

Telephone: 989-790-9120  
Facsimile: 989-790-9063



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## Addendum #2

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Attn: Estimator	Date: February 4, 2025
From: Lisa Donahue, Project Administrator	Pages: 26 (including cover page)
Re: 2023 Bond Phase 3a Project Middle School	Project: Bangor Township School District
CC:	Proj. #: A23906-05

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RFIs	14 Pages
Arch write up	1 Pages
Spec Section 042200 Concrete Unit Masonry	10 Pages

Electronic bids can only be submitted using Building Connected see link  
<https://app.buildingconnected.com/login?retUrl=%2F>

If you would like to listen while bids are being opened, use the link.  
<https://8x8.vc/wolgast/lisa.donahue>

*Paper bids go to school – see below information.*

**Bid Date is scheduled for:**  
**Friday, February 7, 2025, at 2:00 PM**  
Bangor Township School District  
Administration Office  
Matthew Schmidt, Superintendent  
3359 E Midland Road  
Bay City, MI 48706

RFI detail

# #6 Convector Covers to be Painted




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<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>Answered</b>	Feb 4, 2025 by <b>dschwerin@wolgast.com</b>

### Question

<p>Sheet M1.0 Area B & C – The convector covers, do these need to be removed for the painter to paint them and reinstalled after. </p>

### Official response

IMAGINiT Pulse (IMAGINIT TECHNOLOGIES): Covers need to be removed by Mechanical Contractor and turned over to painter for painting. Painting Contractor will return to Mechanical Contractor for reinstallation.

By *dschwerin@wolgast.com* - Feb 4, 2025, 9:49 AM EST

### Impact

Cost impact -

Schedule impact -

### Other attributes

Priority -

Discipline -

Category -

Location -

Location details -

RFI detail

# #12 Room Signage



<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>Answered</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)

## Question

<p> </p>  
 <ul>  
 <li><span style="font-size:10.0pt;">Please clarify required room signage locations and/or quantities (the assumption being only the new addition area)</span></li>  
 <li><span style="font-size:10.0pt;">Are there any other existing rooms that require new room signage?</span></li>  
 </ul>

## Official response

IMAGINiT Pulse (IMAGINIT TECHNOLOGIES): Please see attached document for response.  
 By *IMAGINiT Pulse (IMAGINIT TECHNOLOGIES)* - Jan 30, 2025, 6:33 PM EST

## References and Attachments

### Files (1)

- RFI 12-Room\_Signage-2025-01-27\_jmk012825.pdf

## Impact

**Cost impact** -  
**Schedule impact** -



**Wolgast Corporation**  
 4835 Towne Centre Road Suite 203  
 Saginaw, Michigan 48604  
 P: (989) 790-9120

**Project: A23906-5A Bangor Twp - 23 Bond PH 3A - Middle School**  
 3281 Kiesel Road  
 Bay City, Michigan 48706  
 P: 989-684-8121  
 F: 989-684-6000

## RFI #12: Room Signage

<b>Status</b>	Open		
<b>To</b>	Shannon Finnila (INTEGRATED DESIGNS, INC)	<b>From</b>	Dale Schwerin (WOLGAST CORPORATION) 4835 Towne Centre Road Suite 203 Saginaw, Michigan 48604
<b>Date Initiated</b>	Jan 27, 2025	<b>Due Date</b>	Jan 30, 2025
<b>Location</b>		<b>Project Stage</b>	Bidding
<b>Cost Impact</b>		<b>Schedule Impact</b>	
<b>Spec Section</b>		<b>Cost Code</b>	
<b>Drawing Number</b>		<b>Reference</b>	
<b>Linked Drawings</b>			
<b>Received From</b>	Dale Schwerin (WOLGAST CORPORATION)		
<b>Copies To</b>	Dan Blossom (WOLGAST CORPORATION)		

### Activity

**Question**      **Question from Dale Schwerin WOLGAST CORPORATION on Monday, Jan 27, 2025 at 02:57 PM EST**

- Please clarify required room signage locations and/or quantities (the assumption being only the new addition area)
- Are there any other existing rooms that require new room signage?

