R G Architects, LLC
3171 S. DuPont Parkway
Odessa, DE 19730
302.376.8100
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RGA No. 12032
15 February 2013

ADDENDUM NO. 3

CHRISTINA SCHOOL DISTRICT
Newark High School – Toilet Room Renovations
750 East Delaware Avenue
Newark, DE 19711

R G Architects
3171 S. DuPont Parkway
P.O. Box 650
Odessa, DE 19730
Phone: 302-376-8100 (phone)
Fax: 302-376-9851 (fax)
Email: chris@rgarchitects.net

BIDS DUE: ***Wednesday, February 20 at 2:30 p.m.***

LOCATION: **EDEN SUPPORT CENTER**
925 Bear-Corbitt Road
Bear, Delaware 19701

NOTICE TO ALL BIDDERS

1.0 GENERAL NOTES:

1.1 Bidders are hereby notified that this Addendum shall be and hereby becomes part of their Contract Documents, and shall be attached to the Project Manual for this project.

1.2 The following items are intended to revise and clarify the Drawings and Project Manual, and shall be included by the Bidder in their proposal.

1.3 Bidders shall verify that their Sub-bidders are in full receipt of the information contained herein AND in future addendums posted on the State's website.

1.4 All addenda will be sent out to the registered plan holders via email (or fax). Contractors are encouraged to keep an eye on their email accounts during the bidding period for such updates and the States website.

1.5 All bidders are responsible for checking the State of Delaware website for notifications to changes to the contract documents. R G Architects will ONLY send documents directly to those that attended the pre-bid meeting and registered plan holders. The project is listed at the following website:

http://www.bids.delaware.gov

2.0 Revisions to the SPECIFICATIONS

2.1 09 9405 Terrazzo Repair
2.2 09 9402 Epoxy Terrazzo
2.3 08 1113 HM Doors and Frames

3.0 Revisions to the DRAWINGS

3.1 Note 4 on Drawings A11-1 & All-2, & Note 3 on Drawings A11-3 & A11-4 is to be replaced in its entirety with the following;

> "ENTIRE TERRAZZO FLOOR TO BE PATCH AND REPAIRED AS REQUIRED AFTER DEMOLITION & AS REQUIRED BY SELECTIVE DEMOLITION SHOWN ON MECHANICAL/PLUMBING DRAWINGS, THEN REFINISHED AS SPECIFIED."

4.0 Questions

Q.1 Drawing PD-11-1. General notes states that the sanitary is located in piping tunnels under the floor. During the second walk-thru, we were shown the entrance to one tunnel located in "B-Wing", are there other tunnel entrances in each wing, if so, can you please show entrance points for each wing?

A.1 "B" wing and "C" wing are connected thru tunnels. Access "A" wing can be achieved by entering thru the Boiler room or in storage room 106 in the "A" wing.

Q.2 Please provide / clarify a specification for the solid surface cap color/brand that should be used for pricing. Preferably a price group/brand would be helpful.

A.2 Solid Surface material shall be ½" Corian, color to be selected by architects from manufacturers full range of colors and textures (include all color groups)

Q.3 Wall types shown on drawings for both Newark High School (A40-1) and Kirk MS show the ceramic tile to be installed 6" above the existing ceiling. This would require the ceiling to be demoed and patched around the perimeter in addition to the ceiling removal / replacement work shown on the drawings. Also after speaking to electrical contractors, they will need some of the existing ceiling to be removed to install new light fixtures.

With this much removal of the existing plaster ceiling, the integrity of the original supports could be compromised. Would it be possible to either: 1) Remove the entire ceiling and replace with new. 2) leave existing ceiling, and install new ceiling 6" - 10" lower. 3) install ceramic tile at the height of the existing ceiling (not 6" above ceiling).

A.3 Install ceramic tile at the height of the existing ceiling with no more than 1/4" caulk joint at underside of finished ceiling.

