of the Work and shall include only the following:

9.1.1 Payments made by the Design-Builder to Subcontractors and suppliers, other than design subconsultants, but only in accordance with the subcontracts and supply agreements;

9.1.2 Payments made by the Design-Builder to its design consultants and subconsultants; provided, however, that the Design-Builder shall not be reimbursed for the costs of design services in excess of the Design Fee;

9.1.3 All amounts due to the Design-Builder under the terms of the Department's written authorization for the Design-Builder to perform any portion of the Work as Self-Performed Work. If an authorization for the Design-Builder to engage in Self-Performed Work is not on a fixed-price basis, then, as to that Work, the following costs shall be within the Cost of the Work:

(a) Labor. Properly documented wages actually paid to Project foremen, construction workers, and other personnel in the direct employ of the Design-Builder, while engaged in approved Self-Performed Work, together with contributions, assessments, payroll taxes, or fringe benefits required by the laws or applicable collective bargaining agreements.

(b) Incorporated Materials. The cost, net of trade discounts, of all materials, products, supplies and equipment incorporated into the Self-Performed Work, including, without limitation, costs of transportation and handling.

(c) Unincorporated Materials. The cost of materials, products, supplies and equipment not actually installed or incorporated into the Self-Performed Work, but required to provide a reasonable allowance for waste or spoilage, subject to the Design-Builder's agreement to turn unused excess materials over to the Department at the completion of the Project or, at the Department's option, to sell the material and pay the proceeds to the Department or give the Department a credit in the amount of the proceeds against the Cost of the Work.

9.1.4 Royalty and license fees paid for use of a design, process or product, if its use is required by this Agreement or has been approved in advance by the Department;

9.1.5 Fees for obtaining all required approvals or permits associated with any abatement, demolition, utilities abandonment, and utility relocation (including utility connection fees), including any and all building and/or trade permits fees;

9.1.6 All performance and payment bonds and general liability insurance. The Department may, in its sole discretion, allow the Design-Builder to recover the costs of subcontractor default insurance at a mutually agreed upon rate in lieu of trade level bonds, provided that such insurance be approved by the Department in advance and after being presented with a cost-benefit analysis of such use;

9.1.7 All fees and other costs necessarily incurred to carry out testing and inspection required by the Agreement or applicable laws, or otherwise to maintain proper quality assurance. The costs the Design-Builder incurs to schedule and coordinate any additional testing and inspections the Department may decide to conduct itself shall be within Cost of the Work unless the additional testing establishes that the Work tested was defective or otherwise failed to satisfy requirements set forth in the Agreement, in which case the Design-Builder shall pay the costs, without reimbursement;

9.1.8 All bonds to jurisdictional agencies (utilities, storm water management, land disturbance, and grading);

9.1.9 The Cost of General Conditions, subject however to the Maximum Cost of General Conditions; and

9.1.10 Costs of repairing or correcting damaged or nonconforming Work executed by the Architect, or Design-Builder's other consultants, Subcontractors or suppliers, provided that such damaged or nonconforming Work was not caused by negligence or failure to fulfill a specific responsibility of the Design-Builder, and only to the extent that the cost of repair or correction is not recoverable by the Design-Builder from insurance, sureties, Subcontractors or suppliers. It is understood that the cost of repairing, correcting damaged or nonconforming Work that was Self-Performed shall not be reimbursable in any event.

9.2 Cost of General Conditions.

Items included in the Cost of General Conditions are all items necessary to perform Construction Phase Services described herein including, but not limited to:

- a) Cost of construction staff. Only staff stationed in the field are reimbursable) ;
- b) Fringe Benefits associated with construction staff;
- c) Payroll taxes and payroll insurance associated with construction staff;
- d) Staff costs associated with obtaining permits and approvals;
- e) Out-of-house consultants; including permit expeditors
- f) Travel, Living and Relocation expenses.
- g) Job vehicles.
- h) The field office for the Design-Builder including but not limited to: (i) trailer purchase and/or rent; (ii) field office installation, relocation and removal; (iii) utility connections and charges during the Construction Phase; (iv) furniture; (v) field offices for DGS and Program Manager (vi) office supplies;
- i) Parking costs for the construction staff;
- j) Salting sidewalks and shoveling snow on sidewalks that surround the site;
- k) i) Office equipment including but not limited to: (i) computer hardware and software; (ii) fax machines; (iii) copying machines; (iv) telephone installation, system and use charges: (v) job radios;
- l) Local delivery and overnight delivery costs; and
- m) First aid facility.
- n) Progress photos
- o) Printing cost for drawings, bid packages, etc.
- p) BIM Cost (software, seats, hardware)
- q) Field computer network.
- r) Other (please itemize)

9.3 Costs Not to Be Reimbursed.

All costs not specifically listed in Section 9.1 as being within the Cost of the Work are excluded from the Cost of the Work and shall not be reimbursable. In particular, but without limitation, the Cost of the Work does not include any of the following:

- a) Any personnel or labor costs other than those provided for in **Section 9.2.1 (a)** or **Section 9.1.3 (a)**.
- b) Fees for any permits or licenses the Design-Builder requires to conduct its general business operations.
- c) Capital expenses and interest on capital employed for the Work.
- d) The cost of home or regional offices, it being understood that compensation for such costs included in the Design-Build Fee.
- e) Sales or use taxes, unless the Design-Builder establishes that applicable law required payment of such taxes.
- f) Costs due to the errors or omissions of the Design-Builder or its subcontractors or suppliers at all tiers, negligent or otherwise.
- g) Costs dues to breach of Contract by the Design-Builder or its subcontractors or material suppliers at all tiers, including, without limitation, costs arising from defective or damaged work or its correction, disposal of materials or equipment erroneously supplied, and repairs to property damaged by the Design-Builder or its subcontractors or material suppliers at all tiers.

- h) Any costs incurred in performing work of any kind before Preconstruction NTP, unless specifically authorized by the Department in advance and in writing.
- i) Direct or indirect costs of any kind, except those expressly included in **Section 9.1**.

9.4 Discounts, Rebates And Refunds.

9.4.1 Cash discounts obtained on payments made by the Design-Builder shall accrue to the Department if: (i) before making such payment(s), the Design-Builder included them in an Application for Payment and received payment therefor from the Department; or (ii) the Department has deposited funds with the Design-Builder with which to make such payment(s). All other cash discounts shall accrue to the Design-Builder. Trade discounts, rebates, refunds and amounts received from sales of surplus materials and equipment shall accrue to the Department, and the Design-Builder shall make provisions so that such amounts can be secured.

9.4.2 Amounts that accrue to the Department in accordance with the provisions of Section 9.4.1 shall be credited to the Department as a deduction from the Cost of the Work.

9.5 Facilitating Tax Exempt Purchases.

The Department expects that the Project will qualify as tax-exempt under applicable laws. Upon request, the Department will provide the Design-Builder with the necessary information relating to the tax exemption. In the event any savings are attributable to the tax-exempt status of the Project, the Design-Builder shall not be entitled to share in such savings.

9.6 Accounting Records.

The Design-Builder shall keep full and detailed accounts and exercise such controls as may be necessary for proper financial management under the Agreement. The Design-Builder's accounting and control systems shall be satisfactory to the Department. The Department, its representatives, and the Department's accountants shall be afforded access to the Design-Builder's records, books, correspondence, instruction, drawings, receipts, subcontracts, purchase orders, vouchers, memoranda and other data relating to this Project, and the Design-Builder shall preserve such Project documentation relating to the Project for a period of three years after final payment, or for such longer period as may be required by law.

9.7 Excluded Cost Elements.

It is the Department's intent that the Design-Builder provide a turnkey solution for the implementation of the Project, and the Project Budget set herein has been developed based on such framework. The Design-Builder shall advance the Project in a manner consistent with the Project Budget with the understanding that only the following cost elements shall be excluded from the Project Budget set forth herein:

1. 3rd Party Material Testing;
2. Commissioning;
3. 3rd Party Inspections; and
4. 3rd Party Plan Review.

Article 10 - CONSTRUCTION PHASE PAYMENTS

10.1 Progress Payments.

The Design-Builder shall be compensated in a series of progress payments and a Final Payment, for Work completed in accordance with the Agreement, and for which proper Applications for Payment have been submitted and approved. The amount of each progress payment shall be as follows:

The Cost of Work completed to date

Plus Cost of Work for Pay Period x 60% Design-Build Fee

Current approved estimated

Cost of Work through Final Completion

Plus Any subset of the Design-Build Fee to which the Department has determined the Design-Builder to be Entitled

Minus Applicable retainage

Minus Amounts previously paid by the Department

10.2 Retention.

The Department shall withhold from each progress payment an amount equal to ten percent (10%) of the payment related to: (i) each Subcontract and supply agreement; (ii) the Preconstruction Fee; (iii) Design-Build Fee; (iv) General Conditions Costs; and (v) the Cost of the Work related to each item of Self-Performed Work, until such time as fifty percent (50%) of the then currently budgeted cost associated with each such item has been invoiced, at which point the Department may cease retaining against such item; provided, however, that retention shall not be held on the costs of bonds, insurances, and those elements of the general requirements which consist of a single, insolated effort such as dumpster disposal and safety carpentry. The Department at its sole and absolute discretion may elect to increase the retention on any trade Subcontractor up to ten percent (10%), in the event the Department determines that the situation so warrants. The Department also in its sole and absolute discretion, may elect to reduce the retainage relating to a particular trade Subcontractor, or the Cost of the Work related to a specific item of Self-Performed Work to zero upon: (a) satisfactory completion of such Work; (b) submission of all required warranties, certifications, and operating or maintenance instructions with respect to that Work; and (c) execution of appropriate waivers of lien and releases of claims. However, in no event shall the total retainage held by the Department be reduced to an amount that is less than two and one-half percent (2.5%) of the GMP.

10.3 Project Documents Required with Application for Payment.

Each Application for Payment shall be accompanied by the Design-Builder's job cost ledgers in a form satisfactory to the Department, the Subcontractors' and Suppliers' Applications for Payment on form acceptable to the Department, and such other supporting Project documentation as the Department may reasonably request. Each Application for Payment shall include detailed Project documentation of costs as a condition to approving progress payments, but the Design-Builder shall nevertheless maintain complete documentation of the costs. An executed Release of Liens and Claims in the format required by the Contracting Officer must accompany each Application for Payment.

10.4 Stored Materials.

The Department shall not be required to pay for materials stored at the site or stored at other locations absent prior written authorization to do so, which authorization may be withheld at the Department's sole discretion. If the Department expressly agrees to pay for materials stored at the site but not yet incorporated into the Work, the Application for Payment may also include a request for payment of the cost of such materials, if the materials have been delivered to the site, and suitably stored. Such requests shall be documented by appropriate invoices and bills of sale. Payment for stored materials shall be conditioned also on the Design-Builder's representation that it has inspected the material and found it to be free from defect and otherwise in conformity with this Agreement, and on satisfactory evidence that the materials are insured under the builder's risk policy. Further, if the Design-Builder requests the Department to allow payments for storage of materials offsite, the Design-Builder shall be required, inter alia, to agree to execution of proper Project documentation to afford the Department a secured interest in the materials upon payment.

10.5 Design-Builder's Certification.

Each Application for Payment shall be accompanied by the Design-Builder's signed certification that:

Section 10.5.1. all amounts paid to the Design-Builder on the previous Application for Payment that were attributable to Subcontractor Work or to materials or equipment being supplied by any supplier have been paid over to the appropriate Subcontractors and suppliers;

Section 10.5.2. that all amounts currently sought for Subcontractor Work or supply of materials or equipment are currently due and owing to the Subcontractors and material or equipment suppliers;

Section 10.5.3. that all Work, materials or equipment for which payment is sought is, to the best of the Design-Builder's knowledge, free from defect and meets all of the requirements set forth in the Agreement: and that

Section 10.5.4. that the Design-Builder's subcontracts include the clauses required by subparagraphs (1) through (4) of D.C. Official Code §2-221.02(d) (2017).

Section 10.5.5. The Design-Builder shall not include in an Application for Payment amounts for Work for which the Design-Builder does not intend to pay.

10.6 Lien Waivers.

Each Application for Payment shall be accompanied by written waivers of the right to file a mechanic's lien and all other claims, in a form substantially similar to **Exhibit K** for the Design-Builder and all Subcontractors and material suppliers at all tiers who have supplied labor or material or both for which payment is requested, subject only to receipt of payment. If the Department so requests, the Design-Builder shall also submit unconditional waivers of liens for itself and all Subcontractors and material suppliers at all tiers with respect to Work or materials or equipment for which payment has been previously made, and additional forms of waiver acknowledging receipt of final payment under the Agreement, and providing final release of such liens.

10.7 Warranty of Title.

By submitting an Application for Payment, the Design-Builder warrants to the Department that title to all Work for which payment is sought will pass to the Department, without liens, claims, or other encumbrances, upon the receipt of payment by the Design-

Builder. The Department may require execution of appropriate Project documents to confirm passage of clear title. Passage of title shall not operate to pass the risk of loss with respect to the Work in question. Risk of loss remains with the Design-Builder until Substantial Completion, unless otherwise agreed by the Department, in writing.

10.8 Submission.

On the twenty-fifth day of each month the Design-Builder shall submit to the Department (with a copy to the Program Manager) an Application for Payment, which Application for Payment shall cover the entire month during which the Application for Payment is submitted. All amounts formally submitted via Application for Payment and not disputed by the Department shall be due and payable on the last day of the month following submission or, if that is not a business day, on the following business day. If the Design-Builder and Department are unable to agree on the amounts properly due and owing, the Department shall pay in accordance with its good faith determination and the Design-Builder may protest and pursue a claim as provided in this Agreement and the Standard Contract Provisions (Construction Contracts and Architectural and Engineering Services Contracts).

10.9 Right to Withhold Payments.

The Department will notify the Design-Builder within fifteen (15) days after receiving any Application for Payment of any defect in the Application for Payment or the Design-Builder's performance which may result in the Department's declining to pay all or a part of the requested amount. The Department may withhold payment from the Design-Builder, in whole or part, as appropriate, if:

10.9.1 the Work is defective and such defects have not been remedied; or

10.9.2 the Department has determined that the Design-Builder's progress has fallen behind the Project Schedule, and the Design-Builder fails, within ten (10) calendar days of the Department's written demand, to provide the Department with a realistic and acceptable Recovery Plan in accordance with Section 5.19; or

10.9.3 the Design-Builder's monthly schedule update reflects that the Design-Builder has fallen behind the Project Schedule, and the Design-Builder fails to include, in the same monthly report, a realistic and acceptable Recovery Plan in accordance with Section 5.19; or

10.9.4 the Design-Builder has failed to provide reports in full compliance with Section 5.5 of this Agreement; or

10.9.5 the Design-Builder has failed to pay Subcontractors or suppliers promptly or has made false or inaccurate certifications that payments to Subcontractors or suppliers are due or have been made; or

10.9.6 any mechanic's lien has been filed against the Department, the site or any portion thereof or interest therein, or any improvements on the site, even though the Department has paid all undisputed amounts due to the Design-Builder, and the Design-Builder, upon notice, has failed to remove the lien, by bonding it off or otherwise, within ten (10) calendar days; or

10.9.7 the Department has reasonable evidence that the Work will not be completed by the Substantial Completion Date, as required, that the unpaid

balance of the GMP would not be adequate to cover actual or liquidated damages arising from the anticipated delay; or

10.9.8 the Department has reasonable evidence that the Work cannot be completed for the unpaid balance of the GMP; or

10.9.9 the Design-Builder is otherwise in substantial breach of this Agreement (including, without limitation, failures to comply with LSDBE Utilization requirements; or

10.9.10 the Application for Payment is incomplete, unsubstantiated and/or does not contain sufficient documentation for evaluation by the Contracting Officer.