*Awaiting an Official Response*

Sign types noted on door schedule, page A4.0

JMK 01/28/25

RFI detail

# #13 Domestic Water Piping Type



<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>Answered</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)

### Question

Domestic water piping – What material are we allowed to use on 2-1/2" and larger pipe?

### Official response

Please see attached document for response.

*By IMAGINiT Pulse (IMAGINIT TECHNOLOGIES) - Jan 30, 2025, 6:33 PM EST*

### References and Attachments

#### Files (1)

- RFI 13-Domestic\_Water\_Piping\_Type-2025-01-28\_IDI 01.29.25.pdf

### Impact

Cost impact -

Schedule impact -

### Other attributes

Priority -

Discipline -



**Wolgast Corporation**  
 4835 Towne Centre Road Suite 203  
 Saginaw, Michigan 48604  
 P: (989) 790-9120

**Project: A23906-5A Bangor Twp - 23 Bond PH 3A - Middle School**  
 3281 Kiesel Road  
 Bay City, Michigan 48706  
 P: 989-684-8121  
 F: 989-684-6000

## RFI #13: Domestic Water Piping Type

<b>Status</b>	Open		
<b>To</b>	Shannon Finnila (INTEGRATED DESIGNS, INC)	<b>From</b>	Dale Schwerin (WOLGAST CORPORATION) 4835 Towne Centre Road Suite 203 Saginaw, Michigan 48604
<b>Date Initiated</b>	Jan 28, 2025	<b>Due Date</b>	Jan 31, 2025
<b>Location</b>		<b>Project Stage</b>	Bidding
<b>Cost Impact</b>		<b>Schedule Impact</b>	
<b>Spec Section</b>		<b>Cost Code</b>	
<b>Drawing Number</b>		<b>Reference</b>	
<b>Linked Drawings</b>			
<b>Received From</b>	Dale Schwerin (WOLGAST CORPORATION)		
<b>Copies To</b>	Dan Blossom (WOLGAST CORPORATION)		

### Activity

**Question**      **Question from Dale Schwerin WOLGAST CORPORATION on Tuesday, Jan 28, 2025 at 02:00 PM EST**  
 Domestic water piping – What material are we allowed to use on 2-1/2" and larger pipe?

*Awaiting an Official Response*

Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:

1. Drawn-temper copper tube, ASTM B88, Type L; wrought-copper, solder-joint fittings; and soldered joints.
2. Drawn-temper copper tube, ASTM B88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.
3. Drawn-temper copper tube, ASTM B88, Type L; grooved-joint, copper-tube appurtenances; and grooved joints.

- CRP 01.29.25

RFI detail

# #15 Plumbing Maintenance




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<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINiT TECHNOLOGIES)
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>IMAGINiT Pulse</b> (IMAGINiT TECHNOLOGIES)
<b>Answered</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINiT TECHNOLOGIES)

### Question

<p>22 05 00 – Common work results for plumbing – 3.5 Maintenance – A. Providing maintenance for 1 year. Is this included in this project? If it is required, is it only limited to the equipment in this project?</p>

### Official response

Please see attached document for response.

By *IMAGINiT Pulse (IMAGINiT TECHNOLOGIES)* - Jan 30, 2025, 6:33 PM EST

### References and Attachments

#### Files (1)

- RFI 15-Plumbing\_Maintenance-2025-01-28\_IDI 01.29.25.pdf

### Impact

Cost impact -

Schedule impact -

### Other attributes

Priority -

Discipline -



**Wolgast Corporation**  
 4835 Towne Centre Road Suite 203  
 Saginaw, Michigan 48604  
 P: (989) 790-9120

**Project: A23906-5A Bangor Twp - 23 Bond PH 3A - Middle School**  
 3281 Kiesel Road  
 Bay City, Michigan 48706  
 P: 989-684-8121  
 F: 989-684-6000

