ADDENDUM

February 4, 2019

ADDENDUM # 2
Bid 19C4, Urbana Elementary School Replacement – Construction Stage II

DUE DATE & TIME:
Bids for Construction Stage II - Phase A: 2A Site Work and Geo Thermal; 3A Concrete; 4A Masonry; 5A Steel; 6A General Carpentry; 7A Roofing; 8A Windows and Storefronts; 9A Drywall and Acoustical; 15A Mechanical and 16A Electrical will be received and time stamped in the main lobby of Frederick County Public Schools (FCPS) at 191 South East Street, Frederick, MD 21701, prior to and time stamped no later than 10:00 a.m. local time, February 20, 2019.

Bids for Construction Stage II - Phase B: 9B Tile; 9C Fluid Applied & Terrazzo Flooring (Terrazzo as an Alternate); 9D Resilient Flooring and Rubber Athletic Surfacing; 9E Painting; 11A Food Service; 11B Athletic Equipment; will be received and time stamped in the main lobby of Frederick County Public Schools (FCPS) at 191 South East Street, Frederick, MD 21701, prior to and time stamped no later than 1:30 p.m. local time, February 20, 2019.

Bids received after these times will be returned unopened. All bids will be opened and read aloud in the Central Office Board Room.

This addendum is being issued to provide additions, corrections, clarifications and answers to certain questions raised referencing the original bid packages and any resultant contracts for the above bid.

1. This Addendum includes the following attachment(s):
   a. Oak Contracting, LLC - Addendum No. 2 (99 pages)
   b. Grimm and Parker – Addendum No. 2 (140 pages)

Thank you for your interest in bidding with Frederick County Public Schools and we apologize for any inconvenience this may have caused.

Sincerely,

Kim Miskell

Kim Miskell, CSBO,
Assistant Purchasing Manager

km/ab

pc: Bradley Ahalt, Senior Project Manager, Construction Management
    Dave Toth PM, Oak Contracting
    Don Porter, Grimm & Parker
ADDENDUM NO. 2

February 4, 2019

TO: ALL PLANHOLDERS AND PROSPECTIVE BIDDERS

RE: URBANA ELEMENTARY SCHOOL REPLACEMENT

This addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated January 10, 2019. Acknowledge receipt of this Addendum in the space provided on the Form of Proposal.

General:

See attached Oak Contracting Pre-Bid RFI’s numbered ST 2 PB-004, 009 through 012, 014, 017 through 023, 025 through 028, and 030. for response to questions related to the Bid Documents (96 pages).

Changes to the Specifications:

Section 00 24 13 Specification Cross-Reference

Add Reference Section 06 12 19 Structural Insulated Panels to Contract Package 7A – Roofing.

Add Reference Section 316317 Short Aggregate Pier Foundation Systems to Contract Package 3A – Concrete

Section 00 24 16 Contract Packages

Contract Package 2A Sitework & Geothermal:

Item 2.21: Delete reference to 5,000-Cu. Yds. and replace with 7,000-Cu. Yds.

Delete the last sentence of Item 2.48 and replace with:

“3A Contractor is responsible for footings, walls, ramps, stairs, and slab at the loading dock and footings, walls, ramps, stairs and slab outside of door XC08. 3A Contractor is also responsible for footing and all associated concrete for the screen wall.”

Add Item 2.84:

2.84 3A Contractor shall be responsible for the engineering, design, and installation of the Aggregate Pier Foundation Systems complete, per the Contract Documents. The 3A Contractor will be responsible to remove and stockpile all spoils generated from this operation to a stockpile as designated by the Construction Manager. 2A Contractor will be responsible for disposal/ removal of these spoils. Testing of the Aggregate Piers will be as described in Specification Section 316317. Due to the sequence of installation, contractor to include two separate mobilizations to perform this scope of work. In the event a second mobilization is not needed, Contractor will give credit back on mobilization costs equal to scheduled value. 3A Contractor is responsible for all coordination between the piers, foundations, and underground MEP rough ins.
**Contract Package 3A Concrete:**
Delete Item 2.44 in its entirety and replace with:

2.44 3A Contractor is responsible for footings, walls, ramps, stairs, and slab at the loading dock and footings, walls, ramps, stairs and slab outside of door XC08. 3A Contractor is also responsible for footing and all associated concrete for the screen wall.

Add Item 2.47:

2.47 3A Contractor shall be responsible for the engineering, design, and installation of the Aggregate Pier Foundation Systems complete, per the Contract Documents. The 3A Contractor will be responsible to remove and stockpile all spoils generated from this operation to a stockpile as designated by the Construction Manager. 2A Contractor will be responsible for disposal/ removal of these spoils. Testing of the Aggregate Piers will be as described in Specification Section 316317. Due to the sequence of installation, contractor to include two separate mobilizations to perform this scope of work. In the event a second mobilization is not needed, Contractor will give credit back on mobilization costs equal to scheduled value. 3A Contractor is responsible for all coordination between the piers, foundations, and underground MEP rough ins.

**Contract Package 5A Steel:**
Add Item 2.41:

2.41 5A Contractor is required to provide one (1) complete record copy of the final steel erection drawings to the Construction Manager. Record copy is to include any and all changes made by the Design Team, Owner, or Contractor during the review process. This requirement supersedes any other reference in the Contract Documents.

**Contract Package 6A General Carpentry:**
Add the following to Item 2.01:

O. All Educational Casework as required by the Contract Documents and Specification Section 12 35 50

Delete Item 2.71 in its entirety and replace with:

2.71 The 6A Contractor shall furnish and install the Card Access System complete per specification sections 08 71 00 (Door Hardware) and 28 10 00 (Access and Intrusions Systems) and the Contract Drawings. The 6A Contractor shall coordinate with the 8A and 16A Contractors for raceways, cabling, and rough-in requirements. 16A Contractor is responsible for the rough-in of the required raceways and boxes as shown and as coordinated by the 6A Contractor. The 6A Contractor shall also coordinate with Frederick County Public Schools for programming and testing of the system. The 6A Contractor is responsible for the complete installation of the Card Access System regardless of any other reference in the Contract Documents. 16A Contractor is responsible to furnish and install the Intrusion Detection System per specification section 28 10 00. 6A Contractor is to coordinate the installation of the Card Access System with the 16A Contractor as required for a complete system.

Delete Item 2.73 in its entirety and replace with the following:

2.73 7A Contractor shall furnish and install Structural Insulated Panels at the Pump Station and Outdoor Storage building. 7A Contractor shall furnish and install Asphalt Shingle Roofing at the pump station and outdoor storage building. This includes installation of all plywood underlayment, felt, drip edge, copings, soffits, brake metal, fascia, gutters, down spouts, and all accessories as required by the Contract Documents. 6A Contractor shall furnish all anchor bolts and coordinate installation with the 4A Contractor as required. Anchor bolts not installed in CMU are to be furnished and installed by the 6A Contractor. 6A Contractor to furnish and install all wood blocking which is to include fascia board for brake metal. 9A Contractor shall furnish and install all metal stud trusses.
**Contract Package 7A Roofing:**
Delete Item 2.20 in its entirety and replace with the following:

2.20 7A Contractor shall furnish and install Structural Insulated Panels at the Pump Station and Outdoor Storage building. 7A Contractor shall furnish and install Asphalt Shingle Roofing at the pump station and outdoor storage building. This includes installation of all plywood underlayment, felt, drip edge, copings, soffits, brake metal, fascia, gutters, down spouts, and all accessories as required by the Contract Documents. 6A Contractor shall furnish all anchor bolts and coordinate installation with the 4A Contractor as required. Anchor bolts not installed in CMU are to be furnished and installed by the 6A Contractor. 6A Contractor to furnish and install all wood blocking which is to include fascia board for brake metal. 9A Contractor shall furnish and install all metal stud trusses.

**Contract Package 9A Drywall & Acoustics:**
Delete Item 2.39 in its entirety and replace with the following:

2.39 7A Contractor shall furnish and install Structural Insulated Panels at the Pump Station and Outdoor Storage building. 7A Contractor shall furnish and install Asphalt Shingle Roofing at the pump station and outdoor storage building. This includes installation of all plywood underlayment, felt, drip edge, copings, soffits, brake metal, fascia, gutters, down spouts, and all accessories as required by the Contract Documents. 6A Contractor shall furnish all anchor bolts and coordinate installation with the 4A Contractor as required. Anchor bolts not installed in CMU are to be furnished and installed by the 6A Contractor. 6A Contractor to furnish and install all wood blocking which is to include fascia board for brake metal. 9A Contractor shall furnish and install all metal stud trusses.
## Request For Information ST2 PB-004

### Urbana Elementary School Replacement Project # 1707
3554 Urbana Pike
Frederick, Maryland 21704

**RFI #: ST2 PB-004**

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<th>Author Company</th>
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<tbody>
<tr>
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<td>Don Porter</td>
<td>Oak Contracting, LLC</td>
<td>Kerrigan Toth</td>
</tr>
<tr>
<td>11720 Beltsville Drive</td>
<td>Phone: 240-965-0713</td>
<td>1000 Cromwell Bridge Road</td>
<td>Phone: 410-828-1000</td>
</tr>
<tr>
<td>Suite 600</td>
<td>Fax: 301-595-0089</td>
<td>Towson, MD 21286</td>
<td>Fax: 410-828-7488</td>
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<tr>
<td>Calverton, MD 20705</td>
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**Co-Respondent**

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>Don Porter</td>
<td>4</td>
</tr>
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### Subject

Alternate discrepancy

### Discipline

Specification Clarification

### Category

### Cc: Company Name

<table>
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<tr>
<th>Contact Name</th>
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<th>Notes</th>
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### Question

Alternate 6A references an LVT 2.5mm as noted on A3.1. Spec section 096500 has no LVT product included. Please review and provide Specification for the referenced products.

### Suggestion

### Answer

**Specifications for LVT provided in Addendum 2. - Oak Contracting**
Request For Information  ST2 PB-009

Urbana Elementary School Replacement  Project # 1707
3554 Urbana Pike
Frederick, Maryland  21704

UR:       Fax:

RFI #:  ST2 PB-009 Date Created:  1/28/2019
Author Company Answered By
Oak Contracting, LLC Dave Toth Oak Contracting, LLC Kerrigan Toth
1000 Cromwell Bridge Road Phone:  410-828-1000 1000 Cromwell Bridge Road Phone:  410-828-1000
Towson, MD  21286 Fax:  410-828-7488 Towson, MD  21286 Fax:  410-828-7488

Co-Respondent Author RFI Number

Subject Discipline Category
Playground equipment Civil Drawing / Spec Discrepancy

Cc: Company Name Contact Name Copies Notes

Question Date Required:  2/4/2019
What are the specifications regarding the playground equipment, including age and surfacing/drainage details?

Suggestion

Answer Date Answered:  1/28/2019
Specifications for the Playground Equipment are included in Section 32 30 10. The Specification is mislabelled as "Base-Mounted Pumping Station" in the footer. This will be corrected in a future Addendum.

Specification has been revised by Addendum 2.
**Question**

Door B101A on the door schedule is listed as an aluminum door and aluminum frame. The frame type mark is #9 which is hollow metal framing. Please advise what the framing and door material should be? Aluminum storefront or hollow metal?

**Suggestion**

Opening has been revised in Addendum 2.
## Request For Information  ST2 PB-011

### Urbana Elementary School Replacement
3554 Urbana Pike
Frederick, Maryland  21704

### Project #  1707

#### Tel:       Fax:

**RFI #:  ST2 PB-011 Date Created:  1/29/2019**

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**Co-Respondent**

### Subject
Intercom Headend Equipment and Cabinet substitution request

### Discipline
Contractor Suggestion / Upgrade

### Category

### Cc:  Company Name  Contact Name  Copies  Notes

### Question
See attached substitution request from High Performance Cabling, Inc. recommending their products be accepted for Intercom Headend Equipment and Cabinet. Please review and advise.

### Suggestion

### Answer

**Per FCPS: This substitution request will not be approved.**
Substitution Request Form

IDENTIFICATION:
Contractor/CM: Oak Contracting
Project Name: Urbana Elementary School Replacement
Date: 01/28/19

REFERENCE:
Specification Title: Integrated Telecommunications System
Specification No.: 275123 Page: 1 Article/Paragraph: 1.1.C

DESCRIPTION:
Proposed Substitution: Intercom Headend equipment and cabinet
Manufacturer: Bogen
History: ☑ 5-10 years old

Reason for requesting substitution: ☑ Cause

Explain: Recently installed this Headend equipment in Butterfly Elem School with no issues and have installed this system in previous new school projects for FCPS (Lincoln Elementary School)

Differences between proposed substitution and specified item: Equal in performance

(Use attachment for additional space, if required.)

Proposed substitution affects other parts of Work or applicable Code requirements as follows:

(Use attachment for additional space, if required.)

Post-Bid Savings to Owner for accepting substitution: (N/A Pre-Bid)

Change to Contract Time due to accepting substitution: No Change

LEED Contribution (if applicable to Project) - Explain effects to LEED Action Plan:

(Use attachment for additional space, if required.)
Will undersigned pay any costs caused by the substitution necessitating changes to the building design, construction, engineering and detailing, including additional Architect, inspection and testing fees? □ Yes ☑ No

Does the undersigned waive rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results? □ Yes □ No

Submitted by: High Performance Cabling, Inc.

Signed by: Tim Nelling
Firm: High Performance Cabling, Inc.
Address: 13126 Pennsylvania Ave.
Hagerstown, Md 21742
Telephone: 301-739-8989

SUPPORTING DATA ATTACHED:
☐ Point-by-Point Comparative Data Attached (Required)
☐ Completed Section 01 61 16.01, Accessory Material VOC Content Certification Form Attached (Required)
☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐

CERTIFICATION:
The Undersigned certifies:

- Proposed substitution has been investigated and determined that it meets or exceeds the quality level of the specified product.
- Same warranty will be furnished for proposed substitution as for specified product; provide attachment if different.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances; provide attachment if otherwise.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
- Neither the Owner and Architect will be liable for license fees or royalties.
A/E's REVIEW AND ACTION:

☐ Substitution approved - Make submittals in accordance with Specification Section 01 60 00.

☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01 60 00.

☐ Substitution rejected - Use specified materials.

☐ Substitution Request received too late - Use specified materials.

Signed by: _____________________________ Date: ____________

ADDITIONAL COMMENTS:

Contractor:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Architect:

Approvals are based upon the opinion, knowledge, information, and belief of Architect at time of decision and reliance upon data submitted. Approvals are therefore interim and subject to reconsideration as additional data, materials, workmanship and coordination with other Work are observed and reviewed. In proposing items, Contractor assumes risks, costs and responsibilities for items integration into Work and performance.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

END OF FORM
Date: 08.03.2017

Submittal Item: Integrated Telecommunication Systems Product Data

Submittal Number: 16A-095-275123

Specification Section: 27 51 23

Comments:

1. See comments from Wright Engineering.

End of Review Comments
FCPS – Butterfly Ridge Elementary School
275123-0 Integrated Telecom System – Product Data Sheets

□ REVIEWED ■ COMMENTS NOTED

□ REJECTED □ REVISE AND RESUBMIT

□ RESUBMIT AS SPECIFIED □ RESUBMIT FOR RECORD ONLY

□ FOR INFORMATION ONLY/NOT REVIEWED

This review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents and does not include review of quantities, dimensions, weights or gauges, fabrication processes, sequence of work, construction methods, coordination with the work of other trades, or construction safety precautions all of which are the responsibility of the Contractor. Corrections or comments made on or attached to the shop drawings (or the absence of corrections and comments) during this review in no way relieves the Contractor from complying with the requirements of the Contract Drawings.

Engineer’s Comments:

1. Contractor shall coordinate all conduit, and backbox rough-in and electrical connections, including wall sleeve locations and sizes.

2. Submit the product data to FCPS Technology Services for review and approval. Verify any Owner Review Comments (if any) are incorporated into this submittal review comments.

3. Coordinate with all trades the exact location of PA sound system cabinet. Verify access space for cabinet and maintenance clearances and electrical connection inside cabinet.

4. Coordinate with electrical contractor the 120 volt power connections and locations for powered loudspeakers

Processed by: __Jim Wright_______ Date: __July 21, 2017__
5. Prior to programming of building public address intercom system, coordinate with Owner for actual area / room descriptions of each room served by the intercom system. Program system with actual field installed room numbers and names, do not use room numbers and names on contract drawings.

6. Contractor shall arrange a planning meeting with FCPS Technology Services prepare all required documents prior to installation. For example, coordinate installation of FCPS furnished UPS and Battery Unit in PA rack.

7. Coordinate exact location of exterior FLUSH mounted Public Address loudspeakers. Coordinate all rough-in and speaker recessed backboxes to provide a completely flush installation per spec 275123-2.13.B.&C. The submitted surface mounted Reentrant Horn Loudspeaker (Bogen Model SPT15A/158A) shall only be used in mechanical rooms and other interior non-public / utility areas

8. Coordinate intercom, clocks and sound equipment (ie 2 ft by 2 ft ceiling loudspeakers, clocks, etc) layout with project coordination drawings to avoid conflict with lights, HVAC diffusers, sprinklers, etc. Coordinate locations for recessed products. For example, recessed back-boxes for exterior loudspeakers.

9. Submit 15% spare capacity system expansion per spec 275123-2.11. Submit revised bill of material showing spare capacity per spec. Submit calculations for systems per specifications.

10. Provide 3 year warranty for public address system per spec 275123-1.5.A.

11. Submit detail shop drawings showing the cable routing & other requirements per spec 275123-1.4.D & E. and spec 271300-1.2.B,C. & D.

(end of comments)
To: Dave Macklin  
Lend Lease Construction Inc.  
One Preserve Parkway Ste 700  
Rockville, MD 20852  
Ph: 301-393-9150  Fax: 301-393-9168

Subject: Submittal

Transmittal #: 48  
Date: 7/11/2017  
Job: 17-010 Butterfly Ridge Elementary

WE ARE SENDING YOU:  
☑ Attached  ☑ Under separate cover via None the following items:

☐ Shop drawings  ☑ Prints  ☑ Plans  ☑ Samples  
☐ Copy of letter  ☑ Change order  ☑ Specifications  ☑ Submittal

<table>
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<th>No.</th>
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<td>122413-1 Rev 0</td>
<td>Window Shade Systems- Product Data/Samples</td>
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</table>

THESE ARE TRANSMITTED as checked below:

☑ For approval  ☑ Approved as submitted  ☐ Resubmit ___ copies for approval
☑ For your use  ☑ Approved as noted  ☑ Submit ___ copies for distribution
☑ As requested  ☑ Returned for corrections  ☑ Return ___ corrected prints
☐ For review and comment  ☑ Other
☐ FOR BIDS DUE  ☑ PRINTS RETURNED AFTER LOAN TO US

Remarks:

Copy To: File (Callas Contractors, Inc.), Field (Callas Contractors Inc)

From: Sickeri, Jamie (Callas Contractors, Inc.)

Signature: [Signature]

If enclosures are not as noted, kindly notify us at once.
Job: 17-010  
Butterfly Ridge Elementary  
601 Contender Way  
Frederick, MD 21703  

Spec Section No: 122413  
Submittal No: 1  
Revision No: 0  
Sent Date: 7/11/2017

Spec Section Title:  
Submittal Title: Window Shade Systems- Product Data/Samples

Contractor:
Callas Contractors, Inc.

☑ Approved
☑ Approved as Noted
☑ Revise & Resubmit
CALLAS CONTRACTORS, INC.
Date: 7-11-17

Lend Lease Construction Inc.
Dave Macklin

Contractor's Stamp

CHECKED AND APPROVED FOR SUBMITTAL  
CALLAS CONTRACTORS, INC.

Architect's Stamp

Engineer's Stamp
June 30, 2017

Callas Contractors, Inc.
10549 Downsville Pike
Hagerstown, MD 21740

Project: Butterfly Ridge Elementary
   601 Contender Way
   Frederick, MD 21703

Project No.: 17-010

RE: Roller Shade Submittal

The Neikirk Company, LLC, will furnish and install MechoShade brand roller shades as specified in Division 122413, and indicated in the following submittals. Each type of shade required will be professionally installed per manufacturer's standards and recommendations.

The following will be provided in the indicated locations unless otherwise noted by Note 1 on A3.5:

All exterior facing windows will receive:
MechoShade manually operated roller shades with ThermoVeil 3000 Series shade cloth and Snap-Loc aluminum fascia. No shades on doors.

All interior sidelights will receive:
MechoShade Urban Shade low profile roller shades with Equinox 0700 Series opaque shade cloth and Snap-Loc aluminum fascia. No shades on doors.

Storefronts S-28 & S-29 in Cafeteria will receive:
MechoShade Electro Shades dual motorized solar and blackout shades with ThermoVeil 3000 Series solar shade cloth and 0700 Equinox opaque shade cloth with Snap-Loc aluminum fascia. Shades will NOT cover doors, only transom above. Each storefront will receive six (6) shade bands controlled by four (4) motors. Shades will be operated via a ten-button wall switch allowing for individual operation of both the solar shades and the opaque shades as a group. The shades will be controlled by two (2) IQ/MLC2 controllers as specified.

Please see enclosed data sheet for product information.

We are looking forward to another successful project. Please contact our office should you have any questions or concerns.

Sincerely,

[Signature]

Justin Neikirk

Enclosed: Product Data Sheet(s) and Specifications

Blinds • Shades • Shutters
Sales, Installation & Repairs • Residential and Commercial • All Major Brands – Competitive Prices
Space Crafters – Closet Systems, Glass Shower Enclosures
Motorized Shades in Cafeteria

MechoSystems Construction Details

ROLLER TUBE AND SHADE ASSEMBLY WITH DOUBLESHADE #17 BRACKET (MOTOR INSIDE TUBE)

CONTINUOUS BLOCKING (BY OTHERS) MUST BE LEVEL

CEILING (BY OTHERS) WHERE OCCURS

WINDOW MULLION (BY OTHERS)

OPTIONAL EXTRUDED ALUMINUM ROOM DARKENING SIDE CHANNEL

HEM BAR SEALED INSIDE CLOTH

SOLAR SHADECLOTH IN DOWN POSITION

BLACKOUT SHADECLOTH IN DOWN POSITION

SECTION AT WINDOW HEAD

SCALE: 1/2 FULL SIZE

ElectroShade® Electro®/2
DoubleShade® #17 Bracket
Regular Roll with Fascia, Wall Mount

Drawing No. E2-01.1-003

©2011 MechoShade Systems, Inc. All rights reserved. All trademarks herein are owned by MechoShade Systems, Inc. No partial this document may be reproduced or otherwise used without the express written consent of MechoShade Systems, Inc.
IQ/MLC2® Specification Submittal

Models
IQ/MLC2 Standard 120VAC
Stock No. IML2 120V ST SP

IQ/MLC2 Standard 230VAC
Stock No. IML2 230V ST SP

IQ/MLC2-8 120VAC with 4-Motor Expander Card
Stock No. IML2 4MTR 12 AS

IQ/MLC2-8 230VAC with 4-Motor Expander Card
Stock No. IML2 4MTR 23 AS

Features
• Four-motor, networked shade controller operates motorized shades equipped with standard line-voltage motors.
• Provides four (4) DIP-switch configurable local control ports, which permit control of any combination of the four motors within the controller via dry contact.
• Reprogramming of local control port motor assignments is possible through DIP switches with out needing to access the motor.
• Master control port offers dry-contact group control of all four internal motors.
• Master control port enables control, via daisy chaining, of up to 250 IQ/MLC2 units or 1,000 motors (2,000 motors if using the optional 4-Motor Expander Daughter Card).
• Control ports offer one-touch shade positioning to five (5) alignment points, including three (3) mid-window presets.
• Control ports can provide power to low-voltage control accessories up to 18VDC, 300mA total.
• Preset positions default to 25%, 50%, and 75% of the shade height but are programmable to offer hem bar alignment across windows of different sizes.
• Uniform mode forces groups of shades to operate to predetermined alignment points.
• Switch personality selection enables operation of shades from 1-button, 2-button, and 3-button switches
• Ease of use
  - Removable, two-piece line-voltage terminal block connectors.
  - Troubleshooting LEDs.
• Integrated RS485 half-duplex, CSMA-CA communication network expands control options:
  - Allows up to 250 nodes per network.
  - Enables two-way communication.
  - Uses standard Cat-5 network cable.
• Integration capability with third-party devices via RS232 and dry-contact; requires no additional interface devices.
• Automation port offers daylighting control using photosensors and scheduler-based operation, as well as remote control using IR and RF wireless controls.
• Modular expansion port enables control of up to four (4) pairs of motors using the IQ/MLC2 4-Motor Expansion Card.
• Brownout protection protects against memory loss and unreliable operation during low-line conditions.
• Flash-upgradable firmware promote flexibility for custom requirements and future enhancements.
• ETL listed to UL 325.
• CSA 22.2 No. 247 compliant.
IQ/MLC2 Electrical Specifications

DANGER: Must be installed by a qualified electrician according to all applicable codes and regulations.

Motor 1
120VAC

Motor 2
120VAC

Motor 3
120VAC

Motor 4
120VAC

Power output N1-M1 M4
- 12-18AWG
- 120VAC, 120Vac (motor dependent)
- 230VAC, 200Vac (motor dependent)

Output fuses F1-F4
- Rating: 150VAC, 115VAC, 50VAC
- MFPA: 1.42f or 1.22f
- PIN: T-300-1315-0000

Daughter card attachment for future functionality

AUX power port
- 120VAC, 0.3A

PIN Function
1 GND
2 Pins

Auto port
- PAL

USOC clips
- Modular cable
- 500ft, 50VAC max

OR
- 400ft, max. cumulative

Color Code: Green

PIN Color Function
1 WH/BK N/C
2 WH/BK N/C
3 WH/BK N/C
4 BL UP
5 BL UP
6 GN FEEDBACK
7 N/C
8 N/C

Local switch ports L1-L6

PIN Color Function
1 WH/BK N/C
2 WH/BK N/C
3 WH/BK N/C
4 BL UP
5 BL UP
6 GN FEEDBACK
7 N/C
8 N/C

Power Input
- 12-18AWG
- 120VAC, 200VAC (motor dependent)
- 230VAC, 200VAC (motor dependent)

Input fuse F5 (Brown)
- Rating: 250VAC, 200mA, 115VAC
- MFPA: 1.42f or 1.22f
- PIN: T-300-1315-3000

RS232 port
- R12

M1-M2
- USOC clips
- CAT-6 cable
- 400 ft. max. nodes to node
- 400 ft. max. cumulative
- 30 nodes max
- M1 connects to M2 on the next node

PIN Color Function
1 WH/BK N/C
2 WH/BK N/C
3 WH/BK N/C
4 BL UP
5 BL UP
6 GN FEEDBACK
7 N/C
8 N/C

* A node is a serial device such as IQ/MLC2, intelligent switch, etc.

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IQ/MLC2 Mechanical Specification

Packaging
Wall-mount

Mechanical

Size
10 x 10 x 4 in. (25.4 x 25.4 x 10.16cm)

Weight
7.5 lbs. (3.4kg)

Environmental

Enclosure
NEMA 1

Temp
0-40° C.