10.10 Payment Not Acceptance.

Payment of any progress payment or final payment shall not constitute acceptance of Work that is defective or otherwise fails to conform to the Agreement, or a waiver of any rights or remedies the Department may have with respect to defective or nonconforming Work.

10.11 Department Not Obligated to Others.

The Department shall have no obligation to pay or be responsible in any way for payments to a consultant or subcontractor performing portions of the Work.

10.12 Final Payment.

A final payment (“Final Payment”) shall be made by the Department to the Design-Builder when: (i) Final Completion has been achieved; (ii) all deliverables set forth in Section 5.14, and **Exhibit N** have been delivered to and are accepted by the Department; (iii) the Design-Builder provides the Department a complete set of product manuals (O&M), training videos, and warranties, as applicable; and (iv) a complete final Application for Payment and a final accounting for the Cost of the Work have been submitted by the Design-Builder and reviewed by the Department and, to the extent the Department determines appropriate, the Department’s accountants. The Department shall make Final Payment not more than thirty (30) days after the Department verifies the amount of the final payment set forth in a complete final Application for Payment.

10.12.1 The amount of the Final Payment shall be calculated as follows:

10.12.1.1 Take the sum of the Cost of the Work substantiated by the Design-Builder’s final accounting and the Design-Build Fee; but not more than the GMP.

10.12.1.2 Subtract amounts, if any, for which the Department withholds pursuant to the Agreement.

10.12.1.3 Subtract the aggregate of previous payments made by the Department. (If the aggregate of previous payments made by the Department exceeds the amount due the Design-Builder, the Design-Builder shall promptly reimburse the difference to the Department).

10.12.1.4 The Final Payment shall take into account any savings accruing to the Department or the Design-Builder.

10.12.1.5 The Department will review and report in writing on the Design-Builder's final accounting within 30 days after delivery of the final accounting to the Department by the Design-Builder. Based upon Department's determination of the Cost of the Work, and provided the other conditions of Section 10.12.1 have been met, the Department will, within fifteen (15) days after the Department's determination, notify the Design-Builder of any amount that the Department will withhold and the reasons therefor. The time periods stated in this Paragraph 10.12.1.5 supersede those for typical progress payments.

10.12.1.6 If the Department determines that the Cost of the Work is other than that claimed by the Design-Builder, the Design-Builder shall be entitled to proceed in accordance with Article 3 of the Standard Contract Provisions (Construction Contracts). Pending a final resolution of the disputed amount, the Department shall pay the Design-Builder the amount that the Department determines to be appropriate.

Article 11 - INSURANCE

11.1 Insurance Required by the Project

- A. **GENERAL REQUIREMENTS.** The Contractor at its sole expense shall procure and maintain, during the entire period of performance under this contract, the types of insurance specified below. The Contractor shall have its insurance broker or insurance company submit a Certificate of Insurance to the CO giving evidence of the required coverage prior to commencing performance under this contract. In no event shall any work be performed until the required Certificates of Insurance signed by an authorized representative of the insurer(s) have been provided to, and accepted by, the CO. All insurance shall be written with financially responsible companies authorized to do business in the District of Columbia or in the jurisdiction where the work is to be performed and have an A.M. Best Company rating of A- / VII or higher. Should the Contractor decide to engage a subcontractor for segments of the work under this contract and wish to propose different insurance requirements than outlined below, then, prior to commencement of work by the subcontractor, the Contractor shall submit in writing the name and brief description of work to be performed by the subcontractor on the Subcontractors Insurance Requirement Template provided by the CA, to the Office of Risk Management (ORM). ORM will determine the insurance requirements applicable to the subcontractor and promptly deliver such requirements in writing to the Contractor and the CA. The Contractor must provide proof of the subcontractor's required insurance prior to commencement of work by the subcontractor. If the Contractor decides to engage a subcontractor without requesting from ORM specific insurance requirements for the subcontractor, such subcontractor shall have the same insurance requirements as the Contractor.

All required policies shall contain a waiver of subrogation provision in favor of the Government of the District of Columbia.

The Government of the District of Columbia shall be included in all policies required hereunder to be maintained by the Contractor and its subcontractors (except for workers' compensation and professional liability insurance) as an additional insureds for claims against The Government of the District of Columbia relating to this contract, with the understanding that any affirmative obligation imposed upon the insured Contractor or its subcontractors (including without limitation the liability to pay premiums) shall be the sole obligation of the Contractor or its subcontractors, and not the additional insured. The additional insured status under the Contractor's and its subcontractors' Commercial General Liability insurance policies shall be effected using the ISO Additional Insured Endorsement form CG 20 10 11 85 (or CG 20 10 07 04 **and** CG 20 37 07 04) or such other endorsement or combination of endorsements providing coverage at least as broad and approved by the CO in writing. All of the Contractor's and its subcontractors' liability policies (except for workers' compensation and professional liability insurance) shall be endorsed using ISO form CG 20 01 04 13 or its equivalent so as to indicate that such policies provide primary coverage (without any right of contribution by any other insurance, reinsurance or self-insurance, including any deductible or retention, maintained by an Additional Insured) for all claims against the additional insured arising out of the performance of this Statement of Work by the Contractor or its subcontractors, or anyone for whom the Contractor or its subcontractors may be liable. These policies shall include a separation of insureds clause applicable to the additional insured.

If the Contractor and/or its subcontractors maintain broader coverage and/or higher limits than the minimums shown below, the District requires and shall be entitled to the broader coverage and/or the higher limits maintained by the Contractor and subcontractors.

B. INSURANCE REQUIREMENTS

1. Commercial General Liability Insurance ("CGL") - The Contractor shall provide evidence satisfactory to the CO with respect to the services performed that it carries a CGL policy, written on an occurrence (not claims-made) basis, on Insurance Services Office, Inc. ("ISO") form CG 00 01 04 13 (or another occurrence-based form with coverage at least as broad and approved by the CO in writing), covering liability for all ongoing and completed operations of the Contractor, including ongoing and completed operations under all subcontracts, and covering claims for bodily injury, including without limitation sickness, disease or death of any persons, injury to or destruction of property, including loss of use resulting therefrom, personal and advertising injury, and including coverage for liability arising out of an Insured Contract (including the tort liability of another assumed in a contract) and acts of terrorism (whether caused by a foreign or domestic source). Such coverage shall have limits of liability of not less than \$1,000,000 each occurrence, a \$2,000,000 general aggregate (including a per location or per project aggregate limit endorsement, if applicable) limit, a \$1,000,000 personal and advertising injury limit, and a \$2,000,000 products-completed operations aggregate limit including explosion, collapse and underground hazards.

The contractor should be named as an additional insured on the applicable manufacturer's/distributor's Commercial General Liability policy using Insurance Services Office, Inc. ("ISO") form CG 20 15 04 13 (or another occurrence-based form with coverage at least as broad).

DGS should collect, review for accuracy and maintain all warranties for goods and services.

2. Automobile Liability Insurance - The Contractor shall provide evidence satisfactory to the CO of commercial (business) automobile liability insurance written on ISO form CA 00 01 10 13 (or another form with coverage at least as broad and approved by the CO in writing) including coverage for all owned, hired, borrowed and non-owned vehicles and equipment used by the Contractor, with minimum per accident limits equal to the greater of (i) the limits set forth in the Contractor's commercial automobile liability policy or (ii) \$1,000,000 per occurrence combined single limit for bodily injury and property damage. Form CA 99 48 03 06 Pollution Liability - Broadened Coverage for Covered Autos - Business Auto, Motor Carrier and Truckers must be endorsed onto the policy
3. Workers' Compensation Insurance - The Contractor shall provide evidence satisfactory to the CO of Workers' Compensation insurance in accordance with the statutory mandates of the District of Columbia or the jurisdiction in which the contract is performed.

Employer's Liability Insurance - The Contractor shall provide evidence satisfactory to the CO of employer's liability insurance as follows: \$500,000 per accident for injury; \$500,000 per employee for disease; and \$500,000 for policy disease limit.

All insurance required by this paragraph 3 shall include a waiver of subrogation endorsement for the benefit of Government of the District of Columbia.

4. Crime Insurance (3rd Party Indemnity) - The Contractor shall provide a Crime policy including 3rd party fidelity to cover the dishonest acts of Contractors, its employees and/or volunteers which result in a loss to the District. The Government of the District of Columbia shall be included as loss payee. The policy shall provide a limit of \$25,000 per occurrence.
5. Cyber Liability Insurance - The Contractor shall provide evidence satisfactory to the Contracting Officer of Cyber Liability Insurance, with limits not less than \$2,000,000 per occurrence or claim, \$2,000,000 aggregate. Coverage shall be sufficiently broad to respond to the duties and obligations as is undertaken by Contractor in this agreement and shall include, but not limited to, claims involving infringement of intellectual property, including but not limited to infringement of copyright, trademark, trade dress, invasion of privacy violations, information theft, damage to or destruction of electronic information, release of private information, alteration of electronic information, extortion and network security. The policy shall provide coverage for breach response costs as well as regulatory fines and

penalties as well as credit monitoring expenses with limits sufficient to respond to these obligations. Limits may not be shared with other lines of coverage. A copy of the cyber liability policy must be submitted to the Office of Risk Management (ORM) for compliance review.

6. Environmental Liability/Contractors Pollution Liability Insurance - The Contractor shall provide evidence satisfactory to the CO of environmental liability insurance covering losses caused by pollution or other hazardous conditions arising from ongoing or completed operations of the Contractor. Such insurance shall apply to bodily injury, property damage (including loss of use of damaged property or of property that has been physically injured), clean-up costs, transit and non-owned disposal sites. Coverage shall extend to defense costs and expenses incurred in the investigation, civil fines, penalties and damages or settlements. There shall be neither an exclusion nor a sublimit for mold or fungus-related claims. The minimum limits required under this paragraph shall be equal to the greater of (i) the limits set forth in the Contractor's pollution liability policy or (ii) \$2,000,000 per occurrence and \$2,000,000 in the annual aggregate. If such coverage is written on a claims-made basis, the Contractor warrants that any retroactive date applicable to coverages under the policy precedes the Contractor's performance of any work under the Contract and that continuous completed operations coverage will be maintained for at least ten (10) years or an extended reporting period shall be purchased for no less than ten (10) years after completion.

The Contractor also must furnish to CO Owner certificates of insurance evidencing environmental liability insurance maintained by third party transportation and disposal site operators(s) used by the Contractor for losses arising from facility(ies) accepting, storing or disposing hazardous materials or other waste as a result of the Contractor's operations. Such coverages must be maintained with limits of at least the amounts set forth above.

7. Installation-Floater Insurance - For projects not involving structural alterations, the contractor shall provide an installation floater policy with a limit equal to the Property values being installed as part of the project. The policy shall cover property while located at the project site, at temporary locations, or in transit; deductibles will be the sole responsibility of the contractor.
8. Professional Liability Insurance (Errors & Omissions) - The Contractor shall provide Professional Liability Insurance (Errors and Omissions) to cover liability resulting from any error or omission in the performance of professional services under this Contract. The policy shall provide limits of \$5,000,000 per claim or per occurrence for each wrongful act and \$5,000,000 annual aggregate. The Contractor warrants that any applicable retroactive date precedes the date the Contractor first performed any professional services for the Government of the District of Columbia and that continuous coverage will be maintained or an extended reporting period will be exercised for a period of at least ten years after the completion of the professional services. Limits may not be shared with other lines of coverage.

9. Sexual/Physical Abuse & Molestation - The Contractor shall provide evidence satisfactory to the Contracting Officer with respect to the services performed that it carries \$1,000,000 per occurrence limits; \$2,000,000 aggregate of affirmative abuse and molestation liability coverage. Coverage should include physical abuse, such as sexual or other bodily harm and non-physical abuse, such as verbal, emotional or mental abuse; any actual, threatened or alleged act; errors, omission or misconduct. This insurance requirement will be considered met if the general liability insurance includes an affirmative sexual abuse and molestation endorsement for the required amounts. So called “silent” coverage or “shared” limits under a commercial general liability or professional liability policy will not be acceptable. Limits may not be shared with other lines of coverage. The applicable policy may need to be submitted to the Office of Risk Management (ORM) for compliance review.
10. Commercial Umbrella or Excess Liability - The Contractor shall provide evidence satisfactory to the CO of commercial umbrella or excess liability insurance with minimum limits equal to the greater of (i) the limits set forth in the Contractor’s umbrella or excess liability policy or (ii) \$20,000,000 per occurrence and \$20,000,000 in the annual aggregate, following the form and in excess of all liability policies. All liability coverages must be scheduled under the umbrella and/or excess policy. The insurance required under this paragraph shall be written in a form that annually reinstates all required limits. Coverage shall be primary to any insurance, self-insurance or reinsurance maintained by the District and the “other insurance” provision must be amended in accordance with this requirement and principles of vertical exhaustion.

Construction Projects Controlled by the District

For construction projects controlled by the District, the District will procure the following policies with the District listed as the first named insured. Since the District will control the placement of the policies, the District should not contractually bind itself to secure coverage broader than the minimum that satisfy the interests of the Contractor.

Builders Risk – The District shall purchase and maintain, in a company authorized to do business in the jurisdiction in which the project is located, builders risk insurance, written on an “all risk”, special causes of loss or equivalent form. Builders risk coverage will include boiler and machinery / equipment breakdown, earthquake and flood perils. Building ordinance and terrorism coverage will be included.

The deductible shall not exceed \$25,000 except for earthquake, flood, windstorm, water damage or other perils at the discretion of the District and as available in the insurance industry.

The project limit shall equal the replacement value of the structure, including coverage for property in transit and stored off premises.

At the discretion of the District, builders risk coverage will extend to soft costs and delayed completion.

Builders risk insurance shall include the interests of The Government of the District of Columbia, the Contractor, Subcontractors and Sub – subcontractors in the project.

C. PRIMARY AND NONCONTRIBUTORY INSURANCE

The insurance required herein shall be primary to and will not seek contribution from any other insurance, reinsurance or self-insurance including any deductible or retention, maintained by the Government of the District of Columbia.

D. DURATION. The Contractor shall carry all required insurance until all contract work is accepted by the District of Columbia and shall carry listed coverages for ten years for construction projects following final acceptance of the work performed under this contract and two years for non-construction related contracts.

E. LIABILITY. These are the required minimum insurance requirements established by the District of Columbia. However, the required minimum insurance requirements provided above will not in any way limit the contractor's liability under this contract.

F. CONTRACTOR'S PROPERTY. Contractor and subcontractors are solely responsible for any loss or damage to their personal property, including but not limited to tools and equipment, scaffolding and temporary structures, rented machinery, or owned and leased equipment. A waiver of subrogation shall apply in favor of the District of Columbia.

G. MEASURE OF PAYMENT. The District shall not make any separate measure or payment for the cost of insurance and bonds. The Contractor shall include all of the costs of insurance and bonds in the contract price.