## RFI #15: Plumbing Maintenance

<b>Status</b>	Open		
<b>To</b>	Shannon Finnila (INTEGRATED DESIGNS, INC)	<b>From</b>	Dale Schwerin (WOLGAST CORPORATION) 4835 Towne Centre Road Suite 203 Saginaw, Michigan 48604
<b>Date Initiated</b>	Jan 28, 2025	<b>Due Date</b>	Jan 31, 2025
<b>Location</b>		<b>Project Stage</b>	Bidding
<b>Cost Impact</b>		<b>Schedule Impact</b>	
<b>Spec Section</b>		<b>Cost Code</b>	
<b>Drawing Number</b>		<b>Reference</b>	
<b>Linked Drawings</b>			
<b>Received From</b>	Dale Schwerin (WOLGAST CORPORATION)		
<b>Copies To</b>	Dan Blossom (WOLGAST CORPORATION)		

### Activity

**Question** *Question from Dale Schwerin WOLGAST CORPORATION on Tuesday, Jan 28, 2025 at 02:03 PM EST*  
 22 05 00 – Common work results for plumbing – 3.5 Maintenance – A. Providing maintenance for 1 year. Is this included in this project? If it is required, is it only limited to the equipment in this project?

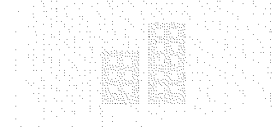
*Awaiting an Official Response*

With regards to the contract verbiage, yes, it is included for, and covers the work the contractor performs and the equipment they install only. - CRP 01.29.25



RFI detail

# #16 Restroom Lavatories and Art Sink




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<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>Answered</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)

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## Question

<p>1. Looking at the print I see there are hanging lavatories in rms: A114, A115, B109, B105, C102, C103. I don't see any details on whether these are laminate or something else, solid surface tops or laminate? </p>  
 <p></p>  
 <p>2. Also I see in Art rm. that they are specing a cabinet unit "Diversified Woodcrafts Art Sink Mod. 3010-ADA". Looking into this unit I see it comes with cabinets, knee panel, full sink top with faucets. Not sure if you want me to provide this whole unit, just base cabs., or if provided by others? I can provide installation of base cabs., sink and plumbing by others. Thank you.</p>

## Official response

1. See Drawings P3.0 Plumbing Fixture Schedule. Restroom Lavatories are a one piece provided and installed by Plumbing Contractor.
2. Art Sink Complete System shall be provided and installed by General Trades Contractor per General Trades Bid Division, Project Inclusions, Number 24.

By *IMAGINiT Pulse (IMAGINIT TECHNOLOGIES)* - Jan 30, 2025, 6:33 PM EST

## Impact

Cost impact -

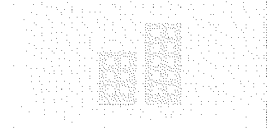
Schedule impact -

## Other attributes

Priority -

RFI detail

# #17 Structural Steel Testing & Inspections



<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)
<b>Answered</b>	Jan 30, 2025 by <b>IMAGINiT Pulse</b> (IMAGINIT TECHNOLOGIES)

## Question

<p>Structural Steel</p>  
 <p>I see in the specs under "Division Inclusions" item 7 states "Provide all special inspections required per specifications" </p>  
 <p>But, under "Excludes" item 2 states "Testing and inspections of steel".</p>  
 <p> </p>  
 <p>Am I to include special inspections in my proposal?</p>

## Official response

Structural Steel Testing & Inspections will be by Owner.  
 By *IMAGINiT Pulse (IMAGINIT TECHNOLOGIES)* - Jan 30, 2025, 6:34 PM EST

## Impact

- Cost impact -
- Schedule impact -

## Other attributes

- Priority -
- Discipline -
- Category -

RFI detail

# #18 Alternate 3 Fixture Count



Status	Closed
Created on	Jan 31, 2025 by dschwerin@wolgast.com
RFI type	Default RFI workflow
Ball in court	dschwerin@wolgast.com
Answered	Jan 31, 2025 by dschwerin@wolgast.com

### Question

Alternate 3 asks that we provide pricing for detaching and reinstalling of light fixtures and etc. Fixtures and devices are not shown on the drawing. Can an allowance be used?