Humidity
< 90% relative humidity, non-condensing

Dimensions and Mounting

[Box mounting diagram]

MechoSystems
Corporate Headquarters
42-03 35th Street
Long Island City, NY 11101

T:+1 (718) 729-2020
F:+1 (718) 729-2941
E: techsales@mechosystems.com
W: mechosystems.com
IQMLC2 system diagram

LOW VOLTAGE CABLE LEGEND

A
CAT5E/C6 - FOR LOW VOLTAGE CAT 5E CONTACT CONNECTIONS
CHORD 28-24 WITH 25-CONDUCTOR STRANDED UNSHELLED TWISTED PAIR
Olympic Wire and Cable (www.olympicwire.com 1-800-628-3266) Part N.
360189006
TERMINATION: RJ-45 MODULAR PLUG CRIMPED (USOC) ON BOTH ENDS

A1
CAT5E/C6 - FOR CABLE FOR RS-485 CONNECTIONS
CHORD 28-24 WITH 25-CONDUCTOR STRANDED HMSHELD TWISTED PAIR
Olympic Wire and Cable (www.olympicwire.com 1-800-628-3266) Part N.
3601690109
TERMINATION: RJ-45 MODULAR PLUG CRIMPED (USOC) ON BOTH ENDS

A4
CAT5E/C6 - FOR RS-232 CONNECTIONS
CHORD 28-24 WITH 25-CONDUCTOR STRANDED HMSHELD TWISTED PAIR
Olympic Wire and Cable (www.olympicwire.com 1-800-628-3266) Part N.
3601690109
TERMINATION: RJ-45 MODULAR PLUG CRIMPED (USOC) ON BOTH ENDS CONNECTED
TO DB-9/DB-12 ADAPTOR (BY OTHERS)

NOTES
1. PARALLEL WIRING TO NEXT DEVICE PER BRANCH CIRCUIT CAPACITY. ALL CONNECTION MUST MEET NATIONAL AND LOCAL CODES AND REGULATIONS.
2. ADDRESSES AND SCHEDULES REQUIRED.
3. MAXIMUM VOLTAGE FOR ALL UNEARTHED CABLE IS 43.5 VDC.
IQMLC2 Point-to-point diagram

Warranty:
Limited warranty on motors and electronics to be free of manufacturing defects in factory materials or workmanship for five years from the date of shipment.

Technical Support:
MechoSystems
T: +1 (718) 729-2020, x2006
E: techsupport@mechosystems.com
W: mechosystems.com

MechoSystems reserves the right to make improvements or changes to its products without prior notice. However, every attempt is made to ensure the information herein is accurate and up to date. Verify with the MechoSystems staff to confirm the product availability, latest specifications, and suitability for your application.
STANDARD ELECTRICAL NOTES

All electrical control equipment is installed in accordance with NEC and local codes.

Electrical control equipment may contain standard electrical symbols, such as, sockets, switches, and other standard equipment. These symbols are conventionally acceptable for future servicing and adjustments during normal working hours and without disassembly in the existing work area. This equipment shall be listed by the National Electrical Testing Association (NETA) and other codes and standards which are acceptable, and shall be listed at the service equipment and circuit breaker.

Some symbols in this diagram may not include line colors, conductor sizes, and other markings that may otherwise be required for a complete installation. The complete diagram may also not define or illustrate every complete electrical wiring diagram and shall be modified for a given project.

LOW VOLTAGE CABLE LEGEND

USOC CRIMPING INSTRUCTIONS EIGHT CONDUCTOR CABLES FOR NETWORK AND DRY CONTACT CONNECTIONS

NOTE:

WHISPERSHADE 10P5 EDU with Mechanom Network

Drawing No. WSP-01.4
Fascia color chip sample set

MechoSystems
Design with light®
mec hosystems.com

MechoSystems Fascia Sample
Clear Anodized

MechoSystems Fascia Sample
Alabaster
Color and finish may vary.

MechoSystems Fascia Sample
Quaker Bronze
Color and finish may vary.

MechoSystems Fascia Sample
Colonial White

MechoSystems Fascia Sample
Mill Finish

MechoSystems Fascia Sample
Black
Color and finish may vary.

MechoSystems Fascia Sample
Grey
Color and finish may vary.

MechoSystems Fascia Sample
White
**Classic Blackout 0700 Series (opaque)**

This series is composed of an opaque vinyl material, which is appropriate for multimedia areas. The 0700 Series—flame retardant and fade resistant—provides insulation and opacity at the window wall.

**Content:** 75% vinyl (coating), 25% fiberglass (yarn)

**Opacity factor:** 0% (opaque)

Stocked: 72 in. (183cm) wide with exceptions

NFPA 701-2004; pass

To request 4½ x 5½ in. (11 x 14cm), 8½ x 11 in. (22 x 28cm), or 24 x 24 in. (61 x 61cm) samples, send an e-mail to samples@mechystems.com.

- **0701 White**
- **0704 Ivory**
- **0706 Oyster**
- **0705 Champagne**
- **0702 Light Grey**
- **0711 Dark Grey**
- **0731 Black/White**

*For special orders, a sample is required.

---

**Project**

**Job number**

Available for QuickShip. All QuickShip orders are subject to the standard terms and conditions of the QuickShip program. Visit mechystems.com/quickship for more information.

This material can vary in color and texture. Specifications (including stock colors) subject to change without notice. Other color options may be available on special order. Allow one to two weeks for delivery. Inventory and lead times vary.

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---

**Classic Blackout 0390 Series (opaque)**

This series is composed of an opaque vinyl material, which is appropriate for multimedia areas. The 0700 Series—flame retardant and fade resistant—provides insulation and opacity at the window wall. The window-facing side of the textile is the same color as the interior color, with the exception of item #0731, which is white.

**Content:** 75% vinyl (coating), 25% fiberglass (yarn)

**Opacity factor:** 0% (opaque)

Stocked: 72 in. (183cm) wide with exceptions

NFPA 701-2004; pass

To request 4½ x 5½ in. (11 x 14cm), 8½ x 11 in. (22 x 28cm), or 24 x 24 in. (61 x 61cm) samples, send an e-mail to samples@mechystems.com.

- **0701 White**
- **0704 Ivory**
- **0706 Oyster**
- **0705 Champagne**
- **0702 Light Grey**
- **0711 Dark Grey**
- **0731 Black/White**

*For special orders, a sample is required.

---

**Project**

**Job number**

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Classic Blackout 0700 Series (opaque)

This series is composed of an opaque vinyl material, which is appropriate for multimedia areas. The 0700 Series flame retardant and fade resistant - provides insulation and opacity at the window wall.

Content: 75% vinyl (coating), 25% fiberglass (yarn)
Openness factor: 0% (opaque)
Stocked: 72 in. (183cm) wide with exceptions
NFS 701-2004: pass

To request 4 x 5 ft. (11 x 14cm), 6 x 11 in (22 x 28cm), or 2 x 24 in. (61 x 61cm) samples, send an e-mail to samples@mechosystems.com.

0701 White
0704 Ivory
0706 Oyster
0705 Champagne
0702 Light Grey
0711 Dark Grey
0731 Black/White

*For special orders, a waiver is required.

Project
Job number

Classic Blackout 0706 Series (opaque)

This series is composed of an opaque vinyl material, which is appropriate for multimedia areas. The 0706 Series flame retardant and fade resistant - provides insulation and opacity at the window wall. The window-facing side of the textile is the same color as the interior color, with the exception of item #0731, which is white.

Content: 75% vinyl (coating), 25% fiberglass (yarn)
Openness factor: 0% (opaque)
Stocked: 72 in. (183cm) wide with exceptions
NFS 701-2004: pass

To request 4 x 5 ft. (11 x 14cm), 6 x 11 in (22 x 28cm), or 2 x 24 in. (61 x 61cm) samples, send an e-mail to samples@mechosystems.com.

0701 White
0704 Ivory
0706 Oyster
0705 Champagne
0702 Light Grey
0711 Dark Grey
0731 Black/White

*For special orders, a waiver is required.

Project
Job number
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Content: 75% vinyl (coating), 25% fiberglass (yarn)
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Stocked: 72 in. (183cm) wide with exceptions
NFPA 701-2004: pass

To request 4¼ x 5½ in. (11 x 14cm), 8¼ x 11 in. (22 x 28cm), or 24 x 24 in. (61 x 61cm) samples, send an e-mail to samples@micromysystems.com.

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<th>0704 Ivory</th>
<th>0708 Oyster</th>
<th>0705 Champagne</th>
<th>0702 Light Grey</th>
<th>0711 Dark Grey</th>
<th>0731 Black/White</th>
</tr>
</thead>
</table>

For special orders, a waiver is required.

Project
Job number

Available for QuickFit. All QuickFit substrates are subject to the standard terms and conditions of the QuickFit program. For more information, visit quickfit.com or call 800-538-8003.

Project
Job number

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MIC-6085-B018
Classic Blackout
0700 Series (opaque)

This series is composed of an opaque vinyl material, which is appropriate for multimedia areas. The 0700 Series—flame retardant and fade resistant—provides insulation and opacity at the window wall.

Content: 75% vinyl (coating), 25% fiberglass (yarn)
Openness factor: 0% (opaque)
Stocked: 72 in. (183cm) wide with exceptions
NFPA 701-2004: pass

To request 4¼ x 5½ in. (11 x 14cm), 8½ x 11 in. (22 x 28cm), or 24 x 24 in. (61 x 61cm) samples, send an e-mail to samples@mechosystems.com.

- 0701 White
- 0704 Ivory
- 0706 Oyster
- 0705 Champagne
- 0702 Light Grey
- 0711 Dark Grey
- 0731 Black/White

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Project

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SCH19006.1213
These reversible shadedcots feature a textured weave with an alternating predominant color in the warp and fill. The standard 3000 and 3200 shadedcots are in a satin weave, and the 3300 series in a diamond weave. Both series may be ordered in the alternate weaves; however, minimums and lead times apply. When ordering, if the face side is to be to the room interior, use the color numbers as shown below. If the reverse is to face the room interior, use the color number followed by the letter "R." content.

303 Bone
3010 Alabaster
3010 Pebble
3011 Parchment
3012 Sandalwood
3013 Driftwood
3013 Sand

To request 4½ x 5½ in. (11 x 14cm), 8½ x 11 in. (20 x 28cm), or 24 x 24 in. (61 x 61cm) samples, send an e-mail to samples@meoshawley.com.

Project
Job number

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ThermoVeil® Reversible Satin/Diamond Weave
Series 3000, 3200, 3300 (1-2% open)

These reversible shadecloths feature a textured weave with an alternating predominant color in the warp and fill. The standard 3000 and 3200 shadecloths are in a satin weave, and the 3300 series in a diamond weave. Both series may be ordered in the alternate weave; however, minimums and lead times apply. When ordering, if the face side is to be to the room interior, use the color numbers as shown below. If the reverse is to face the room interior, use the color number followed by the letter "R."

Content: 75% PVC (coating), 25% polyester (yarn)
Openness factor: 1-2%
Stocked: 72 in. (183cm) and 96 in. (244cm) wide
NFPA 701-2004: pass

To request 4½ x 6½ in. (11 x 14cm), 8½ x 11 in. (22 x 28cm), or 24 x 24 in. (61 x 61cm) samples, send an e-mail to samples@mechosystems.com.

| 3211 Bone         | 3310 Alabaster  |
| 3310 Pebble       | 3311 Parchment  |
| 3012 Sandalwood   | 3012 Charcoal   |
| 3313 Driftwood    | 3016 Mushroom   |
| 3013 Sand         | 3018 Graphite   |

Project number:

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Openness factor: 1-2%
Stocked: 72 in. (180cm) and 96 in. (244cm) wide
NFPA 701-2004: pass

To request 4in. x 5.5 in. (11 x 14cm), 8in. x 11 in. (22 x 28cm), or 24 x 24 in. (61 x 61cm) samples, send an e-mail to samples@machsystsys.com.

Project:
Job number:

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Project:
Job number:

| 3011 Bone     | 3010 Alabaster | 3015 Smoke      | 3014 Pewter     |
| 3016 Charcoal | 3017 Sandalwood | 3018 Driftwood  | 3013 Sand      |
| 3013 Graphite |                 |                 |                |

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ThermoVell® Reversible Satin/Diamond Weave Series 3000, 3200, 3300 (1-2% open)

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NFPA 701-2004: pass

To request 4 x 5½ in. (11 x 14cm), 8½ x 11 in. (22 x 28cm), or 34 x 24 in. (87 x 60cm) samples, send an e-mail to samples@macmoyystems.com.

- D211 Bone
- D3010 Cobblestone
- D3010 Pebble
- D3011 Parchment
- D3012 Sandalwood
- D3013 Driftwood
- D3013 Sand

---

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| 3211 Bone | 3212 Stone |
| 3310 Alabaster | 3315 Smoke |
| 3311 Pebble | 3314 Peater |
| 3311 Patchment | 3317 Charcoal |
| 3312 Sand | 3016 Mushroom |
| 3313 Driftwood | 3018 Graphite |
| 3313 Sand |

Project

Job number

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- [#3211 Bone](#3310 Alabaster)
- [#3310 Alabaster](#3211 Bone)
- [#3310 Pebble](#3311 Parchment)
- [#3311 Parchment](#3310 Pebble)
- [#3312 Sandalwood](#3313 Driftwood)
- [#3313 Driftwood](#3312 Sandalwood)
- [#3313 Send](#3312 Stone)
- [#3314 Pewter](#3316 Smoke)
- [#3316 Smoke](#3314 Pewter)
- [#3317 Charcoal](#3318 Graphite)
- [#3318 Graphite](#3317 Charcoal)

Project:

Job number:

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SIC10615.1213
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<td>Bogen - Quantum 120 Station Rack system</td>
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<td>2</td>
<td>HTA250</td>
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<td>SPT064-10</td>
<td>Geist Rack mounted power strip</td>
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<td>Bogen 10W Attenuator (Volume control)</td>
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<td>Bogen Drop-in Ceiling Speaker</td>
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<td>FMH15T</td>
<td>Bogen 15 Watt Horn (flange mounted)</td>
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<td>Bogen Back box for surface mount (6&quot;)</td>
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<td>SGHD8</td>
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<td>E2032.30.10</td>
<td>West Penn 18/2 Shielded PVC wire</td>
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End of Materials
## Request For Information  ST2 PB-012

**Urbana Elementary School Replacement**
3554 Urbana Pike
Frederick, Maryland  21704

**ST2 PB-012**

**3554 Urbana Pike**
**Frederick, Maryland  21704**

**Tel:       Fax:**

**RFI #:  ST2 PB-012 Date Created:  1/29/2019**

<table>
<thead>
<tr>
<th>Answer Company</th>
<th>Answered By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grimm + Parker Architects</td>
<td>Don Porter</td>
</tr>
<tr>
<td>11720 Beltsville Drive</td>
<td></td>
</tr>
<tr>
<td>Suite 600</td>
<td>240-965-0713</td>
</tr>
<tr>
<td>Calverton, MD  20705</td>
<td>301-595-0089</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Author Company</th>
<th>Authored By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oak Contracting, LLC</td>
<td>Kerrigan Toth</td>
</tr>
<tr>
<td>1000 Cromwell Bridge Road</td>
<td>410-828-1000</td>
</tr>
<tr>
<td>Towson, MD  21286</td>
<td>410-828-7488</td>
</tr>
</tbody>
</table>

**Co-Respondent**

<table>
<thead>
<tr>
<th>Author RFI Number</th>
</tr>
</thead>
</table>

**Subject**

- Tile vs. paint clarification

**Discipline**

- Interior Design

**Category**

- Drawing Discrepancies

**Cc:** **Company Name**

<table>
<thead>
<tr>
<th>Contact Name</th>
<th>Copies</th>
<th>Notes</th>
</tr>
</thead>
</table>

**Question**

The Finish Schedule (drawing A-3.1)- has the corridors A011, A012, A012, A014, B011 as painting but drawing A-6.4 indicates ceramic Tile. Please clarify.

**Suggestion**

**Answer**

**Date Answered:**

Interior Elevations have been revised by Addendum 2.
See questions below from Modular Concepts:

1. Is there any casework intended in room A106?

2. Is there a scheduled “C33” intended just inside the doorway to room A124?

3. Please provide details for desk in Media Center B101. Details provided on A9.9 don’t match what is shown on A9.2.

4. Is there casework intended in the southwest corner of room C104?

5. Where is G5/A9.9 used on this project?

6. Where is A14/A09.10 used on this project?

7. Please verify the display case shown on H1/A9.10 is part of the 064100 and not 101125.

8. Maple Chair rail in the cafeteria is not shown clearly. Can we assume the entire perimeter of the Cafeteria will have this condition?

9. Please verify that detail G1/A9.9 is not used on this project. The standard details show a window sill and countertop separate of one another, not a continuous counter that also acts as a sill.

10. Please advise what doors are intended on the 123551 casework. Are they to be full height or individual compartment doors?

11. Please advise what level of Corian to assume for the C3 and Alternate C1 solid surface counters. Corian level 4?

Please provide responses accordingly.
Suggestion

<table>
<thead>
<tr>
<th>Answer</th>
<th>Date Answered:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. None required. This has been clarified by Addendum 2.</td>
<td></td>
</tr>
<tr>
<td>2. Yes. This has been clarified by Addendum 2.</td>
<td></td>
</tr>
<tr>
<td>3. Details to be provided in Addendum 3.</td>
<td></td>
</tr>
<tr>
<td>4. Yes. This has been clarified by Addendum 2.</td>
<td></td>
</tr>
<tr>
<td>5. Yes. Exact location(s) will be included in Addendum 3.</td>
<td></td>
</tr>
<tr>
<td>6. Detail will be deleted in Addendum 3.</td>
<td></td>
</tr>
<tr>
<td>7. This item is Millwork. Detail will be revised in Addendum 3.</td>
<td></td>
</tr>
<tr>
<td>8. This will be clarified in Addendum 3.</td>
<td></td>
</tr>
<tr>
<td>9. This detail will be revised in Addendum 3.</td>
<td></td>
</tr>
<tr>
<td>10. Individual compartment.</td>
<td></td>
</tr>
<tr>
<td>11. Clarification or color selections will be included in Addendum 3.</td>
<td></td>
</tr>
<tr>
<td>RFI #: ST2 PB-017</td>
<td>Date Created: 1/30/2019</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td><strong>Answer Company</strong></td>
<td><strong>Answered By</strong></td>
</tr>
<tr>
<td>Grimm + Parker Architects</td>
<td>Don Porter</td>
</tr>
<tr>
<td>11720 Beltsville Drive Suite 600</td>
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</tr>
<tr>
<td>Calverton, MD 20705</td>
<td>240-965-0713</td>
</tr>
<tr>
<td><strong>Co-Respondent</strong></td>
<td><strong>Author RFI Number</strong></td>
</tr>
<tr>
<td><strong>Subject</strong></td>
<td><strong>Discipline</strong></td>
</tr>
<tr>
<td>Lighting controls substitution</td>
<td>Electrical</td>
</tr>
<tr>
<td><strong>Cc:</strong> Company Name</td>
<td>Contact Name</td>
</tr>
</tbody>
</table>

**Question**

See attached substitution request from Commercial Lighting Sales, Inc. recommending their products be accepted for lighting control devices. Please review and advise.

**Suggestion**

<table>
<thead>
<tr>
<th><strong>Answer</strong></th>
<th><strong>Date Answered:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>These products will not be permitted for this project.</td>
<td></td>
</tr>
</tbody>
</table>
Project: Urbana ES/Future Frederick County Public Schools

To: Oak Contracting

Substitution Request Number: ____________________________

From: ____________________________

Date: ____________

A/E Project Number: ____________________________

Re: ____________________________

Contract For: ____________________________

Specification Title: Lighting Control Devices

Section: 26 09 23 Page: ____________________________

Description: Digital Room Controllers, relay panels entire section excluding Lighting Contactors

Article/Paragraph: ____________________________

Proposed Substitution: Lehigh EFlex digital room controllers and wall stations

Manufacturer: Lehigh Electric Products Co., Inc.

Trade Name: EFlex Lighting Controls

Model No.: ____________________________

Installer: ____________________________ Address: ____________________________ Phone: ____________________________

History: □ New product □ 2-5 years old □ 5-10 yrs old □ More than 10 years old

Differences between proposed substitution and specified product:

Lehigh EFlex system provides "distributed" and "centralized" control while providing durable wall stations made of Lexan with steel mounting straps.

EFlex products utilize a "distributed" wiring scheme to avoid potential building-wide control issues by putting the processing capability in each room. Issues in one location will not affect lighting in other areas. On the other hand central control systems are desirable in other areas such as egress and exterior spaces to provide broadcast time clock signals. Digitally addressable wall stations are programmed with each local plenum-rated relay/dimming panel. Features include: manual and scene control, timeclock, local override, control of Emergency fixtures and fire alarm interface.

☑ Point-by-point comparative data attached - REQUIRED BY A/E

Reason for not providing specified item: Specified controls system is not represented by our agency.

Similar Installation: See attached “Project List”

Project: Sugarloaf Elem. School

Address: 3400 Stone Barn Drive

Frederick, MD 21704

Architect: Grimm + Parker

Owner: Frederick County Public Schools

Date Installed: 2018

Proposed substitution affects other parts of Work: ☑ No □ Yes; explain ____________________________

Savings to Owner for accepting substitution: N/A - it would allow for additional competition during the bid process

Proposed substitution changes Contract Time: ☑ No □ Yes [Add] [Deduct] ____________________________ days.

Supporting Data Attached: □ Drawings ☑ Product Data □ Samples □ Tests □ Reports □ Upon request

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Page 451 of 600

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Page 451 of 600
The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Kyle Wheeler
Signed by: Kyle Wheeler
Firm: Commercial Lighting Sales, Inc
Address: 6797 Dorsey Road, Suite 3
Elkridge, MD 21075
Telephone: 443-561-1537

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: Date:

Additional Comments:  Contractor  Subcontractor  Supplier  Manufacturer  A/E  

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Page 452
The E-Flex™ lighting and energy control system is a relay based controller for switched and 0-10V lighting control for direct connection to dimming ballasts and LED drivers. The system is flexible enough to act as a standalone room controller, or to accept DMX512 directly to easily integrate alongside DMX-based architectural lighting. It is available with four or eight output circuits and four input banks to accept occupancy, daylight, contact closure and CapT wallstations.

It is an ideal solution for standalone applications – classrooms, conference rooms, offices, or to simply light public spaces such as stairwells, hallways, or lobbies. Built-in support for occupancy and daylight sensors provides a complete energy management solution. Receptacle zone type is provided to meet automatic receptacle control requirements. Additional inputs provide UL924 emergency, timeclock, or demand response support. Demand Response includes load shed adjustment on a zone-by-zone basis for maximum flexibility to meet energy codes and reduce power consumption. An integral astronomical timeclock option is also available with 50 events and support to control individual panels and zones or to broadcast an event to all panels on FlexNet.

E-flex provides support for both primary and secondary daylight zones controlled from a single photocell. Secondary daylight zones can be adjusted on a zone-by-zone basis using DASC (daylight scaler) which scales the effect of the daylight sensor on a zone from 100% down to 0.

Each input bank has an input for Lehigh’s CapT™ wallstations which provide a capacitive touch button interface with wake-on proximity sensing for low-power operation. CapT wall stations include button layouts with up to 7-buttons from simple ON/OFF to a 4-preset recall with OFF, and raise/lower control.

With DMX512 and RDM support the E-Flex integrates alongside DMX-based lighting fixtures and is compatible with Lehigh’s Solitaire and Impress DMX architectural control systems, as well as the DX3 architectural processor.

Dimensions:

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions</th>
<th>Part Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Flex 4</td>
<td>9.5”H x 12” W x 3”D.</td>
<td>H2800 E-Flex-4, DMX, 0-10V</td>
</tr>
<tr>
<td>E-Flex 8</td>
<td>16.25”H x 12”W x 3”D.</td>
<td>H2814 E-Flex-4, DMX, 0-10V, Timeclock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H2810 E-Flex-8, DMX, 0-10V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H2815 E-Flex-8, DMX, 0-10V, Timeclock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H2803 E-Flex-4, Relays Only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H2813 E-Flex-8, Relays Only</td>
</tr>
</tbody>
</table>
Input/Output Diagram

Default Programming Riser – Four rooms, 1 zone each, wired

CapT™ Wall Stations

- Low Cost Capacitive Touch
- No Mechanical buttons
- 2, 5, and 7 Button Layouts
- Preset Recall
- Raise/Lower
- 16 presets in banks of four

CapT wall stations for the E-Flex Lighting and Energy control system provide a capacitive touch button interface with wake-on proximity sensing for low-power operation. CapT wall stations include button layouts with up to 7-buttons for simple ON/OFF to a 4-preset recall with OFF, and raise/lower control. The 4-preset recall layout is bank selectable via a dip switch on the rear of the station and can be configured to recall presets 1-4, 5-8, 9-12, or 13-16 from an EFRP (E-flex relay panel).

In the upper corner of the station are two LEDs. The top LED is always ON and will flicker when the proximity sensor is activated. The bottom LED will be lit while a button is pressed. The top five buttons include an LED on the right to indicate activation.

Each EFRP (E-Flex relay panel) has four CapT inputs; only one CapT station can be connected to an input. A single CapT station can be connected to more than one relay panel to expand the number of lighting zones to control. By configuring a CapT input on the EFRP, a CapT wall station can be set up to control one or more zones of the connected EFRP(s). By default a single zone is assigned to the corresponding CapT input on the EFRP for out of the box operation as a standalone 4-zone room controller.

Zone assignment can be unique for each CapT wall station or the same zones can be assigned to more than one CapT wall station. With multiple zones assigned, a CapT station can recall full lighting looks which are editable on the relay panel. The 16 presets available on the relay panel can be edited with the PC-based E-Flex EFRP configurator tool software or using the on-board user interface of the EFRP.

<table>
<thead>
<tr>
<th>ON/OFF (CapT-2)</th>
<th>ON/OFF, R/L, Preset (CapT-5)</th>
<th>Preset 1-4, OFF, R/L (CapT-7)</th>
</tr>
</thead>
</table>

Available in colors – black, white, tan.
Rear View of Station

Connections:
- 24V
- Ground
- Signal

Wiring:
150 ft. maximum.
(3) - 22-18 AWG or Cat5.
Cat5 – two pairs for power.

Part Numbers

<table>
<thead>
<tr>
<th>P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2820</td>
<td>CapT-2 Black</td>
</tr>
<tr>
<td>H2822</td>
<td>CapT-5 Black</td>
</tr>
<tr>
<td>H2823</td>
<td>CapT-7 Black</td>
</tr>
<tr>
<td>H2824</td>
<td>CapT-2 White</td>
</tr>
<tr>
<td>H2825</td>
<td>CapT-5 White</td>
</tr>
<tr>
<td>H2826</td>
<td>CapT-7 White</td>
</tr>
<tr>
<td>H2830</td>
<td>CapT-2 Tan</td>
</tr>
<tr>
<td>H2832</td>
<td>CapT-5 Tan</td>
</tr>
<tr>
<td>H2833</td>
<td>CapT-7 Tan</td>
</tr>
</tbody>
</table>

Typical Risers

CapT Wall Station per EFRP (E-Flex relay Panel) Input

CapT Wall Station to Multiple EFRPs (E-Flex relay Panel)
## SUBSTITUTION REQUEST

**Project:** Urbana ES/Future Frederick County Public Schools  
**To:** Oak Contracting  
**Re:**

<table>
<thead>
<tr>
<th>Specification Title:</th>
<th>Lighting Control Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section:</td>
<td>26 09 23</td>
</tr>
<tr>
<td>Page:</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Digital Room Controllers, relay panels, occ sensors entire section excluding Lighting Contactors</td>
</tr>
<tr>
<td>Article/Paragraph:</td>
<td></td>
</tr>
</tbody>
</table>

**Proposed Substitution:** GreenMax Digital Room Control and GreenMax Relay Panel Systems  
**Manufacturer:** Leviton Mfg. Co., Inc.  
**Trade Name:** GreenMax Digital Room Control and GreenMax Relay Panel systems  
**Model No.:**

**Installer:**  
**Address:**

<table>
<thead>
<tr>
<th>History:</th>
<th>New product</th>
<th>2-5 years old</th>
<th>5-10 yrs old</th>
<th>More than 10 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☑</td>
<td></td>
<td></td>
<td>☐</td>
</tr>
</tbody>
</table>

**Differences between proposed substitution and specified product:**

- DRC products utilize a “distributed” wiring scheme to avoid potential building-wide control issues by putting the processing capability in each room. Issues in one location will not affect lighting in other areas. On the other hand central control systems are desirable in other areas such as egress and exterior spaces to provide broadcast time clock signals. Local digitally addressable wall stations, occ sensors and photocells are programmed with each local plenum-rated relay/dimming relay module. Features include: manual and scene control, timelock, local override, control of Emergency fixtures, fire alarm and BAS interface.