H. NOTIFICATION. The Contractor shall ensure that all policies provide that the CO shall be given thirty (30) days prior written notice in the event of coverage and / or limit changes or if the policy is canceled prior to the expiration date shown on the certificate. The Contractor shall provide the CO with ten (10) days prior written notice in the event of non-payment of premium. The Contractor will also provide the CO with an updated Certificate of Insurance should its insurance coverages renew during the contract.

I. CERTIFICATES OF INSURANCE. The Contractor shall submit certificates of insurance giving evidence of the required coverage as specified in this section prior to commencing work. Certificates of insurance must reference the corresponding contract number. Evidence of insurance shall be submitted to:

The Government of the District of Columbia

And emailed to the attention of:

Eric Njonjo
Contracting Officer
Department of General Services
Contracts & Procurement Division
1250 U Street, NW, 2nd Floor
Washington, DC 20009
Email: eric.njonjo@dc.gov

The CO may request and the Contractor shall promptly deliver updated certificates of insurance, endorsements indicating the required coverages, and/or certified copies of the insurance policies. If the insurance initially obtained by the Contractor expires prior to completion of the contract, renewal certificates of insurance and additional insured and other endorsements shall be furnished to the CO prior to the date of expiration of all such initial insurance. For all coverage required to be maintained after completion, an additional certificate of insurance evidencing such coverage shall be submitted to the CO on an annual basis as the coverage is renewed (or replaced).

- J. DISCLOSURE OF INFORMATION. The Contractor agrees that the District may disclose the name and contact information of its insurers to any third party which presents a claim against the District for any damages or claims resulting from or arising out of work performed by the Contractor, its agents, employees, servants or subcontractors in the performance of this contract.
- K. CARRIER RATINGS. All Contractor's and its subcontractors' insurance required in connection with this contract shall be written by insurance companies with an A.M. Best Insurance Guide rating of at least A- VII (or the equivalent by any other rating agency) and licensed in the District.

Article 12- BONDS

12.1 Performance Bond and Payment Bond.

The Design-Builder shall, before commencing the Construction Phase, provide to the Department a payment bond and performance bond, each with a penal sum equal to the full value of the GMP. Such bond shall remain in full force and effect until Final Completion is achieved and the Department shall be able to draw upon such bond regardless of the amount paid by the Department to the Design-Builder, even if such amount exceeds the penal value of such bond. Unless otherwise directed by the Department, the Design-Builder shall require all Subcontractors whose Subcontract prices exceed One Hundred Thousand Dollars (\$100,000) to provide payment and performance bonds, with a penal sum equal to one hundred percent (100%) of the subcontract price. . All bonds must be in a form acceptable to the Department, its lenders or bond trustee, and issued by a surety authorized to do business in the District of Columbia and bonding company listed on the United States Department of Treasury's Listing of Approved Sureties. All subcontractors' bonds must include a dual obligee rider, naming the Design-Builder and the Department as dual obligees. If the Guaranteed Maximum Price is increased pursuant to the terms of the Agreement, the Department may require that the amount of the bonds be increased in the amount of one hundred percent (100%) of the increase, and the Design-Builder shall promptly comply. The Design-Builder shall furnish a copy of its bonds to any potential beneficiary of the bonds, or permit that person or company to make a copy. If the bonds provided become unacceptable to the Department, the Design-Builder shall promptly provide substitute security acceptable to the Department. If the Design-Builder intends to exercise its rights as dual obligee under any trade Subcontractor's bond, it shall first give the Department twenty (20) days written notice, so that the Department may lodge any objection it may reasonably have to the proposed action.

Article 13 - ECONOMIC INCLUSION REQUIREMENTS

Section 13.1 LSDBE Utilization.

Section 13.1.1 If the Design-Builder is a CBE, the Design-Builder shall perform at least 35% of the contracting effort with its own forces, and in such case, if the Design-Builder subcontracts any design services, at least 35% of the dollar value of this Agreement shall be subcontracted to small business enterprises (“SBE”s) and the Design-Builder must submit a subcontracting plan in accordance with D.C. Official Code § 2-218.46. The subcontracting plan (**Exhibit D**) should have been submitted as part of the Design-Builder’s Proposal and may only be amended with the prior written approval of a Contracting Officer and the Director of the Department of Small and Local Business Development (“DSLBD”).

Section 13.2 Mandatory Subcontracting Requirements

13.2.1 Official DC. Code § 2–218.91. Certified Business Enterprise assistance:

Section 13.2.2 Unless the Director of the Department of Small and Local Business Development (DSLBD) has approved a waiver in writing, in accordance with D.C. Official Code § 2-218.51, for all contracts in excess of \$250,000, at least 35% of the dollar volume of the contract shall be subcontracted to qualified small business enterprises (SBEs).

Section 13.2.3 If there are insufficient SBEs to completely fulfill the requirement of paragraph 9.1.2.1, then the subcontracting may be satisfied by subcontracting 35% of the dollar volume to any qualified certified business enterprises (CBEs); provided, however, that all reasonable efforts shall be made to ensure that SBEs are significant participants in the overall subcontracting work.

Section 13.2.4 A prime contractor that is certified by DSLBD as a small, local or disadvantaged business enterprise shall not be required to comply with the provisions of sections 9.1.2.1 and 9.1.2.2.

Section 13.2.5 Except as provided in 9.1.2.5 and 9.1.2.6, a prime contractor that is a CBE and has been granted a proposal preference pursuant to D.C. Official Code § 2-218.43, or is selected through a set-aside program, shall perform at least 35% of the contracting effort with its own organization and resources and, if it subcontracts, 35% of the subcontracting effort shall be with CBEs. A CBE prime contractor that performs less than 35% of the contracting effort shall be subject to enforcement actions under D.C. Official Code § 2-218.63.

Section 13.2.6 A prime contractor that is a certified joint venture and has been granted a proposal preference pursuant to D.C. Official Code § 2-218.43, or is selected through a set-aside program, shall perform at least 50% of the contracting effort with its own organization and resources and, if it subcontracts, 35% of the subcontracting effort shall be with CBEs. A certified joint venture prime contractor that performs less than 50% of the contracting effort shall be subject to enforcement actions under D.C. Official Code § 2-218.63.

Section 13.2.7 Each CBE utilized to meet these subcontracting requirements shall perform at least 35% of its contracting effort with its own organization and

resources.

Section 13.2.8 Subcontracting Plan (Exhibit I)

If the Design-Builder is required by law to subcontract under this Agreement, then the subcontracting plan submitted with its Proposal, may only be amended with the prior written approval of the Contracting Officer and Director of DSLBD, as previously stated herein; and, any reduction in the dollar volume of the subcontracted portion resulting from an amendment of the Subcontracting Plan shall inure to the benefit of the District. The Subcontracting Plan shall include the following:

- (1) The name and address of each subcontractor;
- (2) A current certification number of the small or certified business enterprise;
- (3) The scope of work to be performed by each subcontractor; and
- (4) The price that the prime contractor will pay each subcontractor.

Section 13.2.9 Copies of Subcontracts

Within twenty-one (21) days of the date of award, the Contractor shall provide fully executed copies of all subcontracts identified in the subcontracting plan to the Contracting Officer (CO), City Administrator (CA), District of Columbia Auditor and the Director of DSLBD.

Section 13.2.10 Subcontracting Plan Compliance Reporting

Section 13.2.10.1 If the Contractor has a subcontracting plan required by law for this contract, the Contractor shall submit a quarterly report to the CO, CA, District of Columbia Auditor and the Director of DSLBD. The quarterly report shall include the following information for each subcontract identified in the subcontracting plan:

- (A) The price that the prime contractor will pay each subcontractor under the subcontract;
- (B) A description of the goods procured or the services subcontracted for;
- (C) The amount paid by the prime contractor under the subcontract; and
- (D) A copy of the fully executed subcontract, if it was not provided with an earlier quarterly report.

Section 13.2.10.2 If the fully executed subcontract is not provided with the quarterly report, the prime contractor will not receive credit toward its subcontracting requirements for that subcontract.

Section 13.2.11 Annual Meetings

Upon at least 30-days written notice provided by DSLBD, the Contractor shall meet annually with the CO, CA, District of Columbia Auditor and the Director of DSLBD to provide an update on its subcontracting plan.

Section 13.2.12 DSLBD Notices

The Contractor shall provide written notice to the DSLBD and the District of Columbia Auditor upon commencement of the contract and when the contract is completed.

Section 13.2.13 Enforcement and Penalties for Breach of Subcontracting Plan

Section 13.2.13.1 A contractor shall be deemed to have breached a subcontracting plan required by law, if the contractor (i) fails to submit subcontracting plan monitoring or compliance reports or other required subcontracting information in a reasonably timely manner;

(ii) submits a monitoring or compliance report or other required subcontracting information containing a materially false statement; or (iii) fails to meet its subcontracting requirements.

Section 13.2.13.2 A contractor that is found to have breached its subcontracting plan for utilization of CBEs in the performance of a contract shall be subject to the imposition of penalties, including monetary fines in accordance with D.C. Official Code § 2-218.63.

Section 13.2.14 If the CO determines the Contractor's failure to be a material breach of the contract, the CO shall have cause to terminate the contract under the default provisions in **Article 8 of the Standard Contract Provisions (Exhibit J), Default**.

Section 13.2.15 Neither the Design-Builder nor a Subcontractor may remove a Subcontractor or tier-Subcontractor if such Subcontractor or tier-Subcontractor is certified as an LSDBE company unless the Department approves of such removal, in writing. The Department may condition its approval upon the CMAR developing a plan that is, in the Department's sole and absolute judgment, adequate to maintain the level of LSDBE participation on the Project.

Section 13.3 Equal Employment Opportunity and Hiring of District Residents

Section 13.3.1 The Design-Builder shall comply with applicable laws, regulations and special requirements of the Contract Documents regarding equal employment opportunity and affirmative action programs. In accordance with the District of Columbia Administrative Issuance System, Mayor's Order 85-85 dated June 10, 1985, the forms for completion of the Equal Employment Opportunity Information Report are incorporated herein as **Exhibit H**. A contract award cannot be made to any contractor that has not satisfied the equal employment requirements.

Section 13.3.2 The Design-Builder shall ensure that at least fifty-one percent (51%) of the Design-Builder's team and every sub-consultant's and subcontractor's employees hired after the effective date of the Agreement, or after such subconsultant or subcontractor enters into a contract with the Design-Builder, to work on the Project shall be residents of the District of Columbia. This percentage shall be applied in the aggregate, and not trade by trade. In addition, the Design-Builder shall use commercially reasonable best efforts to comply with the workforce percentage goals established by the recently adopted amendments to the First Source Employment Agreement Act of 1984 (D.C. Code §§ 2-219.01 *et seq.*) and any implementing regulations, including, but not limited to the following requirements:

- (i) At least 20% of journey worker hours by trade shall be performed by District residents;
- (ii) At least 60% of apprentice hours by trade shall be performed by District residents;
- (iii) At least 51% of the skilled laborer hours by trade shall be performed by District residents; and

(iv) At least 70% of common laborer hours shall be performed by District residents.

Section 13.3.3 intentionally omitted

Section 13.3.4 Thirty five percent (35%) of all apprentice hours worked on the Project shall be worked by District residents.

Section 13.4 Economic Inclusion Reporting Requirements

Section 13.4.1 Upon execution of the Agreement, the Design-Builder and all its member firms, if any, and each of its Subcontractors shall submit to the Department a list of current employees and apprentices that will be assigned to the Agreement, the date they were hired and whether or not they live in the District of Columbia.

Section 13.4.2 The Design-Builder and its constituent entities shall comply with subchapter X of Chapter II Title 2, and subchapter II of Chapter 11 of Title 1 of the D.C. Code, and all successor acts thereto and the rules and regulations promulgated thereunder. The Design-Builder and all member firms and Subcontractors shall execute a First Source Agreement (**Exhibit V**) with the District of Columbia Department of Employment Services (“DOES”) prior to beginning work at the Project site.

Section 13.4.3 The Design-Builder shall maintain detailed records relating to the general hiring of District of Columbia and community residents.

Section 13.4.4 The Design-Builder shall be responsible for: (i) including the provisions of Section 9.3 in all subcontracts; (ii) collecting the information required in Section 9.3 from its Subcontractors; and (iii) providing the information collected from its Subcontractors in the reports required to be submitted by the CMAR pursuant to Section 9.3.

Section 13.5 Service Contract Act Provision. The Design-Builder agrees that the work performed under this Agreement shall be subject to the Service Contract Act Wage Determination in effect on the date this agreement is executed. Service Contract Wage Schedules are available at wdol.gov, **Exhibit E**. Notwithstanding the terms of the Standard Contract Provisions, the Davis-Bacon Act is not applicable to this Agreement.

Section 13.6 Living Wage Act. In addition to the requirements set forth in the First Source Employment Agreement, the Design-Builder shall comply with all applicable provisions of the Living Wage Act of 2006, **Exhibit Q**, as amended (codified at D.C. Official Code §§ 2-220.01 et seq.) and its implementing regulations.

Section 13.7 Apprenticeship Act. The D.C. Apprenticeship Act of D.C. Law 2-156, (as amended, the Act) may apply to these Projects. As applicable, the Design-Builder firms and its subcontractors selected to perform work on the Projects on a craft-by-craft basis may be required to comply with the Act. If applicable, all terms and conditions of the D.C. Apprenticeship Council Rules and Regulations shall be implemented, and the selected Design-Builder firms shall be liable for any subcontractor non-compliance

Section 13.8 WAY TO WORK AMENDMENT ACT OF 2006

13.8.1. Except as described in **Section 13.14.8** below, the Design-Builder shall comply with Title I of the Way to Work Amendment Act of 2006, effective June 8, 2006 (D.C. Law 16-118, D.C. Official Code §2-220.01 et seq.) (“Living Wage Act of 2006”), for contracts for services in the amount of \$100,000 or more in a 12-month period.

13.8.2 The Design-Builder shall pay its employees and subcontractors who perform services under the Contract no less than the current living wage.

13.8.3 The Design-Builder shall include in any subcontract for \$15,000 or more a provision requiring the subcontractor to pay its employees who perform services under the Contract no less than the current living wage rate.

13.8.4 The DOES may adjust the living wage annually and Design-Builder will find the current living wage rate on its website at www.does.dc.gov.

13.8.5 The Design-Builder shall provide a copy of the Fact Sheet attached within (**Exhibit Q**) to each employee and subcontractor who performs services under the Contract. The Design-Builder shall also post the Notice attached within (**Exhibit Q**) in a conspicuous place in its place of business. The Design-Builder shall include in any subcontract for \$15,000 or more a provision requiring the subcontractor to post the Notice in a conspicuous place in its place of business.

13.8.6 The Design-Builder shall maintain its payroll records under the Contract in the regular course of business for a period of at least three (3) years from the payroll date, and shall include this requirement in its subcontracts for \$15,000 or more under the Contract.

13.8.7 The payment of wages required under the Living Wage Act of 2006 shall be consistent with and subject to the provisions of D.C. Official Code §32-1301 et seq.