### Official response

Dale Schwerin (WOLGAST CORPORATION): Please include a \$10,000 allowance in your bid for this work.

By dschwerin@wolgast.com - Jan 31, 2025, 3:12 PM EST

### Impact

Cost impact -

Schedule impact -

### Other attributes

Priority Normal

Discipline -

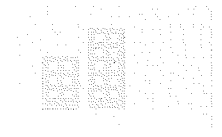
Category -

Location -

Location details -

RFI detail

# #19 Window Removal




---

<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Feb 3, 2025 by <b>dschwerin@wolgast.com</b>
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>dschwerin@wolgast.com</b>
<b>Answered</b>	Feb 3, 2025 by <b>dschwerin@wolgast.com</b>

---

## Question

Seeing how a good amount of the exterior windows are being removed / replaced, is the general trades contractor removing the existing windows after the new windows are on site?  
 Or are we removing the windows and install temporary enclosures until the new windows arrive

---

## Official response

Dale Schwerin (WOLGAST CORPORATION): Windows will be removed once new windows are onsite. Goal will be to remove and replace window all in the same day. It will not be required to temporarily board up unless installing contractor can get new window installed. Then installing contractor will need to temporarily board up window.

*By dschwerin@wolgast.com - Feb 3, 2025, 2:17 PM EST*

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## Impact

**Cost impact** -

**Schedule impact** -

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## Other attributes

**Priority** Normal

**Discipline** -

**Category** -

**Location** -

---

RFI detail

# #20 Flooring Demo



Status	Closed
Created on	Feb 3, 2025 by dschwerin@wolgast.com
RFI type	Default RFI workflow
Ball in court	dschwerin@wolgast.com
Answered	Feb 3, 2025 by dschwerin@wolgast.com

### Question

On demolition drawings – keynote #10 state Remove existing flooring and base (Abatement by Owner)  
 Is the General Trades division supposed to include any cost for this or would this all fall on the owner's abatement contractor?

### Official response

Dale Schwerin (WOLGAST CORPORATION): In locations of flooring removal, the flooring material is positive for asbestos. The Owner will have their abatement Contractor remove flooring and grind off any material left on the surface of the concrete.

*By dschwerin@wolgast.com - Feb 3, 2025, 2:28 PM EST*

### Impact

Cost impact	-
Schedule impact	-

### Other attributes

Priority	Normal
Discipline	-
Category	-
Location	-

RFI detail

# #21 Bulletin Board Specifications




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<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Feb 4, 2025 by <b>dschwerin@wolgast.com</b>
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>dschwerin@wolgast.com</b>
<b>Answered</b>	Feb 4, 2025 by <b>dschwerin@wolgast.com</b>

## Question

I did not see a specification for the Bulletin Board surfaces. Typically for schools, this would be cork or Forbo. We also apply fabrics, but generally for office settings. Any chance you know this specification for Bangor MS?

## Official response

Dale Schwerin (WOLGAST CORPORATION): Claridge Cork and Forbo would be fine.

*By dschwerin@wolgast.com - Feb 4, 2025, 8:11 AM EST*

## Impact

Cost impact -

Schedule impact -

## Other attributes

Priority Normal

Discipline -

Category -

Location -

Location details -

RFI detail

# #22 Card Readers and Cameras




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<b>Status</b>	<b>Closed</b>
<b>Created on</b>	Feb 4, 2025 by <b>dschwerin@wolgast.com</b>
<b>RFI type</b>	Default RFI workflow
<b>Ball in court</b>	<b>dschwerin@wolgast.com</b>
<b>Answered</b>	Feb 4, 2025 by <b>dschwerin@wolgast.com</b>

## Question

---

What will the extent of the scope the electrical contractor would be responsible for the card readers and cameras. It looks like it would be for the EC to run the CAT 6 cable, terminate at both ends, and mount the cameras and card reader provided by others. Who will be responsible for the programing of these devices? It would make sense for Honor to since it is their system and that would be covered by the owner?