- ☑ Point-by-point comparative data attached - REQUIRED BY A/E

**Reason for not providing specified item:** Specified controls system is not represented by our agency.

**Similar Installation:** See attached “Project List”  
**Project:** Oakcrest School  
**Address:** 1619 Crowell Rd.  
**Owner:** Private (Roman Catholic association)  
**Date Installed:**

**Proposed substitution affects other parts of Work:** ☑ No  
☐ Yes; explain

**Savings to Owner for accepting substitution:** N/A - it would allow for additional competition during the bid process

**Proposed substitution changes Contract Time:** ☑ No  
☐ Yes [Add] [Deduct] ____________________________ days.

**Supporting Data Attached:**  
☐ Drawings  
☑ Product Data  
☐ Samples  
☐ Tests  
☐ Reports  
☐ Upon request

---

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Page 451
The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
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- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Kyle Wheeler
Signed by: Kyle Wheeler
Firm: Commercial Lighting Sales, Inc.
Address: 6797 Dorsey Road, Suite 3
Elkridge, MD 21075
Telephone: 443-561-1537

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: __________________________ Date: __________

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ ________
PRODUCT DESCRIPTION
The GreenMAX® DRC Low Voltage Room Controller serves as the “brain” of any GreenMAX DRC Room Control System by coordinating the energy management functions within the room. Each room requires one room controller to connect with components such as DRC Smart Packs, digital keypads, and sensors.

SYSTEM DESCRIPTION
The GreenMAX DRC Room Control System offers a fully distributed room control system, with each room operating independently of others; no dependence on network processors or centralized controllers. This revolutionary system is fully configurable via the GreenMAX DRC app for smart devices, and can be used to comply with IECC, ASHRAE 90.1, and 2016 Title 24, Part 6 occupancy/vacancy sensing, multi-level lighting, daylight harvesting, partial-ON, partial-OFF, scheduling, exterior lighting, demand response and receptacle control requirements, and it is listed on the DesignLights Consortium (DLC) Qualified Products List (QPL) for Networked Lighting Control systems (certification pending).

GREENMAX DRC APP
Wirelessly commission, configure, control, monitor and provision the GreenMAX DRC system using the GreenMAX DRC App designed for any WiFi-enabled Android or iOS smart device.

APPLICATIONS
• Single room controller for GreenMAX DRC systems—one required per room
• DIN rail applications, such as phase control dimmers

USE WITH THESE LEVITON SYSTEMS
• GreenMAX DRC
• GreenMAX relay panels
• Sapphire™ Touchscreen

FEATURES
• Low voltage model is powered from LumaCAN network and can be surface mounted or installed into a DIN rail enclosure
• Connects to building WiFi network for configuration and communication between rooms.
• Acts as an access point for direct connection
• UL2043 Plenum rated
• Single analog input
## PRODUCT DATA

### SPECIFICATIONS

#### ELECTRICAL

<table>
<thead>
<tr>
<th>Power Input</th>
<th>+12-24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Voltage Connections</td>
<td>LumaCAN: (2) RJ45, CAT6A or better, termination provided via jumper (LCTRM-RJ) AUX In: 3-wire 2-part terminals, 26-18AWG (solid or stranded)</td>
</tr>
</tbody>
</table>

#### CONNECTIVITY

<table>
<thead>
<tr>
<th>Network Connections</th>
<th>(2) RJ45, CAT6 or better for connection to LumaCAN network. Termination provided via local termination switch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Topology</td>
<td>Daisy chain, 1600’ max between repeaters Home-run topology and network length up to 10,000’ can be achieved when using LumaCAN network repeaters (NPRPT) Maximum 110 nodes between repeaters Maximum 250 nodes on a LumaCAN network</td>
</tr>
</tbody>
</table>

#### ENVIRONMENTAL

<table>
<thead>
<tr>
<th>Operating Temperature Range</th>
<th>32° to 104° F (0° to 40° C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature Range</td>
<td>14° to 185° F (-10° to 85° C)</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>0 to 90% non-condensing, for indoor use only</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP30</td>
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#### OTHER

<table>
<thead>
<tr>
<th>Listings</th>
<th>UL, cUL (File # E148771), emergency bypass (UL924)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Codes</td>
<td>Can be used to comply with IECC, ASHRAE 90.1, and 2016 Title 24, Part 6 occupancy/vacancy sensing, multi-level lighting, daylight harvesting, partial-ON, partial-OFF, scheduling, exterior lighting, demand response and receptacle control requirements</td>
</tr>
<tr>
<td>Warranty</td>
<td>Limited 5-year</td>
</tr>
</tbody>
</table>

#### DIMENSIONS

![Diagram](image_url)

- 3.39” (86mm)
- 4.13” (105mm)
- 2.28” (57.8mm)

### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>CAT. NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRC00-OL0</td>
<td>GreenMAX DRC Room Controller with interface to LumaCAN, and WiFi networks, DIN rail form factor, low voltage, color: putty</td>
</tr>
<tr>
<td>DINRK-001</td>
<td>DIN Rail Rack Mount Enclosure, Small, 14x10” with (1) 12.9” rail</td>
</tr>
<tr>
<td>DINRK-A03</td>
<td>DIN Rail Rack Mount Enclosure, Medium, 21x25” with (3) 13.7” rails</td>
</tr>
<tr>
<td>DINRK-A06</td>
<td>DIN Rail Rack Mount Enclosure, Large, 25x48” with (5) 19.5” rails</td>
</tr>
</tbody>
</table>

---

**Leviton Manufacturing Co., Inc. Energy Management, Controls and Automation**

20497 SW Teton Avenue, Tualatin, OR 97062  tel 800-736-6682  fax 503-404-5954  tech line (6:00AM-4:00PM PT Mon-Fri) 800-959-6004

**Leviton Manufacturing Co., Inc. Global Headquarters**

201 North Service Road, Melville, NY 11747-3138  tel 800-323-8920  fax 800-832-9538  tech line (8:30AM-7:00PM ET Mon-Fri) 800-824-3005

Visit our Website at: [www.leviton.com/emca](http://www.leviton.com/emca)

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G-10313/A19-tb
**DESCRIPTION**

The GreenMAX DRC 0-10V Smart Pack enables switching and 0-10V dimming control of a single zone of fixtures, allowing for a distributed control solution. Used to control multiple fixtures in a zone or for plug load control solutions, the DRC uses distributed relays, which eliminates the need to run wires back to a cabinet. This distributed system architecture saves on installation and equipment costs. DRC relays can be used as a normal or emergency relay; a remote relay with the GreenMAX® DRC system; or as a single room control relay with the Sapphire™ Touch Screen.

The GreenMAX DRC Room Control System offers a fully distributed room control system, with each room operating independently of others—no dependence on network processors or centralized controllers. This revolutionary system is fully configurable via the GreenMAX DRC app for smartphone devices, and can be used to comply with IECC, ASHRAE 90.1, and 2016 Title 24, Part 6 occupancy/vacancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF, demand response and receptacle control requirements. It is listed on the DesignLights Consortium (DLC) Qualified Products List (QPL) for Networked Lighting Control systems (certification pending).

**FEATURES**

- Single channel device—(1) 0-10V output plus (1) relay
- Plug load controls
- UL924 Emergency
- Utilizes Leviton High Inrush Stability (H.I.S.) circuitry for increased reliability
- Connects via the LumaCAN network via RJ45 connectors and CAT6 wiring
- 0-10V control can be Class 1 or Class 2 wiring
- Used for both switching only loads and dimming loads controllable with a 0-10V control signal
- All relay models are latching to reduce parasitic energy waste over NO/NC relays

**APPLICATIONS**

- Single channel LumaCAN 0-10V relay
- Distributed controls
- GreenMAX® remote relay
- Direct load control from Sapphire™

**INSTALL NOTES**

- Installs as 4” square electrical box cover or via 1/2” nipple
- When Class 2 In Conduit is required, use 4” square extension ring and blank cover on low voltage side
- May be field-painted to match surroundings (requires 4S blank cover to protect Class 2 side)
**PRODUCT DATA**

**WIRING DIAGRAM**

**SPECIFICATIONS**

**ELECTRICAL**
- **Input Voltage**: 120-277VAC, 50/60 Hz, 20A Max
- **Supported Loads**:
  - 20A Tungsten
  - 20A Standard Ballast
  - 16A Electronic Ballast, LED Drivers
  - 20A General Purpose/Plug Load Control
  - Motor: 1/2 HP, 9.8 FLA @ 120V AC; 2HP, 12 FLA @ 240-277V AC
- **Control Output**: 0-10V, 100mA sinking, Class 1 or Class 2 wiring
- **Network requirements**: LumaCAN network input and output, RJ45 connectors

**ENVIRONMENTAL**
- **Operating Temperature**: 23° to 122°F (-5° to 50°C)
- **Storage Temperature**: 4° to 185°F (-20° to 85°C)
- **Ambient Humidity**: 0-90% non-condensing
- **Listings**: UL, cUL, plenum rated (UL2043), emergency bypass (UL924)

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>CAT. NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRD07-ED0</td>
<td>GreenMAX DRC Smart Pack, 0-10V, 120-277VAC, 50/60Hz 20A max, 100mA sink current</td>
</tr>
</tbody>
</table>

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20497 SW Teton Avenue, Tualatin, OR 97062  tel 800-736-6682  fax 503-404-5594  tech line (6:00AM-4:00PM PT Mon-Fri) 800-959-6004

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GreenMAX® Relay Control Panels
Modular Relay System Offers Unparalleled Flexibility

DESCRIPTION
The Leviton GreenMAX® Relay Control Panel line offers features and performance not available from any competing product on the market today. For increased reliability and durability, GreenMAX Cabinets and Relay Modules have a 25,000A Short Circuit Current Rating (SCCR) at 277VAC. Native communication network protocols—BACnet/IP, Ethernet, and LumaCAN—are built into each GreenMAX Command Module (processor) to offer unparalleled connectivity. No additional parts or adapters are needed to communicate with other products utilizing these protocols.

For increased flexibility, the modular GreenMAX system includes separate Cabinet enclosures, Command Modules (processor, power supply, and low voltage inputs), Relay Insert Panels, Relay Modules, and a Handheld Display Unit (HDU). For easier manageability and accessibility, Leviton ships empty cabinet enclosures separately from the electronic components. This makes the cabinets lighter and easier to handle and requires less effort to install. To further minimize handling and damage to the electronic components, Leviton can ship the electronic components later in the project schedule or as required.

All GreenMAX Relay Modules are 1-pole or 2-pole latching relay types that reduce parasitic energy use. The relay modules are the same physical size, allowing the optimal mix of relays to be customized for each application. Models include a basic control relay module and/or a self-contained dimming and switching relay module that supports daylight harvesting capabilities.

A Handheld Display Unit (HDU) can be detached from the cabinet mounting location and moved to the most convenient network connection point to connect to any open LumaCAN or port on the same network as the cabinets. Commissioning and start-up functions are easier with the HDU, which allows programming to be done in the space being controlled rather than from the electrical room.

APPLICATIONS
• Heavy retrofit applications
• New construction projects
• Government facilities
• Office buildings
• Hospitals/medical offices
• Universities
• Restaurants
• Large campuses
• Any location requiring Daylight Harvesting and Demand Response

FEATURES
• Cabinets and relay modules with 25,000A Short Circuit Current Rating (SCCR) at 277VAC
• Relay modules rated at 30A General Fluorescent Ballast at 20A Incandescent
• Relay modules are latching with manual actuator
• Industry standard 0-10V dimming and switching relay module
• Programming and monitoring of the system is done with the exclusive Handheld Display Unit (HDU)
• Empty enclosure ships separately from electrical components
• Supports native protocols of BACnet/IP, Ethernet, and LumaCAN
• 8, 16, 32 and 48 relay sizes
• Four programmable levels of demand response
• Can be used to comply with IECC, ASHRAE 90.1, and 2016 Title 24, Part 6 occupancy/vacancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF, scheduling, demand response, and receptacle control requirements
FEATURES

Relay Cabinet
- GreenMAX cabinet has a 25,000A at 277VAC short circuit current rating (SCCR) for increased reliability and durability
- Modular system includes separate empty cabinet enclosures, a command module, and relay insert panels to minimize handling and subsequent damage during installation
  - Command Module is the processor and power supply of the GreenMAX system and optionally includes a low voltage remote input card for analog devices
  - Relay insert panels feature quick install; each panel takes only two screws to install
- Native communication network protocols—BACnet/IP, Ethernet, and LumaCAN—are built into each command module to offer unparalleled connectivity; no additional devices are needed to communicate with other products utilizing these protocols
- Increased arc flash protection—the cabinet door opens to expose only the low voltage area of the cabinet
  - High voltage areas can be accessed by removing the wire-way covers—this requires the removal of retaining screws
- Voltage barriers can be installed between individual relay modules. This allows voltages from mixed sources in the same cabinet

Relay Modules
- All GreenMAX relay modules have a 25,000A short circuit current rating (SCCR) at 277V for increased reliability and durability
- Rated at 30A general fluorescent ballast (this rating is 20A, 347V in Canada) and 20A incandescent for all GreenMAX relays
- All relays are latching with a manual actuator to reduce parasitic energy waste over NO/NC relays
- Manual actuation lever on all GreenMAX relays allow users to manually bypass the system to turn lights on or off without a CPU or power
- Self-contained dimming and switching relay module in 1-pole configurations supports daylight harvesting capabilities

Remote Low Voltage (RLV)
- Remote low voltage input cabinets can be installed closer to the devices they serve (such as occupancy sensors, LV switches and photocells) to reduce wiring and labor and provide additional power; this also makes commissioning and troubleshooting easier
- Additional low voltage input points are available in quantities of 8 and 16
- Power supply input: 70W (max), 100-277VAC single phase input, 24VDC output
- The RLV utilizes CAT6 network cable to interconnect with the system and communicates via LumaCAN

Handheld Display Unit (HDU)
- Manage the GreenMAX system(s) remotely from any network device location
- System configuration and scheduling is performed via the HDU—this can be done while standing in the room or controlled space; programming is no longer confined to the electrical room
- Control entire GreenMAX system from any access point—relay cabinets, switches, or remote low voltage cabinets
- One HDU can be used for multiple systems
- Can be stored in the cabinet or designated docking station
- Communicate via LumaCAN
- 7-hour run time on a single full charge (batteries included)
- Astronomical clock—sunrise/sunset
- HDU does not need to be connected to system during operation. Full system functionality is provided independent of HDU

*Pair GreenMAX relay control panels, GreenMAX relay modules and GreenMAX HDU with GreenMAX digital switches and Leviton low voltage switches for a complete lighting control strategy.
FEATURES

Electrical
- Power supply input: 70W (max), 100-277VAC single phase input, 24VDC output
- All input voltages: 50/60Hz phase to neutral
- Non-volatile memory and micro-SD card protect programming during blackouts

Wiring
- Internal: factory pre-wired and tested
- System components:
  - LumaCAN requires standard CAT6 network cabling
  - Low voltage Class 2 wiring connects input cards to control devices such as occupancy sensors, low voltage switches, and photocells
  - Hard-wired dedicated emergency input is provided in each cabinet and requires an external normally open (N/O) contact closure; the cabinet provides the source of low voltage +24VDC for this circuit; programmable individual relay response to the emergency signal
- Line voltage:
  - Feed for command module (control electronics) and load wiring only
  - Requires single phase hot and neutral connection
- LumaCAN Network:
  - CAT6 cable
  - RJ45 connectors
  - Wiring configuration (EIA/TIA 568B)
- Power must be injected into LumaCAN cable every 900 feet
  - Use a remote low voltage cabinet or a relay cabinet
  - Power supply—two-sided allowing up to 1500mA per side

Network Connections
- Maximum LumaCAN communication network segment length is 1600 ft from end of line termination to end of line termination. Longer network lengths can be achieved with the use of a LumaCAN repeater
- Ethernet connectivity is native to each command module
  - Ethernet can be used to connect BACnet/IP system
  - Ethernet can be used to bridge between runs of LumaCAN to extend network length
  - BACnet/IP is native to each command module
    - BACnet/IP must be run to each cabinet—may require Ethernet/network switch

Physical
- Enclosure: NEMA type 1, IP20 protection; #16 US gauge steel; indoor only
- Mounting: surface or flush mount

Environmental
- Ambient temperature range: 32°-122°F (0°-50°C)
- Relative humidity: <90% non-condensing

Listings
- UL508, UL924, cUL
- Can be used to comply with IECC, ASHRAE 90.1, and 2016 Title 24, Part 6 occupancy/vacancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF, scheduling, demand response, and receptacle control requirements

Listings
- Relay modules backed by 10-year warranty
- Relay panels backed by 2-year warranty

*ARRA compliant panels available—consult factory for availability
## ORDERING INFORMATION

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<thead>
<tr>
<th>CAT. NO.</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Enclosures (all cabinets are surface mount with a locking door)</td>
<td></td>
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<tr>
<td>R08TC-100</td>
<td>GreenMAX Relay Cabinet, 8-Relay Size, NEMA 1</td>
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<tr>
<td>R16TC-100</td>
<td>GreenMAX Relay Cabinet, 16-Relay Size, NEMA 1</td>
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<tr>
<td>R32TC-100</td>
<td>GreenMAX Relay Cabinet, 32-Relay Size, NEMA 1</td>
</tr>
<tr>
<td>R48TC-100</td>
<td>GreenMAX Relay Cabinet, 48-Relay Size, NEMA 1</td>
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<tr>
<td>Command Modules (includes power supply with main processor unit), option 24VDC low voltage input card</td>
<td></td>
</tr>
<tr>
<td>RPM00-300</td>
<td>Main Command Module, 100-277VAC, 50/60Hz, no inputs, LumaCAN 3</td>
</tr>
<tr>
<td>RPM08-308</td>
<td>Main Command Module with 8-port low voltage input card, 100-277VAC, 50/60Hz, LumaCAN 3</td>
</tr>
<tr>
<td>RPM16-316</td>
<td>Main Command Module with 16-port low voltage input card, 100-277VAC, 50/60Hz, LumaCAN 3</td>
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<tr>
<td>Panel Interiors</td>
<td></td>
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<tr>
<td>R0800-000</td>
<td>Relay Insert Panel, empty with (8) spaces</td>
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<tr>
<td>R1600-000</td>
<td>Relay Insert Panel, empty with (16) spaces</td>
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<tr>
<td>R1616-1CB</td>
<td>Relay Insert Panel with (16) 1-pole RTC basic relays</td>
</tr>
<tr>
<td>R1616-1DS</td>
<td>Relay Insert Panel with (16) 1-pole dimming and switching relays</td>
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<tr>
<td>R1616-1TB</td>
<td>Relay Insert Panel with (16) 1-pole basic relays</td>
</tr>
<tr>
<td>R1616-2CB</td>
<td>Relay Insert Panel with (16) 2-pole RTC relays</td>
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<tr>
<td>Remote Inputs with Power Supply (all cabinet power supplies are rated 120-277VAC, 50/60Hz)</td>
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<tr>
<td>RL08-308</td>
<td>Remote Low Voltage Input Cabinet, 8 inputs, NEMA 1 enclosure, LumaCAN 3</td>
</tr>
<tr>
<td>RL16-316</td>
<td>Remote Low Voltage Input Cabinet, 16 inputs, NEMA 1 enclosure, LumaCAN 3</td>
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<tr>
<td>Relays (all relays are rated 30A, 120-230-277/347VAC, 50/60Hz), see GreenMAX relay data sheet for complete ratings</td>
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<tr>
<td>RELA Y-1CB</td>
<td>GreenMAX latching relay, 1-pole RTC basic</td>
</tr>
<tr>
<td>RELA Y-1DS</td>
<td>GreenMAX latching relay, 1-pole, dimming and switching, 0-10VDC dimming, sinking</td>
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<tr>
<td>RELA Y-1TB</td>
<td>GreenMAX latching relay, 1-pole basic</td>
</tr>
<tr>
<td>RELA Y-2CB</td>
<td>GreenMAX latching relay, 2-pole RTC</td>
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<tr>
<td>RELA Y-2TB</td>
<td>GreenMAX latching relay, 2-pole basic</td>
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<tr>
<td>RELA Y-BFM</td>
<td>Blank filler module</td>
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<tr>
<td>Cabinet Accessories</td>
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<tr>
<td>RGBAR-008</td>
<td>GreenMAX voltage barriers for 8-relay cabinets, 1 pair</td>
</tr>
<tr>
<td>RGBAR-016</td>
<td>GreenMAX voltage barriers for 16-, 32-, and 48-relay cabinets, 1 pair</td>
</tr>
</tbody>
</table>

NOTE: For GreenMAX digital switches and color change kits - see GreenMAX digital switches data sheet.

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**LEVITON SPECIFICATION SUBMITTAL**

<table>
<thead>
<tr>
<th>JOB NAME:</th>
<th>CATALOG NUMBERS:</th>
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<tbody>
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<td>JOB NUMBER:</td>
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GreenMAX® Digital Switches
Offers Programming Flexibility

Leviton GreenMAX® Digital Switches are 100% digital. Specifically designed for use with GreenMAX Relay Control Panels, GreenMAX Digital Switches utilize LumaCAN protocols for unparalleled programming flexibility. All communication and monitoring functions can be performed from any GreenMAX Digital Switch location. Simply connect the GreenMAX Handheld Display Unit (HDU) to any GreenMAX Digital Switch for easy programming and system control of all devices on the GreenMAX network. Available in 1-, 2-, 4-, 8-button and keyswitch configurations, these switches connect using RJ45 connectors and CAT6 cabling. For dimming applications, use 4-button switch with dimming module for control of 0-10V dimming circuits.

APPLICATIONS
• Heavy retrofit applications
• New construction projects
• Government facilities
• Office buildings
• Hospitals/medical offices
• Universities
• Restaurants
• Large campuses
• Any other location where centralized lighting control, programming and monitoring are required

FEATURES
• Models include 1-, 2-, 4-, 8-button and keyswitch configurations
• RJ45 connectors to provide IN and OUT connections to the LumaCAN network
• Can be used to comply with IECC, ASHRAE 90.1 and 2016 Title 24, Part 6 occupancy/vacancy sensing, 0-10V dimming, daylight harvesting, partial-ON, partial-OFF, scheduling, demand response, and receptacle control requirements
• Any button can be configured to control 0-10VDC dimming circuits
• Easy-to-access port on top of switch provides connectivity for the GreenMAX HDU
• Custom engraved labeling available on switch buttons and screwless wall plates
  - 1, 2, 4 button: up to 8 characters per two lines of text*
  - 8 button: up to 4 characters per one line of text*
• Install a mix of GreenMAX Relay Panels, Remote Input Cabinets and Digital Switches on a single LumaCAN
• Buttons can be programmed for ON, OFF, ON/OFF, dimmed raise/lower or single zone preset ON level
• Status LED for each button provides true relay status
• Matching screwless single-gang wall plate is supplied and digital switches are compatible with all available Decora® wall plates*
• Mounts in a standard depth wall box. All switches can be installed in a multi-gang application. The multi-gang wall plate is sold separately.
• Use with GreenMAX Relay Systems
• Available in White, Ivory, Light Almond and Gray. Color change kit available for Black and Red buttons (key switch stainless only).
• Draws its power from the LumaCAN
• Keyswitch includes a set of 2 keys, stainless steel wall plate, tamper resistant screws and installation tool*
• Keyswitch is spring return to the center position. Quarter turn of the key functions as a momentary switch input. Key can be removed in the center position only.

*Excluding keyswitch
PRODUCT DATA

DIMENSIONS

WIRING DIAGRAM

SPECIFICATIONS

Electrical
- Input Power: 24VDC (LumaCAN integral)
- Consumption: 1 Unit Load = 25mA (max)
- Connectors: RJ45
- Class 2
- Cables: CAT6

Environmental
- Ambient Temperature Range: 32 - 122°F (0 - 50°C)
- Relative Humidity: <90% non-condensing

Listings
- Complies with energy code requirements for IECC, ASHRAE 90.1 and Title 24

Warranty
- Limited 2-Year Warranty

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>CAT. NO.*</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDGSW-1Cx</td>
<td>GreenMAX Digital Switch, 1-Button, LumaCan3 (includes single gang wallplate)</td>
</tr>
<tr>
<td>RDGSW-2Cx</td>
<td>GreenMAX Digital Switch, 2-Button, LumaCan3 (includes single gang wallplate)</td>
</tr>
<tr>
<td>RDGSW-4Cx</td>
<td>GreenMAX Digital Switch, 4-Button, LumaCan3 (includes single gang wallplate)</td>
</tr>
<tr>
<td>RDGSW-8CW</td>
<td>GreenMAX Digital Switch, 8-Button, LumaCan3 (includes single gang wallplate), Color: White</td>
</tr>
<tr>
<td>RDGSW-1K3</td>
<td>GreenMAX Keyswitch (includes single gang Stainless Steel wallplate)**</td>
</tr>
<tr>
<td>RDGSW-1Ey</td>
<td>GreenMAX 1 Button Color Change Kit (includes single gang wallplate)</td>
</tr>
<tr>
<td>RDGSW-2Ey</td>
<td>GreenMAX 2 Button Color Change Kit (includes single gang wallplate)</td>
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<tr>
<td>RDGSW-4Ey</td>
<td>GreenMAX 4 Button Color Change Kit (includes single gang wallplate)</td>
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<tr>
<td>RDGSW-8Ey</td>
<td>GreenMAX 8 Button Color Change Kit (includes single gang wallplate)</td>
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<tr>
<td>RDGSW-1Fy</td>
<td>GreenMAX 1 Button Color Change Kit with Engraving (includes single gang wallplate)</td>
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<tr>
<td>RDGSW-2Fy</td>
<td>GreenMAX 2 Button Color Change Kit with Engraving (includes single gang wallplate)</td>
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<tr>
<td>RDGSW-4Fy</td>
<td>GreenMAX 4 Button Color Change Kit with Engraving (includes single gang wallplate)</td>
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<tr>
<td>RDGSW-8Fy</td>
<td>GreenMAX 8 Button Color Change Kit with Engraving (includes single gang wallplate)</td>
</tr>
</tbody>
</table>

* Replace x to indicate color: (W) = White, (I) = Ivory, (T) = Light Almond, (G) = Gray
Replace y to indicate color: (W) = White, (I) = Ivory, (T) = Light Almond, (G) = Gray, (R) = Red, (E) = Black
ARRA compliant models available - consult factory for availability
** Stainless steel wallplate cannot be engraved. Multi-gang keyswitch order requires a custom wallplate

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Integrated Room Control (IRC) Lighting Controllers

DESCRIPTION
The Integrated Room Control (IRC) Lighting Controllers are Decora® devices for controlling non-dimmable and dimmable luminaries connected to the IRC Controller. The IRC Lighting Controllers provide a unique control station with multi-function capabilities available in 1-, 2- and 4-button configurations. The devices come in white with a matching wallplate and color change kits are available.