13.8.8 The requirements of the Living Wage Act of 2006 do not apply to:

- (1) Contracts or other agreements that are subject to higher wage level determinations required by federal law;
- (2) Existing and future collective bargaining agreements, provided, that the future collective bargaining agreement results in the employee being paid no less than the established living wage;
- (3) Contracts for electricity, telephone, water, sewer or other services provided by a regulated utility;
- (4) Contracts for services needed immediately to prevent or respond to a disaster or imminent threat to public health or safety declared by the Mayor;
- (5) Contracts or other agreements that provide trainees with additional services including, but not limited to, case management and job readiness services; provided that the trainees do not replace employees subject to the Living Wage Act of 2006;
- (6) An employee under 22 years of age employed during a school vacation period, or enrolled as a full-time student, as defined by the respective institution, who is in high school or at an accredited institution of higher education and who works less than 25 hours per week; provided that he or she does not replace employees subject to the Living Wage Act of 2006;
- (7) Tenants or retail establishments that occupy property constructed or improved by receipt of government assistance from the District of Columbia; provided, that the tenant or retail establishment did not receive direct government assistance from the District;

- (8) Employees of nonprofit organizations that employ not more than 50 individuals and qualify for taxation exemption pursuant to section 501(c)(3) of the Internal Revenue Code of 1954, approved August 16, 1954 (68A Stat. 163; 26 U.S.C. § 501(c)(3));
- (9) Medicaid provider agreements for direct care services to Medicaid recipients, provided, that the direct care service is not provided through a home care agency, a community residence facility, or a group home for mentally retarded persons as those terms are defined in section 2 of the Health-Care and Community Residence Facility, Hospice, and Home Care Licensure Act of 1983, effective February 24, 1984 (D.C. Law 5-48; D.C. Official Code § 44-501); and
- (10) Contracts or other agreements between managed care organizations and the Health Care Safety Net Administration or the Medicaid Assistance Administration to provide health services.

13.8.9 The Mayor may exempt a contractor from the requirements of the Living Wage Act of 2006, subject to the approval of Council, in accordance with the provisions of Section 109 of the Living Wage Act of 2006.

Article 14 - LIQUIDATED DAMAGES

Section 14.1 Delay in Submission of Deliverables.

Subject to the terms set forth in Sections 3.1.2 and 4.12, if the Design-Builder fails to provide any of the deliverables set forth in **Exhibit C**, the Design-Builder shall pay to the Department liquidated damages in the amount set forth in the Project Information Section of this Agreement for each such deliverable that is not timely submitted.

Section 14.2 Delay in Substantial Completion.

If the Design-Builder fails to achieve Substantial Completion of the Project by the Substantial Completion Date, the Parties acknowledge and agree that the actual damage to the Department for the delay will be impossible to determine, and in lieu thereof, the Design-Builder shall pay to the Department, as fixed, agreed and liquidated delay damages in the amount set forth in the Project Information Section of this Agreement per day for each calendar day of delay for failure to meet the applicable Substantial Completion Date.

The Design-Builder and the Department agree that the liquidated damages set forth in this Article do not constitute, and shall not be deemed, a penalty but represent a reasonable approximation of the damages to the Department associated with a delay in the Project. These damages shall not apply if the delay is the result of force majeure and the Design-Builder otherwise complies with the provisions set forth in the Standard Contract Provisions (Construction Contracts and Architectural/Engineering Services Contracts).

Section 14.3 Early Completion. In the event the Design-Builder achieves Substantial Completion of the Project prior to the Substantial Completion Date, the Design-Builder shall maintain the completed Project, at its own expense, until such time that the Department agrees to occupy and use the Project for its intended use.

Article 15 - MISCELLANEOUS PROVISIONS

15.1 Ownership and Use of Project Documents. The Drawings, Specifications and other Project Documents prepared by the Architect/Engineer and copies thereof furnished to the Design-Builder, are for use solely with respect to this Project. They are not to be used by the Design-Builder, Subcontractors, Sub-subcontractors or suppliers on other projects, or for additions to this Project outside the scope of the Work, without the specific written consent of the Department, and the Architect/Engineer. The referenced Drawing, Specifications and other Project Documents shall become the property of the Department. The District will be the sole owner of all project drawings, specification and other Project Documents and the Design-Builder shall provide the District with a complete set of “as-built” within sixty (60) days of final completion.

15.2 Assignment.

The Department and Design-Builder respectively bind themselves, their partners, members, joint venturers, constituent entities, successors, assigns and legal representative to the other party hereto and to partners, members, joint venturers, constituent entities, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Agreement. Neither party to the Agreement shall assign the Agreement or its rights and obligations under the Agreement, without written consent of the other party. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Agreement.

15.3 Buy American Act Provision.

The Design-Builder shall comply with the provisions of the Buy American Act (41 U.S.C. § 10a), including, but not limited to, the purchase of steel.

15.3.1 In accordance with the Buy American Act (41 U.S.C. § 10a-10d), and Executive Order 10582, December 17, 1954 (3 CFR, 1954-58 Comp., p. 230), as amended by Executive Order 11051, September 27, 1962 (3 CFR, 1059—63 Comp., p. 635), the Design-Builder agrees that only domestic construction material will be used by the Design-Builder, subcontractors, material men and suppliers in the performance of the Agreement, except for non-domestic material listed in the Agreement.

“Components” as used in this Section, means those articles, materials and supplies incorporated directly into the end products.

“Domestic end product”, as used in this section, means, (1) an unmanufactured end product mined or produced in the United States, or (2) an end product manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States, exceeds 50 percent of the cost of all its components.

Components of foreign origin of the same class or kind as the products shall be treated as domestic. Scrap generated, collected, and prepared for processing in the United States is considered domestic.

“End Products”, as used in this Section, means those articles, materials, and supplies to be acquired for public use under this Contract.

The Design-Builder shall deliver only domestic end products, except those:

1. For use outside the United States;
2. That the District determines are not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality;
3. For which the District determines that domestic preference would be inconsistent with the public interest; or
4. For which the District determines the cost to be unreasonable.

15.3.2 Domestic Construction Material. “Construction material” means any article, material or supply brought to the construction site for incorporation in the building or work. An unmanufactured construction material is a “domestic construction material” if it has been mined or produced in the United States. A manufactured construction material is a “domestic construction material” if it has been manufactured in the United States and if the cost of its components which have been mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. “Component” means any article, material, or supply directly incorporated in a construction material.

15.3.3 Domestic Component. A component shall be considered to have been “mined, produced, or manufactured in the United States” regardless of its source, in fact, if the article, material or supply in which it is incorporated was manufactured in the United States and the component is of a class or kind determined by the Government to be not mined, produced or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.

15.3.4 Foreign Material. When steel materials are used in a project a minimal use of foreign steel is permitted. The cost of such materials cannot exceed one-tenth of one percent of the total project cost, or \$2,500,000, whichever is greater.

15.4 Davis-Bacon Act Provision.

The Design-Builder agrees that the construction work performed under this Agreement shall be subject to the Davis-Bacon Act (40 U.S.C. §§ 276a-276a-7). The wage rates applicable to this Project are attached as **Exhibit G**. The Design-Builder further agrees that it and all of its subcontractors shall comply with the regulations implementing the Davis-Bacon Act and such regulations are hereby incorporated by reference. At such time as the Design-Builder is preparing its GMP, if no construction work was authorized and received prior to the GMP. The Quick Payment Clause

15.5 Interest Penalties to Contractors

15.5.1.1 The District will pay interest penalties on amounts due to the Design-Builder under the Quick Payment Act, D.C. Official Code §2-221.01 *et seq.*, as amended, for the period beginning on the day after the required payment date and ending on the date on which payment of the amount is made. Interest shall be calculated at the rate of 1.5% per month. No interest penalty shall be paid if payment for the completed delivery of the item of property or service is made on or before the required payment date. The required payment date shall be:

- a. The date on which payment is due under the terms of the Contract;

- b. Not later than 7 calendar days, excluding legal holidays, after the date of delivery of meat or meat food products;
- c. Not later than 10 calendar days, excluding legal holidays, after the date of delivery of a perishable agricultural commodity; or
- d. 30 calendar days, excluding legal holidays, after receipt of a proper invoice for the amount of the payment due, if a specific date on which payment is due is not established by contract;

Section 15.5.1.2 Any amount of an interest penalty which remains unpaid at the end of any 30-day period shall be added to the principal amount of the debt and thereafter interest penalties shall accrue on the added amount.

Section 15.5.1.3 No interest penalty shall be due to the Design-Builder if payment for the completed delivery of goods or services is made on or after:

- a. 3rd day after the required payment date for meat or a meat food product;
- b. 5th day after the required payment date for an agricultural commodity; or
- c. 15th day after any other required payment date in the case of any other item.

Section 15.5.2 Payments to Subcontractors

Section 15.5.2.1 The Design-Builder must take one of the following actions within seven (7) days of receipt of any amount paid to the Design-Builder by the District for work performed by any subcontractor under this contract:

- a. Pay the subcontractor for the proportionate share of the total payment received from the District that is attributable to the subcontractor for work performed under the Contract; or
- b. Notify the Contracting Officer and the subcontractor, in writing, of the Design-Builder's intention to withhold all or part of the subcontractor's payment and state the reason for the nonpayment.

Section 15.5.2.2 The Design-Builder must pay any subcontractor or supplier interest penalties on amounts due to the subcontractor or supplier beginning on the day after the payment is due and ending on the date on which the payment is made. Interest shall be calculated at the rate of 1.5% per month. No interest penalty shall be paid on the following if payment for the completed delivery of the item of property or service is made on or before:

- a. The 3rd day after the required payment date for meat or a meat product;
- b. The 5th day after the required payment date for an agricultural commodity; or
- c. The 15th day after the required payment date for any other item.

Section 15.5.2.3 Any amount of an interest penalty which remains unpaid by the Design-Builder at the end of any 30-day period shall be added to the principal amount of the debt to the subcontractor and thereafter interest penalties shall accrue on the added amount.

Section 15.5.2.4 A dispute between the Design-Builder and subcontractor relating to the amounts or entitlement of a subcontractor to a payment or a late payment interest penalty under the Quick Payment Act does not constitute a dispute to which the District of Columbia is a party. The District may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

Section 15.5.3 Subcontractor Quick Payment Clause Flow-Down Requirements

Section 15.5.3.1 The Design-Builder shall include in each subcontract under this Contract a provision requiring the subcontractor to include in its contract with any lower-tier subcontractor or supplier the payment and interest clauses required under paragraphs (1) and (2) of D.C. Official Code §2-221.02(d).

Section 15.5.4 Requirements for Change Order Payments

Section 15.5.4.1 The Department and the Design-Builder are prohibited from requiring the Prime Contractor or a subcontractor to undertake any work that is determined to be beyond the original scope of the Prime Contractor's or a subcontractor's contract or subcontract, including work under a District-issued change order, when the additional work increases the contract price beyond the not-to-exceed price or negotiated maximum price of the underlying contract, unless the Contracting Officer:

- a. Agrees with the Prime Contractor and, if applicable, the subcontractor on a price for the additional work;
- b. Obtains a certification from the Chief Financial Officer that there are sufficient funds to compensate the Prime Contractor and, if applicable, the subcontractor for the additional work;
- c. Has made a written, binding commitment with the Prime Contractor to pay for the additional work within 30 days after the Prime Contractor submits a proper invoice for the additional work to the CO; and
- d. Gives written notice of the funding certification from the Chief Financial Officer to the Prime Contractor;

Section 15.5.4.2 The Design-Builder is required to include in its subcontracts a clause that requires the Prime Contractor to:

- a. Within 5 business days of receipt of the notice required under subparagraph (A)(iv) of this paragraph, provide the subcontractor with notice of the approved amount to be paid to the subcontractor based on the portion of the additional Work to be completed by the subcontractor;
- b. Pay the subcontractor any undisputed amount to which the subcontractor is entitled for any additional work within 10 days of receipt of payment for the additional Work from the District; and
- c. If the Prime Contractor withholds payment from a subcontractor, notify the subcontractor in writing and state the reason why payment is being withheld and provide a copy of the notice to the CO.

Section 15.5.4.3 The Department, Design-Builder, CMAR Contractor, or a subcontractor are prohibited from declaring another party to the contract to be in default or assessing, claiming, or pursuing damages for delays in the completion of the construction due to the inability of the parties to agree on a price for the additional work.

Section 15.5.4.4 AUTHORIZED CHANGES BY THE CONTRACTING OFFICER

- a. The CO is the only person authorized to approve changes in any of the requirements of this Contract.
- b. The Design-Builder shall not comply with any order, directive or request that changes or modifies the requirements of this Contract, unless issued in writing and signed by the CO.
- c. In the event the Design-Builder effects any change at the instruction or request of any person other than the CO, the change will be considered to have been made without authority and no adjustment will be made in the Contract price to cover any cost increase incurred as a result thereof.

Section 15.6 Contract Work Hours and Safety Standards Act Provision. The Design-Builder agrees that the applicable work performed under this Agreement shall be subject to the Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 327-333).

Section 15.7 False Claims Act. Design-Builder shall be governed by all laws and regulations prohibiting false or fraudulent statements and claims made to DC government, including the prescriptions set forth in District of Columbia Code Official Code §22-2514 and §§2-381.01 *et seq.* In the event that it is discovered that the Design-Builder has made a false, fraudulent or unsupported statement or claim to the Department, the Department may terminate this Agreement without liability.

Section 15.8 Interpretation of Contract and Order of Precedence. All of the Project documents comprising the Agreement should be read as complementary, so that what is called for by one is called for by all. Ambiguities shall be construed in favor of a broader scope of Work for the Design-Builder, as the intent of the Agreement is, with specific identified exceptions, to require the Design-Builder to assume entire responsibility for construction of the Project. If there is any inconsistency among the Project documents comprising the Agreement, the order of precedence among them is as follows, with the first listed Project document having the highest priority:

1. This Agreement and its Modifications, Change Orders, Change Directives, and Exhibit A to Exhibit S thereto;
2. The Department's Standard Contract Provisions (Construction Contracts and Architectural/Engineering Services Contracts), as amended, and any missing term in this Agreement shall be addressed in accordance with the Standard Contract Provisions; and
3. The Construction Project documents released or approved by the Department.
4. DGS Division 1 Specification

Section 15.9 Independent Contractor. The Design-Builder and the Design-Builder's employees: (1) shall perform the services specified herein as independent contractors, not as employees or agent of the District, or joint venture or partner with the District; (2) shall be responsible for their own management and administration of the work required and bear sole responsibility for complying with any and all technical, schedule, financial requirements or constraints attendant to the performance of this Agreement; (3) shall be free from supervision or control by any government employee with respect to the manner or method of performance of the service specified; but (4) shall, pursuant to the government's right and obligation to inspect, accept or reject work, comply with such general direction of the CO, or

the duly authorized representative of the CO as is necessary to ensure accomplishment of the Agreement objectives. The Design-Builder shall have exclusive authority to manage, direct, and control the work, and shall be responsible for all means, methods, techniques, sequences, and procedures, as well as for Project safety.

Section 15.10 No Third-Party Beneficiary Rights. Nothing in this Agreement shall be construed as creating third-party beneficiary rights in any person or entity, except as otherwise expressly provided in this Agreement.

Section 15.11 Media Releases. Neither the Design-Builder, its employees, agents or Subcontractors or material suppliers shall make any press release or similar media release related to the Project unless such press release have been discussed with the Department prior to its issuance.