## Official response

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Dale Schwerin (WOLGAST CORPORATION): Contractor to run wiring and connect Owner devices. Programing will be by Owner.

*By dschwerin@wolgast.com - Feb 4, 2025, 9:41 AM EST*

## Impact

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**Cost impact** -

**Schedule impact** -

## Other attributes

---

**Priority** Normal

**Discipline** -

**Category** -

**Location** -

1021 West Baraga Avenue,  
Marquette, Michigan 49855  
Phone (906) 228-4480 Fax (906) 228-7524

8571 W. Grand River Ave., Suite 600  
Brighton, Michigan 48816  
Phone: (810) 229-2701 Fax: (810) 229-6767

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Addendum No: 2

Project Number: 22-011

Project: Bangor Township Schools  
Phase 3A  
Middle School Projects

Date: 1/31/2025

Issued To: Wolgast

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The contractor shall acknowledge receipt of all addenda by listing the number where indicated on the bid form.

Drawings, specifications, and / or proposals are herein amended, expanded, and / or modified, and become a part of the Contract Documents with the same effect as if incorporated in the original documents. Any contrary provisions contained, or referred to, in Drawings and / or Specifications, shall remain applicable unless overridden by this Addendum. Revised provisions herein shall include all labor, materials, methods, modifications, etc. required for the completion of the Work.

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#### Specifications

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1. Revised Specification:  
042200 Concrete Unit Masonry

**Attachments: As noted above.**

END OF ADDENDUM

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**SECTION 042200  
CONCRETE UNIT MASONRY**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes:
  - 1. Concrete masonry units.
  - 2. Clay face brick.
  - 3. Concrete face brick.
  - 4. Steel reinforcing bars.

1.2 RELATED SECTIONS

- A. Section 033000- Cast-in-place Concrete: Placement of reinforcing bars.
- B. Section 079200- Joint Sealers: rod and sealant at control and expansion joints.

1.3 REFERENCES

- A. ACI 530/ASCE 5/TMS 402 Building Code Requirements for Masonry Structures.
- B. ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.
- C. ANSI/ASTM A82 Cold Drawn Steel Wire for Concrete Reinforcement.
- D. ANSI/ASTM C216 Facing Brick(Solid Masonry Units Made From Clay or Shale).
- E. ASTM A307 Carbon Steel Externally Threaded Standard Fasteners.
- F. ASTM C67-Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- G. ASTM C90 Load Bearing Concrete Masonry Units.
- H. ASTM C91 Masonry Cement
- I. ASTM C94 Ready Mixed Concrete
- J. ASTM C144 Aggregate for Masonry Mortar
- K. ASTM C150 Portland Cement
- L. ASTM C207 Hydrated Lime for Masonry Purposes
- M. ASTM C270 Mortar for Unit Masonry
- N. ASTM C387 Packaged, Dry, Combined Materials, for Mortar and Concrete
- O. ASTM C404 Aggregates for Masonry Grout
- P. ASTM C476 Grout for Masonry IMIABC International Masonry Industry All Weather Council: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction

1.4 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.
- B. Samples: For each type and color of the following:
  - 1. Face brick
  - 2. Colored-aggregate mortar.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of product. For masonry units, include data on material properties material test reports substantiating compliance with requirements.

## 1.7 QUALITY ASSURANCE

- A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
  - 1. Build sample panels for each type of exposed unit masonry construction, typical exterior wall, typical interior wall, typical exterior and interior walls in sizes approximately 16 inches long by 24 inches high.

## 1.8 FIELD CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## 1.9 EFFLORESCENCE

- A. Samples of veneer for exterior walls will be tested for efflorescence per ASTM C67 prior to acceptance of veneer. The samples shall be taken directly from the pallets delivered to the site, at the rate of one sample per 5000 units.
- B. In the event that efflorescence appears after walls are in place, the Architect shall select samples of veneer and mortar taken directly from the wall to be tested for chemical content. If efflorescence producing materials are found in the veneer or mortar in amounts exceeding the limits called for by this specification and the referenced ASTM standards, the contractor shall bear the cost of the testing and remedial work on the masonry. If efflorescence producing materials in both the veneer and the mortar do not exceed the limits as stated above, the cost of the testing and patching the areas where samples were removed shall be by Owner.