OPERATION
The IRC Lighting Controllers work in conjunction with the features of the IRC which offers daylight harvesting, occupancy sensing, time clock inputs and manual-ON and partial-ON capabilities.
• RLVSW-4LW provides 4-button ON/OFF and Dim/Bright control as well as a Full Bright option
• The RLVSW-1LW provides 1-button ON/OFF control
• The RLVSW-2LW provides 2-button ON/OFF control

FEATURES
• Function description:
  - ON—all lights to daylight harvesting level
  - Bright—raise light levels with press hold or multiple press, temporary override of daylight harvesting level
  - Dim—lower light levels with press hold or multiple press, temporary override of daylight harvesting level
  - OFF—turn off lights
• Designer Decora styling complements any interior for sleek aesthetics
• Entry station utilizes industry standard buttons for room lighting control
• Can be used with stand-alone IRC System
• Enables Ladderless Commissioning™ of IRC Systems. Modify the daylight harvesting target level with the 4-button controller

DIMENSIONS

<table>
<thead>
<tr>
<th>1,2 &amp; 4 Button Controllers</th>
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<td>A  1.65” (42.06mm)</td>
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<tr>
<td>B  4.60” (117.07mm)</td>
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<tr>
<td>C  2.75” (69.85mm)</td>
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<tr>
<td>D  0.37” (9.55mm)</td>
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<tr>
<td>E  1.16” (29.51mm)</td>
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<td>F  2.68” (68.25mm)</td>
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**PRODUCT DATA**

### SPECIFICATIONS

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<tr>
<td>Input Voltage</td>
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<tr>
<td>Input Current</td>
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<tr>
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<tbody>
<tr>
<td>Operating Temperature Range</td>
<td>32-104°F (0-40°C)</td>
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<tr>
<td>Storage Temperature Range</td>
<td>14-158°F (-10-70°C)</td>
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<tr>
<td>Relative Non-Humidity</td>
<td>20-90% non-condensing</td>
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<td>Color</td>
<td>White, Color Change Kits available</td>
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<td>Installation</td>
<td>Low Voltage Class 2 Wiring</td>
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<tr>
<td>Warranty</td>
<td>Limited 2-Year Warranty</td>
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### ORDERING INFORMATION

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<th>DESCRIPTION</th>
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<td>RLVSW-1LW</td>
<td>1-button ON/OFF Controller for use with IRC System</td>
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<tr>
<td>RLVSW-2LW</td>
<td>2-button ON/OFF Controller for use with IRC System</td>
</tr>
<tr>
<td>RLVSW-4LW</td>
<td>4-button ON/OFF Controller for use with IRC System</td>
</tr>
<tr>
<td>RDGSW-1Ex*</td>
<td>1-button Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-2Ex*</td>
<td>2-button Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-4Ex*</td>
<td>4-button Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-1Fx*</td>
<td>1-button Custom Engraved Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-2Fx*</td>
<td>2-button Custom Engraved Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-4Fx*</td>
<td>4-button Custom Engraved Color Change Kit</td>
</tr>
</tbody>
</table>

*Replace x to indicate color: White (W), Ivory (I), Light Almond (T), Gray (G), Black (E) and Red (R).*

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**WIRING DIAGRAM**

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**DESCRIPTION**

Provolt™ Low Voltage Keypads are Decora® devices for controlling non-dimmable and dimmable luminaries connected to Provolt 0-10V Dimming Room Controllers (PRC). The Provolt Keypads provide a unique control station with multi-function capabilities available in 1-, 2- and 4-button configurations with a matching white wallplate. For additional colors, color change kits are available.

**OPERATION**

The Provolt Keypads work in conjunction with the features of the PRCs which offer daylight harvesting, occupancy sensing and manual-ON and partial-ON capabilities.

- **PL VSW-4LW** provides 4-button ON/OFF and Dim/Bright control as well as a Full Bright option
- The **PL VSW-1LW** provides 1-button ON/OFF control
- The **PL VSW-2LW** provides 2-button ON/OFF control

**FEATURES**

- Function description:
  - **ON**—all lights overridden to FULL ON
  - **Bright**—raise light levels with press hold or multiple press, temporary override of daylight harvesting level
  - **Dim**—lower light levels with press hold or multiple press, temporary override of daylight harvesting level
  - **OFF**—turn off lights
- Designer Decora styling complements any interior for sleek aesthetics
- Keypads utilize industry standard buttons for room lighting control

**DIMENSIONS**

<table>
<thead>
<tr>
<th>1, 2 &amp; 4 Button Switches</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.65” (42.06mm)</td>
</tr>
<tr>
<td>B</td>
<td>4.60” (117.07mm)</td>
</tr>
<tr>
<td>C</td>
<td>2.75” (69.85mm)</td>
</tr>
<tr>
<td>D</td>
<td>0.37” (9.55mm)</td>
</tr>
<tr>
<td>E</td>
<td>1.16” (29.51mm)</td>
</tr>
<tr>
<td>F</td>
<td>2.68” (68.25mm)</td>
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**PRODUCT DATA**

**SPECIFICATIONS**

<table>
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<tr>
<th>ELECTRICAL</th>
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<tbody>
<tr>
<td>Input Voltage</td>
<td>0-28V DC, 2mA-10mA</td>
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<table>
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<tr>
<th>ENVIRONMENTAL</th>
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<tbody>
<tr>
<td>Operating Temperature</td>
<td>32-104°F (0-40°C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>14-158°F (-10-70°C)</td>
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<tr>
<td>Relative Humidity</td>
<td>0-90% non-condensing</td>
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<table>
<thead>
<tr>
<th>PHYSICAL</th>
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</thead>
<tbody>
<tr>
<td>Color</td>
<td>White, color change kits available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>Low voltage Class 2 wiring, max wiring distance 800 feet</td>
</tr>
<tr>
<td>Warranty</td>
<td>Limited 5-Year Warranty</td>
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</table>

**WIRING DIAGRAM**

![Wiring Diagram]

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>CAT. NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLVSW-1LW</td>
<td>Provolt Keypads, 1-button ON/OFF controller for use with Provolt Room Controllers</td>
</tr>
<tr>
<td>PLVSW-2LW</td>
<td>Provolt Keypads, 2-button ON/OFF controller for use with Provolt Room Controllers</td>
</tr>
<tr>
<td>PLVSW-4LW</td>
<td>Provolt Keypads, 4-button ON/OFF controller for use with Provolt Room Controllers</td>
</tr>
<tr>
<td>RDGSW-1Ex*</td>
<td>1-button Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-2Ex*</td>
<td>2-button Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-4Ex*</td>
<td>4-button Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-1Fx*</td>
<td>1-button Custom Engraved Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-2Fx*</td>
<td>2-button Custom Engraved Color Change Kit</td>
</tr>
<tr>
<td>RDGSW-4Fx*</td>
<td>4-button Custom Engraved Color Change Kit</td>
</tr>
</tbody>
</table>

*Replace x to indicate color: White (W), Ivory (I), Light Almond (T), Gray (G), Black (E) and Red (R). Color change kits are blank and available for engraving.*

---

**Leviton Manufacturing Co., Inc. Global Headquarters**
201 North Service Road, Melville, NY 11747-3138  tel 800-323-8920  fax 800-832-9538  tech line (8:30AM-7:00PM ET Mon-Fri) 800-824-3005

**Leviton Manufacturing Co., Inc. Energy Management, Controls and Automation**
20497 SW Teton Avenue, Tualatin, OR 97062  tel 800-736-6682  fax 503-404-5594  tech line (6:00AM-4:00PM PT Mon-Fri) 800-959-6004

**Visit our Website at:** [www.leviton.com/provolt](http://www.leviton.com/provolt)  ©2016 Leviton Manufacturing Co., Inc. All rights reserved. Subject to change without notice.
GreenMAX®
DRC 2-Port Analog Interface (AI)

PRODUCT DESCRIPTION
The GreenMAX® DRC 2-Port Analog Interface (AI) allows the integration of low voltage inputs into the system. These inputs commonly include occupancy/vacancy sensors, photocells, and security and/or emergency system inputs.

SYSTEM DESCRIPTION
The GreenMAX DRC Room Control System offers a fully distributed room control system, with each room operating independently of others—no dependence on network processors or centralized controllers. This revolutionary system is fully configurable via the GreenMAX DRC app for smart devices, and can be used to comply with IECC, ASHRAE 90.1, and 2016 Title 24, Part 6 occupancy/vacancy sensing, multi-level lighting, daylight harvesting, partial-ON, partial-OFF, scheduling, exterior lighting, demand response and receptacle control requirements, and it is listed on the DesignLights Consortium (DLC) Qualified Products List (QPL) for Networked Lighting Control systems (certification pending).

GREENMAX DRC APP
Wirelessly commission, configure, control, monitor and provision the GreenMAX DRC system using the GreenMAX DRC App designed for any WiFi-enabled Android or iOS smart device.

APPLICATIONS
- Integration of any low voltage occupancy sensor with the GreenMAX DRC system
- Integration of any photocell with the GreenMAX DRC system
- Integration of any low voltage switch or contact closure with the GreenMAX DRC system
- Fire alarm or security system “all on”
- Use with GreenMAX DRC Room Controller supporting AI features
- Use with Sapphire™ for remote occupancy sensors, switches, or photocells

USE WITH THESE LEVITON SYSTEMS
- GreenMAX DRC
- GreenMAX relay panels
- Sapphire™ Touchscreen

WIRING DIAGRAMS

Leviton Manufacturing Co., Inc. Energy Management, Controls and Automation
20487 SW Teton Avenue, Tualatin, OR 97062 tech line 800-959-6004 fax 503-404-5594
©2019 Leviton Manufacturing Co., Inc. All rights reserved. Subject to change without notice.
GREENMAX® DRC 2-PORT ANALOG INTERFACE (AI)

PRODUCT DATA

Leviton Manufacturing Co., Inc. Energy Management, Controls and Automation
20497 SW Teton Avenue, Tualatin, OR 97062  tel 800-736-6682  fax 503-404-5594  tech line (6:00AM-4:00PM PT Mon-Fri) 800-959-6004

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Visit our Website at: www.leviton.com/emca
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CAT. NO. DESCRIPTION

DRID0-C02  GreenMAX DRC 2-Port AI, LumaCAN, DIN rail or surface mount
DRID0-CB2  GreenMAX DRC 2-Port AI, LumaCAN, mounted to blank plate for installation onto 4-11/16" back box

NETWORK COMMANDS & CONFIGURATION PROPERTIES

• Configured through the GreenMAX DRC app
• Configured as Input Type or Command Type
• Each input is configured independently
• When configured as input type:
  - Occupancy sensor
  - Input number
  - Delay time (0-60 seconds, 1-240 minutes)
  - Photocell
  - Input number
  - Max calibration level (0-2,048; default 2,048)
  - Momentary switch
  - Contact closure/maintained switch
  - Potentiometer
• When configured as command type:
  - Load shed
    - Active and inactive settings
    - Load shed 1/2/3, enable/disable
    - Load shed 1 & 2 & 3 disable
    - Do nothing
  - Behavior transition
    - Schedule #
    - Behavior #
    - Sensor delay time
    - Blink warn time override
    - Switch time override
  - Group control
    - Group number
    - Priorities
    - Level active and inactive settings

SPECIFICATIONS

ELECTRICAL

Power Input  +12-24VDC, 35mA+ connected device consumption
Power Output  As needed and available at the input (pass-through); short-circuit current limited trip point software configurable, default=100mA, max=1500mA
Number of Inputs  (2) contact closure, active high/low, 0-10V, 0-24V

CONNECTIVITY

Network Connections  (2) RJ45, CAT6 or better for connection to LumaCAN network. Termination provided via local termination switch.
Network Topology  Daisy chain, 1600’ max between repeaters
                  Home-run topology and network length up to 10,000’ can be achieved when using LumaCAN network repeaters (NPRPT)
                  Maximum 110 nodes between repeaters
                  Maximum 250 nodes on a LumaCAN network

OTHER

Mounting  Surface or DIN rail
Terminal Torque  7 in/lb
Listings  UL, cUL (File # E148771), RoHS, CE
Energy Codes  Can be used to comply with IECC, ASHRAE 90.1, and 2016 Title 24, Part 6 occupancy/vacancy sensing, multi-level lighting, daylight harvesting, partial-ON, partial-OFF, scheduling, exterior lighting, demand response and receptacle control requirements
Warranty  Limited 5-year

ORDERING INFORMATION
See questions below from Waynesboro Construction and provide answers accordingly.

1. Addendum #1 approved Jamestown Advanced Products Trash Cans and Benches. Now are shown on the site. Please clarify.

2. The tentative schedule showing five weeks from award of contract to start of the piping and structure installation is not feasible. It may take four weeks to fabricate and receive the structures after approval of the shop drawings. This is not including time to get contracts out, procure shop drawings and receive approval on the submittals.

3. Plan C-5: Should the Bus exit onto Urbana Pike have a stop sign in addition to the stop bar?

4. Plan C-5A: Are we to provide any of the signage in the “Figure 75-B”?

5. Plan C-5: Clarify the painted fire lane curbs. It is hard to distinguish the markings on the curb line.

6. Plan C-5: Are the interior site sign signs to have a 12” wide stop bar painting on the pavement? Are drawn by not identified.

Suggestion

Answer

1. Locations and quantities have been provided in Addendum 2.
2. Per Oak, the Construction Schedule will not be changed.

3. A Stop Sign is required. This will be clarified in Addendum 3.

4. Signage is required. This will be clarified in Addendum 3.

5. Per Oak, painted Fire Lane curbs correspond to the indicated Fire Lane signage.

6. Stop bars are required. This will be clarified in Addendum 3.
# Request For Information  ST2 PB-019

**Urbana Elementary School Replacement**  
3554 Urbana Pike  
Frederick, Maryland  21704  
Tel:  
Fax:  

**RFI #: ST2 PB-019**  
**Date Created: 1/30/2019**  

<table>
<thead>
<tr>
<th>Answer Company</th>
<th>Answered By</th>
<th>Author Company</th>
<th>Authored By</th>
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</thead>
<tbody>
<tr>
<td>Frederick County Public Schools</td>
<td>Brad Ahalt</td>
<td>Oak Contracting, LLC</td>
<td>Kerrigan Toth</td>
</tr>
<tr>
<td>191 South East Street</td>
<td>Phone: 301-644-5164</td>
<td>1000 Cromwell Bridge Road</td>
<td>Phone: 410-828-1000</td>
</tr>
<tr>
<td>Frederick, MD  21701</td>
<td>Fax: 301-644-5175</td>
<td>Towson, MD  21286</td>
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</tbody>
</table>

**Co-Respondent**

**Discipline**

**Category**

- VOICE OVER INTERNET PROTOCOL (VoIP) AND DATA SYSTEMS

- Technology

- Other

**Cc:**

- Company Name

- Contact Name

- Copies

- Notes

## Question

**Date Required: 2/6/2019**

See below questions from Signamax:

1. Per SECTION 27 15 00 part 1.3: We do not see a cable manufacturers specification other than TIA standards and performance characteristics. It does mention AMP is preferred but equivalent is acceptable. How can we submit a proposal for equivalent product?

2. Per SECTION 27 15 00 part 3.14 A: The specifications state the installation can only be done by FCPS approved cable vendors. Can we get a list of approved vendors?

## Suggestion

**Answer**

**Date Answered:**

1. Per Oak: Products other than listed manufacturer must meet the same characteristics. These will be reviewed during the normal submittal process. Substitution request is not required for these products.

2. FCPS has removed the requirement for prequalified cabling contractors.
After review of the Urbana Replacement Elementary School RFP; specifically Page 271500-1 (Section 27 15 00 – Voice Over Internet Protocol (VoIP) and Data Systems) Paragraph C. It states: “The computer network installer shall be on the list of pre-qualified cabling contractors and shall be approved by the Frederick County Board of Education.”

How does a vendor become a pre-qualified cabling contractor?

Suggestion

Answer

See Prebid RFI # 019 for answer to this question.
**Urbana Elementary School Replacement**
3554 Urbana Pike
Frederick, Maryland 21704

**Project #** 1707

**Tel:**
**Fax:**

**RFI #:** ST2 PB-021  **Date Created:** 1/30/2019

<table>
<thead>
<tr>
<th>Answer Company</th>
<th>Answered By</th>
<th>Author Company</th>
<th>Authored By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grimm + Parker Architects</td>
<td>Don Porter</td>
<td>Oak Contracting, LLC</td>
<td>Kerrigan Toth</td>
</tr>
<tr>
<td>11720 Beltsville Drive</td>
<td>Phone: 240-965-0713</td>
<td>1000 Cromwell Bridge Road</td>
<td>Phone: 410-828-1000</td>
</tr>
<tr>
<td>Suite 600</td>
<td>Fax: 301-595-0089</td>
<td>Towson, MD 21286</td>
<td>Fax: 410-828-7488</td>
</tr>
<tr>
<td>Calverton, MD 20705</td>
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</tbody>
</table>

**Co-Respondent**

**Author RFI Number**

**Subject**
Concrete footing

**Discipline**
Structural

**Category**
Drawing Discrepancies

<table>
<thead>
<tr>
<th>Cc: Company Name</th>
<th>Contact Name</th>
<th>Copies</th>
<th>Notes</th>
</tr>
</thead>
</table>

**Question**

See below from G. Moehrle Masonry:

Drawing S1.4 cuts detail 4/S4.1 through a section of wall that does not indicate a concrete footing. Detail 4/S4.1 indicates a concrete footing with a CMU foundation continuing to the slab. Please clarify.

**Suggestion**

**Answer**

**Response to RFI # ST2 PB-021**

There is no footing required. Just delete the section marks.

WOLFMAN & ASSOCIATES, P.C., Consulting Engineers

By: Steve Jiau  Date: 1/30/19
?? no footing shown

RECESS KITCHEN SLAB AREA FOR QUARRY TILE. SLOPE TO FLOOR DRAINS, REFER TO KITCHEN MECH./ARCHT. DWGS. FOR RECESS EXTENT.

DEPRESS SLAB FOR WALK IN FREEZER/REFRIGER, REFER TO THE KITCHEN PLANS FOR DEPTH & LOCATION.
See below from G. Moehrle Masonry:

Walls Types 3.1 and 8.1 indicate a “Self Adhered Sheet Air Barrier” and “2-1/2”Foamed-In-Place Insulation”(also part of an air barrier system).
  • Please confirm that both systems are required at walls types 3.1 and 8.1
  • If confirmed yes, please indicate the positioning of the sheet air barrier, i.e., on the CMU or on the sheathing

Please provide responses accordingly.

Suggestion

Both systems are required. The contents of all of the exterior wall assemblies are listed in order from exterior to interior, therefore the air barrier is applied to the sheathing.
**EXTERIOR WALL CONSISTING OF:**

7/8" METAL WALL PANEL TYPE 1  
METAL PANEL MOUNTING CLIPS  
SELF ADHERED SHEET AIR BARRIER  
5/8" GYPSUM SHEATHING  
2-1/2" FOAMED-IN-PLACE INSULATION  
3" VERT. GALV. Z-GIRT  
8" NOM. CMU  
R-VALUE: 20.0

**EXTERIOR WALL CONSISTING OF:**

7/8" METAL PANEL TYPE 1  
1/4" MOUNTING CLIPS  
5/8" GYPSUM SHEATHING  
7/8" METAL FURRING CHANNELS  
2" FOAMED-IN-PLACE INSULATION BETWEEN  
2-1/2" VERT. GALV. Z-GIRT  
5/8" EXTERIOR SHEATHING  
6" METAL STUDS W/ R-19 BATT INSULATION  
5/8" GYPSUM BOARD  
R-VALUE: 39.12

**EXTERIOR WALL CONSISTING OF:**

7/8" METAL PANEL TYPE 1  
1/4" MOUNTING CLIPS  
5/8" GYPSUM SHEATHING  
1" FOAMED-IN-PLACE INSULATION BETWEEN  
1-1/2" VERT. GALV. Z-GIRT  
5/8" EXTERIOR SHEATHING  
6" METAL STUDS W/ R-19 BATT INSULATION  
5/8" GYPSUM BOARD  
R-VALUE: 29.07
See below from G. Moerhle Masonry:

Regarding Specification 04 73 23 Manufactured Stone Cladding:

- **Section 1.2, Shop Drawings:**
  -- Reference is made to illustrating a precise layout of the stone pieces, including the numbering of each stone
  -- Section 2.1B of the same specification section tells us that this is a 2-piece ashlar pattern
  -- The 2-piece ashlar pattern would consist of 2 stone heights of random lengths, installed in a random pattern
  -- Neither listed manufacturer can meet the requirement of the Shop Drawing layout requirement of the specification if using a random ashlar pattern
  -- An illustration of the stone arrangement, joints, bonding, and anchoring can best be displayed with a mock-up panel
  -- Pre-mock-up, general illustration of the pattern can be reviewed from the manufacturers data, such as the attached brochure

- **Section 2.1 Products:**
  -- Item 2.1B1 lists ST-005 and 2-piece Ashlar Pattern
  -- The ST-005 is a 8” high x 24” long stone
  -- The 2-piece Ashlar Pattern contains only 4” and 6” nominal height stones of various random lengths; see page 3 of the attached brochure
  -- Please clarify the stone pattern, random 2-piece or a custom pattern
  -- This link, https://schuts.com/stone/building-stone/shouldice-designer-stone will take one to the Shouldice website where the same general observations can be made

Please provide responses accordingly.
Requirements have been revised by Addendum 2 per suppliers recommendations.
SECTION 04 73 23 - MANUFACTURED STONE CLADDING

PART 1 GENERAL

1.1 SECTION INCLUDES
   A. Manufactured stone cladding where indicated on the drawings.
      1. Terms "Manufactured Stone Cladding" and "Building Stone" to be interchangeable and of the same meaning within the Construction Documents.

1.2 SHOP DRAWINGS
   A. Indicate sizes and sections of stone, arrangements of joints and bonding, anchoring, dowelling and cramping.
   B. Each stone indicated on shop drawings must bear corresponding number marked on its back or bed or on the package labeling.

1.3 SUBMITTALS
   A. LEED Submittals: Comply with Section 018113.
      1. MR Credit 2: BPDO - Environmental Product Declarations
         a. For stone masonry: Industry-wide or product-specific EPD.

1.4 SAMPLES
   A. Submit three samples of limestone dimension stone to illustrate color and pattern range, and finish texture.

1.5 QUALITY ASSURANCE
   A. Fabricator: Company having sufficient capacity to quarry, cut, and deliver the stonework on schedule.
   B. Installer: Company or person specializing in commercial stone work with 10 years experience. Employ skilled stone fitters at the site to do necessary field cutting as stones are set.
   C. Obtain stone from a single quarry source with resources to provide materials of specified consistent quality.

1.6 MOCKUPS
   A. Incorporate into mock up specified in Section 04 20 00.

1.7 DELIVERY, STORAGE AND HANDLING
   A. Manufacturer shall deliver product to job site as scheduled.
   B. Manufacturer shall separate stone layers in each cube with spacers to prevent product damage.
   C. Stone cubes shall be shrink wrapped at time of delivery.
   D. Product shall be delivered on wooden pallets.
   E. Product shall be placed on stable soil.
   F. Product shall not be stacked greater than two cubes high.
   G. White products shall be stacked one cube high only.
   H. Product shall remain shrink wrapped until time of installation.
1.8 ENVIRONMENTAL REQUIREMENTS

PART 2 PRODUCTS
2.1 MANUFACTURERS
   A. Shouldice Estate Stone, Bradford Blend.
   B. Reading Rock; RockCast Caliza Stone Series.
      1. Ashlar Series, Ohio Split ST-005; 2-piece Ashlar Pattern.
      2. Color match to Architect's sample.

2.2 MATERIALS
   A. Masonry Units shall meet ASTM C90 Specifications.
   B. Units shall be manufactured with integral water repellent additive.
   C. Units shall be uniform and consistent in colour
   D. Refer to drawings for unit options locations and quantities.
   E. Mortar Types: Refer to Section 04 20 00, Unit Masonry.
      1. Loadbearing: Type S based on specifications.
      2. Non-Loadbearing: Type N based on specifications
      3. Mortar color shall be a custom color as selected by Architect.
      4. Mortar joint shall be concave unless otherwise specified.
   F. Veneer Anchorage and Ties: Refer to Section 04 20 00, Unit Masonry.

2.3 ACCESSORIES
   A. Anchors, Cramps, Dowels: to ASTM C1242, stainless steel, Type 304 as recommended by manufacturer.
   B. Bed Reinforcement: as specified in Section 04 20 00.
   C. Through-Wall and Flexible Flashing: as specified in Section 04 20 00.
   D. Weep Vents: as specified in Section 04 20 00.
   E. Sealant and Backer Rod: as specified in Section 07 90 05.

PART 3 EXECUTION
3.1 PREPARATION
   A. Apply asphalt emulsion to concrete surfaces, shelf angles, structural steel supports against which stone is to be applied.
   B. Clean stone surfaces by washing with stiff fiber brush and water.

3.2 SETTING STONE - GENERAL
   A. Set stones plumb, true, and level, to requirements indicated on drawings and approved shop drawings.
   B. Align stone edges and faces according to established relationships and indicated tolerances.
   C. Provide movement joints of widths and at locations indicated on drawings. Do not fill movement joints with mortar.
ADVANTAGES

The Ashlar Series offers dramatic benefits with variances in color, spec and design. All RockCast products are manufactured to the highest quality and testing standards in the industry.

* Design Flexibility – Choose from two similar mix designs, RockCast Architectural Modular Veneer (AMV) or Caliza Stone Series.

* Available in 4 textures and 4 unit heights.

* Pattern Flexibility – Design a repeating pattern utilizing the Cut Stone program. Or, achieve a random pattern with the Chiseled Tumbled texture.

* Ready Order – Availability in 5 - 6 weeks.

* Continuity in your design is easily achieved by combining with RockCast Custom Cast Stone profiles in matching or complementing colors throughout the project. Reference our custom cast stone Standard Color Selection for monotone and blends available in 5 - 6 weeks.

* Experience – Backed by industry experience and professionals who’ve been producing masonry products since 1947. Consistently produced to ASTM standards, ensuring product performance.

* Install using standard masonry practices.

* Durability – Can be used at grade.

* Moisture control – Manufactured with Rheopel Plus integral water repellent for enhanced long-term performance, per ACI530.

SPECIFICATIONS/INSTALLATION

MODULAR VENEER SPECIFICATIONS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>ASTM TEST METHOD</th>
<th>ASTM C90 SPEC. LIMITS</th>
<th>ROCKCAST AMV</th>
<th>CALIZA STONE SERIES</th>
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</thead>
<tbody>
<tr>
<td>Density (lbs. per cu. ft.)</td>
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<td>N.A.</td>
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<td>&gt;120 pcf</td>
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<td>Compressive Strength</td>
<td>C140</td>
<td>1900 psi</td>
<td>3000-5000 psi</td>
<td>2500 - 3500 psi</td>
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<tr>
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<td>C140</td>
<td>13%</td>
<td>&lt;6%</td>
<td>&lt;6%</td>
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<tr>
<td>Linear Shrinkage</td>
<td>C426</td>
<td>0.065%</td>
<td>&lt;.05%</td>
<td>.065%</td>
</tr>
</tbody>
</table>

CALIZA STONE SERIES SPECIFICATIONS

Caliza Stone Series units, in Chiseled Tumbled texture (Cantera), with physical dimensions and characteristics comply with ASTM C55 (concrete brick) and the physical properties of ASTM C568 (limestone dimension stone).

* Ashlar Series products are shipped and sold in “FULL CUBES ONLY” and packaged by height. Pulling from random cubes is required to create the desired patterns.

* Once the Chiseled Tumbled texture units are tumbled, some units will be broken. The broken pieces will not be culled but will be packaged/shipped providing additional random lengths. Smaller units (4” and 6”) are more likely to break during the tumbling process than larger units, therefore, providing more random lengths in those sizes.

LIFETIME WARRANTY

All of our RockCast products go through the same rigorous product testing and are backed with warranties to support our guarantees for quality.
PATTERN SAMPLES

Cut Stone Pattern
Repeating patterns under the Cut Stone program can be pre-designed using Smooth, Split, and Chiseled textures only. 16" x 24" full size smooth is available to be used in a 4 piece Cut Stone pattern only.