Section 15.12 Construction. This Agreement shall be construed fairly as to all Parties and not in favor of or against any party, regardless of which party prepared the Agreement.

Section 15.13 Notices. All notices or communications required or permitted under the Agreement shall be in writing and shall be hand delivered or sent by telecopier or by recognized overnight carrier to the intended recipient at the address stated below, or to such other address as the recipient may have designated in writing. Any such notice or communication shall be deemed delivered as follows: if hand delivered, on the day so delivered, if sent by telecopier, on confirmation of successful transmission, and if sent by recognized overnight carrier, the next business day.

If to the Department:

If to the Design-Builder:

George Lewis, Associate Director
and Chief Procurement Officer
Department of General Services
2000 14th Street, NW, 4th Floor
Washington, DC 20009

This Section shall be read as imposing minimum requirements for distribution of required contractual notices, and not as displacing distribution requirements with respect to design Project documents, construction submittals, periodic reports, and other Project documents.

Section 15.14 Limitations. The Design-Builder agrees that any statute of limitations applicable to any claim or suit by the Department arising from this Agreement or its breach shall be controlled by applicable District of Columbia law.

Section 15.15 Survival. All agreements warranties, and representations of the Design-Builder contained in the Agreement or in any certificate or Project document furnished pursuant to the Agreement shall survive termination or expiration of the Agreement.

Section 15.16 No Waiver. If the Department waives any power, right, or remedy arising from the Agreement or any applicable law, the waiver shall not be deemed to be a waiver of the power, right, or remedy on the later recurrence of any similar events. No act, delay, or course of conduct by the Department shall be deemed to constitute the Department's waiver, which may be effected only by an express written waiver signed by the Department.

Section 15.17 Remedies Cumulative. Unless specifically provided to the contrary in the Agreement, all remedies set forth in the Agreement are cumulative and not exclusive of any other remedy the Department may have, including, without limitation, at law or in equity. The Department's rights and remedies will be exercised at its sole discretion, and shall not be regarded as conferring any obligation on the Department to exercise those rights or remedies for the benefit of the Design-Builder or any other person or entity.

Section 15.18 Headings/Captions. The headings or captions used in this Agreement or its table of contents are for convenience only and shall not be used in interpreting the Agreement.

Section 15.19 Entire Agreement; Modification. The Agreement supersedes all contemporaneous or prior negotiations, representations, course of dealing, or agreements, either written or oral. No modifications to the Agreement shall be effective against the Department unless made in writing signed by both the Department and the Design-Builder, unless otherwise expressly provided to the contrary in the Agreement. Notwithstanding the foregoing, nothing herein shall be construed to limit the Department's ability to unilaterally modify the Agreement.

Section 15.20 Severability. In the event any one or more of the provisions contained in this Agreement shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision of this Agreement, and in lieu of each such invalid, illegal or unenforceable provision, there shall be added automatically as a part of this Agreement a provision as similar in terms to such invalid, illegal or unenforceable provision as may be possible and be valid, legal and enforceable; each part of this Agreement is intended to be severable.

Section 15.21 Anti-Deficiency Acts. The obligations and responsibilities of the Department under the terms of the Agreement, or any subsequent agreement entered into pursuant to this Agreement or referenced herein (to which the Department is a party), are and shall remain subject to the provisions of: (i) the federal Anti-Deficiency Act, 31 U.S.C. §§ 1341, 1342, 1349-1351, 1511-1519 (2004) (the "**Federal ADA**"), and D.C. Official Code §§ 1-206.03(e) and 47-105 (2001); (ii) the District of Columbia Anti-Deficiency Act, D.C. Official Code §§ 47-355.01 – 355.08 (2004 Supp.) (the "**D.C. ADA**" and (i) and (ii) collectively, as amended from time to time, the "**Anti-Deficiency Acts**"); and (iii) Section 446 of the District of Columbia Home Rule Act, D.C. Official Code § 1-204.46 (2001). Pursuant to the Anti-Deficiency Acts, nothing in this Agreement shall create an obligation of the Department in anticipation of an appropriation by Congress for such purpose, and the Department's legal liability for payments and other charges under this Agreement shall not arise or obtain in advance of the lawful availability of appropriated funds for the applicable fiscal year as approved by Congress. **IN ACCORDANCE WITH § 446 OF THE HOME RULE ACT, D.C. CODE § 1-204.46, NO DISTRICT OF COLUMBIA OFFICIAL IS AUTHORIZED TO OBLIGATE OR EXPEND ANY AMOUNT UNDER THE AGREEMENT OR CONTRACT DOCUMENTS UNLESS SUCH AMOUNT HAS BEEN APPROVED, IS LAWFULLY AVAILABLE AND APPROPRIATED BY ACT OF CONGRESS.**

Section 15.22 Time. Time, if stated in a number of days, will be calendar days and thus include Saturdays, Sundays, and holidays, unless otherwise stated herein.

Section 15.23 Americans With Disabilities Act of 1990 ("ADA"). During the performance of this Contract, the Design-Builder and any of its Subcontractors shall comply

with the ADA. The ADA makes it unlawful to discriminate in employment against a qualified individual with a disability. See *42 U.S.C. §12101 et seq.*

Section 15.24 Contracts in Excess of One Million Dollars. Any contract in excess of \$1,000,000 shall not be binding or give rise to any claim or demand against the District until approved by the Council of the District of Columbia and signed by the Contracting Officer.

Section 15.25 COVID-19 Vaccination Certification Requirement for District Contractors and Grantees in Accordance with Mayor’s Order 2021-099 (“Order”)

Section 15.25.1 All District government contractors and grantees shall ensure that each of their employees, agents, and subcontractors who provide goods or perform services in person in District of Columbia facilities or worksites, or who have in-person contact with other persons in order to complete their work under the contract or grant have been either: (i) fully vaccinated against COVID-19, or (ii) granted one of the exemptions identified this Order by the contractor or grantee, are undergoing weekly COVID-19 testing and only reporting to the workplace when such test result is negative, and are wearing masks while working.

Section 15.25.2 Each District government agency under the administrative control of the Mayor with procurement authority independent of the Chief Procurement Officer, and each grant-making agency may issue change orders, enter into amendments to grant agreements or grant award notifications, and include terms in new contracts, grant agreements, or grant award notifications that include the requirement set forth in **Section 5.25.1**

Section 15.25.3 Contractors and grantees shall be responsible for ensuring compliance with this Order by their employees, agents, and subcontractors, and failure to do so may result in adverse consequences. Each District government contractor and grantee shall, at the request of the District government, provide to the District government a certification of its compliance with this requirement.

Section 15.25.4 Nothing in this Order shall be deemed to prevent contractors or grantees from imposing stronger vaccination requirements on their employees, agents, or subcontractors, subject to applicable federal and local laws and regulations.

Section 15.25.5 Contractors or grantees may be required to demonstrate further proof of vaccination, exemption documentation, and/or COVID-19 test results upon request of the City Administrator, the relevant agency’s contracting office, or other investigative authorities.

Section 15.25.6 Limitation. This Order does not vest any rights in constituents to have government services delivered by fully vaccinated employees, contractors, interns, or grantees, nor does it vest any rights in employees, contractors, interns, or grantees to interact only with fully vaccinated colleagues. Employees, contractors, interns, grantees, colleagues, and constituents are not entitled to know whether someone is at work because they have certified that they have been fully vaccinated or because they have obtained an exemption from the vaccination requirement imposed by this Order.

Section 15.25.7 Privacy. Completed vaccination certification forms and exemption requests shall be treated as private records exempt from disclosure under section 204(a)(2) of the Freedom of Information Act of 1976, effective March 29, 1977, D.C. Law 1-96; D.C. Official Code § 2-534(a)(2); however, the information included on those forms and requests may be used internally for verification, staffing, payroll, and assignments, and as any other operational needs may require, consistent with local and federal laws and regulations.

Section 15.26 Retention of Records: Inspections and Audits.

15.26.1 As used in this clause, “records” includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.

15.26.2 Examination of Costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price re-determinable contract, or any combination of these, the Design-Builder shall maintain and the CO, or an authorized representative of the CO, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this Contract. This right of examination shall include inspection at all reasonable times of the Design-Builder’s plants, or parts of them, engaged in performing the Contract.

15.26.3 Cost or pricing data. If the Design-Builder has been required to submit cost or pricing data in connection with any pricing action relating to this Contract, the CO, or an authorized representative of the CO, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Design-Builder’s records, including computations and projections, related to:

- a. The proposal for the contract, subcontract, or modification;
- b. The discussions conducted on the proposal(s), including those related to negotiating;
- c. Pricing of the contract, subcontract, or modification; or
- d. Performance of the contract, subcontract or modification.

15.26.4 Comptroller General

a. The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the Design-Builder’s directly pertinent records involving transactions related to this Contract or a subcontract hereunder.

b. This paragraph may not be construed to require the Design-Builder or subcontractor to create or maintain any record that the Design-Builder or subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.

15.26.5 Reports. If the Design-Builder is required to furnish cost, funding, or performance reports, the CO or an authorized representative of the CO shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating:

- a. The effectiveness of the Design-Builder’s policies and procedures to produce data compatible with the objectives of these reports; and
- b. the data reported.

15.26.6 Availability. The Design-Builder shall make available at its office at all reasonable times the records, materials, and other evidence described in **Section 15.25**, for examination, audit, or reproduction, until three (3) years after final payment under this Contract or for any shorter period specified in the RFP, or for any longer period required by statute or by other section of this Contract. In addition:

a. If this Contract is completely or partially terminated, the Contractor shall make available the records relating to the work terminated until three (3) years after any resulting final termination settlement; and

b. The Design-Builder shall make available records relating to appeals under Article 19 of this Contract (Claims and Disputes Resolution) or to litigation or the settlement of claims arising under or relating to this Contract until such appeals, litigation, or claims are finally resolved.

15.26.7 The Design-Builder shall insert a clause containing all the terms of this **Section 8.3**, including this **15.26.7** in all subcontracts under this Contract that exceed the small purchase threshold of \$100,000.00 and:

a. That are cost-reimbursement, incentive, time-and-materials, labor-hour, or price re-determinable type or any combination of these;

b. For which cost or pricing data are required; or

c. That requires the subcontractor to furnish reports as discussed in **Section 15.26.5** of this Contract.

15.26.8 The Inspector General, District of Columbia Auditor, or Director shall be entitled to audit the books and records of a contractor or any subcontractor under any negotiated contract or subcontract, other than a firm fixed-price contract, to the extent that the books and records relate to the performance of the contract or subcontract. Books and records shall be maintained by the contractor for a period of three (3) years from the date of final payment under the prime contract and by the subcontractor for a period of three (3) years from the date of final payment under the subcontract, unless a shorter period is otherwise authorized in writing. The Inspector General, District of Columbia Auditor, or Director may, at reasonable times, inspect the part of the place of business of a contractor or any subcontractor which is related to the performance of any contract awarded or to be awarded by the District.

Section 15.27 Gratuities Not to Benefit Provisions.

If it is found, after notice and hearing, by the Department that gratuities (in the form of entertainment, gifts, payment, offers of employment or otherwise) were offered or given by the Design-Builder, or any agent or representative of the Design-Builder, to any official, employee or agent of the Department or the District with a view toward securing the Agreement or any other contract or securing favorable treatment with respect to the awarding or amending, or the making of any determinations with respect to the performance of the Agreement, the Department may, by written notice to the Design-Builder, terminate the right of the Design-Builder to proceed under the Agreement and may pursue such other rights and remedies provided by law and under the Agreement.

Section 15.27.1 In the event the Agreement is terminated as provided in Section 15.26, the Department shall be entitled:

a. to pursue the same remedies against the Design-Builder as it could pursue in the event of a breach of the Agreement by the Design-Builder; and

b. as a penalty in addition to any other damages to which it may be entitled by law, to exemplary damages in an amount (as determined by the Department) which shall be not less than ten times the costs incurred by the Design-Builder in providing any such gratuities.

Section 15.27.2 No member of, nor delegate to Congress, Mayor or City Council Member, nor the Department nor employee of the District or employee of the Department shall be admitted to any share or part of the Agreement or to any benefit that may arise therefrom, and all agreements entered into by the CO of the Department in which he or she be personally interested as well as all agreements made by the Department in which the Mayor or City Council Member or employee of the District shall be personally interested shall be void and no payments shall be made on any such contracts by the Department; but this provision shall not be construed or extend to the agreement if the share of or benefit to the member of, or delegate to Congress, Mayor or City Council Member, or employee of the District is de minimis.

Section 15.28 Ethical Standards for the Department's Employees And Former Employees. The Department expects the Design-Builder to observe the highest ethical standards and to comply with all applicable law, rules, and regulations governing ethical conduct or conflicts of interest. Neither the Design-Builder, nor any person associated with the Design-Builder, shall provide (or seek reimbursement for) any gift, gratuity, favor, entertainment, loan or other thing of value to any employee of the District or the Department not in conformity with applicable law, rules or regulations. The Design-Builder shall not engage the services of any person or persons in the employment of the Department or the District for any work required, contemplated or performed under the Agreement. The Design-Builder may not assign to any former employee or District employee or agent who has joined the Design-Builder's firm any matter on which the former employee, while employed by the Department, had material or substantial involvement in the matter. The Design-Builder may request a waiver to permit the assignment of such matters to former personnel on a case-by-case basis. The Design-Builder shall include in every subcontract a provision substantially similar to this section so that such provisions shall be binding upon each Design-Builder or vendor.

Section 15.29 Non-Discrimination in Employment Provisions.

15.29.1 District of Columbia Human Rights Act

a. The Design-Builder shall not discriminate in any manner against any employee or applicant for employment that would constitute a violation of the District of Columbia Human Rights Act, effective December 13, 1977, as amended (D.C. Law 2-38; D.C. Official Code § 2-1401.01 *et seq.*) ("Act", as used in this clause). The Design-Builder shall include a similar clause in all subcontracts, except subcontracts for standard commercial supplies or raw materials. In addition, the Design-Builder agrees, and any subcontractor shall agree, to post in conspicuous places, available to employees and applicants for employment, a notice setting forth the provisions of this non-discrimination clause as provided in section 251 of the Act.

b. Pursuant to Mayor's Order 85-85, (6/10/85), Mayor's Order 2002-175 (10/23/02), Mayor's Order 2011-155 (9/9/11) and the rules of the Office of Human Rights, Chapter 11 of Title 4 of the D.C. Municipal Regulations, the following clauses apply to the Contract:

1. The Design-Builder shall not discriminate against any employee or applicant for employment because of race, color, religion, national origin, sex, age, marital status, personal appearance, sexual orientation, family responsibilities, matriculation, political affiliation, or physical handicap.

2. The Design-Builder agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, national origin, sex, age, marital status, personal appearance, sexual orientation, family responsibilities, matriculation, political affiliation, or physical handicap. The affirmative action shall include, but not be limited to, the following:

- i. Employment, upgrading, or transfer;
- ii. Recruitment or recruitment advertising;
- iii. Demotion, layoff, or termination;
- iv. Rates of pay, or other forms of compensation; and
- v. Selection for training and apprenticeship.

3. Unless otherwise permitted by law and directed by the Department, the Design-Builder agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Department setting forth the provisions paragraphs 1 and 2 of Section 15.28.1(b) of this Agreement, concerning non-discrimination and affirmative action.