Q.4 Plumbing contractors have indicated that additional floor demo and patch may be required to install the sinks. The plans do not currently call for any terrazzo repair at sink locations. Please review this and consider providing an allowance for additional concrete demo and patch with terrazzo patching at sinks.

A.4 The previous addendum stipulates an allowance for each bathroom. The Contractor shall determine the amount of unidentified demolition (cutting & patching) as is required to install the new work shown.

Q.5 Please consider providing a moisture barrier membrane overtop of new and existing concrete subfloor at all terrazzo locations because it will allow us to maintain an aggressive schedule and not wait for the concrete floor patch to cure for 30 to 40 days in order to meet the moisture requirements of the terrazzo systems.

A.5 Moisture mitigation membrane shall be installed over existing concrete slab areas designated to receive new epoxy terrazzo flooring.

Q.6 The square footage of patching at Newark High School is in question. The terrazzo should be removed to the metal strips between panels and that may require 2 to 3 sf per linear foot of removed partitions in addition to the toilet and urinal areas.

A.6 The terrazzo should be cut back to the first metal edge strip where required as you suggest (and is specified). The 100 s.f. allowance of additional patching of terrazzo in each individual bathroom shall be adequate at this time.

Q.7 Addendum 1 said that you would notify us to who the fire alarm vendor is. Can you please provide the contractors name.

A.7 Anaconda or Simplex

Q.8 Please clean up bid forms to eliminate alternate #2 and unit prices which appear not to be required.

A.8 It's a place holder, in case we add Alternate #2 at a later time prior to bid. This section and Unit Prices can be left blank if not required for bidding purposes.

Q.9 Ref. specification 099405, page 4, paragraph 3.6 "Finishing". Should we assume refinishing the existing terrazzo requires grinding, grouting, polishing and sealing these floors? A typical terrazzo installation is ground using 24 grit stones; ground again with 80 grit and then polished with 120 grit stones. 1500 grit finish is noted for both schools. We believe a 1500 grit finish would be extremely slippery for toilet rooms and will not comply with ADA guidelines.

A.9 See attached revised specification section 09 9405 for clarification.

Q.10 Ref. drawing A40-1, Wall Types WT-1, WT-3 and WT-4. We note the backer board is to extend 6" above the ceiling. Is the wall tile to extend 6" above the ceiling or just above the ceiling line?

A.10 Install ceramic tile to underside of finished ceiling leaving no more than 1/4" caulk joint at underside of finished ceiling.

Q.11 Ref. drawing A70-2, soffit details 4 & 5; Do these soffits receive paint or a tile finish?

A.11 These soffits are to be primed and painted.

Q.12 On drawing E01-1 Note 5, Panel L2A-B Calls to change out a panel. Are the Panels

Single Phase or 3 Phase? Are they load center or Panel boards?

A.12 The panel needs to be a Square "D" NQOD 120/208V 3ph 4w panel 2 section 84 pole panel

Q.13 The spec book for Newark High has in the TOC: 08 1113 HM Doors and Frames. There is no spec section in the NHS book for HM Doors and Frames. Please provide one. Can I assume that it is the same spec for Kirk Middle School?

A.13 The section was erroneously left out. See attached specification section 08 1113.

Q.14 Is the tile installer permitted to field cut large tile to make the smaller sizes required shown? i.e. if a 6"h tile is required in the pattern, can we cut a 12" tile in half?

A.14 **NO!** All cuts shall be factory made using the "Linear Options" program with the exception of vertical cuts at wall corners, door frames, and tiles abutting ceilings.

Q.15 On drawing D11-1 can you clarify where we are to install new epoxy terrazzo vs patching and installing cementitious terrazzo??