Random Pattern
Random patterns available only in Chiseled Tumbled texture.

SELECTIONS

COLOR OPTIONS
Units are available in monotone and blended colors. Select from 22 standard colors in the RockCast Modular Veneer Series mix design. Caliza Stone Series units are available in 8 standard colors. Reference each Series’ standard color selection on www.readingrock.com.

TEXTURE OPTIONS

SIZE AVAILABILITY

• Cut Stone Series units originate from 12" and 24" length pieces. 16" x 24" full size smooth is available to be used in a 4 piece Cut Stone pattern only.
• Chiseled Tumbled units are shipped in random lengths after tumbling.

LEADERS IN LEED®

Many Reading Rock products contribute to the achievement of LEED credits on projects. We proudly support the development of green product innovations and are committed to developing and improving our entire product line with respect to the environment. In fact, Reading Rock was one of the first cast stone manufacturers to devote resources to products with supplementary cementitious materials (SCM).
ABOUT READING ROCK

Since 1947, Reading Rock has had a passion for manufacturing quality building material products and providing exceptional services. While our level of dedication began on a small scale as a block manufacturer, today Reading Rock is recognized for solutions and services including: hardscapes, tile, architectural stone, brick, thin veneer, CMU and hearth. From the plant floor to the job site, we are committed to enhancing our customer partnerships through quick product turnaround, on-time delivery and our resolute focus on continuous improvement. At Reading Rock, we never relent on ways to improve our processes to ensure we exceed expectations. With state-of-the-art technology, certified technicians, in-house LEED® APs and GAs and engineers, we’re confident you’ll experience the Reading Rock difference by receiving the right products, on time, every time.

Reading Rock’s purpose is to help support and finance the initiatives of RettSyndrome.org. Every one of our associates helps to contribute to help those who can’t help themselves. For more information, visit RettSyndrome.org.

RettSyndrome.org’s mission is to fund research for treatments and a cure for Rett syndrome while enhancing the overall quality of life for those living with Rett syndrome by providing information, programs, and services.
Urbana Elementary School Replacement  Project # 1707
3554 Urbana Pike  Tel:  Fax:
Frederick, Maryland  21704

RFI #:  ST2 PB-025  Date Created:  1/31/2019

Answer Company  Answered By  Author Company  Authored By
Grimm + Parker Architects  Don Porter  Oak Contracting, LLC  Anthony Kukowski
11720 Beltsville Drive  Phone: 240-965-0713  3400 Stone Barn Drive  Phone: 410-828-1000
Suite 600  Fax: 301-595-0089  Frederick, MD  21704  Fax: 410-828-7488
Calverton, MD  20705

Co-Respondent  Author RFI Number

Subject  Discipline  Category
CMU Dowelling in Slab  Structural

Question  Date Required:  2/7/2019
Reference Drawings S1.1, S1.2, A1.1, A1.2, and ST2 PB-021  The CMU walls at classroom entrances are shown to be supported by the normal slab thickness with no provisions for dowelling the CMU to the slab.  In addition, the response to ST2 PB-021 confirmed the CMU walls along the Maintenance Corridor are supported directly on the slab.  Please review and advise if the slab should be thickened along the corridor wall lines and advise if drilled and epoxied dowels are acceptable.  Please provide direction for dowelling requirements.

Suggestion

Answer  Date Answered:

Response to RFI#: ST2 PB-025
1. The footings or thickened slabs are not required for interior non load-bearing walls.
2. See Note 3 at Exterior Wall Reinforcing Schedule on S-3.1 for reinforcing bars if required and these reinforcing bars do not need to be doweled into the slab-on-grade.

WOLFMAN & ASSOCIATES, P.C., Consulting Engineers
By:  Steve Jiau  Date:  2/1/19
**Request For Information  ST2 PB-026**

**Urbana Elementary School Replacement**  
3554 Urbana Pike  
Frederick, Maryland  21704  

**Project # 1707**  
Tel:       Fax:  

**RFI #:  ST2 PB-026 Date Created:  1/31/2019**

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<th>Answered By</th>
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<tr>
<td>Oak Contracting, LLC</td>
<td>Anthony Kukowski</td>
<td>Oak Contracting, LLC</td>
<td>Anthony Kukowski</td>
</tr>
<tr>
<td>3400 Stone Barn Drive</td>
<td>Phone: 410-828-1000</td>
<td>3400 Stone Barn Drive</td>
<td>Phone: 410-828-1000</td>
</tr>
<tr>
<td>Frederick, MD  21704</td>
<td>Fax: 410-828-7488</td>
<td>Frederick, MD  21704</td>
<td>Fax: 410-828-7488</td>
</tr>
</tbody>
</table>

**Subject**  
Slab Doweling Scope Clarification  

**Discipline**  
Architectural  

**Co-Respondent**  

**Category**  

**Frequent Question**  

**Date Required:  2/7/2019**

Received from Moehrle Masonry:

In conditions where CMU walls bear on slab, no details or notes have been observed indicating that the CMU is to be doweled to the slab via a drilled and epoxied dowel. There are various details that do show 'L' shaped rebar cast into the slab, terminating in the CMU cores. Please confirm that drilled & epoxied doweling of CMU walls are not part of Bid 4A.

**Suggestion**

**Answer**  

Date Answered:  1/31/2019  

If dowels are required for CMU walls supported directly on slab, the 4A contractor will responsible to furnish and install.
Urbana Elementary School Replacement  Project #: 1707
3554 Urbana Pike  Tel:  Fax:
Frederick, Maryland  21704

RFI #: ST2 PB-027  Date Created: 2/1/2019

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<td>Don Porter</td>
<td>Oak Contracting, LLC</td>
<td>Kerrigan Toth</td>
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<tr>
<td>11720 Beltsville Drive</td>
<td>Phone: 240-965-0713</td>
<td>1000 Cromwell Bridge Road</td>
<td>Phone: 410-828-1000</td>
</tr>
<tr>
<td>Suite 600</td>
<td>Fax: 301-595-0089</td>
<td>Towson, MD 21286</td>
<td>Fax: 410-828-7488</td>
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<tr>
<td>Calverton, MD 20705</td>
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Co-Respondent  Author RFI Number

Subject  Discipline  Category
Mondo substitution request  Architectural  Contractor Suggestion / Upgrade

Cc:  Company Name  Contact Name  Copies  Notes

Question  Date Required: 2/8/2019
See attached substitution request from Dynamic Sports Construction, Inc. recommending their products be accepted for the athletic flooring system. Please review and advise.

Suggestion

Answer  Date Answered:
Not an acceptable substitution. This appears to be a poured in place system. Specified system is prefabricated surfacing.
### SUBSTITUTION REQUEST

**Project:** Urbana Elementary School Replacement  
**To:** Oak Contracting  
**Re:** Urbana Elementary School

<table>
<thead>
<tr>
<th>Specification Title:</th>
<th>Resilient Athletic Flooring</th>
<th>Description:</th>
<th>Product</th>
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<tr>
<td><strong>Section:</strong></td>
<td>096566</td>
<td><strong>Page:</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Article/Paragraph:</strong></td>
<td>Part 2 Paragraph 2.1 &amp; 2.2</td>
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**Proposed Substitution:** DynaForce  
**Manufacturer:** Dynamic Sports  
**Trade Name:** N/A  
**Installer:** Dynamic Sports

<table>
<thead>
<tr>
<th><strong>Address:</strong></th>
<th>301 Sonny Drive, Leander, TX 78641</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model No.:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Phone:</strong></td>
<td>512-260-6722</td>
</tr>
<tr>
<td><strong>Model No.:</strong></td>
<td>same as above</td>
</tr>
<tr>
<td><strong>Phone:</strong></td>
<td>same as above</td>
</tr>
</tbody>
</table>

**History:**  
- [ ] New product  
- [ ] 2-5 years old  
- [X] More than 10 years old

**Differences between proposed substitution and specified product:**  
Products are equal.

- [X] Point-by-point comparative data attached - REQUIRED BY A/E

**Reason for not providing specified item:** Competitive bidding.

**Similar Installation:**  
**Project:** Henrietta Recreation Center  
**Architect:** Passerro Associates  
**Owner:** Town of Henrietta  
**Date Installed:** October 2016

| **Address:** | 605 Caulkins Rd.  
|--------------|------------------|
| **Owner:** | Town of Henrietta  
| **Date Installed:** | October 2016 |
| **Proposed substitution affects other parts of Work:** | [X] No |

**Savings to Owner for accepting substitution:** N/A ($_______)  
**Proposed substitution changes Contract Time:**  
- [ ] No  
- [ ] Yes [Add]  
- [ ] [Deduct] _______ days.

**Supporting Data Attached:**  
- [ ] Drawings  
- [X] Product Data  
- [ ] Samples  
- [ ] Tests  
- [ ] Reports  
- [ ] _______
The Undersigned certifies:
- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: 
Signed by: 
Firm: Dynamic Sports Construction, Inc. 
Address: 301 Sonny Drive, 
Leander, TX 78641
Telephone: 512-260-6722

A/E's REVIEW AND ACTION
- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: 
Date: 

Additional Comments: 

Contractor
Subcontractor
Supplier
Manufacturer
A/E

Copyright 1996, Construction Specification Institute,
601 Madison Street, Alexandria, VA 22314-1791
September 1996
CSI Form 13.1A
PART 1 – GENERAL

1.1 DESCRIPTION
A. The DynaForce® synthetic flooring system as supplied and installed by Dynamic Sports Construction, Inc. is a high quality, true dual-durometer system. This system incorporates a 4mm to 14mm base-mat and a seamless 2mm polyurethane surface.

1.2 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General Terms and Conditions of the Contract and Division 1 of the specifications shall apply to this section.

1.3 SECTION INCLUDES
A. Seamless, 2mm polyurethane resin over prefabricated rubber base-mat including adhesive, finish coating and gameline markings.

1.4 REFERENCES
A. Applicable Publications: The following publication forms a part of this specification to the extent referenced thereto:

1.5 SUBMITTALS
A. Submit under provisions of Section 01300.
B. Shop Drawings: Indicating gameline layouts and track markings in accordance with the NCAA and NFHSFA regulations. Include borders, logos, free-throw zones/lanes and keys as applicable.
C. Product Data: Specifications for all materials and manufacturers installation instructions.
D. Samples: 4” x 6” samples of each indicating color and texture of that specified. Submit all available linestriping colors.
E. Submit to owner complete instructions for care and maintenance.
F. Submit copy of manufacturers sample warranty.

1.6 QUALITY ASSURANCE
A. Qualifications: Installer shall be a full-time employee of flooring contractor with a minimum of 3 years experience with specified floor system.
B. Contractor shall have completed at least ten (10) facilities with the specified system in the last year.

1.7 WARRANTY
A. Resilient sports flooring is warranted against defects in materials and workmanship for a period of one (1) year from the date of installation. The warranty excludes damage or defects caused by improper construction or design of the sub-floor, by subsequent deterioration of the sub-floor, moisture migration, hydrostatic pressure, neglect, lack of maintenance, vandalism, abuse or acts of God.

PART 2 – PRODUCTS

2.1 MANUFACTURERS
A. Available manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:
   2. Floor system is based on Dynamic Sports Construction, Inc. products.

3. Other floor systems meeting the requirements of this specification must submit technical data to Architect ten (10) days prior to bid.

2.2 PHYSICAL PROPERTIES
A. Polyurethane top layer shall meet the following physical properties:
   1. Consistency .................. Liquid
   2. Non Volatile percentage ........ 100%
   3. Shore Hardness (DIN 53505) ....... 80 Shore A
   4. Tensile Strength (53517) ........... min. 1400 psi
   5. Elongation at Break (DIN 53504) .... 300%
   6. Tear Strength .......................... min. 35 N/mm
   7. Inflammability of Top Layer (DIN 51960) ................ Class 1/Not flammable

B. Prefabricated rubber base layer shall meet the following physical properties:
   1. Density (ASTM D-297) .................. 0.45 pcf
   2. Tensile Strength (ASTM D-412) .... 88%
   3. Elongation (ASTM D-412) ............ 97%
   4. Compressibility (ASTM F-36A) at 50 psi.......................... 20 % Compression....87% of Recovery at 100 psi................. 91% recovery at 200 psi.......................... 91% recovery (25% deflection, 22 hours at 158 degrees F)
   5. Die Tear PPI (ASTM-624) ............ 30ppi
   6. Thickness ................................ 4mm to 14mm
   7. Flexibility (ASTM F-147) ............ 0-1
   8. Compression Set B (ASTM D-395) ............. 26 % of Recovery @ 25% deflection (158F / 22 hrs)
   9. Compression Set (DIN 53517) ........... 1.9 %
   10. Ball Bounce (DIN 18032) .......... > 98 % lower value for 14 mm + 3 mm system
   11. Coefficient of Friction (DIN 18032) ........ 0.4 - 0.7
   12. Shock Absorption DIN 18032 (force reduction) ...20%-45%
   13. Impact Resistance ....................... 11 Nm
   14. Inflammability (DIN 51960) ........ Class I
   15. Resistance Rolling Load (DIN 18032).No Damage
   16. Remaining Indentation ........... <0.5mm
   17. Wear Resistance- 1000 cycles ......<4 grams loss
   18. Moisture Absorption ................. a. Surface 0%
   19. b. Base Mat 20.8%
   20. Heat Resistance ...................... .098 m2K/W (Unaffected from -20F to 135F)
2.3 DynaForce™ Base-mat Adhesive
   A. Two-component polyurethane adhesive applied at a rate of 750g/m2 (0.15lb/sf).

2.4 DynaForce™ Base-mat
   A. Prefabricated rubber mat made of all recycled rubber granules bound with MDI polyurethane binder with a constant thickness of 4mm to 14mm (as specified). No liquid-applied polyurethane base layers will be accepted.

2.5 DynaForce™ Sealer
   A. A two-component, thixotropic polyurethane sealer applied at a rate of 600g/m2 (0.12lb/sf).

2.6 DynaForce™ Resin
   A. Pigmented, two-component polyurethane wear layer shall be applied at a rate of 1350g/m2 (0.278lb/sf @ 1mm thickness). The wear layer shall be self-leveling and result in a total polyurethane thickness of 2 mm (0.556lb/sf total).

2.7 DynaForce™ Finish Coating
   A. Two-component pigmented polyurethane matte-finish shall be applied at a rate of 140g/m2 (0.03lb/sf), either by spray application, or lambs wool roller. Color to be selected from manufacturers standard color range. Total thickness of flooring system shall be as specified by architect.

PART 3 – EXECUTION

3.1 WORKING CONDITIONS
   A. The building shall be dry, closed in, lighted and permanently heated. The temperature shall be maintained at a minimum of 65 degrees F and relative humidity at a maximum of 50% for 48 hours prior to, during and 48 hours after installation. The concrete shall be dry with a smooth steel troweled finish. No curing agents or compounds shall be used on the concrete. Variations in the sub-floor shall not exceed plus or minus 1/8” within a 10’ radius. The installation area shall be closed to all traffic for a period of ten (10) days.

3.2 BASE-MAT
   A. Thoroughly mix the DynaForce® Base-mat adhesive and apply directly to the concrete sub-floor with a notched trowel at a rate of 0.15 lbs/sf.
   B. Roll base-mat into fresh adhesive. Do not allow compression fit at any seams. Roll all base-mat applications with a 100lb. linoleum roller, continue to repeat rolling process as necessary to ensure adhesive transfer.

3.3 SEAL COAT
   A. Thoroughly mix the DynaForce® Sealer. Apply to the base-mat with a flat steel trowel. Allow the sealer coat to cure before applying Resilient Layer.

3.4 RESILIENT LAYER
   A. Thoroughly mix the DynaForce® Resin to achieve 2mm thickness. Sand any imperfections and tack clean floor prior to application of matte finish.

3.5 MATTE FINISH
   A. Mix pigmented DynaForce® Finish Coating. Apply with airless sprayer or roller; apply at a rate of 0.03lbs/sf.

3.6 GAME LINES
   A. Lay out and tape game lines using approved taping machine. Mix two-component game line paint and roller apply. Remove tape.
# VOC Emission Test Certificate

**Product Name:** DynaForce

**Company:** Dynamic Sports Construction, Inc

**Company Website:** www.dynamicsportsconstruction.com

**Product Type:** Flooring (all types)

**Date Produced:** 9/26/2018

**Certificate Information**

- **Certificate No.:** 181019-01
- **Certified By:** Raja S. Tannous, Laboratory Director
- **Date:** October 19, 2018


## Acceptance Criteria and Results Demonstrating Compliance of Product Sample to Referenced Standard:

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<tr>
<th>Exposure Scenario</th>
<th>Individual VOCs of Concern</th>
<th>Formaldehyde</th>
<th>TVOC</th>
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<tr>
<td></td>
<td>Criterion</td>
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<td>Range</td>
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<tr>
<td><strong>School Classroom</strong></td>
<td>≤ ¼ Chronic REL</td>
<td>≤ 9.0 μg/m³</td>
<td>&gt; 0.5 - 4.9 mg/m³</td>
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<tr>
<td><strong>Private Office</strong></td>
<td>≤ ¼ Chronic REL</td>
<td>≤ 9.0 μg/m³</td>
<td>&gt; 0.5 - 4.9 mg/m³</td>
</tr>
</tbody>
</table>

| Product Coverage | Not applicable |

1. Exposure scenarios & product quantities for classroom & office are defined in Tables 4-2 – 4-5 (CDPH Std. Mtd. V1.2-2017)
2. Maximum allowable concentrations of individual target VOCs are specified in Table 4-1 (Ibid.)
3. Maximum allowable formaldehyde concentration is ≤ 9 μg/m³, effective Jan 1, 2012; previous limit was ≤ 16 μg/m³ (Ibid.)
4. Information only; predicted TVOC Range in three categories, i.e., ≤ 0.5 mg/m³, > 0.5 - 4.9 mg/m³, and > 5.0 mg/m³
5. Information and applicable only to tests of wet-applied products: grams of sample applied per square meter of substrate

### Standards & Codes Recognizing CDPH Standard Method V1.2 (partial list)

- USGBC LEED Version 4.1, BD&C, ID&C
- The WELL Building Standard
- ANSI/GBI 01, Green Building Assessment Protocol
- Green Guide for Healthcare V2.2


Berkeley Analytical is an independent, third-party laboratory specializing in the analysis of organic chemicals emitted by and contained in building products, finishes, furniture, and consumer products. We are an ISO/IEC 17025 accredited laboratory (IAs, TL-383); all standards used in performing this test are in Berkeley Analytical’s scope of accreditation.

**Disclaimer:** This certificate of compliance affirms that: 1) A sample of the listed product was tested according to the referenced standard; 2) The measured VOC emissions from the sample were evaluated for the defined exposure scenarios; and 3) The results meet the acceptance criteria of the referenced standard(s). Berkeley Analytical is not responsible for any claims regarding a product or products entered into commerce that may be based on this test. Berkeley Analytical provides this certificate of compliance "AS IS" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

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College of Southern Maryland

Matapeake MS – Stevensville, MD
### PHYSICAL PROPERTIES COMPARISON - Urbana Replacement Elementary School Section 096566 Resilient Athletic Flooring

<table>
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<tr>
<th>Test Analysis</th>
<th>DynaForce</th>
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<tr>
<td>Elongation at Break</td>
<td>min 300%</td>
<td>230%</td>
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<tr>
<td>Tensile Strength, psi</td>
<td>Min 1400</td>
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<td>Coefficient of Friction</td>
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<td>Hardness Shore (ASTM/D2240) Wear Layer</td>
<td>80 Shore A +/- 5%</td>
<td>Shore A 68 +/- 5%</td>
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<td>Critical Radiant Flux /Flamibility</td>
<td>Class 1 not Flammable (Din 519610)</td>
<td>Class 1</td>
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<tr>
<td>Static Load Limit</td>
<td>≥ 0.004</td>
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<tr>
<td>Green Guard Certification</td>
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<td>Total Thickness</td>
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<td>Made in the USA</td>
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<tr>
<td>Warranty</td>
<td>As Per specification</td>
<td>As Per Specifications</td>
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****Standards & Codes Recognizing CDPH Standard Method V1.2 (partial list)
- USGBC LEED Version 4, BD&C, ID&C
- The WELL Building Standard
- ANSI/GBI 01, Green Building Assessment Protocol
- Green Guide for Healthcare V2.2
Request For Information  ST2 PB-028

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<td>3554 Urbana Pike</td>
<td>Tel:       Fax:</td>
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<td>Frederick, Maryland  21704</td>
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<tr>
<td>Grimm + Parker Architects</td>
<td>Don Porter</td>
</tr>
<tr>
<td>11720 Beltsville Drive</td>
<td>Phone: 240-965-0713</td>
</tr>
<tr>
<td>Suite 600</td>
<td>Fax: 301-595-0089</td>
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<tr>
<td>Calverton, MD  20705</td>
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<td>Received from Waynesboro Construction:</td>
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<tr>
<td>Reference Drawing A9.4. What type of lockers are to be provided at Custodial Office 123?</td>
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<th>Suggestion</th>
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<table>
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<tr>
<th>Answer</th>
<th>Date Answered:</th>
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<tbody>
<tr>
<td>Lockers at C123 to be type L4. This will be included in Addendum 3.</td>
<td></td>
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</table>
See questions below from Kinsley and provide responses accordingly.

1. In regard to the entry sign, E18/A-0.5 indicates mounting post is by sign manufacturer. Contract package 5A-2.39 indicates 5A is responsible for any steel. Contract package 2A-2.52 seems to assign signposts to 2A. Please clarify if 5A is responsible for any sign posts and if so, which ones.

2. A6 & A10/A-1.12 call out a ¼” continuous galv. steel bent plate by CFMF contractor. Please confirm the plate isn’t in the 5A package.

3. A6 & A12/A-3.7 call out a ¼” continuous galv. steel bent plate by CFMF contractor. Please confirm the plate isn’t in the 5A package.

4. J18, J6 & A6/A3.9 call out a ¼” continuous galv. steel bent plate by CFMF contractor. Please confirm the plate isn’t in the 5A package.

5. A6 & E6/A3.10 call out a ¼” continuous galv. steel bent plate by CFMF contractor. Please confirm the plate isn’t in the 5A package.

6. The following items in Spec 05 50 00 can be ambiguous. Are these part of the 5A package? If so, please identify specific items for each and reference the details pertaining to each.
   a. Steel framing and supports for countertops
   b. Steel framing and supports for mechanical and electrical equipment.
   c. Steel framing and supports for applications where framing and supports are not specified in other sections.
   d. Miscellaneous metal trim.
e. Miscellaneous storm drainage piping specialties.

f. Pipe grid.

7. Regarding Spec 05 50 00-2.3-B. Shop Finish (stairs, ladders, frames, etc.): the only items I see called out as galvanized and powder coated are the exterior rails at the loading dock. Please indicate which stairs, ladders and frames (or any other items) are galvanized and powder coated.

8. Our understanding is that 05A will furnish interior items as primed only (no galvanizing unless specifically indicated) and exterior items as galvanized only, without primer or finish coat (except for rails at loading dock and other items depending on response to question above). Please confirm this is correct.

9. I’m not seeing any stair gates. Spec 05 50 00-2.3-C gives instructions for shop finish on stair gates, where are these located?

Suggestion

Answer Date Answered:

1. Per Oak: 5A Contractor is responsible for 4"x4" galvanized steel post and associated anchor bolts for the site sign. All other exterior sign posts are by 2A Contractor.

2. Per Oak: 5A Contractor shall supply plate in accordance with 5A Scope Item 2.38.

3. Per Oak: 5A Contractor shall supply plate in accordance with 5A Scope Item 2.38.

4. Per Oak: 5A Contractor shall supply plate in accordance with 5A Scope Item 2.38.

5. Per Oak: 5A Contractor shall supply plate in accordance with 5A Scope Item 2.38.

6. Per Oak: These items are clarified in the Specification Cross-Reference sections for each contract package. 5A Contractor is responsible to review all scope items (i.e. 2.12 and 2.24) and the remainder of the contract documents for responsibility of all referenced sections.

7. Exterior Guards and Handrails have been revised to Aluminum per Addendum 2. Ladders are noted and specified as galvanized. Roof stair is noted and specified as galvanized.

8. It is the responsibility of the bidder to review the Contract Documents thoroughly to determine the extent of the requirements. All exterior steel shall be hot-dipped galvanized unless specifically noted otherwise. Interior steel requiring hot-dipped galvanized will be where specifically noted.

9. Stair gates are not required. This will be deleted by Addendum 3.
February 1, 2019

URBANA ELEMENTARY SCHOOL REPLACEMENT
BID PACKAGE
ADDENDUM NO. 2
21740.00

TO THE CONTRACT DRAWINGS AND SPECIFICATIONS FOR THE REFERENCED PROJECT, DATED JANUARY 10, 2019, AS PREPARED BY GRIMM AND PARKER ARCHITECTS, 11720 BELTSVILLE DRIVE, SUITE 600, CALVERTON, MARYLAND 20705.

This Addendum includes changes and clarifications to the Contract Documents. The information includes the following:

SPECIFICATION ITEMS:

ITEM NO. 1: SECTION 00 01 03 TABLE OF CONTENTS
TOC-2 DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES
ADD 06 12 19 STRUCTURAL INSULATED PANELS
TOC-7 DIVISION 31 – EARTHWORK
ADD 316317 SHORT AGGREGATE PIER FOUNDATION SYSTEMS

ITEM NO. 2: SECTION 04 73 23 MANUFACTURED STONE CLADDING
047323-1 Paragraph 1.3
DELETE Paragraph B.
047323-2 Paragraph 2.1.B.1
SUBSTITUTE Ashlar Series, Caliza “Ohio”, Split tumbled finish; 2-piece Ashlar Pattern consisting of 4 inch and 6 inch high nominal stone pulled from two pallets, in random lengths.

ITEM NO. 3: SECTION 06 12 19 STRUCTURAL INSULATED PANELS
ADD This section in its entirety included in this Addendum.

ITEM NO. 4: SECTION 08 71 00 DOOR HARDWARE
SUBSTITUTE This section in its entirety with section included in this Addendum.

ITEM NO. 5: SECTION 09 65 00 RESILIENT FLOORING
096500-3 Paragraph 2.1
ADD D. Luxury Vinyl Tile (See Alternate) complying with ASTM F 1700, Class III, Type B.
1. Acceptable Products
2. Thickness: 2.5 mm.
3. Wear Layer: 40 mil. Reduced wear layer will be acceptable contingent on meeting the applicable warranty listed below.
5. Size: 12 inches x 12 inches.
6. Color: As selected by Architect from the full line of colors and patterns.
7. Floor Pattern: Match pattern provided by Architect.
8. Indoor Air Quality: FloorScore Certification.
ITEM NO. 6: SECTION 10 14 00 SIGNAGE
10 14 00-5 Paragraph 2.6.A.3 SUBSTITUTE
Size: 4'-0" high by 8'-0" wide by 1'-0" deep.

ITEM NO. 7: SECTION 22 42 16.13 COMMERCIAL LAVATORIES
2242 16.13-3 Paragraph 2.3.A.1 ADD
e. Moen, Inc.
2242 16.13-4 Paragraph 2.3.B.1 ADD
e. Moen, Inc.

ITEM NO. 8: SECTION 22 42 16.16 COMMERCIAL SINKS
2242 16.16-7 Paragraph 2.4.B.1 ADD
g. Moen, Inc.
2242 16.16-7 Paragraph 2.4.C.1 ADD
g. Moen, Inc.
2242 16.16-8 Paragraph 2.4.D.1 ADD
g. Moen, Inc.

ITEM NO. 9: SECTION 22 42 23 COMMERCIAL SHOWERS, RECEPTORS, AND BASINS
224223- Paragraph 2.1.B.1 ADD
d. Moen, Inc.