4. The Design-Builder shall, in all solicitations or advertisements for employees placed by or on behalf of the Design-Builder, state that all qualified applicants will receive consideration for employment pursuant to the non-discrimination requirements set forth in **Section 15.29.1**.

5. The Design-Builder agrees to send to each labor union or representative of workers with which it has a collective bargaining agreement, or other contract or understanding, a notice to be provided by the Department, advising each labor union or workers' representative of the Design-Builder's commitments under this **Section 15.29.1**, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

6. The Design-Builder agrees to permit access by the Department to all books, records and accounts pertaining to its employment practices for purposes of investigation to ascertain compliance with this **Section 15.29.1**, and to require under terms of any Subcontractor agreement each Subcontractor to permit access of the Subcontractors, books, records, and accounts for such purposes..

7. The Design-Builder shall include in every subcontract this **Section 15.29.1** so that such provisions shall be binding upon each subcontractor or vendor.

8. The Design-Builder shall take such action with respect to any subcontract as the CO may direct as a means of enforcing these provisions, including sanctions for noncompliance; provided, however, that in the event the Design-Builder becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the Department, the Design-Builder may request the District to enter into such litigation to protect the interest of the District.

Section 15.29.2 PREGNANT WORKERS FAIRNESS

a. The Design-Builder shall comply with the Protecting Pregnant Workers Fairness Act of 2016, D.C. Official Code § 32-1231.01 *et seq.* (PPWF Act).

b. The Design-Builder shall not:

1. Refuse to make reasonable accommodations to the known limitations related to pregnancy, childbirth, related medical conditions, or breastfeeding for an employee, unless the Design-Builder can demonstrate that the accommodation would impose an undue hardship;

2. Take an adverse action against an employee who requests or uses a reasonable accommodation in regard to the employee's conditions or privileges of employment, including failing to reinstate the employee when the need for reasonable accommodations ceases to the employee's original job or to an equivalent position with equivalent:

- i. Pay;
- ii. Accumulated seniority and retirement;
- iii. Benefits; and
- iv. Other applicable service credits;

3. Deny employment opportunities to an employee, or a job applicant, if the denial is based on the need of the employer to make reasonable accommodations to the known limitations related to pregnancy, childbirth, related medical conditions, or breastfeeding;

4. Require an employee affected by pregnancy, childbirth, related medical conditions, or breastfeeding to accept an accommodation that the employee chooses not to accept if the employee does not have a known limitation related to pregnancy, childbirth, related medical conditions, or breastfeeding or the accommodation is not necessary for the employee to perform her duties;

5. Require an employee to take leave if a reasonable accommodation can be provided; or

6. Take adverse action against an employee who has been absent from work as a result of a pregnancy-related condition, including a pre-birth complication.

c. The Design-Builder shall post and maintain in a conspicuous place a notice of rights in both English and Spanish and provide written notice of an employee's right to a needed reasonable accommodation related to pregnancy, childbirth, related medical conditions, or breastfeeding pursuant to the PPWF Act to:

1. New employees at the commencement of employment;
2. Existing employees; and
3. An employee who notifies the employer of her pregnancy, or other condition covered by the PPWF Act, within 10 days of the notification.

d. The Design-Builder shall provide an accurate written translation of the notice of rights to any non-English or non-Spanish speaking employee.

e. Violations of the PPWF Act shall be subject to civil penalties as described in the PPWF Act.

15.29.3 UNEMPLOYED ANTI-DISCRIMINATION

a. The Design-Builder shall comply with the Unemployed Anti-Discrimination Act of 2012, D.C. Official Code § 32-1361 *et seq.* (“Anti-Discrimination Act”).

b. The Design-Builder shall not:

1. Fail or refuse to consider for employment, or fail or refuse to hire, an individual as an employee because of the individual's status as unemployed; or
2. Publish, in print, on the Internet, or in any other medium, an advertisement or announcement for any vacancy in a job for employment that includes:
 - i. Any provision stating or indicating that an individual's status as unemployed disqualifies the individual for the job; or
 - ii. Any provision stating or indicating that an employment agency will not consider or hire an individual for employment based on that individual's status as unemployed.

c. Violations of the Unemployed Anti-Discrimination Act shall be subject to civil penalties as described in the Anti- Discrimination Act.

Section 15.30 ASSIGNMENT OF CONTRACT PAYMENTS

a. Subject to **Section 15.30** of this Contract, in accordance with Title 27 DCMR Section 3250, the Design-Builder may assign due or to become due as a result of the performance of this Design-Builder to a bank, trust company, or other financing institution funds.

b. Any assignment shall cover all unpaid amounts payable under this Agreement and shall not be made to more than one party.

c. Notwithstanding an assignment of Contract payments, the Design-Builder, not the assignee, is required to prepare invoices. Where such an assignment has been made, the original copy of the invoice must refer to the assignment and must show that payment of the invoice is to be made directly to the assignee as follows:

“Pursuant to the instrument of assignment dated _____, make payment of this invoice to (name and address of assignee).”

Section 15.31 FREEDOM OF INFORMATION ACT (“FOIA”)

The District of Columbia Freedom of Information Act, at *D.C. Official Code § 2-532 (a-3)*, requires the District to make available for inspection and copying any record produced or collected pursuant to a District contract with a private contractor to perform a public function, to the same extent as if the record were maintained by the agency on whose behalf the contract is made. If the Design-Builder receives a request for such information, the Design-Builder shall immediately send the request to the PM designated in **Section 1.3** of this Agreement who will provide the request to the FOIA Officer for the agency with programmatic responsibility in accordance with the D.C. Freedom of Information Act. If the agency with programmatic responsibility receives a request for a record maintained by the Design-Builder pursuant to the Contract, the PM will forward a copy to the Design-Builder. In either event, the Design-Builder is required by law to provide all responsive records to the PM within the timeframe designated by the PM. The FOIA Officer for the agency with programmatic responsibility will determine the releasability of the records. The District will reimburse the Design-Builder for the costs of searching and copying the records in accordance with *D.C. Official Code §2-532* and Chapter 4 of Title 1 of the *D.C. Municipal Regulations*.

ARTICLE 16- TERMINATION OR SUSPENSION

Section 16.1 All terminations or suspensions arising out of or under this Agreement shall be in accordance with the terms of the Standard Contract Provisions (Construction Contracts and Architectural/Engineering Services Contracts).

Section 16.2 Failure to Agree Upon GMP. The Department shall have the right to terminate this Agreement in the event that the Department and the Design-Builder are unable to agree upon a GMP for the Project and the Department shall have the right, but not the obligation, to assume any of the Design-Builder's trade subcontracts upon such terms and conditions as requested by the Department. The Department's decision to terminate under this Section shall be made in the Department's sole and absolute judgment and shall not be subject to review by any reviewing body, including, but not limited to, arbitrators appointed under this Agreement or any court of competent jurisdiction.

Section 16.3 Termination for Default. The Department may terminate the Agreement for default if the Design-Builder fails to perform any of its duties or obligations under the Agreement. In particular, but without limitation, the Department may terminate the Agreement if:

1. The Design-Builder fails to perform the Work diligently, in accordance with the Project Schedule or to make such progress in the Work as the Department reasonably believes is necessary to complete the Project within the time required by the Agreement; or
2. The Design-Builder fails to perform the Work in a good and workmanlike manner or to correct defects in the Work promptly upon notice by the Department; or
3. The Department reasonably determines that the Design-Builder has abandoned the Work, or has failed to pay laborers, mechanics, materialmen, Subcontractors or suppliers when payment is due; or
4. The Design-Builder becomes insolvent, makes an assignment for the benefit of creditors, files a voluntary petition under any chapter of the Bankruptcy Code or has an involuntary petition filed against it under any chapter of the Bankruptcy Code, or the Design-Builder has a receiver appointed, or files for dissolution or otherwise is dissolved; or
5. The Design-Builder fails to pay its debts in a timely manner or becomes insolvent, the Department reasonably determines that the Design-Builder does not have the financial ability to carry out its obligations under the Agreement and the Design-Builder fails to give the Department prompt and reasonable assurances of its ability to perform.

Section 16.3.1 The Department shall provide the Design-Builder with written notice of its intent to terminate the Agreement, under this Section.

Section 16.3.2 If the Department terminates the Agreement for default, the Department will have the right to take over the Work, to accept assignment of some or all Subcontracts or agreements with material suppliers, to take possession of the Project, to take and use all tools, equipment and supplies then being used in connection with the Work, and to finish the Project

by whatever method it deems expedient, including accepting assignment of all outstanding Subcontracts and Supply Agreements.

Section 16.4 Termination for Convenience. The Department may terminate the Contract in whole or specified part, for its convenience, for any reason. The notice of termination shall state the effective date of termination, the extent of the termination, and any specific instructions. The termination for convenience that arises out of or under this Agreement shall be in accordance with the terms of the Standard Contract Provisions (Construction Contracts and Architectural/Engineering Services Contracts).

Section 16.5 Continued Responsibility After Termination. If the Design-Builder is terminated, for default, for Convenience or otherwise, the Design-Builder shall remain responsible for defects or non-conformities in all Work performed to the date of the termination.

Article 17 – OTHER CONDITIONS AND SERVICES

This Agreement and the rights and obligations of the Department and Design-Builder herein are subject to the approval of the Council for the District of Columbia.

Article 18 – CHANGES IN THE WORK

Section 18.1 Changes Authorized. In accordance with the Standard Contract Provisions (Construction Contract) and the Standard Contract Provisions for Architectural and Engineering services Contracts, the Department may, without invalidating the Agreement, and without notice to or approval of any surety, order changes in the Work, including additions, deletions or modifications. Any such change must be conveyed by the Department to the Design-Builder via written Change Directive or Change Order.

Section 18.2 Executed Change Directive/Change Order Required. Only a written Change Directive or Change Order, executed by the Department’s Contracting Officer, may make changes to the Agreement. In particular, but without limitation, a written Change Directive or Change Order executed by the Department’s Contracting Officer is the only means by which changes may be made to the Substantial or Final Completion Dates, the Design-Build Fee, or the Guaranteed Maximum Price.

Section 18.3 Department-Initiated Changes

1. If the Department wishes to make a change in the Work or to accelerate the Work, it will execute and issue to the Design-Builder a written Change Directive, either directing the Design-Builder to proceed at once with the changed Work or directing it to not to proceed, but to inform the Department, in writing, of the amount, if any, by which the Design-Builder believes that Substantial or Final Completion Dates and/or the Guaranteed Maximum Price should be adjusted to take the Change Order or Change Directive into account.
2. Within ten (10) days of receiving a Change Directive, the Design-Builder shall provide the Department with a written statement of all changes in the Agreement, including, without limitation, any changes to the Substantial or Final Completion Dates or the Guaranteed Maximum Price to which it believes it is entitled as a result of the Change Directive. If additional time is sought, a

schedule analysis supporting the requested extension should be included. The schedule analysis should include a written narrative explanation. If a change in the Guaranteed Maximum Price is sought (or if the Department has requested a deduct change), the statement should include a breakdown, by line item, of the estimated cost changes attributable to the proposed change. The Department may request, and the Design-Builder shall provide, further cost breakdowns, clarifications, Project Documentation or back-up if the Department reasonably believes such additional information is needed to understand and evaluate the request. The additional information required may include cost and pricing data in accordance with the Department's regulations. Any requested adjustment to the Guaranteed Maximum Price shall be limited to increased Cost of the Work due to the Change Directive. The Design-Builder is not entitled to any markup on any kind of Change Orders except as authorized in Section 18.8, and if so authorized, any mark-up shall be in accordance with Section 18.11.

3. If the Department has not yet directed the Design-Builder to proceed with the change described by a Change Directive, the Department may rescind it. If the Department wishes to proceed, or has already directed the Design-Builder to proceed, the Design-Builder shall immediately proceed with the changed Work and, the Department and the Design-Builder shall use their good faith best efforts to reach an agreement upon the modifications to the Substantial or Final Completion Dates, and/or the Guaranteed Maximum Price that are justified by the Change Directive. If the Department and the Design-Builder reach agreement, the agreement shall be set forth in a Change Order and the Design-Builder shall also execute it, at which point it will become binding on both Parties.
4. If the Parties fail to reach an agreement within sixty (60) days after the Department receives the Design-Builder's detailed statement pursuant to Section 18.3.2, and such other Project documentation as the Department may request, the Design-Builder may assert a claim in accordance with the Agreement. In such a case, and subject to adjustment via the claims and disputes process, the Department shall unilaterally grant the Design-Builder such adjustments, if any, to the Substantial or Final Completion Dates, the Guaranteed Maximum Price, and/or the Preconstruction or Design-Build Fee as the Department has judged to be appropriate.

Section 18.4 Notice of Change Event. The Design-Builder must give the Department written notice of any Change Event within ten (10) calendar days of the date on which the Design-Builder knew, or reasonably should have known, of the Change Event. To the extent available, the notice must state the nature of the Change Event and describe, generally, all changes in the Agreement to which the Design-Builder believes it is entitled. Such notice is an express condition precedent to any claim or request for adjustment to the Substantial or Final Completion Dates, or the Guaranteed Maximum Price arising from the Change Event and, if the notice is not given within the required time, the Design-Builder will have waived the right to any adjustment to the Substantial or Final Completion Dates, or the Guaranteed Maximum Price arising from the Change Event.

Section 18.5 Detailed Change Request. Within twenty (20) days after giving notice of a Change Event, the Design-Builder shall submit a written Change Request to the Department describing, in reasonable detail, all adjustments it seeks to the Substantial or Final Completion Dates or the Guaranteed Maximum Price as a result of the Change Event. The

Change Request shall include the same information as described in Section 18.3 with respect to any Agreement changes the Design-Builder seeks due to the Change Event, and the amount of any requested adjustment to the Guaranteed Maximum Price shall be limited in accordance with that Section 18.3.

Section 18.6 Changes to GMP. Subject to the condition precedent that the Design-Builder have complied with the notice and documentation provisions of this Article, and subject to the limitations stated in this Agreement, the Design-Builder is entitled to an adjustment to the Guaranteed Maximum Price in the following cases:

1. If the Department issues a Change Directive or Change Order that directs the Design-Builder to proceed with work which is beyond the scope of Work included within this Agreement; or
2. The Design-Builder encounters Differing Site Conditions or Hazardous Materials not identified in the Preconstruction Phase.

Section 18.7 Deductive Change Orders. The Department reserves the right to issue deductive Change Orders (reducing the Guaranteed Maximum Price or modifying the Substantial or Final Completion Dates to an earlier date) when changes are effected, by Change Directive or otherwise, which will decrease the cost of completing the Work or the time within which it can be completed.

Section 18.8 No Adjustments to Fee. The Design-Builder understands and agrees that the Design-Build Fee shall not be increased or decreased as a result of any Change Orders or Change Directive. In furtherance of this understanding, the Design-Builder agrees that it shall not be entitled to an increase in the Maximum Cost of General Conditions, or the Design-Build Fee by virtue of changes authorized by the Department unless such changes fall outside the general scope of work contemplated by this Agreement. The term general scope of work shall mean a state-of-the-art elementary school that is consistent with the Department's program of requirements and incorporates sustainable design initiatives. Without limiting the generality of the foregoing, it is understood and agreed that the Design-Builder shall not be entitled to any additional fees or general conditions unless (i) the Department makes additions to the scope provided for in this Agreement that cause the GMP, either individually or in the aggregate, to increase by more than ten percent (10%); or (ii) the Department makes additions to the scope provided for herein which (other than for punchlist or warranty work) require the Design-Builder's services for the Project to extend beyond the Substantial Completion Date.