## **PART 2 - PRODUCTS**

### 2.1 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
  - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

### 2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. Integral Water Repellent: Provide units made with integral water repellent for exposed units and where indicated.
- C. CMUs: ASTM C90.
  - 1. Masonry for the load-bearing wythe of all load-bearing walls and all exterior walls shall have a masonry compressive strength, f'm, of 2500 psi
  - 2. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3750 psi for load-bearing walls, and 1900 psi for all other walls.
  - 3. Density Classification: Normal weight.

### 2.3 FACE BRICK

- A. Face Brick: ANSI/ASTM C216, Type FBS, Grade SW; color as follows:
  - a. Bowerston custom blend, 75% #1425 Blush Buff Flash Bark modular/ 25% #1425 Sunfire Bark Modular
  - 2. The saturation coefficient requirement of ANSI/ASTM C216 shall not be waived.
  - 3. Maximum water absorption shall not exceed 5% by weight of unit.
  - 4. The initial rate of absorption shall not be less than 6 grams per minute nor more than 20 grams per minute.
  - 5. The maximum permissible extent of chippage 0"-1/4" in from the edge and 0"-3/8" in from the corner shall not exceed 40%.
  - 6. If cored units are supplied, three cores of 1-1/2" maximum diameter shall be the pattern provided.
- B. Brick Masonry Units: Nominal modular size of 2-2/3" high x 8" long x 4" wide and nominal utility size 4" high x 12" long x 4" wide, or as indicated in specific brick selection. Provide special units for bull nosed corners.

### 2.4 CONCRETE LINTELS

- A. Concrete Lintels: ASTM C1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs.

### 2.5 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I, gray color.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C91/C91M, Type S.
- E. Aggregate for Mortar: ASTM C144, Standard masonry type.
  - 1. White-Mortar Aggregates: Natural white sand or crushed white stone.
  - 2. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

- F. Aggregate for Grout: ASTM C404.
- G. Cold-Weather Admixture: Non-chloride, non-corrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- H. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
- I. Water: Clean and Potable.

## 2.6 REINFORCEMENT AND ANCHORAGE

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
  - 1. Interior Walls: Mill- galvanized, carbon steel.
  - 2. Exterior Walls: Hot-dip galvanized carbon steel.
  - 3. Wire Size for Side Rods: 9 gauge (0.148-inch) diameter.
  - 4. Wire Size for Cross Rods: 9 gauge (0.148-inch) diameter.
  - 5. Spacing of Cross Rods: Not more than 16 inches o.c.
  - 6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
  - 7. Cavity Walls: Standard hook and eye adjustable anchors.
  - 8. Strap Anchors: Bent steel shape, one inch wide x 3/16" thick.
  - 9. Dovetail Anchors: Bent steel strap, galvanized finish, 24 gauge with 12 gauge wire triangles.
  - 10. Built-in Anchors: ASTM A307.
  - 11. Reinforcing Steel: Deformed type, specified in Section 03001; uncoated finish.
- C. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
  - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
  - 2. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
  - 3. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- D. Partition Top Anchors: 0.105-inch- thick metal plate with a 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.
- E. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.
  - 1. Corrosion Protection: Unless otherwise required, protect joint reinforcement, ties and anchors from corrosion by galvanizing in conformance with Sections 1.13.4.3 of ACI 530/ASCE 5/TMS 402 and Section 2.4 F of ACI 530.1/ASCE 6/TMS 602.
- F. All intersecting masonry walls (load and nonloadbearing) shall be anchored or bonded together by one of the methods described in the 2015 Michigan Building Code, unless noted otherwise. Masonry walls intersecting a perpendicular wall of a different material shall be anchored to that wall by means of steel connectors per 2015 Michigan Building Code, unless noted otherwise.
- G. Interior nonloadbearing masonry walls, with an unsupported length between intersecting perpendicular walls greater than 36 times the wall thickness, shall be braced to the floor or roof structure above at intervals not exceeding 36 times the wall thickness, unless noted otherwise.