ITEM NO. 10: SECTION 316317 SHORT AGGREGATE PIER FOUNDATION SYSTEMS ADD
This section in its entirety included in this Addendum.

ITEM NO. 11: SECTION 32 30 10 MODULAR PLAYGROUND EQUIPMENT SUBSTITUTE
This section in its entirety with section included in this Addendum.

DRAWING ITEMS: TITLE SHEET
ITEM NO. TS1: SHEET TS-2 LIST OF DRAWINGS ADD
Drawing C-4P SWM PROFILES to Civil List of Drawings.

DRAWING ITEMS: CIVIL
ITEM NO. C1: SHEET C-0 Cover Sheet SUBSTITUTE
This sheet in its entirety with revised sheet included in this Addendum. REVISE
Sheet index.

ITEM NO. C2: SHEET C-1A DEMOLITION PLAN SUBSTITUTE
This sheet in its entirety with revised sheet included in this Addendum. REVISE
Extent of sidewalk to be removed.
ADD Demo trees in water meter easement.

ITEM NO. C3: SHEET C-1B DEMOLITION PLAN SUBSTITUTE
This sheet in its entirety with revised sheet included in this Addendum. ADD
Demo of sidewalk and deck.
<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>SHEET C-2A</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>C4</td>
<td>EROSION AND SEDIMENT CONTROL PLAN</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Sheet sequence callout notes numbers updated.</td>
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<td>C5</td>
<td>EROSION AND SEDIMENT CONTROL PLAN</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Sheet sequence callout notes numbers updated.</td>
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<td>C6</td>
<td>EROSION AND SEDIMENT CONTROL DETAILS</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Sequence Of Construction.</td>
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<td>C7</td>
<td>EROSION AND SEDIMENT CONTROL PROFILES</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Basin A Sections.</td>
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<td>C8</td>
<td>EROSION AND SEDIMENT CONTROL DETAILS</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. ADD Filter Log Detail. REVISE Trap B Profile.</td>
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<td>C10</td>
<td>SITE PLAN</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. ADD Sidewalk And Concrete Bridge Over Outfall At EW-44.</td>
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<td>C11</td>
<td>SITE DETAILS</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. ADD Detail 12 Concrete Handicap Ramp Section.</td>
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<td>C12</td>
<td>PLAY STRIPING DETAILS</td>
<td>SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. ADD Renumber Detail Callouts. Intermediate Striping Plan View.</td>
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<td>SEWER PROFILE</td>
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ITEM NO. C14: SHEET C-3K SEWER PROFILE
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Profile From S-4 To Property Line.

ITEM NO. C15: SHEET C-3M WATER PROFILE
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Profile Stationing and Length.

ITEM NO. C16: SHEET C-3N WATER PROFILE
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Profile Stationing and Length.

ITEM NO. C17: SHEET C-4A GRADING PLAN
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Location Of MH-26.
REVISE Revised Alignment of Stormdrain MH -10 to HW-8.
ADD Handicap Ramps at Both School Entrances.

ITEM NO. C18: SHEET C-4B GRADING PLAN
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Grading and Location Of I-47.
REVISE The Alingment of Storm Drain MH-42 to EW-44.
REVISE Grading at EW-44 and Added Riprap and Sidewalk.

ITEM NO. C19: SHEET C-4C STORMDRAIN PROFILES
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Profile from MH-41 to EW-44.

ITEM NO. C20: SHEET C-4D STORMDRAIN PROFILES
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Profile from MH-6 to HW-8.

ITEM NO. C21: SHEET C-4K STORMDRAIN PROFILES
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Microbioretension Faciltiy Typical Section.

ITEM NO. C22: SHEET C-4L SWM PROFILES
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE SWM-1 and SWM-2 Profiles.

ITEM NO. C23: SHEET C-4M SWM PROFILES
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE SWM-3 and SWM-4 Profiles.

ITEM NO. C24: SHEET C-4N SWM PROFILES
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE SWM-6 and SWM-7 Profiles.

ITEM NO. C25: SHEET C-4P SWM PROFILES
ADD This sheet in its entirety with sheet included in this Addendum.
ITEM NO. C26: SHEET C-5 SIGNAGE & STRIPING PLAN
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
ADD Handicap Signs in After Hour Parking.

DRAWING ITEMS: LANDSCAPE ARCHITECTURE

ITEM NO. L1: SHEET L-2.1 LANDSCAPE PLAN
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
ADD Trees in Courtyard
REVISE SWM Plantings

ITEM NO. L2: SHEET L-2.3 LANDSCAPE PLAN
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
ADD Additional Species.
REVISE Plant Quantities.

DRAWING ITEMS: ARCHITECTURAL

ITEM NO. A1: SHEET A-0.5 ARCHITECTURAL SITE PLAN
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A2: SHEET A-0.6 SITE DETAILS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A3: SHEET A-1.3 PARITAL FIRST FLOOR PLAN – AREA C1
REVISE Exterior Handrails and Guardrails at loading dock ramp to be Aluminum in lieu of Powder Coated Galvanized.

ITEM NO. A4: SHEET A-1.6 PARITAL SECOND FLOOR PLAN – AREA B
CLARIFY This sheet was not substituted by Addendum 1. The sketch SKA-1.6.1 was the only revision to this sheet.

ITEM NO. A5: SHEET A-3.1 FINISH SCHEDULE
REVISE Room No. A204 base to PT, and all walls to HPC.
REVISE Room No. B106C base to PT, and all walls to HPC.
REVISE Room No. B202 base to PT, and all walls to HPC.
REVISE Room No. C126 all walls to HPC.

ITEM NO. A6: SHEET A-3.2 DOOR SCHEDULE
SUBSTITUTE This sheet in its entirety with revised sheet included with this Addendum.

ITEM NO. A7: SHEET A-4.11 WALL SECTIONS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A8: SHEET A-5.2 STAIR PLANS AND SECTIONS
REVISE Details F14 and H14: Exterior Handrails and Guardrails to Aluminum in lieu of Powder Coated Galvanized.
ITEM NO. A9: SHEET A-5.8 MISCELLANEOUS DETAILS
REVISE Details H5, H9, H12, H15: Exterior Handrails and Guardrails to Aluminum in lieu of Powder Coated Galvanized.

ITEM NO. A10: SHEET A-6.1 INTERIOR ELEVATIONS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A11: SHEET A-6.2 INTERIOR ELEVATIONS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A12: SHEET A-6.3 INTERIOR ELEVATIONS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A13: SHEET A-6.4 INTERIOR ELEVATIONS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A14: SHEET A-9.1 PARTIAL FIRST FLOOR FURNISHING PLAN – AREA A
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A15: SHEET A-9.2 PARTIAL FIRST FLOOR FURNISHING PLAN – AREA B
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A16: SHEET A-9.3 PARTIAL FIRST FLOOR FURNISHING PLAN – AREA C1
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A17: SHEET A-9.6 PARTIAL SECOND FLOOR FURNISHING PLAN – AREA B
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

ITEM NO. A18: SHEET A-9.8 PARTIAL SECOND FLOOR FURNISHING PLAN – AREA C2
REVISE Plan per attached sketch SKA-9.8.1.

DRAWING ITEMS: STRUCTURAL

ITEM NO. S1: SHEET S-1.4 PARTIAL FIRST FLOOR PLAN – AREA C2
REVISE Plan per sketch ASK-2.

ITEM NO. S2: SHEET S-1.14 OUT BUILDINGS AND DETAILS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.

DRAWING ITEMS: MECHANICAL

ITEM NO. M1: SHEET M-2.3 PARTIAL FIRST FLOOR PLAN – AREA C1
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Ductwork layout for DSS-5.
ADD Note outlining structural support for DSS-5.

ITEM NO. M2: SHEET M-7.1 MECHANICAL DETAILS
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum.
REVISE Geothermal Pipe sizes on detail #2.
ITEM NO. M3: SHEET M-9.1 MECHANICAL EQUIPMENT SCHEDULES
ADD Note outlining structural support for DSS-5. Refer to attached sketch SKM-9.1.2.

DRAWING ITEMS: PLUMBING

ITEM NO. P1: SHEET P-0.1 PARTIAL FOUNDATION PLAN – AREA A
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

ITEM NO. P2: SHEET P-0.2 PARTIAL FOUNDATION PLAN – AREA B
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

ITEM NO. P3: SHEET P-0.3 PARTIAL FOUNDATION PLAN – AREA C1
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

ITEM NO. P4: SHEET P-0.4 PARTIAL FOUNDATION PLAN – AREA C2
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

ITEM NO. P5: SHEET P-2.1 PARTIAL FIRST FLOOR PLAN – AREA A
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

ITEM NO. P6: SHEET P-2.2 PARTIAL FIRST FLOOR PLAN – AREA B
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

ITEM NO. P7: SHEET P-2.3 PARTIAL FIRST FLOOR PLAN – AREA C1
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes and 4” SW overflow nozzle size and location.

ITEM NO. P8: SHEET P-2.4 PARTIAL FIRST FLOOR PLAN – AREA C2
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

ITEM NO. P9: SHEET P-3.1 KITCHEN PART PLAN – PLUMBING
SUBSTITUTE This sheet in its entirety with revised sheet included in this Addendum. Additions include pipe sizes.

DRAWING ITEMS: ELECTRICAL

ITEM NO. E1: SHEET E-1.4 PARTIAL FIRST FLOOR PLAN – AREA C2 - POWER
SUBSTITUTE REVISE This sheet in its entirety with revised sheet included in this Addendum.

Location of Projection Screen in Gym C133. Refer to revised sheet for additional information.
ITEM NO. E2: SHEET E-2.3 PARTIAL FIRST FLOOR PLAN – AREA C1 - LIGHTING

REVISE

Exterior lighting fixture Type N1 location near Column Line 15’ outside Room C104. Refer to sketch SKE-2.3.1.

ADD

Exterior lighting fixture Type N1 near Column Line 13’ outside Room C104. Refer to sketch SKE-2.3.1.

*****
SECTION 06 12 19 - STRUCTURAL INSULATED PANELS

PART 1  GENERAL

1.1  SECTION INCLUDES
   A. Structural insulated panels for roofs.
   B. Fasteners and adhesives.
   C. Accessories.

1.2  RELATED REQUIREMENTS
   A. Section 07 31 13 - Asphalt Shingles: Underlayment over structural insulated roof panel.

1.3  REFERENCE STANDARDS
   D. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.

1.4  ADMINISTRATIVE REQUIREMENTS
   A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.5  SUBMITTALS
   A. Product Data: Provide structural insulated panel manufacturer's product literature including structural properties, design load capacities and installation instructions.
   B. Shop Drawings: Fully dimensioned fabrication and installation details for structural insulated panels. Indicate dimensions, materials, connections and arrangement of joints. Include anchorage, size and type of fasteners, and accessories.
      1. Include calculations that indicate compliance with the applicable building code and the structural insulated panel manufacturer's requirements.
      2. Include seal of Professional Engineer registered in the State of Maryland on drawings and calculations.
   C. Design Data: As required by authorities having jurisdiction.
   D. Designer's Qualification Statement.
   E. Manufacturer's Qualification Statement.
      1. Include statement that the composite wood products used in the panel system contain no added urea-formaldehyde resins.
   H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
1.6 QUALITY ASSURANCE
A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State of Maryland.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
   1. Member of Structural Insulated Panel Association (SIPA).
   2. Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
C. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Deliver structural insulated panels in manufacturer's packaging, if any, and with manufacturer labels and markings intact.
B. Cover structural insulated panels with waterproof covering during transportation and storage. Keep dry.
C. Protect edges of wood construction panels and foam cores.
D. Fully support structural insulated panels off the ground.
E. Do not lift structural insulated panels by wood construction panel layer.

1.8 WARRANTY
A. Correct defective Work within a five year period after Date of Substantial Completion.
B. Provide twenty year manufacturer warranty on structural insulated panel material and workmanship.

PART 2 PRODUCTS

2.1 STRUCTURAL INSULATED PANELS
A. Structural Insulated Panels: Provide structural insulated panels capable of withstanding design loads including dead load, live load, wind load and seismic load.
B. Structural Insulated Roof Panel: Oriented strand board construction panel laminated to both sides of rigid polyurethane closed cell insulation board.
   1. Panel Width: 4 feet
   2. Overall Thickness: 5-5/8 inches, nominal.
   3. Edge Treatment: Manufacturer's tongue and groove edge profile; cam locks located on maximum 2'-0" centers.
   4. Thermal Resistance: R-value of 34.

2.2 MATERIALS
A. Oriented Strand Board: 7/16 inch thick, APA Exposure 1, DOC PS-2 span rating 24/16, minimum.
B. Polyurethane Closed Cell Foam: Minimum of 2.2 pcf (35 kg/cu m) insulation meeting manufacturers quality standards and the following:
   2. Compressive Strength: 23 psi, ASTM D 1621.
8. Tensile Strength: 37 psi, ASTM D 1623.
10. WVT/Perm Inches: 1.0, ASTM E 96.
11. Foam Fire Rating: Class 1, UL723.
12. Flame Spread: 20, UL723.
13. Smoke Developed: 300, UL723.

C. Laminating Adhesive: Manufacturer's standard; complying with ICC-ES AC05.

D. Dimension Lumber:
   1. Sizes: Nominal sizes as indicated on drawings, S4S.
   2. Moisture Content: S-dry or MC19.

E. Cam Locks: Installed in the panel during the manufacturing process.

F. Wiring Chases: If indicated or required, shall be formed into the panel during the manufacturing process.

G. Foam Sealant: Compatible with all components of the panel and adjacent materials, provided by manufacturer.

2.3 ACCESSORIES

A. Fasteners and Anchors:
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   4. Panel Screws: Pancake head; minimum thread diameter 0.255 inch, minimum shank diameter of 0.190 inch and minimum head diameter 0.625 inch.
   5. Heavy Duty Metal Screws: 1/8 inch to 1/4 inch diameter.
   6. Light Duty Metal Screws: 1/8 inch or less diameter.

B. Underlayment for Asphalt Shingles: As specified in Section 07 31 13.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive structural insulated panels. Verify conditions suitable for installation. Report unsatisfactory conditions to Architect. Do not proceed with structural insulated panel work until unsatisfactory conditions corrected.

3.2 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.3 INSTALLATION

A. Install structural insulated panels in accordance with manufacturer's instructions.
1. Comply with manufacturer's written recommendation for number, size and placement of fasteners.
2. Join structural insulated panel edges according to manufacturer's written recommendation.

B. Restrictions:
   1. Do not over cut oriented strand board or plywood face when field-cutting openings.
   2. Do not install electrical chases inside structural insulated panels.
   3. Do not install plumbing inside structural insulated panels without consulting manufacturer and obtaining written recommendations.
   4. Protect structural insulated panel core from solvents and solvent vapors.

C. Prevent damage to structural insulated panels.

D. Seal panel joints with manufacturer’s recommended sealant.

E. Repair or replace damaged panels.

3.4 PROTECTION

A. Do not leave panels exposed to moisture. Remove wet panels or allow to dry completely before installation of sealants, tape, weather barrier.

B. Protect installed structural insulated panels from subsequent construction operations.

C. Cover top and edges of unfinished panel work. Protect from weather and prevent accumulation of water in cores.

END OF SECTION
SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware for:
   a. Swinging doors.

2. Electronic access control system components, including:
   a. Electronic access control devices.

3. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier’s responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section “Alternates” for alternates affecting this section.
2. Division 07 Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.
3. Division 26 sections for connections to electrical power system and for low-voltage wiring.
4. Division 28 sections for coordination with other components of electronic access control system.
1.03 REFERENCES

A. UL - Underwriters Laboratories
   1. UL 10B - Fire Test of Door Assemblies
   2. UL 10C - Positive Pressure Test of Fire Door Assemblies
   3. UL 1784 - Air Leakage Tests of Door Assemblies
   4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute
   1. Sequence and Format for the Hardware Schedule
   2. Recommended Locations for Builders Hardware
   3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute
   1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.04 SUBMITTALS

A. General:
   1. Submit in accordance with Conditions of Contract and Division 01 requirements.
   2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
   3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.

B. Action Submittals:
   1. Product Data: Technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
   2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
      a. Wiring Diagrams: For power, signal, and control wiring and including:
         1) Details of interface of electrified door hardware and building safety and security systems.
         2) Schematic diagram of systems that interface with electrified door hardware.
         3) Point-to-point wiring.
         4) Risers.
   3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

a. Door Index; include door number, heading number, and Architects hardware set number.
b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
c. Quantity, type, style, function, size, and finish of each hardware item.
d. Name and manufacturer of each item.
e. Fastenings and other pertinent information.
f. Location of each hardware set cross-referenced to indications on Drawings.
g. Explanation of all abbreviations, symbols, and codes contained in schedule.
h. Mounting locations for hardware.
i. Door and frame sizes and materials.
j. Name and phone number for local manufacturer's representative for each product.
k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include operational descriptions for: egress, ingress (access), and fire/smoke alarm connections.
   1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:

a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
   1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
f. Prepare key schedule by or under supervision of supplier, detailing Owner’s final keying instructions for locks.
6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory or shop prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.

2. Product data for electrified door hardware:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.

3. Certificates of Compliance:
   a. UL listings for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
   b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in “QUALITY ASSURANCE” article, herein.
   c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in “QUALITY ASSURANCE” article, herein.

4. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Factory order acknowledgement numbers (for warranty and service)
   d. Name, address, and phone number of local representative for each manufacturer.
   e. Parts list for each product.
   f. Final approved hardware schedule, edited to reflect conditions as-installed.
   g. Final keying schedule
   h. Copies of floor plans with keying nomenclature
   i. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
   j. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.05 QUALITY ASSURANCE

A. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.

1. Warehousing Facilities: In Project’s vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
4. Coordination Responsibility: Assist in coordinating installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
   a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

B. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
   2. Can provide installation and technical data to Architect and other related subcontractors.
   3. Can inspect and verify components are in working order upon completion of installation.
   5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.

C. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

D. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

F. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.

G. Keying Conference
   1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      b. Preliminary key system schematic diagram.
      c. Requirements for key control system.
      d. Requirements for access control.
      e. Address for delivery of keys.

H. Pre-installation Conference
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

I. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1. Deliver each article of hardware in manufacturer’s original packaging.

C. Project Conditions:

1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
2. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

D. Protection and Damage:

1. Promptly replace products damaged during shipping.
2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

F. Deliver keys and permanent cores to Owner by registered mail or overnight package service.
1.07 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.08 WARRANTY

A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Beginning from date of Substantial Completion, for durations indicated.
   a. Closers:
      1) Mechanical: 30 years.
      2) Electrified: 2 years.
   b. Automatic Operators: 2 years.
   c. Exit Devices:
      1) Mechanical: 3 years.
      2) Electrified: 1 year.
   d. Locksets:
      1) Mechanical: 3 years.
      2) Electrified: 1 year.
   e. Continuous Hinges: Lifetime warranty.
   f. Key Blanks: Lifetime

2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.09 MAINTENANCE

A. Maintenance Tools: Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: “No Substitute.”

1. Where “No Substitute” is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
4. Install hardware with fasteners provided by hardware manufacturer.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 HINGES

A. Manufacturers and Products:

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
4. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and
   one additional hinge for each 30 inches (762 mm) of additional door height.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins
7. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.

2.04 CONTINUOUS HINGES

A. Aluminum Geared

1. Manufacturers:
   a. Scheduled Manufacturer: Ives.

2. Requirements:
   a. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
   b. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
   c. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
d. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.

e. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by testing agency acceptable to authority having jurisdiction.

f. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.

g. Install hinges with fasteners supplied by manufacturer.

h. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

   a. Scheduled Manufacturer: Von Duprin EPT-10.

B. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires sufficient to accommodate electric function of specified hardware.

C. Locate electric power transfer per manufacturer’s template and UL requirements, unless interference with operation of door or other hardware items.

2.06 FLUSH BOLTS

A. Manufacturers:

   1. Scheduled Manufacturer: Ives.

B. Requirements:

   1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.07 COORDINATORS

A. Manufacturers:

   1. Scheduled Manufacturer: Ives.
B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.08 MORTISE LOCKS

A. Manufacturers and Products:


B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3 hour fire doors.
2. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
3. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to “KEYING” article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
6. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
   a. Lever Design: Schlage 06A.

2.09 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:


B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3 hour fire doors.
2. Cylinders: Refer to “KEYING” article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Provide electrified options as scheduled in the hardware sets.
8. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.
   a. Lever Design: Best 15 lever.

2.10 AUXILIARY LOCKS

A. Deadlocks:
   1. Manufacturers and Products:
      a. Scheduled Manufacturer and Product: Schlage L400 series.
      b. Acceptable Manufacturers and Products: No substitution.
   2. Requirements:
      a. Provide mortise deadlock series conforming to ANSI/BHMA A156 and function as specified.
      b. Cylinders: Refer to “KEYING” article, herein.
      c. Provide deadlocks with standard 2-3/4 inches (70 mm) backset. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
      d. Provide manufacturer’s standard strike.

2.11 EXIT DEVICES

A. Manufacturers and Products:

B. Requirements:
   1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
   2. Cylinders: Refer to “KEYING” article, herein.
   3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
   4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
   5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
   6. Provide flush end caps for exit devices.
   7. Provide exit devices with manufacturer’s approved strikes.
   8. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
   9. Mount mechanism case flush on face of doors, or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
10. Provide cylindrical or hex-key dogging as specified at non fire-rated openings.
11. Provide dogging indicators (CDSI) for visible indication of dogging status.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as
    keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application,
    highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double or single tab mount for steel doors, face mount for
    aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used
    on the project.

2.12 CYLINDERS

A. Manufacturers:
   1. Scheduled Manufacturer: Best.

B. Requirements:
   1. Provide interchangeable cylinders/cores to match Owner’s existing key system,
      compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match
      lockset, manufacturer’s series as indicated. Refer to “KEYING” article, herein.

C. Construction Keying:
   1. Replaceable Construction Cores.
      a. Provide temporary construction cores replaceable by permanent cores, furnished in
         accordance with the following requirements.
         1) 3 construction control keys
         2) 12 construction change (day) keys.
      b. Owner or Owner’s Representative will replace temporary construction cores with
         permanent cores.

2.13 KEYING

A. Provide a factory registered keying system, complying with guidelines in
   ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Provide cylinders/cores keyed into Owner’s existing factory registered keying system.

C. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying
   conference.

D. Requirements:
   1. Provide permanent cylinders/cores keyed by the manufacturer according to the following
      key system.
a. Master Keying system as directed by the Owner.

2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.

3. Provide keys with the following features:
   a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
   b. Patent Protection: Keys and blanks protected by one or more utility patent(s).

4. Identification:
   a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication “Keying Systems and Nomenclature” for identification. Do not provide blind code marks with actual key cuts.
   b. Identification stamping provisions must be approved by the Architect and Owner.
   c. Stamp cylinders/cores and keys with Owner’s unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with “DO NOT DUPLICATE” along with the “PATENTED” or patent number to enforce the patent protection.
   d. Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
   e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

5. Quantity: Furnish in the following quantities.
   a. Change (Day) Keys: 3 per cylinder/core.
   b. Permanent Control Keys: 3.

2.14 KEY CONTROL SYSTEM

A. Manufacturers:
   1. Scheduled Manufacturer: Telkee.

B. Requirements:
   1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
      a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
      b. Provide hinged-panel type cabinet for wall mounting.
2.15 DOOR CLOSERS

A. Manufacturers and Products:


B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2 inch (38 mm) diameter with 3/4 inch (19 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearm for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.16 ELECTRO-MECHANICAL CLOSER/HOLDERS

A. Manufacturers and Products:


B. Requirements:

1. Provide single-point or multi-point hold-open electro-mechanical closer/holders as specified. Coordinate voltage requirements and provide transformer if necessary.
2. Provide multi-point electro-mechanical closer/holders with swing free arms.
3. Provide closer/holders that function as full rack and pinion door closer when current is interrupted or continuous hold-open is not engaged.
4. Provide door closers with fully hydraulic, full rack and pinion action with high strength cylinder and full complement bearings at shaft.
5. Cylinder Body: 1-1/2 inch (38 mm) diameter with 5/8 inch (16 mm) diameter double heat-treated pinion journal.
6. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
7. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
8. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.17 ELECTRO-MECHANICAL AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN Senior Swing.

B. Requirements:

1. Provide low energy automatic operator units that are electro-mechanical design complying with ANSI/BHMA A156.19.
   a. Opening: Powered by DC motor working through reduction gears.
   b. Closing: Spring force.
   d. Operation: Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment.
   e. Cover: Aluminum.

2. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 2 to 30 seconds, and logic terminal to interface with accessories, mats, and sensors.
3. Provide drop plates, brackets, or adapters for arms as required to suit details.
4. Provide hard-wired motion sensors and/or actuator switches for operation as specified. Provide weather-resistant actuators at exterior applications.
5. Provide key switches, with LED’s, recommended and approved by manufacturer of automatic operator as required for function as described in operation description of hardware sets. Cylinders: Refer to “KEYING” article, herein.
6. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
7. Provide units with inputs for smoke evacuation doors, where specified, which allow doors to power open upon fire alarm activation and hold open indefinitely or until fire alarm is reset, presence detector input, which prevents closed door from opening or door that is fully opened from closing, hold open toggle input, which allows remote activation for indefinite hold open and close second time input is activated, vestibule inputs, which...
allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

2.18 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives.

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
6. Provide wire pulls of solid bar stock, diameter and length as scheduled.
7. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.19 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives.

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
   a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
   b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
   c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
2.20 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturers: Glynn-Johnson.
   2. Acceptable Manufacturers: ABH.

B. Requirements:
   1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
   2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
   3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
   4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.21 DOOR STOPS AND HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturer: Ives.

B. Provide door stops at each door leaf:
   1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
   2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
   3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.22 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

B. Requirements:
   1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

3. Size of thresholds:
   a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
   b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width

4. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.23 SILENCERS

A. Manufacturers:
   1. Scheduled Manufacturer: Ives.

B. Requirements:
   1. Provide "push-in" type silencers for hollow metal or wood frames.
   2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
   3. Omit where gasketing is specified.

2.24 MAGNETIC HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturer: LCN.

B. Requirements:
   1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.25 DOOR POSITION SWITCHES

A. Manufacturers:
   1. Scheduled Manufacturer: Schlage.

B. Requirements:
1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

2.26 FINISHES

A. Finish: BHMA 626/652 (US26D); except:
   1. Hinges at Exterior Doors: BHMA 630 (US32D)
   2. Continuous Hinges: BHMA 628 (US28)
   4. Protection Plates: BHMA 630 (US32D)
   5. Overhead Stops and Holders: BHMA 630 (US32D)
   6. Door Closers: Powder Coat to Match
   7. Wall Stops: BHMA 630 (US32D)
   8. Weatherstripping: Clear Anodized Aluminum
   9. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.

C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
   2. Custom Steel Doors and Frames: HMMA 831.