Section 18.9 Executed Change Orders or Contract Modifications are Final. The Design-Builder agrees that any Change Order or Contract Modification executed by the Department and Design-Builder constitutes its full and final adjustment for all costs, delays, disruptions, inefficiencies, accelerations, schedule impacts, or other consequences arising from the change modification in question, whether a Change Directive, or a Change Event, or from any claimed cumulative effect of changes made to the date of the Change Order or Contract Modification, and that no further adjustments in compensation or time shall be sought or made with respect to the Change Directive or the Change Event giving rise to the Change Order or Contract Modification. Although the Parties anticipate that most Change Orders or Contract Modifications will not require an adjustment to the Cost of General Conditions, if the Work described in a Change Order or Contract Modification requires an increase or decrease in the Maximum Cost of General Conditions (i.e. because such a Change requires additional field staff or other equipment that would be classified as General Conditions Costs), the Change Order or Contract Modification shall contain an increase to the Design-Build Fee adjusting

such amount. The cost of processing a Change Order or Contract Modification shall not be considered an event that will require an increase in the Maximum Cost of General Conditions.

Section 18.10 Failure to Agree. If the Design-Builder claims entitlement to a change in the Agreement, and the Department does not agree that any action or event has occurred to justify any change in time or compensation, or if the Parties fail to agree upon the appropriate amount of the adjustment in time or compensation, the Department will unilaterally make such changes, if any, to the Agreement, as it determines are appropriate pursuant to the Agreement. The Design-Builder shall proceed with the Work and the Department's directives, without interruption or delay, and shall make a claim as provided in Article 18 herein. Failure to proceed due to a dispute over a change request shall constitute a material breach of the Contract and entitle the Department to all available remedies for such breach, including, without limitation, termination for default.

Section 18.11 Mark-Up on Trade Work (Change Order). Change Order work shall be reimbursed as follows:

1. Intervening tier Subcontractors shall be entitled to a mark-up of two percent (2%) (Covering home office overhead, the cost of insurance and bonds, field supervision, general conditions and profit) on Work Performed by lower-tier Subcontractors;
2. To the extent permitted by **Section 18.8**, the Design-Builder shall be entitled to an increase in its Design-Build Fee at a rate of 2% on work performed by Subcontractors. Such markup shall cover the same cost elements that were included in the Design-Build Fee;
3. Direct Cost of the Work shall mean labor, material and other costs reasonably and necessarily incurred in the proper performance of the Work as approved by the Department and shall include, but not be limited to: (Direct Cost of the Work does not, however, include home office overhead, field supervision, general conditions or profit of either the Subcontractor or the Design-Builder. No personnel above the level of a working foreman shall be considered a Direct Cost of the Work).
 - (a) **Labor.** Payment will be made for direct labor cost plus indirect labor cost such as insurance, taxes, fringe benefits and welfare provided such costs are considered reasonable. Indirect costs shall be itemized and verified by receipted invoices. If verification is not possible, up to five percent (5%) of direct labor costs may be allowed.
 - (b) **Rented Equipment.** Payment for required equipment rented from an outside company that is neither an affiliate of, nor a subsidiary of, the Design-Builder will be based on receipted invoices which shall not exceed rates given in the current edition of the Rental Rate Blue Book for Construction Equipment. If actual rental rates exceed manual rates, written justification shall be furnished to the Contracting Officer for consideration. No additional allowance will be made for overhead and profit. The Design-Builder shall submit written certification to the Contracting Officer that any required rented equipment is neither owned by nor rented from the Design-Builder or an affiliate of or subsidiary of the Design-Builder.

- (c) **Contractor's Equipment.** Payment for required equipment owned by the Design-Builder or an affiliate of the Design-Builder will be based solely on an hourly rate derived by dividing the current appropriate monthly rate by 176 hours. No payment will be made under any circumstances for repair costs, freight and transportation charges, fuel, lubricants, insurance, any other costs and expenses, or overhead and profit. Payment for such equipment made idle by delays attributable to the Government will be based on one-half the derived hourly rate under this subsection.
- (d) **Materials.** Incorporated and unincorporated materials as permitted under Section 9.1.

Article 19 – CLAIMS & DISPUTE RESOLUTION

All claims or disputes arising out of this Agreement shall be governed by the terms of the Standard Contract Provisions (for Architectural and Engineering Services and Construction Contracts).

Article 20 - EXHIBITS

Exhibit A	Program Requirements and Educational Specifications
Exhibit B	Project schedule
Exhibit C	Deliverable List
Exhibit D	SBE Subcontracting Plan
Exhibit E	Service Contract Act
Exhibit F	Key Personnel
Exhibit G	Davis Bacon Act Wage Determination
Exhibit H	Design-Builder's Designated Representatives
Exhibit I	Department's Designated Representatives and Contracting Officers
Exhibit J	Standard Contract Provisions (Construction and Architecture/Engineering)
Exhibit K	Form of Lien Waiver
Exhibit L	Form of GMP Amendment
Exhibit M	GMP Basis Project Documents Submission Date
Exhibit N	FF&E and Close-Out
Exhibit O	Subcontractor Performance Evaluation Form
Exhibit P	Equal Employment Opportunity Policy
Exhibit Q	Living Wage Act
Exhibit R	Award Fee Pool
Exhibit S	DGS Division One Specifications
Exhibit T	DGS Close Out Manual
Exhibit U	BIM Requirements
Exhibit V	First Source Employment Agreement - Construction.

IN WITNESS WHEREOF, the Parties have executed this Agreement (No. DCAM-21-CS-RFP-0017) through their duly authorized representatives and effective as of the last date written below.

DEPARTMENT OF GENERAL SERVICES, (INSERT DESIGN BUILDER)
an agency within the executive branch
of the Government of the District of Columbia

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

Exhibit A - Program Requirements and Educational Specifications

Exhibit B - Project Schedule

Exhibit C - Deliverable List

Design and Preconstruction Phase Deliverables

Deliverables shall include but not limited to:

- a) Project Schedule.
- b) List of Long Lead Items that could adversely impact the Project's schedule and recommendations for purchase.
- c) Concept Cost Estimate and Concept Designs.
- d) Schematic Cost Estimate and Schematic Design.
- e) Design Development Cost Estimate and Design Development.
- f) Permit Set of Construction Documents Cost Estimate and Permit Set of Construction Documents.
- g) Permit Set of Construction Documents, including DCRA plan review responses.
- h) Issued for Construction Documents.
- i) Life Safety Floor Plans
- j) List of subcontractors from which the Design-Builder intends to solicit bids and bidding procedure.
- k) Trade bid tabulations, including all subcontractor Proposals.
- l) Report outlining Value Engineering strategies.
- m) GMP Proposal.
- n) Construction Phase Baseline Schedule.
- o) Statement of constructability within ten (10) days of the conclusion of the Design and Preconstruction Phase, executed by both the Design-Builder and the Project Architect/Engineer.
- p) Insurance Certificates
- q) Payment and Performance Bonds
- r) Reports outlining recommended Net Zero Energy strategies per each design milestone

Construction Deliverables

Deliverables shall include but not limited to:

- a) Contingency Balance Update.
- b) Hazardous Material Abatement Subcontractor Insurance Certificates.
- c) Hazardous Material Abatement Records.
- d) Construction Document Packages.
- e) Progress Meeting Minutes.
- f) Project Schedule Updates.
- g) Project Progress Reports.
- h) Cost Variance Report.

- i) OSHA Safety Plan.
- j) Close out documents (Product Manuals, Warranties, etc.).
- k) Quality Control Plan.
- l) Quality Control Inspection Reports.
- m) Corrective Action Plan.
- n) Prolog submissions.
- o) Invoices and Acceptable Application for Payment with Release of Liens and Claims.
- p) Insurance Certificates.
- q) Performance and Payment Bonds and Agreement of Indemnity
- r) Certificate of Substantial Completion executed by the Project Architect/Engineer and submitted Department for review, concurrence and approval
- s) Documents that may be required by Contracting Officer from time to time.

Close-Out Deliverables

Deliverables shall include but not limited to:

- a) A complete set of the Design-Builder's Project files.
- b) A complete set of product manuals (O&M), Close-Out Deliverables training videos, warranties, etc.
- c) As built record drawings.
- d) Attic stock and schedule.
- e) Equipment schedule.
- f) Proposed schedule of maintenance.
- g) Environmental, health & safety documents.
- h) All applicable inspection certificates/permits (boiler, elevator, emergency evacuation plans, health inspection, etc.).
- k) LEED – Preliminary Construction Review.

Exhibit D - SBE Subcontracting Plan

Exhibit E
Service Contract Act

Exhibit F - Key Personnel

Exhibit G - Davis Bacon Act Wage Determination

Exhibit H - Design-Builder's Designated Representatives

Exhibit I - Department's Designated Representatives and Contracting Officers

George G. Lewis

Associate Director & Chief Procurement Officer, Contracts and Procurement Division

Department of General Services

Contracts and Procurement Division

2000 14th Street NW, 8th Floor

Washington, DC 20009

Eric Njonjo

Contracting Officer, Contracting and Procurement Division

Department of General Services

1250 U Street NW, 2nd Floor

Washington, DC 20009

**Exhibit J – Standard Contract Provisions (Construction and
Architecture/Engineering)**

Exhibit K - Form of Lien Waiver

Exhibit L - Form of GMP Amendment

GUARANTEED MAXIMUM PRICE AMENDMENT

DESIGN-BUILD AGREEMENT

AITON ELEMENTARY SCHOOL

THIS GUARANTEED MAXIMUM PRICE AMENDMENT (“Amendment”) is entered into by and between the **DISTRICT OF COLUMBIA GOVERNMENT**, acting by and through its **DEPARTMENT OF GENERAL SERVICES** (the “Department”) and **[DESIGN-BUILDER]**, (the “Design-Builder”) pursuant to the Agreement, dated _____, between the District of Columbia government, by and through the Department and the Design-Builder, for design-build work at the **AITON ELEMENTARY SCHOOL** and to establish a Guaranteed Maximum Price and Contract Time for the Work as set forth below.

ARTICLE I

GUARANTEED MAXIMUM PRICE

Section 1.1 Guaranteed Maximum Price. Subject to additions and deductions which may be made only in accordance with the Agreement, the Design-Builder represents, warrants and guarantees to the Department that the total maximum cost to be paid by the Department for Design-Builder’s complete performance under the Agreement, including, but not limited to, Final Completion of all Work, all services of Design-Builder under the Agreement, and all fees, compensation and reimbursements to Design-Builder, shall not exceed the total amount of **[INSERT AMOUNT]** Dollars (\$**[INSERT AMOUNT]**) (“*Guaranteed Maximum Price*”). Costs which would cause the Guaranteed Maximum Price (as may be adjusted pursuant to the Contract Documents) to be exceeded shall be paid by the Design-Builder without reimbursement by the Department.

Section 1.2 Guaranteed Maximum Price Components. The Guaranteed Maximum Price is comprised of the maximum amount payable by the Department for:

- 1.2.1** the Cost of the Work for full and complete performance of the Work in strict accordance with the Contract Documents;
- 1.2.2** a Pre-Construction Fee for the Design-Builder, as defined in the Agreement, in the amount of **[INSERT AMOUNT]**;
- 1.2.3** a Design-Build Fee for the Design-Builder, as defined in the Agreement, in the amount of **[INSERT AMOUNT]**;
- 1.2.4** a Maximum Cost of General Conditions, , as defined in the Agreement, in the amount of **[INSERT AMOUNT]**;
- 1.2.5** The Guaranteed Maximum Price is further broken down into line items and categories on Exhibits ____ attached hereto.

Section 1.3 Basis for the GMP. The GMP is for the performance of the Work in accordance with the Contract Documents listed and attached to this Amendment and marked

Exhibits ____ through ____, as follows:

1.3.1 Exhibit ____: List of Drawings, Specifications, addenda and General, Supplementary and other Conditions of the Agreement on which the Guaranteed Maximum Price is based

1.3.2 Exhibit ____: A list of Unit Prices and Allowance items as well as a statement of their basis.

1.3.3 Exhibit ____: Assumptions and Clarifications made in preparing the Guaranteed Maximum Price, noting in particular any exclusions. The Assumptions and Clarifications shall take precedence over the Drawings and Specifications, but shall be subordinate to the Agreement and the terms of this Amendment.

1.3.4 Exhibit ____: The proposed Guaranteed Maximum Price, including a statement of the detailed cost estimate organized by trade categories, allowances, Contingency, and other items and the fee that comprise the Guaranteed Maximum Price.

1.3.5 Exhibit ____: A Construction Phase Schedule which shall include, but not be limited to, the Substantial and Final Completion Dates, upon which the proposed Guaranteed Maximum Price is based, and a schedule of the Construction Project Documents issuance dates upon which the Substantial and Final Completion Dates are based (the "Project Schedule").

1.3.6 Exhibit ____: An LSDBE Utilization Plan setting forth the names and estimated dollar volume of the work that will be performed by small, local and disadvantaged business enterprises, as certified by the Department of Small and Local Business Development, upon which the GMP is based.

Section 1.4 Incomplete Drawings and Specifications. Design-Builder and the Department acknowledge that the Drawings and Specifications are not complete and, as of the date hereof, that such Drawings and Specifications have reached the level of approximately 100% complete design development Project Documents. The Design-Builder, however, has been actively involved in the design process and hereby represents that it has a sufficient understanding of the Project to agree to a Guaranteed Maximum Price to Fully Complete the Project. The Design-Builder hereby acknowledges that the GMP Basis Project Documents provides sufficient detail and information to provide a firm Guaranteed Maximum Price and that the Guaranteed Maximum Price proposed therein is intended to represent the Design-Builder's offer to Fully Complete the Project. The Design-Builder and the Department agree to work together to complete the Drawings and Specifications as provided in this Agreement, consistent with the Guaranteed Maximum Price premises and assumptions and Project Schedule.

Section 1.5 Design Intent; Inferable Work. Design-Builder agrees that the Guaranteed Maximum Price is based on the current state of the design, which represents approximately 100% complete design development Project Documents. The GMP Basis Project Documents will include various clarifications and assumptions that are intended to

further define the scope of Work that will be required to complete design. The Design-Builder has included within the Guaranteed Maximum Price sufficient amounts to cover aspects of the Work that are not shown on the GMP Basis Project Documents. If the Department does not approve any such scope increase, the Design-Builder shall cause the Architect to develop a design that is consistent with the original design intent and shall complete the Work for an amount that does not exceed the GMP.

Section 1.6 Cost Overruns. Subject to additions or deductions which may be made in accordance with the Agreement, the Design-Builder shall be solely liable and responsible for and shall pay any and all costs, fees and other expenditures in excess of the Guaranteed Maximum Price for and/or relating to the Work, without entitlement to reimbursement from the Department. Design-Builder shall not be entitled to any fee, payment, compensation or reimbursement under this Agreement or relating to the Work or Project other than as expressly provided in the Agreement.