## 2.7 FLASHING

- A. Flexible Flashing: Use one of the following unless otherwise indicated:
  - 1. Copper-Laminated Flashing: 5-oz./sq. ft. copper sheet bonded between two layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
  - 2. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch.

## 2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).
- B. Drilled in Concrete Anchors (DCA's) for grouted masonry. Provide stainless steel or galvanized to G185 coating per ASTM A153 for DCA's in contact with preservative treated wood.
- C. Drilled in Concrete Anchors (DCA's) for hollow masonry. Provide stainless steel or galvanized to G185 coating per ASTM A153 for DCA's in contact with preservative treated wood.
- D. Cavity Wall Drainage: Mortar Net, or equal with head joint cell vent as indicated on architectural drawings.
- E. Control Joints: Form with preformed rubber or PVC joint devices.

## 2.9 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use portland cement-lime or masonry cement mortar unless otherwise indicated.
  - 3. For exterior masonry, use portland cement-lime or masonry cement mortar.
  - 4. For reinforced masonry, use portland cement-lime or masonry cement mortar.
  - 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
  - 1. For masonry below grade or in contact with earth, use Type S.
  - 2. For reinforced masonry, use Type S.
  - 3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
  - 4. For interior nonload-bearing partitions, Type O may be used instead of Type N.
- D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
  - 1. Application: Use colored-aggregate mortar for exposed mortar joints with the following units:

- a. Face Brick
- E. Grout for Unit Masonry: Comply with ASTM C476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
  - 2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
  - 3. Provide grout with a slump of 8 to 10 inches as measured according to ASTM C143/C143M.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION, GENERAL**

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

#### **3.2 TOLERANCES**

- A. Dimensions and Locations of Elements:

- 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
- 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
- 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

- B. Lines and Levels:

- 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
- 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
- 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
- 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
- 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.

- C. Joints:

- 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
- 2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
- 3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

### 3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- F. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

### 3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
  - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
  - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
  - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

### 3.5 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
  - 1. Space reinforcement not more than 16 inches o.c.
  - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
  - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

### 3.6 FLASHING

- A. General: Install embedded flashing at ledges and other obstructions to downward flow of water in wall where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  - 2. At lintels, extend flashing a minimum of 8 inches into masonry at each end. At heads and sills, extend flashing 8 inches at ends and turn up not less than 2 inches to form end dams.
  - 3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
  - 4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

### 3.7 WEEPS

- A. Provide weep holes at 24" on center horizontally above through-wall flashing and at bottom of walls.
- B. Weep holes and cavity vents shall consist of un-mortared, open head joints with honeycomb type inserts.
- C. The weep hole shall extend through the lowest bed joint to the top side of the through-wall flashing.
- D. Provide cavity vents at the top of each cavity space at 48" on center horizontally.

### 3.8 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
  - 1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.



2. Limit height of vertical grout pours to not more than 60 inches.

### 3.9 FIELD QUALITY CONTROL

- A. Reference structural drawings for additional Special Inspection requirements as designated per Chapter 17 of the Michigan Building Code.
- B. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Owners expense.
- C. Inspections: Special inspections according to Level C in TMS 402/ACI 530/ASCE 5.
  1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
  2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  3. Place grout only after inspectors have verified proportions of site-prepared grout.
- D. Testing Prior to Construction: One set of tests.
- E. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.
- G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.
- H. Mortar Test (Property Specification): For each mix provided, according to ASTM C780. Test mortar for compressive strength.
- I. Grout Test (Compressive Strength): For each mix provided, according to ASTM C1019.
- J. Prism Test: For each type of construction provided, according to ASTM C1314 at 28 days.

### 3.10 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  2. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

END OF SECTION