B. Install each hardware item in compliance with manufacturer’s instructions and recommendations, using only fasteners provided by manufacturer.
C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

H. Lock Cylinders: Install construction cores to secure building and areas during construction period.

   1. Replace construction cores with permanent cores as indicated in keying section.

I. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

J. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

K. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

L. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

M. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

N. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

O. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

P. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

Q. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
3.03 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, Installer's Architectural Hardware Consultant must examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

A. Hardware items are referenced in the following hardware. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.

B. Hardware Sets:

HARDWARE GROUP NO. 01

FOR USE ON MARK #(S):
A010     B010B

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### Door Hardware

**URBANA REPLACEMENT ELEMENTARY SCHOOL**  
**FREDERICK COUNTY PUBLIC SCHOOLS**

**Project No. 21740.00**

**Grimm + Parker Architects**

**DOOR HARDWARE**

**08 71 00 - 23**

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**FREE EGRESS AT ALL TIMES**

**ENTRY WITH VALID CREDENTIAL OR ACCESS CONTROL TIME ZONE OR KEY OVERRIDE**

**UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED**

**DOOR MONITORED**

---

**HARDWARE GROUP NO. 02**

**FOR USE ON MARK #(S):**

A010A  
B010A

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**HARDWARE GROUP NO. 03**

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XB03  
XC11

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### Door Hardware

**Grimm + Parker Architects Project No. 21740.00**  
**URBANA REPLACEMENT ELEMENTARY SCHOOL**  
**FREDERICK COUNTY PUBLIC SCHOOLS**

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**Door Monitored**

### Hardware Group No. 03A

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XA01    XC34

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**Door Monitored**

### Hardware Group No. 04

For use on Mark #(S):
XA03    XA08    XB02    XC08    XC09
XA04    XB01    XC17

Door Hardware

08 71 00 - 24
DOOR HARDWARE
08 71 00 - 25
2 EA PERMANENT CORE TO MATCH EXISTING SYSTEM 626 BES
1 EA RIM CYLINDER 80-159 626 SCH
1 EA MORTISE CYLINDER 80-132 626 SCH
1 EA DOOR PULL VR910 NL 630 IVE
2 EA SURFACE CLOSER 4040XP SCUSH 689 LCN
2 EA PA MOUNTING PLATE 4040XP-18PA 689 LCN
2 EA CUSH SHOE SUPPORT 4040XP-30 689 LCN
2 EA BLADE STOP SPACER 4040XP 689 LCN
1 EA GASKETING BY ALUM DR MFG B/O
2 EA DOOR SWEEP 8198AA AA ZER
1 EA THRESHOLD 656A-223 A ZER
1 EA CREDENTIAL SUPPLIED BY OTHER B/O READER
2 EA DOOR CONTACT 679-05HM BLK SCE
1 EA POWER SUPPLY PS904 900-2RS-KL VON
1 EA INTERCOM/REMOTE RELEASE (@XA02 ONLY) SUPPLIED BY OTHERS AIP

DOOR NORMALLY CLOSED AND LOCKED
FREE EGRESS AT ALL TIMES
ENTRY WITH VALID CREDENTIAL OR ACCESS CONTROL TIME ZONE OR KEY OVERRIDE OR @XA02 ONLY, BY REMOTE RELEASE
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED

DOOR MONITORED

HARDWARE GROUP NO. 05

FOR USE ON MARK #(S):
A011  B010  B011  C010

EACH TO HAVE:
QTY  DESCRIPTION  CATALOG NUMBER  FINISH  MFR
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1 EA FIRE EXIT HARDWARE 9949-EO-F-LBL 626 VON
1 EA FIRE EXIT HARDWARE 9949-L-F-06-LBL 626 VON
1 EA PERMANENT CORE TO MATCH EXISTING SYSTEM 626 BES
1 EA RIM CYLINDER 80-159 626 SCH
2 EA SURFACE CLOSER 4040XP RW/PA 689 LCN
2 EA KICK PLATE 8400 10" X 1" LDW B-CS 630 IVE
2 EA FIRE/LIFE WALL MAG SEM7830 689 LCN
2 EA MEETING STILE 328AA-S AA ZER
1 EA GASKETING 488SBK PSA BK ZER

MAGNETIC HOLD OPENS TO BE TIED TO FIRE ALARM SYSTEM AND RELEASE UPON ACTIVATION OF FIRE ALARM.
HARDWARE GROUP NO. 07

FOR USE ON MARK #(S):
A012   A022   B012   B022

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MAGNETIC HOLD OPENS TO BE TIED TO FIRE ALARM SYSTEM AND RELEASE UPON ACTIVATION OF FIRE ALARM.

HARDWARE GROUP NO. 08

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A114A   A102D   A122   A128   A204B   B101BA   C106

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HARDWARE GROUP NO. 08A

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DURING OCCUPIED HOURS, DOORS (A101 & A101C) NORMALLY UNLOCKED BY ACCESS CONTROL TIME ZONE OR PUSH BUTTON
DOORS LOCK WITH ACCESS CONTROL TIME ZONE OR DESK MOUNTED PUSH BUTTON OR DURESS BUTTON
AFTER HOURS, DOORS NORMALLY CLOSED AND LOCKED
FREE EGRESS AT ALL TIMES
ENTRY WITH KEY OVERRIDE OR WHEN UNLOCKED WITH PUSH BUTTON OR ACCESS CONTROL TIME ZONE
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED

HARDWARE GROUP NO. 08B

FOR USE ON MARK #(S):
A110B  B102A

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DOOR NORMALLY CLOSED AND LOCKED
FREE EGRESS AT ALL TIMES
ENTRY WITH VALID CREDENTIAL OR KEY OVERRIDE
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED
DOOR MONITORED
HARDWARE GROUP NO. 09

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HARDWARE GROUP NO. 09A

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DURING OCCUPIED HOURS, DOORS (A101 & A101C) NORMALLY UNLOCKED BY ACCESS CONTROL TIME ZONE OR PUSH BUTTON
DOORS LOCK WITH ACCESS CONTROL TIME ZONE OR DESK MOUNTED PUSH BUTTON OR DURESS BUTTON
AFTER HOURS, DOORS NORMALLY CLOSED AND LOCKED
FREE EGRESS AT ALL TIMES
ENTRY WITH KEY OVERRIDE OR DESK MOUNTED PUSH BUTTON OR ACCESS CONTROL TIME ZONE UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED
HARDWARE GROUP NO. 10

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HARDWARE GROUP NO. 10A

FOR USE ON MARK #(S):

B211A

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DOOR NORMALLY CLOSED AND ELECTRIC STRIKE UNLOCKED
ENTRY WITH PASSAGE FUNCTION LEVER
WHEN IN USE, TOUCH SENSOR BUTTON @ B211A OR B211B LOCKS MAGNETIC LOCKS
RELEASING TOUCH SENSOR BUTTON UNLOCKS MAGNETIC LOCKS ON BOTH DOORS
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION, MAGNETIC LOCKS AND ELECTRIC
STRIKE UNLOCK
DOORS MONITORED
HARDWARE GROUP NO. 10B

FOR USE ON MARK #(S):
B104A   B211B

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DOOR NORMALLY CLOSED AND ELECTRIC STRIKE UNLOCKED ENTRY WITH PASSAGE FUNCTION LEVER
WHEN IN USE, TOUCH SENSOR BUTTON @ B211A OR B211B LOCKS MAGNETIC LOCKS ON BOTH DOORS
RELEASING TOUCH SENSOR BUTTON UNLOCKS MAGNETIC LOCKS ON BOTH DOORS
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION, MAGNETIC LOCKS AND ELECTRIC STRIKE UNLOCK
DOORS MONITORED

HARDWARE GROUP NO. 11

FOR USE ON MARK #(S):
A104     A214     A215     A216     A217     A223
B103     B110     B112     B214     B215
B216     A102A

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DOOR HARDWARE
08 71 00 - 31
HARDWARE GROUP NO. 12

FOR USE ON MARK #(S):
A102E  A111  A114  A116  A117  
A119  A120  A123  A124  A125  
B201  C101  C114A

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HARDWARE GROUP NO. 13

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HARDWARE GROUP NO. 14

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**HARDWARE GROUP NO. 23**

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| B201A |

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**HARDWARE GROUP NO. 23A**

FOR USE ON MARK #(S):

| B106D |

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# HARDWARE GROUP NO. 26

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B020

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HARDWARE GROUP NO. 28

FOR USE ON MARK #(#S):

C103 C111 C134

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**HARDWARE GROUP NO. 31**

FOR USE ON MARK #(S):
C116

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HARDWARE GROUP NO. 32A

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C133A

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DURING OCCUPIED HOURS, DOOR NORMALLY UNLOCKED
AFTER HOURS, DOOR NORMALLY CLOSED AND LOCKED
FREE EGRESS AT ALL TIMES
ENTRY WITH ACCESS CONTROL TIME ZONE OR KEY OVERRIDE OR LOSS OF POWER OR
FIRE ALARM ACTIVATION
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR UNLOCKS
DOOR MONITORED

HARDWARE GROUP NO. 34
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## DOOR HARDWARE

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**C120**

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### HARDWARE GROUP NO. 36

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**C130**

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HARDWARE GROUP NO. 37

FOR USE ON MARK #(S):
S1.1

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DURING OCCUPIED HOURS, DOORS NORMALLY HELD OPEN
AFTER HOURS, DOORS NORMALLY CLOSED AND LOCKED
FREE EGRESS AT ALL TIMES
ENTRY WITH VALID CREDENTIAL OR KEY OVERRIDE OR LOSS OF POWER OR FIRE ALARM ACTIVATION
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOORS UNLOCK
DOORS MONITORED

HARDWARE GROUP NO. 38

FOR USE ON MARK #(S):
S2.2  S3.2  S4.2

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DOOR HARDWARE
08 71 00 - 43
DURING OCCUPIED HOURS, DOORS NORMALLY HELD OPEN
AFTER HOURS, DOORS NORMALLY CLOSED AND LOCKED FREE EGRESS AT ALL TIMES
ENTRY WITH VALID CREDENTIAL OR KEY OVERRIDE OR LOSS OF POWER OR FIRE ALARM ACTIVATION
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOORS UNLOCK DOORS MONITORED

HARDWARE GROUP NO. 39

FOR USE ON MARK #(#S):
XA05  XP01

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# Hardware Group No. 39A

**For Use On Mark #(#):**

**XC05**

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Door normally closed and locked
Free egress at all times
Entry with valid credential key override
Upon loss of power or fire alarm activation door remains locked
Door monitored

# Hardware Group No. 40

**For Use On Mark #(#):**

**XB20**  **XC25**  **XC26**

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## DOOR HARDWARE

**HARDWARE GROUP NO. 41**

**FOR USE ON MARK #(S):**

XC01A

XC02A

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**DOOR MONITORED**

## HARDWARE GROUP NO. 42

**FOR USE ON MARK #(S):**

C117

XC04

XP04

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HARDWARE GROUP NO. 42A

FOR USE ON MARK #(S):

| GATE 1 | GATE 2 | GATE 3 | GATE 4 | GATE 5 | GATE 6 |

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HARDWARE GROUP NO. 43

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| XC03 | XC13 | XC15 |

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HARDWARE GROUP NO. 44

FOR USE ON MARK #(S):

| XC06 | XC14 |

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DOOR NORMALLY CLOSED AND LOCKED
FREE EGRESS AT ALL TIMES
ENTRY WITH VALID CREDENTIAL OR ACCESS CONTROL TIME ZONE OR KEY OVERRIDE
UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED
DOOR MONITORED

HARDWARE GROUP NO. 44A
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UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED
DOOR MONITORED
HARDWARE GROUP NO. 45

FOR USE ON MARK #(S):

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UPON LOSS OF POWER OR FIRE ALARM ACTIVATION DOOR REMAINS LOCKED
DOOR MONITORED

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DOOR MONITORED

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MAGNETIC HOLD OPENS TO BE TIED TO FIRE ALARM SYSTEM AND RELEASE UPON ACTIVATION OF FIRE ALARM.
SECTION 32 30 10 - MODULAR PLAYGROUND EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED WORK:

A. Section 31 20 00 "Earthmoving"

1.3 DESCRIPTION OF WORK:

A. This Section shall be used as a standard of quality for equipment.

B. Provide and install modular playground structure, complete with all play components, fasteners, supports and footings, ground cover and timber edging. Locate in area indicated on Drawings. Provide ground cover and edging in profile and extent as indicated. Provide rubber tile surfacing at Pre-K/Kindergarten play area.

C. Delegated Design: Modular Playground Equipment design and layout will be provided by the Equipment Supplier to fit in the areas shown on the drawings. Equipment layouts shall comply with the requirements included at the end of this section.

1.4 QUALITY ASSURANCE:

A. Safety Requirements: Design playground components to avoid snagging of clothing and entrapment of hands, arms, or other body parts. Equipment shall conform to the following:

B. Single Source Responsibility: All playground components and accessories shall be supplied by one manufacturer.

C. Erection of the equipment shall be performed by an installer authorized and approved by the Manufacturer.

1.5 SUBMITTALS:

A. Product Data: Submit Manufacturer's technical data for materials, including catalog information for major components, anchors, fasteners and other accessories along with information on finishes. Provide Manufacturer's standard installation procedures.
   1. Submit location of product manufacture and of extraction/recovery of primary raw materials.
2. Submit recycled-content data, designating percentages of post-consumer and post-industrial recycled material.

B. Shop Drawings: Submit shop drawings indicating layout of specified components, details for anchoring and fastening of individual components, details of support and foundations, and any other fabrication or erection information not fully described by the product literature.

1.6 WARRANTIES:

A. Provide Manufacturer's standard warranty on main support components to cover structural failure due to corrosion, deterioration or defects in workmanship.

B. Provide Manufacturer's standard one (1) year warranty covering defects in materials and workmanship for playground components except as noted below:
   1. Structural (Main Components): ten (10) years
   2. Plastic: five (5) years
   3. Rubber Tile Playground Surfacing: fifteen (15) years.

PART 2 – PRODUCTS

2.1 APPROVED MANUFACTURERS:

A. Game Time c/o West Recreation
   a. Vendor ID # 6694
   b. P.O. Box 487, Queenstown, Maryland 21658
   c. 800.233.0529

B. Max Play Fit, LLC
   a. Vendor ID # 15341
   b. 1945 Melson Way, Hockessin, Delaware 19707
   c. 800.574.3033

C. Playground Specialists, Inc.
   a. Vendor ID # 12519
   b. 17352 North Seton Avenue, Emmitsburg, Maryland 21727
   c. 301.271.9234

D. Taylor Sports and Recreation
   a. Vendor ID # 974
   b. P.O. Box 1706, Martinsburg, West Virginia 25402
   c. 304.263.7857

2.2 MATERIALS:

A. General Design Requirements
   1. Straight Slides (including pipe slides) without transition sections at the base of the slide shall not exceed 30 degrees of incline. Slide "fall zones" shall comply with US CPSC guidelines.
2. Provide adequate "no encroachment zone" around entire perimeter of playground area.

3. Overall height of equipment shall not exceed 6'-6", except for fireman's poles which shall not exceed 10 feet in height.

4. Fastening, Fabrication and Finish details: Protruding bolts, sharp or jagged edges, non-capped open-ended pipes or other openings shall not be acceptable. Piping or other supports shall not extend more than 2" beyond a locking collar.

5. Foundations: The minimum specifications for the diameter, depth and excavation of footings shall be as follows:
   a. Poles up to and including 6" in diameter: 12" in diameter and 3 feet in depth.
   b. Poles exceeding 6" in diameter: Diameter shall be twice the pole diameter and 3 feet in depth.

B. Ground Cover and Drainage: Provide treated wood mulch over the entire area indicated on the drawings, to a minimum depth of 12". Coordinate with drawings to ensure adequate drainage under the ground cover, and to avoid ponding. Maximum allowable slope shall be 2%.

C. Edging: Provide timber border around entire perimeter. Timber shall be pressure treated for ground contact with non-CCA treatment materials (0.40 #2 or better; ACQ is an acceptable wood treatment); recycled and/or creosoted timber shall not be acceptable.
   1. All edges shall be 1/2" radius.
   2. All lumber shall be free from splinters.
   3. Two tiers of lumber shall be provided with rowlock or half-lapped joints. Bottom tier of lumber shall be staked to the ground with steel rods reinforcing bars, 1/2" round, 36" on center, and 24" deep.
   4. Top and bottom tiers shall be spiked together using galvanized fasteners.

D. Support Posts: 5" O. D., 11 gauge minimum galvanized steel with plastic coated end caps.

E. Fasteners: Provide self-locking nuts or other devices to prevent loosening of assemblies. All fasteners shall be galvanized, cadmium plated, or otherwise treated to prevent rusting.

F. Metal Decks: Perforated, non-skid.

G. Fireman's Pole (Sliding Pole): Fabricated from 1 5/8" O. D. galvanized steel pipe.

H. Spiral Slide: Polyethylene composition with the following features:
   1. Center Tube: 3 1/2" O. D. 11 gauge minimum galvanized steel.
   2. Front Leg: 1 1/2" O. D. 11 gauge minimum galvanized steel.
   3. Slide shall rest flush on the upper platform.

J. "Curly" Climber:
1. General: Climber shall have no gaps greater than 3 1/2", and less than 9" between coils. Design shall not allow passage of children into the interior of the coil.
2. Coils shall be fabricated from not less than 1 5/6" O. D. galvanized steel pipe.
3. Center support post shall be fabricated from not less than 1 5/8" O. D. galvanized steel pipe.

K. Double Wide Plastic Slide: Single piece, UV stabilized molded polyethylene with average thickness of 5/16" and integral color. Sides shall be 8" high above the slide surface; center divider shall not have gaps. Width of slide bedway shall be 16" minimum.

L. Horizontal "Challenge" Ladder: 2 3/8" O. D. galvanized plastic-covered outside rails, with eight (8) rungs consisting of 1 1/4" O. D. galvanized steel welded to the rails at 12" on center.

M. Arched Chain Climber: One-piece, all welded construction. Side rails shall be 1 5/8" O.C. galvanized steel pipe, arched, and spaced 30" center to center. Chain: 4/0 steel with oven cured PVC "no pinch coating"; or galvanized coating.

N. Recycled-plastic: Recycled HDPE or other recycled plastic components may be used if approved in advance by FCPS.

O. Rubber Tile Playground Surfacing: 100% post-consumer SBR (Styrene Butadiene Rubber) tire rubber and EPDM colored granules bound together by a wear and weather resistant polyurethane and a 3 mm top wear layer with tapered, conical support legs. Tile thickness to be determined by the playground equipment supplier dependent on ASTM F1292 requirements for critical fall height.
1. Colors/Pattern: Provide up to 4 colors of tiles, including specialty pattern tiles. Layout to be provided by Architect.
2. Acceptable Products: Subject to compliance with specific requirements, provide one of the following:
   a. Game Time – RecycledTiles1
   b. Max Play Fit – Rubber Tiles
   c. Playground Specialists – PlayGuard Tiles

PART 3 – EXECUTION

3.1 INSPECTION:
A. Installer and Owner's Representative shall examine the area and conditions under which the playground equipment will be installed. Do not proceed until all conditions, which would be detrimental to the installation, are corrected.

3.2 INSTALLATION:

A. General: Install the playground equipment in accordance with the Manufacturer's recommended procedures and installation sequence. All equipment shall be rigid, straight, plumb and level. Secure all equipment with Manufacturer's fastening devices.

B. Foundations: All support holes shall be filled with concrete to the full-required depth. The top of the concrete shall be 6" below finished grade. All primary supports shall be temporarily supported until concrete has sufficiently cured.

C. Secure timber edging in place by spiking as specified herein. Rods shall not protrude beyond the face of the timber.

D. Fasteners: All in-place bolts shall be cut flush with the nut, and peened and filed. Self-locking nuts or other devices must be provided to prevent nut and bolt assemblies from loosening or coming apart.

E. Welds: Ensure that all welds are protected with rust inhibiting paint.

F. Metal Connectors: Secure with pins or spot welding to prevent loosening of the connection.

3.3 CLEAN-UP:

A. Remove all debris, excess materials, tools and excess excavation spoils from the project area and dispose of legally.

3.4 WASTE MANAGEMENT:

A. Recycle waste materials in accordance with Division 1 “Construction Waste Management” requirements.
Playgrounds and Playground Equipment Educational Specifications

Overview

Recess is an essential component of a comprehensive school physical activity program and of the total educational experience for elementary students. Recess is integral to all aspects of a child’s development. Free play is a universal need for all children. Benefits of play include social, cognitive, physical, and emotional benefits. Playscapes, including playground apparatus, hardscapes, and athletic fields provide a safe setting for play to occur. These facilities are also vital to the school’s physical education program.

Goals

Students will derive physical, social, cognitive, and emotional benefits through play. Physical benefits include increased cardio-reparatory endurance, muscular endurance and strength, flexibility, balance, spatial awareness, motor planning, motor development, and neurological development. The joy of movement is a byproduct. Social benefits include the development of cooperative skills, sharing, conflict resolution, respect for rules, self-discipline, respect for others, interaction with peers not possible in the regular classroom, development of friendship, and communication/negotiation skills. Brain research also shows the cognitive benefits of play such as language development, increased attention and focus, and decreased restlessness and boredom. Finally, emotional benefits such as a reduction in stress and anxiety, increased perseverance, self-directions, responsibility, self-acceptance are derived from play. Students can practice skills and rehearse behaviors as well as healthy risk-taking during play.

Number of Participants

Elementary school students participate in structured recess activities for a minimum of 20 minutes per day. The number of students may range from one class of approximately 30 students, an entire grade level of students, to multiple grade levels at the same time of approximately 200 students. Each playground apparatus (one for grades 3-5, one for grades 1-2, and one for grades PreK/K) shall allow for a child capacity of at least 75 students and include the elements listed below.

Space Requirements

1. Four separate All-Weather Play Areas (hardscapes) shall be included:
   a. Pre-Kindergarten and Kindergarten Play Area 40’ x 60’
   b. Primary area 90’ x 125’
   c. Intermediate area 110’ x 175’
   d. Physical Education Class area 50’ x 80’
2. Three separate Playground Apparatus Areas shall be included that are adjacent to the all-weather play area for the grade level, including minimum space requirements:
   a. Pre-Kindergarten and Kindergarten Play Area (certified for ages 2-5) – 5,625 ft²
   b. Primary area (certified for ages 5-12) – 7,500 ft²
   c. Intermediate area (certified for ages 5-12) – 7,500 ft²
3. The Pre-K/K area should be fenced.
4. Hardscapes should be asphalt and contain markings for both traditional playground games and games from the Peaceful Playgrounds program. The specific diagram for lines and markings will be issued by the FCPS Project Manager.
5. All weather access paths shall be provided from the school to the hardscape area and to the playground apparatus area. A ramped berm shall be placed between the surfaces if necessary so that there is wheelchair accessibility.
6. Safety surfacing such as engineered wood fiber for all three playground apparatus areas shall be in place. ADA accessibility surfacing such as rubber tile surfacing will be provided at the Pre-K/Kindergarten area.
7. Playground apparatus hardware should be stainless steel that resists rust and corrosion and are tamper resistant.
8. Playground apparatus decks and tubing shall be constructed with 12-gauge steel.
9. Playground apparatus powder coating shall be resistant to chipping and color resistant.
10. Playground apparatus shall have a minimum of 5-inch diameter posts shall be used for grade 1-5. 3 ½ inch diameter posts are the minimum for the preK-K area.
11. Playground apparatus component attachments should not overlap deck surfaces.
12. There shall be an eight foot maximum deck height for the grades 3-5 area, a six foot maximum deck height for the grades 1-2 area, and a five foot maximum deck height for the preK-K area.
13. There shall be an element of flow and continuous movement among all of the elements of the playground apparatus. This element of flow shall allow students to develop their cardio-respiratory endurance as well as their muscular strength and endurance as they move through the playground apparatus.
14. Active play where students can increase their physical activity levels in a main priority in design.

Elements of Each Playground Apparatus:
1. Spinning/Swinging/Swiveling
2. Climbing and Brachiating
3. Sliding
4. Balancing
5. Rocking
6. Linking Components and Ramps
7. Panels and ground level play components

**Many playground apparatus components can incorporate multiple elements.

Spinning/swinging/swiveling components develop muscular strength and balance. This movement leads to greater neurological development as the body automatically adjusts to the movement through space. It also provides engagement for students. There shall be a minimum of four swinging/spinning/swiveling elements. “Traditional” swings (with bays as a separate apparatus) shall not be included.

Climber and overhead component play contribute to upper body strength and muscular development. The dynamic parts provide higher levels of challenge. Height provides students with an element of risk-taking and challenge. Children build self-esteem and problem-solving skills as they maneuver through the playground. A minimum of 6 components shall be provided for climber and overhead component play. At least two of these components shall provide for brachiating skill development. At least one component shall be a net climber. At least one component shall have dynamic motion. At least one component shall link to a deck or other component. At least one component will allow students to perform a pull-up/chin-up exercise. Climbing poles (like a “fireman’s pole”) shall not be included.

Slides develop students’ balance and spatial awareness. Neurological development also takes place when students get the feeling of sliding. Slides also connect deck heights with ground level or other decks. A minimum of 3 slides shall be in place. No tube slides shall not be included.

Balancing activities allow students to develop important physical skill. A minimum of two balance activities shall be included. Log roll type elements shall not be included.

Linking components give students giving choices about where to go next as well as providing challenge. A minimum of 3 linking components shall be used. At least one component shall
incorporate brachiating (arm-over-arm) skills. At least one component shall incorporate balance skills. At least one component shall incorporate climbing skills. No crawl tubes, tunnels, or track rides type elements shall be included.

Ramps are linking components used as access for all children, but are necessary for children with disabilities. A minimum of one ADA wide-ramp should be provided to allow access for students to a higher deck height (deck height that is a minimum of 3 feet). The width of this ramp should be a minimum of 74 inches. This ramp should provide access to at least four ADA-accessible components.

Panels can be used by students in a wheelchair and can provide a side-by-side activity. Panels can also provide a way to integrate classroom content with play. Panels give adults and children a place to interact together. A minimum of two interactive panels shall be included. At least one panel shall be placed in the “crow’s nest” position adjacent to the ramp so that a student in a wheelchair can fully access the component.

The space under platforms and decks are places for children to congregate and interact. The roofs provided by this create an enclosed space, and add to its appeal as gathering space. These spaces shall include ground level components; however, supervision of these components shall be considered in their placement.

Ground level play components promote socialization, manipulation, imagination, balance, auditory stimulation, and more. They also provide opportunities for integrating play for children for all abilities. A minimum of 5 ground level play components that address a variety of needs shall be included.

There shall be a minimum of 5 elevated ADA compatible activities and 5 ground ADA accessible activities.
SUMMARY OF PLAYGROUND EXPERIENCES FOR PreK/K PLAYGROUNDS

2018
Experiences for Students in PreK/Kindergarten
All equipment certified for ages 2-5 years.
Minimum Capacity of 75 students playing simultaneously.

Spinning/Swinging/Swiveling – Pre-K & K
  □ Minimum of 3 elements for Pre-K and K play sets
  □ Must have at least (1) spinning, (1) swinging, and (1) swiveling element
  □ Traditional belt swings not permitted

Climbing and Brachiating – Pre-K & K
  □ Minimum of 2 elements
  □ At least 1 element for overhead brachiating (arm/arm) experiences
  □ At least 1 element for climbing

Sliding – All age levels
  □ A minimum of 3 slides per play set
  □ No tube slides shall be included
  □ No spiral slides shall be included

Balancing and Rocking – All age levels
  □ A minimum of 2 balancing experiences shall be included
  □ Log roll type elements shall not be included

Linking Components and Ramps
  □ Bridges and ramps included as needed to match play and flow of the experience
  □ Bridges and ramps included in compliance with ADA regulations

Panels and Ground Play Components – Age Appropriate – 2-5 yrs.
  □ A minimum of 4 ground level play components that address a variety of needs, including
    socialization, manipulation, imaginative play, balance, and/or auditory stimulation shall be
    included

Inclusive Play Elements – Age Appropriate – 2-5 yrs.
  □ A minimum of 2 inclusive play elements
  □ IMPORTANT: These elements can also be satisfied by company’s product identification in any of
    the categories listed above

Shade Structures
  □ Full or Partial Shade over all sliding elements
  □ Shade structures shall be bid as an alternate (follows FCPS past practice)

Additional Specifics
  □ Maximum Deck Heights – 5 feet for PreK/K playsets
SUMMARY OF PLAYGROUND EXPERIENCES FOR PRIMARY PLAYGROUNDS

2018
Experiences for Students in Primary Grades 1&2 (Ages 5-8)
All equipment certified for ages 5-12
Minimum Capacity of 75 students playing simultaneously.