Section 1.7 Allowances. The Guaranteed Maximum Price includes specific "Unit Price Allowance Amounts" for certain items as shown on the Schedule of Values and budgeted in the Guaranteed Maximum Price ("*Allowance Items*"). The only Allowance Items shall be those specifically identified as such in the Schedule of Values and in the Guaranteed Maximum Price. The Allowance Amounts represent all Costs of the Work of the Allowance Items, including, without limitation, costs of materials, labor, handling, transportation, loading and unloading and installation, as determined by Design-Builder.

ARTICLE 2

INTENT, INTERPRETATION AND CORRELATION

Section 2.1 Intent of the Agreement. The intent of the Agreement is for the Design-Builder to perform and supply, and the Department hereby engages Design-Builder to and Design-Builder hereby agrees to perform and supply, the Work, including all necessary design services, scheduling, procurement, supervision, construction, and construction management services and supply all necessary labor, materials, equipment and related work and services necessary to fully complete the Work and obtain the intended results of the Contract Documents, including, but not limited to the requirements of the Project Schedule and the Guaranteed Maximum Price requirements set forth in Article 1 above. The enumeration of particular items in the Specifications and/or Drawings shall not be construed to exclude other items. The Contract Documents are complementary, and what is required by any one of the Contract Documents (including either a Drawing or Specification) as being necessary to produce the intended results shall be binding and required as a part of the Work as if required by all Contract Documents.

Section 2.2 Design-Builder's Compliance with Contract Documents. Design-Builder agrees, accepts and assumes that the Department's decision will require implementation of the most stringent requirements among any conflicting provisions of the Contract Documents as being part of the Work. The Design-Builder agrees to be bound by all decisions by the Department to implement the most stringent of any conflicting requirements within the

Contract Documents. Any failure by Design-Builder to seek such clarifications shall in no way limit the Department's ability to require implementation, including replacement of installed Work at a later date at Design-Builder's sole expense, to achieve compliance with the more stringent requirements. Without limiting the generality of the foregoing, the Design-Builder hereby agrees as follows:

2.2.1 The failure of the Department to insist in any one or more instances upon a strict compliance with any provision of this Agreement, or to exercise any option herein conferred, shall not be construed as a waiver or relinquishment of the Department's right thereafter to require compliance with such provision of this Agreement, or as being a waiver of the Department's right thereafter to exercise such option, and such provision or option will remain in full force and effect.

2.2.2 If there is any inconsistency in the Drawings or any conflict between the Drawings and Specifications, Design-Builder shall provide the better quality or greater quantity of Work or materials, as applicable, unless the Department directs otherwise in writing.

2.2.3 Design-Builder shall be responsible for dividing the Work among the appropriate Subcontractors and Vendors. No claim will be entertained by the Department based upon the organization or arrangement of the Specifications and/or the Drawings into areas, sections, subsections or trade disciplines.

2.2.4 Detail drawings shall take precedence over scale drawings, and figured dimensions on the Drawings shall govern the setting out of the Work.

2.2.5 Unless the Specifications expressly state otherwise, references to documents and standards of professional organizations shall mean the latest editions published prior to the Effective Date.

2.2.6 Technical words, abbreviations and acronyms in the Contract Documents shall be used and interpreted in accordance with customary usage in the construction industry.

2.2.7 Whenever consent, permission or approval is required from any party pursuant to the provisions of the Contract Documents, such consent, permission or approval shall, unless expressly provided otherwise in this Agreement, be given or obtained, as applicable, in writing.

ARTICLE 3

[INTENTIONALLY OMITTED]

ARTICLE 4

OTHER PROVISIONS

Section 4.1 Design-Builder's Responsibilities. The Design-Builder also expressly acknowledges that this Project and the Work will proceed on a "fast-track" method of construction, i.e., construction will commence without final Drawings and Specifications in place. More specifically, while Drawings and Specifications are complete for certain portions of Work, the design process will continue for other portions during construction based on the Guaranteed Maximum Price premises and assumptions. The Design-Builder has been, and will continue to be, an active participant in the design process. Given such participation, the Design-Builder represents that it is familiar with the scope and quality of those aspects of the Project that have not yet been fully designed, and has taken such scope and quality matters into consideration in preparing each component of the Guaranteed Maximum Price. The Design-Builder agrees to work with the Department in managing the construction and design work to complete the design process. The Design-Builder shall manage the Project, including coordinating redesign or value engineering necessary or advisable for certain aspects of the Project at any stage of the design process in order to bring the cost of such Work within or below, but not in excess of, the respective allowances or the budgeted or allocated amounts for other items contained in the Guaranteed Maximum Price. Once the Drawings and Specifications are complete, it is recognized by the Design-Builder and the Department that the scope of the Guaranteed Maximum Price may include Work not expressly indicated on the Contract Documents, but which is reasonably inferable from the Contract Documents, and such Work shall be performed without any increase in the Guaranteed Maximum Price or extension of Contract Time, except if and to the extent otherwise expressly provided in this Agreement.

ARTICLE 5

MISCELLANEOUS PROVISIONS

Section 5.1 Prior Agreement Unaffected. Except as expressly agreed to herein, all of the terms, conditions, representations and warranties set forth in the Agreement shall remain unaffected and in full force and affect.

Section 5.2 Integrated Agreement. This Amendment and any attachment hereto set forth the entire agreement and understanding of the parties regarding the transactions contemplated hereby and supersede all prior oral and written agreements, arrangements and understandings relating to the subject matter hereof. There are no oral or written agreements or understandings, representations or warranties among the parties other than those set forth herein.

Section 5.3 Counterparts. This Amendment may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which shall be considered one and the same instrument.

Section 5.4 Construction. This Agreement shall be construed fairly as to all parties and not in favor of or against any party, regardless of which party prepared the Agreement.

IN WITNESS WHEREOF, each of the parties to this Amendment to Agreement (DCAM-21-CS-RFP-0017) has caused it to be executed by its duly authorized representative on the dates set forth below.

**DISTRICT OF COLUMBIA GOVERNMENT, by and through its
DEPARTMENT OF GENERAL SERVICES**

By: _____

Name: _____

Title: _____

Date: _____

[DESIGN-BUILDER]

By: _____

Name: _____

Its: _____

Date: _____

Exhibit M - GMP Basis Project Documents Submission Date

Exhibit N - FF&E and Close-Out

FF&E

The Design-Builder shall be responsible for FF&E as set forth in this Exhibit: [TBD at GMP Amendment]

Exhibit O - Subcontractor Performance Evaluation Form
To be determined at GMP Amendment

Exhibit P - Equal Employment Opportunity Policy

Exhibit Q – Living Wage Act

Exhibit R – Award Fee Pool

Exhibit S - DGS Division One Specifications

Exhibit T - DGS Closeout Manual

Exhibit U - BIM Requirements

Exhibit V - First Source Employment Agreement - Construction

Exhibit 3

(Form of Notice to Proceed and Letter Contract)

**GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF GENERAL SERVICES**



[DATE]

[Contractor's address]

Reference: Request For Proposals No. DCAM-21-CS-RFP-0017 (“RFP”) – Design-Build Services for Aiton Elementary School.

Subject: Notice to Proceed and Letter Contract

Dear Mr. _____,

We refer to the proposal submitted by _____ (the “Contractor” or “Design-Builder”) in response to the above referenced RFP. We are pleased to inform you that this work has been awarded to _____, and if this Letter Contract (“Letter Contract”) is signed by the Contractor without modification of any kind, it will serve as a notice to proceed for the work described below. This notice to proceed is subject to the following terms:

1. Letter Contract. This is a Letter Contract between the Contractor and the District of Columbia Government, acting by and through its Department of General Services (“DGS” or the “Department”), and shall govern our relationship until such time as a final contract is entered into for the work described in the above referenced RFP (the “Definitized Contract”); provided, however, that to the extent an issue is not covered in this Letter Contract, the RFP shall govern. Once the Definitized Contract is executed by an authorized Contracting Officer, this Letter Contract shall automatically terminate and merge into the Definitized Contract.
2. Scope of Work. The Contractor shall provide Design-Build Services for Aiton Elementary School project, located at 533 48th Place NE, Washington, DC 20019, as described in the Contractor’s Proposal dated _____ submitted in response to the subject RFP.
3. Deliverables. In connection with the services provided pursuant to this Letter Contract, the Contractor shall provide, at a minimum, the deliverables in accordance with the requirements in the RFP and Form of Contract to the Department’s Program Manager and in the referenced instances to the Contracting Officer. [ADD deliverables]

In the event that the Contractor fails to timely submit any such deliverable, the Contractor shall pay to the Department as liquidated damages Five Thousand Dollars (\$5,000) plus Five Hundred Dollars \$500.00 per day after receiving written notice from the Contracting Officer of failure to submit each deliverable. This remedy is cumulative and does not limit any other right or remedy of the Department under the contract or applicable District law.

4. Not to Exceed Amount. The limit of this authorization is up to \$_____ (“Not to Exceed” Amount or “NTE”) including portions of the pre-construction fee, design fee, and general conditions cost in addition to other costs as further described in the Schedule of the Values (**Exhibit A**). In no event shall the Contractor be entitled to receive more than the NTE under this Letter Contract unless authorized in advance and in writing by a duly authorized Contracting Officer. This not-to-exceed amount includes all costs incurred by the Contractor in connection with the work authorized hereby.

5. Insurance. At all times while working under this Letter Contract, the Contractor shall maintain insurance as described in the RFP. All such policies shall be endorsed to add the District of Columbia, including, but not limited to, its Department of General Services, and the respective agents, employees and offices of each as additional insureds.

6. Duration. Once signed by the Contractor, the Letter Contract will become effective on the date the Letter Contract is executed by the Department. This Letter Contract will terminate on the earlier to occur of the following: (i) the date the Definitized Contract becomes effective; or (ii) [Insert Date]. DGS reserves the right to terminate this Letter Contract, in whole or specified part, for convenience in the manner described in **Article 5** and **Article 6** of the District of Columbia Department of General Services Standard Contract Provisions General Provisions for Construction Contract.

7. Billing. All invoices shall be submitted directly to the Department at the address specified in the RFP. Purchase Order numbers should be included in all future invoices and accounting records. Properly prepared invoices with the necessary backup shall be paid within thirty (30) days of receipt. Invoices not paid by that date shall bear interest in accordance with the Quick Payment Act.

8. Key Personnel. To carry out its duties, the Design-Builder shall provide at least the key personnel identified in **Exhibit F** (“Key Personnel”), who shall carry out the functions identified in **Exhibit F**. Among others, the Key Personnel shall include:

A - Key Personnel of the Prime Contractor:

- (i) Project Manager; (ii) Superintendent; and (iii) Project executive.

B - Key Personnel of the Architect/Engineer

- (i) Project Manager; (ii) Project Architect; (iii) Principal in Charge; (iv) Lead Mechanical Engineer; (v) Lead Structural Engineer, and (vi) Lead Envelope Consultant.

It is contemplated that these Key Personnel will work from the design stage, purchasing and throughout the bulk of the field work. The Design-Builder’s obligation to provide adequate staffing is not limited to providing the Key Personnel, but is determined by the needs of the Project. If any of the Key Personnel become unavailable to perform services in connection with the Letter Contract due to death, disability or separation from the employment of the Design-Builder or any affiliate of the Design-Builder, then the Design-Builder shall promptly notify the Department’s Contracting Officer and propose a replacement acceptable to the Department. The Department shall be entitled to complete information before approving such replacement. Certain members of the Design-Builder’s Key Personnel shall be subject to a replacement fee for their removal or reassignment by the Design-Builder.

If the Design-Builder replaces one of the Key Personnel listed in **Exhibit F** as being subject to a replacement fee, without the prior written consent of the Department, then the Design-Builder shall pay to the Department (\$25,000) for each replacement as replacement fee and not a penalty, to reimburse the Department for its administrative costs arising from the Design-Builder's failure to provide the Key Personnel. The foregoing replacement fee amount shall not bar recovery of any other damages, costs or expenses other than the Department's internal administrative costs.

9. ProjectTeam. The Design-Builder shall utilize the Department's current project management software ("ProjectTeam") system to submit any and all Project Documentation required to be provided by the Design-Builder for the Project, including, but not limited to: (i) requests for information; (ii) submittals; (iii) meeting minutes; (iv) invoices/applications for payment (full package including all forms required by DGS); (v) certified payrolls (in addition to upload via LCP Tracker); (vi) drawings and specifications; (vii) punchlist; and (viii) other Project Documents as may be designated by the Department. The Design-Builder also shall require all subcontractors and subconsultants to utilize ProjectTeam for the Project execution.

Electronic storage and transmission of information via ProjectTeam system shall be compliant with the provisions of the Document Security section of these General Requirements.

10. Purchase Order Number. This Letter Contract will become effective on the date the Letter Contract is executed by the Department. The Department's Contracting & Procurement Division will issue a purchase order number and will be sent in a separate cover. That number should be included in all future invoices and accounting records. In the event that you do not obtain a purchase order number please contact Sailab Sulemanzai via sailab.sulemanzai@dc.gov directly to obtain this number.

11. Ownership and Use of Documents. All documents and work product prepared by the Contractor shall become the property of the Department upon the payment of invoices submitted under the Letter Contract.

12. Trade Work/Site Control. Unless otherwise directed by the Department, the Contractor shall not perform any trade work or take control of the site. Any authorization to proceed with trade work will include appropriate provisions relating to compliance documents (first source employment agreement, Department of Small and Local Business Development (DSLBD)), bonds, insurance, and safety procedures. At a minimum, however, the Department's Standard Contract Provisions for Construction shall apply. In addition to the requirements set forth in any such subsequent authorization, prior to executing this Letter Contract, the Contractor shall provide the Department's Contracting Officer with certificates evidencing insurance, a payment and performance bond having a penal value equal to the then value of the Letter Contract and the Contractor's agreement of indemnity. In the event the Contractor fails to provide the Department with such certificates of insurance, the agreement for indemnity or bond, the Department may withhold any subsequent payment until such documents are provided.

13. Entire Agreement; Modification. This Letter Contract, along with the Standard Contract Provisions, (**Exhibit A** – Architectural & Engineering Services and **Exhibit B** – Construction Services) supersede all contemporaneous or prior negotiations, representations, course of dealing, or agreements, either written or oral. No modifications to this Letter Contract shall be effective against the Department and unless made in writing signed by the Department. Notwithstanding the provisions of this Section 14, nothing herein shall limit the Department's ability to unilaterally modify this Letter Contract.

14. Davis Bacon Act Wage Determination. The Contractor agrees that the work performed under this Letter Contract shall be subject to the Davis Bacon Wage Determination as set forth in **Exhibit D** in effect at the time of Letter Contract execution by the Department.

15. Service Contract Act. The Contractor agrees that the work performed under this Letter Contract shall be subject to the Service Contract Act as set forth in **Exhibit E** in effect at the time of Letter Contract execution by the Department.

16. Living Wage Act. The Contractor agrees that the work performed under this Letter Contract shall be subject to the Living Wage Act in effect at the time of Letter Contract execution by the Department. As such, the Contractor and its subcontractors shall comply with the wage reporting requirements imposed by the act as set forth in **Exhibit G**.

ISSUED BY:

ACCEPTED BY:

By: _____

By: _____

Name: Eric Njonjo

Name: _____

Title: Contracting Officer

Title: _____

Date: _____

Date: _____

Exhibits