Spinning/Swinging/Swiveling
1. Minimum of 4 elements
2. At least 1 spinning; 1 swinging; 1 swiveling experience
3. Traditional belt swings with bays shall NOT be included

Climbing and Brachiating
1. Minimum of 6 elements
2. At least 2 brachiating elements
3. At least 1 element provide a pull-up or chin-up experience
4. At least 1 element shall be a climbing wall that links to a deck, no higher than 6 feet
5. At least 1 element shall have dynamic motion
6. At least 1 element shall link to a deck or other component
7. Climbing poles (like a “fireman’s pole) shall not be included

Sliding
1. A minimum of 3 slides per play set
2. No tube slides shall be included
3. No spiral slides shall be included
4. Climbing poles (like a “fireman’s pole) shall not be included
5. Sliding elements should have full or partial shade

Balancing and Rocking
1. A minimum of 2 balancing experiences shall be included
2. Log roll type elements shall NOT be included
3. Spring rocking elements shall NOT be included

Linking Components and Ramps
1. Minimum of 3 components be included
2. Bridges and ramps included as needed to match play and flow the experience
3. Bridges and ramps included in compliance with ADA regulations; Ramps are linking components used as access for all children, but are necessary for children with disabilities. A minimum of one ADA wide-ramp should be provided to allow access for students to a higher deck height (deck height that is a minimum of 3 feet). The width of this ramp should be a minimum of 74 inches in order to provide dual access for handicapped and typical students. This ramp should provide access to at least four ADA-accessible components.
4. Suspension Bridges with ropes/cables shall NOT be included
5. At least 1 linking component – brachiating
6. At least 1 linking component - balancing
7. At least 1 linking component – climbing
Panels and Ground Play Components – All age levels
1. A minimum of 4 ground level experiences
2. A minimum of 2 interactive play panels
3. All panels and ground play components shall address a variety of needs, including socialization, manipulation, imaginative play, balance, and/or auditory stimulation.
4. The space under platforms and decks are places for children to congregate and interact. The roofs provided by this create an enclosed space, and add to its appeal as a gathering space. These spaces shall include ground level components. However, supervision of these components shall be considered in their placement.

Shade Structures
1. Full or Partial Shade over all sliding elements
2. Shade structures shall be bid as an alternate (follows FCPS past practice)

Additional Specifics
1. Maximum Deck Heights – 6 feet
2. Entire play experience should allow for at least 75 students
SUMMARY OF PLAYGROUND EXPERIENCES FOR INTERMEDIATE PLAYGROUNDS

2018
Experiences for Students in Intermediate Grades 3-5 (Ages 8-12)
All equipment certified for ages 5-12
Minimum Capacity of 75 students playing simultaneously.

Spinning/Swinging/Swiveling
1. Minimum of 4 elements
2. At least 1 spinning; 1 swinging; 1 swiveling experience
3. Traditional belt swings with bays shall NOT be included

Climbing and Brachiating
1. Minimum of 6 elements
2. At least 2 brachiating elements
3. At least 1 element provide a pull-up or chin-up experience
4. At least 1 element shall be a climbing wall that links to a deck, no higher than 6 feet
5. At least 1 element shall have dynamic motion
6. At least 1 element shall link to a deck or other component
7. Climbing poles (like a “fireman’s pole) shall not be included

Sliding
1. A minimum of 3 slides per play set
2. No tube slides shall be included
3. No spiral slides shall be included
4. Climbing poles (like a “fireman’s pole) shall not be included
5. Sliding elements should have full or partial shade

Balancing and Rocking
1. A minimum of 2 balancing experiences shall be included
2. Log roll type elements shall NOT be included
3. Spring rocking elements shall NOT be included

Linking Components and Ramps
1. Minimum of 3 components be included
2. Bridges and ramps included as needed to match play and flow the experience
3. Bridges and ramps included in compliance with ADA regulations; Ramps are linking components used as access for all children, but are necessary for children with disabilities. A minimum of one ADA wide-ramp should be provided to allow access for students to a higher deck height (deck height that is a minimum of 3 feet). The width of this ramp should be a minimum of 74 inches in order to provide dual access for handicapped and typical students. This ramp should provide access to at least four ADA-accessible components.
4. Suspension Bridges with ropes/cables shall NOT be included
5. At least 1 linking component - brachiating
6. At least 1 linking component - balancing
7. At least 1 linking component – climbing
Panels and Ground Play Components – All age levels
1. A minimum of 4 ground level experiences
2. A minimum of 2 interactive play panels
3. All panels and ground play components shall address a variety of needs, including socialization, manipulation, imaginative play, balance, and/or auditory stimulation.
4. The space under platforms and decks are places for children to congregate and interact. The roofs provided by this create an enclosed space, and add to its appeal as a gathering space. These spaces shall include ground level components. However, supervision of these components shall be considered in their placement.

Shade Structures
1. Full or Partial Shade over all sliding elements
2. Shade structures shall be bid as an alternate (follows FCPS past practice)

Additional Specifics
1. Maximum Deck Heights – 8 feet
2. Entire play experience should allow for at least 75 students
SECTION 316317- SHORT AGGREGATE PIER FOUNDATION SYSTEMS

PART 1 - GENERAL

0.1 RELATED DOCUMENTS:
   A. Drawings and general provisions of the contract including General and Supplementary Conditions, and Division 1, Specification Sections apply to work in this section.

1.2 RELATED WORK:
   A. Refer to Section 312000 "Earthmoving"

1.3 SUMMARY
   A. Work shall consist of designing, furnishing and installing aggregate pier foundations to the lines and grades designated on the project site and foundation plans and as specified herein. The aggregate piers shall be constructed by compacting aggregate in an excavated hole using special high-energy impact densification equipment. The aggregate piers shall be in a columnar-type configuration and shall be used to produce an intermediate foundation system for support of foundation loads.

1.4 PERFORMANCE REQUIREMENTS
   A. Installers of aggregate pier foundation systems shall be licensed by Geopier Foundation Company, Inc., or pre-bid approved equal, and shall have demonstrated experience in the construction of similar size and types of projects. Installers of other rammed, vibrated column systems meeting the requirements of this specification shall demonstrate that their system is equivalent in all respects for providing the necessary support to the foundation. The installer must be pre-approved by the Owner two weeks prior to bid date.

   B. Accepted Installers of aggregate pier foundation system:
      1. Geostructures Inc. (703) 771-9844
      2. Terra Systems (540) 882-4130
      3. Hayward Baker (410) 551-1980

   C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1.

1.5 REFERENCE STANDARDS
   A. Design
      1. "Control of Settlement and Uplift of Structures Using Short Aggregate Piers”, by Every C. Lawton (Assoc. Prof., Dept. of Civil Eng., Univ. of Utah), Nathaniel S. Fox (President, Geopier Foundation Co., Inc.), and Richard L. Handy (Distinguished Prof. Emeritus, Iowa State Univ., Dept. of Civil Eng.), reprinted from IN-SITU DEEP SOIL IMPROVEMENT, Proceedings of sessions sponsored by the Geotechnical Engineering Division/ASCE in conjunction with the ASCE National Convention held October 9-13, 1994, Atlanta, Georgia.
      2. “Settlement of Structures Supported on Marginal or Inadequate Soils Stiffened with Short Aggregate Piers”, by Every C. Lawton and Nathaniel S. Fox.

B. Modulus Load Testing
   1. ASTM D-1143 - Pile Load Test Procedures
   2. ASTM D-1194 - Spread Footing Load Test

C. Materials and Inspection
   1. ASTM D-1241 - Aggregate Quality
   2. ASTM STP 399 - Dynamic Penetrometer Testing
   3. ASTM D-422 - Gradation of Soils

D. Where specifications and reference documents conflict, the Architect/Engineer shall make the final determination of the applicable document.

1.6 CERTIFICATIONS AND SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Submittal:
   1. The Contractor shall submit seven (7) sets of detailed design calculations, construction drawings including pier layout, and shop drawings for approval at least four (4) weeks prior to the beginning of construction. A detailed explanation of the design properties for settlement calculations shall be submitted with the design. Additionally, the Contractor’s quality control test program for aggregate piers, meeting these design requirements, shall be submitted. All computer-generated calculations and drawings shall be prepared and sealed by a Professional Engineer, licensed in the State of Maryland, where the piers are to be constructed.

C. The Contractor shall submit a notarized manufacturer’s certification prior to the start of work, stating that the aggregate and other materials used meet the requirements of this specification.

D. Daily Aggregate Pier Progress Reports: The Contractor shall furnish a complete and accurate record of aggregate pier installation to the Construction Manager, Testing Agency, Structural Engineer, and Architect. The record shall indicate the pier location, length, average lift thickness, and final elevations of the base and top of pier. The record shall also indicate the type and size of the densification equipment used. The Contractor shall immediately report any unusual conditions encountered during installation to the Construction Manager and to the Testing Agency.

E. Contractor shall provide as-built record drawings.

1.7 MEASUREMENT AND PAYMENT

A. Quantities and sizes of piers shall be based on the aggregate pier design provided by the Contractor as required to provide the necessary support for the building foundations as shown on the Foundation Plan provided in the plans. If building foundation requirements change, increasing wall foundation lengths or the number of column footings, or if directed by the Architect, additional aggregate piers may be required. Measurement and payment for additional piers required to address foundation plan changes shall be per each in...
accordance with the unit prices provided in the Contract as provided by the Contractor on the Form of Proposal.

PART 2 - PRODUCTS

2.1 AGGREGATE

A. Aggregate used for piers constructed above the water table shall be Type I Grade B in accordance with ASTM D-1241-68, or shall be other graded aggregate selected by the Contractor and successfully used in the load test. It shall be compacted to a densification and strength which provides resistance to the dynamic penetration test (ASTM STP 399) of a minimum average of 15 blows per 1.75 inch vertical movement.

B. The number of tests performed during a workday by the Testing Agency shall depend on the consistency of achieving this minimum penetration resistance. Penetration tests need not be performed on every pier, nor on a continuous basis. If average penetration resistances measured exceed 15 blows, and less than 10% of tests fall below 15 blows, then testing may be reduced to spot checks. A pattern of successful tests is sufficient to reduce testing to several tests per day. Observation of questionable aggregate moisture content or questionable aggregate gradation appearance may determine the need for additional dynamic penetration testing to verify that proper densification and strength are being achieved.

C. For aggregate used for piers constructed below the water table, the gradation shall be the same as Type I Gradation B, except that particles passing the No. 40 sieve shall be eliminated. Alternately, No. 57 stone or other stone selected by the Aggregate Pier Installer may be used. Dynamic penetration resistance testing is inappropriate for this material.

PART 3 - DESIGN REQUIREMENTS

3.1 DESIGN REQUIREMENTS - GENERAL

A. The design submitted by the Contractor shall consider the bearing capacity and settlement of all footings supported by aggregate piers, and shall be in accordance with acceptable engineering practice and these specifications. Total and differential settlement shall be considered.

3.2 AGGREGATE PIER DESIGN

A. Aggregate piers shall be designed in accordance with generally accepted engineering practice and the method described in “Control of Settlement and Uplift of Structures Using Short Aggregate Piers”, by Every C. Lawton, Nathaniel S. Fox, and Richard L. Handy, reprinted from IN-SITU DEEP SOIL IMPROVEMENT, Proceedings of sessions sponsored by the Geotechnical Engineering Division/ASCE in conjunction with the ASCE National Convention held October 9 - 13, 1994, Atlanta Georgia. The design shall meet the following criteria:

1. Allowable Bearing Pressure for Aggregate Pier Improved Soil 5,000 (min.) psf
2. Minimum Aggregate Pier Area Coverage (Spread Footings) 30%*
3. Estimated Total Long-Term Settlement for footings \( \leq 1 \) inch *
4. Est. Long-Term Differential Settlement for Adjacent Footings \( \leq 0.5 \) inches*

### 3.3 CAPACITY AND SIZE OF THE AGGREGATE PIERS

A. The Contractor shall be responsible for delivering a system that will support the structure, while controlling settlement in accordance with these specifications. Any modifications to the size and spacing of the aggregate piers shall be approved by the Structural Engineer, Testing Agency, and Architect.

#### PART 4 - EXECUTION

### 4.1 GENERAL

A. Survey Work: The Contractor shall engage a Maryland Licensed land surveyor or professional engineer to perform surveys, layouts and measurements for aggregate pier-supported footings, mats, or grade beams for this project, including layout of piers. The Contractor shall provide ground elevations in sufficient detail to estimate drilling depth elevations to within 2 inches. Before excavating, lay out each drilled pier to lines and levels required. Record actual measurements of each drilled pier’s location, shaft diameter, bottom and top elevations, deviations from specified tolerances and other specified data.

1. Record and maintain information pertinent to each drilled pier and cooperate with the Owner’s Testing and Testing Agency to provide data for required reports.

B. Locate existing underground utilities prior to excavating drilled piers. Protect all existing and adjacent property structures, utilities, pavements and other facilities from damage caused by settlement, lateral movement, vibration and other hazards created by drilled pier operations.

C. Tolerances: Construct drilled piers to within ACI 336.1 tolerances.

1. If location or out-of-plumb tolerances are exceeded, provide corrective construction.

### 4.2 EXCAVATION

A. Unclassified Excavation: Excavation is unclassified to subgrade (for the aggregate piers, subgrade is defined as the bottom of the pier) and includes excavation to design bearing elevations regardless of character of materials or obstructions encountered. Should any obstruction be encountered during drilling or excavation for aggregate piers, the Contractor shall notify the Construction Manager, Testing Agency, Architect, and Structural Engineer in writing at once. Obstructions include, but are not limited to: boulders, timbers, concrete, bricks, utility lines, etc., which shall prevent placing the piers to the required depth, or shall cause the pier to drift from the required location. Dense natural rock or weathered rock layers shall not be deemed obstructions, and piers may be terminated short of design lengths on such materials as approved by the Structural Engineer and the Testing Agency. Payment for additional or relocated piers shall be in accordance with the unit prices as submitted on the Form of Proposal. No additional cost will be considered for down time.

B. Excavate shafts for drilled piers to required elevations. Remove loose material from bottom of excavation. Notify and allow Testing Agency to test and inspect bottom of excavation. If unsuitable bearing stratum is encountered, make adjustments to drilled piers as directed by Testing Agency at no additional cost.
C. Excavate shafts for closely spaced drilled piers and those occurring in fragile strata only after adjacent drilled piers are filled with aggregate.

B. Dewatering: Remove all water from excavated shafts before placing aggregate. The methods of dewatering shall be as selected and designed by the Contractor. Dewatering shall remove, from the start of excavation until completion of backfilling, all water from excavations and drilled pier shafts. All groundwater, including water from such sources as springs, seepage, leakage, perched water and all surface water from such sources as rain, snow, runoff, accident spillage and all liquid mud, from whatever source shall be removed. Water and its removal shall be considered unclassified excavation, fully the responsibility of the Contractor, without additional cost to the Owner. The responsibility for the performance of Dewatering methods and devices shall lie entirely with the Contractor. The correction of settlement and damage to persons and property due to settlement shall be the responsibility of the Contractor. All water, mud, etc., removed from excavations shall be directed to an approved Sediment Control Device.

4.3 BOTTOM STABILIZATION VERIFICATION TEST

A. At the beginning of the project, the Testing Agency may require a bottom stabilization verification test be performed to provide quantitative information on pier stabilization. This test may also be required when a new soil formation is encountered. After completion of the bottom pier bulb, or at anytime during the process of constructing the pier, the energy source may be turned off, and a bottom stabilization verification test may be performed. A reference bar is placed over the cavity, and a mark is made on the tamper shaft that has been placed on top of the compacted aggregate. The energy to the tamper is restarted. If the measured vertical movement exceeds 150% of the value achieved during the load test, added energy is applied to re-densify the bulb. The procedure for measuring is then repeated. If there is still movement greater than 150% of the value achieved during the load test and greater than ½ inch, a lift of loose aggregate may be placed on top of the compacted aggregate. The verification test may then be performed on this next lift after it is densified. If there is excessive movement on this lift, another lift may be placed and tested. Movement must be limited to below 150% of the values achieved for the load test before completion of 2/3 of the pier depth unless unusually powerful modified hydraulic hammers are being used with tamper heads smaller than 26 inches in diameter.

4.4 REJECTED AGGREGATE PIERS

A. Aggregate piers improperly located or installed beyond the maximum allowable tolerances shall be abandoned and replaced with new piers, unless the Testing Agency approves other remedial measures. All materials and labor required to replace rejected aggregate piers shall be provided at no additional cost to the Owner.

4.5 PLAN LOCATION AND ELEVATION OF AGGREGATE PIERS

A. The location of each pier shall be established by the Contractor based on the foundation plan provided in the documents. The Contractor shall develop a pier location plan based on this foundation plan and the required pier design. The center of each installed pier shall be within 6-inches of the approved locations submitted with the Contractor’s design layout. The final measurement for the top of aggregate piers shall be the lowest point on the
aggregate in the last compacted lift. Piers installed outside of the above tolerances and deemed not acceptable shall be rebuilt at no additional expense to the Owner.

4.6 QUALITY ASSURANCE

A. The Contractor shall have a full-time Quality control representative to verify and report all QC installation procedures. The Owner’s Testing Agency shall provide Quality Assurance services and shall monitor the load tests when load tests are to be performed. The Testing Agency shall monitor the installation of load test aggregate piers to document procedures and criteria used for constructing the load test pier(s). The Contractor shall provide and install all dial indicators and other measuring devices. The Testing Agency shall monitor the installation of aggregate piers. The Contractor shall adhere to all methods, standards, and codes described herein, unless authorized in writing by the Construction Manager.

1. A written drilled-pier report will be prepared by the Contractor and provided to Construction Manager and Testing Agency for each drilled pier as follows:
   a. Actual top and bottom elevations
   b. Top of rock elevation (if encountered)
   c. Description of soil materials
   d. Description, location and dimensions of obstructions
   e. Final top centerline and deviations from requirements
   f. Variation of shaft from plumb
   g. Shaft excavating method
   h. Design and tested bearing capacity of bottom
   i. Ground water conditions and water-infiltration rate, depth and pumping
   j. Date and time of starting and completing excavation
   k. Inspection report

B. Trial Drilled Pier: Construct trial drilled pier of diameter and depth and at location indicated by Testing Agency, of same diameter and depth as drilled piers located at least three diameters clear of permanent piers, to demonstrate Installer’s construction methods, equipment, standards of workmanship and tolerances.

C. Load Test: Two Aggregate Pier Modulus Tests shall be performed at locations agreed upon by the Aggregate Pier Designer and the Testing Agency to verify or modify Aggregate Pier designs. Aggregate Piers that are tested to provide a safe design, and that meet the tolerances described in this specification, may be used in the finished work. Aggregate Piers shall be tested to 150 percent of the maximum design stress as shown in the aggregate pier design submittal. Modulus Test Procedures shall utilize appropriate portions of ASTM D 1143 and ASTM D 1194, as outlined below. The modulus schedule shall be as follows.

<table>
<thead>
<tr>
<th>Increment</th>
<th>Approximate Load</th>
<th>Minimum Duration</th>
<th>Maximum Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seat</td>
<td>&lt; 9</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>15</td>
<td>60</td>
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</tr>
<tr>
<td>7</td>
<td>117</td>
<td>60</td>
<td>120</td>
</tr>
</tbody>
</table>
Each load increment shall be held for the minimum duration shown. For each load increment the deflection of the top plate shall be measured. The top plate shall be located on top of the Aggregate Pier or on top of concrete cast on top of the Aggregate Pier. If the rate of the Aggregate Pier deflection exceeds 0.01 inches per hour, the load shall be held in 15 minute increments until the rate of the Aggregate Pier deflection is less than 0.01 inches per hour (0.0025 inches per 15 minutes), or the maximum duration is reached. Test Aggregate Pier deflections of each plate shall be measured using a minimum of two dial gauges graduated to 0.001 inches. Dial gauges shall be anchored to the loading jack base, with gauge plungers set on reference beams anchored at least two diameters from the Aggregate Pier. The test jack, pump and pressure gauges shall have been calibrated within no longer than six months from the date of the test. If there are any questions regarding jack, pump and gauge accuracy, a confirmation calibration shall be performed after the modulus test. The results of the modulus test shall be reported on a deflection versus stress graph. The Aggregate Pier modulus shall be calculated as the maximum design stress divided by the deflection of the top plate. The deflection of the top plate shall not exceed the upper zone settlement as shown in the design calculations for any pier location.

4.7 FOOTING BOTTOM

A. All excavations for footing bottoms supported by aggregate pier foundations shall be prepared in the following manner by the 3A - Concrete Contractor: Over excavation below the bottom of the footing elevation shall be limited to 3-inches. A toothless grading bucket or hand-excavating will be required by the 3A Contractor to trim footing bottom accordingly in order to minimize disturbance to top of Aggregate Pier.

B. Compaction of surface soil and top of aggregate piers shall be prepared using a standard, hand-operated impact compactor (“Whacker Packer”, “Jumping Jack”, or equal). Compaction shall be performed over the entire footing bottom to compact any loose surface soil and loose surface pier aggregate. This work will be by the 3A - Concrete Contractor.

C. Excavation and surface compaction of all footings shall be the responsibility of the 3A - Concrete Contractor.

END OF SECTION 316317
PARTIAL 1st FLOOR PLAN AREA C2
4. **DUCTLESS SPLIT HEAT PUMP SYSTEM NO. 5 (DSS–5)**
(SERVES PLATFORM C110)

**GENERAL:**
- Based on Daikin Multi-Position Air Handling Unit w/ Wireless Interface Adapter or Equal of Mitsubishi.
- R410A Refrigerant, Low Ambient Cooling to 0°F
- Provide Hard Wired Wall Mounted Controller
- Provide Refrigerant Piping between Condenser and Indoor Unit.
- Size Piping According to Manufacturer’s Recommendations.
- Provide w/ Factory Supplied Support

**CAPACITY:**
- 3-Ton Total Cooling Capacity
- 95°F DB/78°F WB Outdoor Conditions
ELEVATION - ROOM SIGNAGE

ROOM SIGNAGE

TO OPERATE THE SPACE TO MEET IBC 1007.6.4 AND 1007.6.5

PROVIDE AREA OF REFUGE SIGNAGE FOR EACH AREA INDICATED

RESTROOM STAIR 1

STAIR 1

EXIT

STAIR 1

DOOR HINGES, TYP.

SANS SERIF OR SIMPLE SERIF CAPS

SANS SERIF TYPE STYLE

TACTILE TEXT RAISED 1/32"

MIN. 5/8" CAP. HEIGHT

TACTILE TEXT RAISED 1/32"

BOTTOM BOUNDARY OF PICTOGRAM FIELD (6" X 6"

MIN).
PARTIAL FIRST FLOOR FURNISHING PLAN - AREA A

GENERAL FURN. SCHEDULE

COUNTERTOP SCHEDULE

EQUIPMENT SCHEDULE

GENERAL FURNISHING AND EQUIPMENT NOTES

LOCKER SCHEDULE

METAL SHELVING

DISPLAY CASE

NOTE: NOT ALL ITEMS INDICATED ON SCHEDULE ARE REPRESENTED IN THIS PROJECT.

- PROVIDE ADEQUATE BLOCKING IN STUD WALLS AND AT CMU WALLS FOR WALL SEE SPEC SECTION 12 35 51 FOR REQUIREMENTS OF MUSIC INSTRUMENT STORAGE CABINETS.

- ALL CASEWORK WHICH MEETS A WALL AT ONE OR BOTH ENDS, TO BE PROVIDED WITH FILLER PANELS AND SCRIBED TO THE WALL(S) FULL CASEWORK REQUIREMENTS.

- DIVISIONS IN CASEWORK ARE SHOWN FOR CLARITY AND DO NOT REPRESENT BREAKS IN THE COUNTERTOP.

- ALL CABINET HEIGHTS INCLUDE COUNTERTOPS. DIMENSIONS ARE TO THE NEAREST INCH.
1. The wall footings shall be on compacted fill with a capacity of 2500 psf. The finished slab elevation shall be 0.00'. Refer to the civil drawing for the finished floor elevation.

2. The slab on grade shall be 5" (U.N.O.) concrete with 6"x6"-W2.0/W2.0 welded wire mesh, in flat sheets. Slab to be poured in place over vapor barrier and aggregate base. See soil report.

3. Top of footing elevations noted on plan are taken from reference elevation 0.00'-0".

4. Roof sheathing to be 19/32" plywood, see structural notes.

5. Roof truss bearing to be (0'-0") +0'-0" above finished floor below, U.N.O.

6. Roof truss framing plan.

ENGINEERS & MECHANICAL SUBCONTRACTORS. Lower the footing elevations (shown on the drawing) as indicated in detail 6/S-5.1.

S-5.1 FOR TYPICAL DETAILS & STRUCTURAL NOTES

S-5.2 FOR STRUCTURAL STEEL TYPICAL DETAILS

ENGINEERS & MECHANICAL SUBCONTRACTORS. Provide 48d b lap reinforcement to the table 'groat proportions by volume for masonry construction' on SHT. S-3.1.
MECHANICAL DETAILS

 URBNR ELEMENTARY SCHOOL REPLACEMENT
 FREDERICK COUNTY, MARYLAND

BID SET

ADDENDUM 1

ADDENDUM 2
8" SW, 8,300 SF, 276 GPM
(I.E. 443.00') REFER TO CIVIL DRAWINGS FOR CONTINUATION.

6" SAN
(I.E. 439.00') REFER TO CIVIL DRAWINGS FOR CONTINUATION.

5' 5'
7' 7'
9' 9'
10' 10'
11' 11'
13' 13'
15' 15'

H G J K P N M L 2"S UP TO WATER COOLER
3"S UP TO MS
4"S UP TO WC
3"S UP TO FD
2"S UP TO LAV
2"S UP TO WASH FOUNTAINS
2"S UP TO UR
2"V UP
2"V UP
4"S UP TO WC (TYP OF 5)
3"S UP TO FD
2"S UP TO SINK
2"S UP TO SINK
2"S UP TO SINK
2"S UP TO SINK
2"S UP TO SINK
2"S UP TO SINK
2"S UP TO WASH FOUNTAIN
4"S UP TO WC
2"S UP TO WASH FOUNTAIN
2"S UP TO UR
S UP TO SINK

4" SW UP (3,300 SF, 110 GPM)
6" SW UP (5,000 SF, 166 GPM)
8" SW
6" SW UP (5,200 SF, 173 GPM)
4" SW UP (3,300 SF, 110 GPM)

RADON SUCTION PIT
6" RADON VENT UP

MATCHLINE - REFER TO SHEET P-0.4 FOR CONTINUATION

MATCHLINE - REFER TO SHEET P-0.1 FOR CONTINUATION

PARTIAL FOUNDATION PLAN - AREA C1

KEY PLAN - AREA C1

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PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE No. 35222, EXPIRATION DATE: 01/05/2020.

SCALE: 1/8" = 1'-0"
MATCHLINE FOR CONTINUATION

PARTIAL FOUNDATION PLAN - AREA C1

REFER TO SHEET P-0.3 FOR CONTINUATION
1. THE WHOLE POTABLE WATER SYSTEM AND ALL ITS COMPONENTS SHALL COMPLY WITH NSF 61-ANNEX G, NSF 372, AND ALL MARYLAND STATE "LEAD FREE" PLUMBING LAWS AND GUIDELINES.

2. PROVIDE DRIP PAN AND LIQUID SENSOR BELOW TRAPS FOR SANITARY PIPING SERVING FLOOR DRAINS ON THE SECOND FLOOR AREAS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

3. FOR ADDITIONAL SIZING REFER TO RISER DIAGRAMS, DETAILS AND PLUMBING FIXTURE CONNECTION SCHEDULE.