A.15 Existing terrazzo floor patching/repair/refinishing is to be completed using cementitious terrazzo, as specified, to match adjacent color & aggregate density. See (revised) specification section 09 9405 'Terrazzo Repair". In areas where terrazzo does not currently exist (i.e. at entrance to bathrooms in "A" wing) the system will be epoxy terrazzo per revised 09 9402. See attached specifications for additional clarification

5.0 ATTACHMENT LIST:

A. Bid Register

B. Specification Section 09 09405 Terrazzo Repair, and 09 9402 Epoxy Terrazzo

C. Specification Section 08 1113 HM Doors and Frames

PLEASE PRINT CLEARLY

Christina School District
Newark High School - Toilet Room Renovations

[illegible]
Christina School District, Eden Support Center
925 Bear-Corbitt Road
Bear, DE 19701

RGA # 12032

BID DOCUMENTS REGISTER

PLEASE PRINT CLEARLY

$ 125.00 per set

#01

Name of Company:	NASON CONSTRUCTION
Physical Address:	2000 FOULK RD STE F
City, State:	WILMINGTON DE 19810
Contact:	JIM CONNELL
GC:	YES [X] NO [ ]
EMAIL:	JCONNELL@NASONCONSTRUCTION.COM
Fax	302 529 2812
Phone:	302 529 2549
Date:	01/31/2013

#02

Name of Company:	Disabatino Construction
Physical Address:	1 South Cleveland Ave
City, State:	Wilmington DE
Contact:	T Laws
GC:	YES [X] NO [ ]
EMAIL:	tlaws@disabatino.com
Fax	652-3774
Phone:	652-3881
Date:	1/31/13

#03

Name of Company:	Delden Builders Inc
Physical Address:	100 Naamans RD Suite 3F
City, State:	Claymont DE 19703
Contact:	Marc Wolfe
GC:	YES [X] NO [ ]
EMAIL:	MarcWolfe@Mac.Com
Fax	(302) 791 0243
Phone:	(302) 791 0245
Date:	1/31/13

#04

Name of Company:	Kent Construction Company
Physical Address:	2 Big Oak Road
City, State:	SMYRNA DE 19977
Contact:	Lynn Madden / Pete Ksenich
GC:	YES [X] NO [ ]
EMAIL:	Lynn@KentConstructionCo.com
Fax	(302) 653 - ~~6469~~ 4044
Phone:	(302) 653 - 6469
Date:	1/31/2013

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Christina School District
Newark High School - Toilet Room Renovations

Christina School District, Eden Support Center
925 Bear-Corbitt Road
Bear, DE 19701

RGA # 12032

BID DOCUMENTS REGISTER

PLEASE PRINT CLEARLY

#05

Name of Company: W+W Contractors Inc.
Physical Address: 1713 S. 56th St
City, State: Phila., PA 19143
Contact: Alex WALKER GC: YES ☑ NO ☐
EMAIL: wwalker@wwcontractor.com
Fax 215-724-2082
Phone: 215-724-0270 Date: 1/31/13

#06

Name of Company: JOSHI CONSTRUCTION CO.
Physical Address: 2272 BRACKENVILLE ROAD,
City, State: HOCKESSIN, DE. 19707
Contact: KIRTI P. JOSHI GC: YES ☑ NO ☐
EMAIL: JOSHICONSTRUCTION@COMCAST.NET
Fax 302-239-4704
Phone: 302-239-5090 Date:

#07

Name of Company: C & D CONTRACTORS
Physical Address: PO BOX 9263
City, State: WILM, DE
Contact: KEN VANDERGRIFT GC: YES ☑ NO ☐
EMAIL: KVANDERGRIFT.CD@VERIZON.NET
Fax 764-7585
Phone: 764-8013 Date: 1/31/13

#08

Name of Company: AMAKOR INC
Physical Address: 72 Clinton Street P.O Box 636
City, State: Delaware City Delaware
Contact: Steve Serbu GC: YES ☑ NO ☐
EMAIL: AMAKOR@AOL.COM
Fax 302 834-8681
Phone: 302 834-8664 Date: 1/31/13

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Christina School District
Newark High School - Toilet Room Renovations

Christina School District, Eden Support Center
925 Bear-Corbitt Road
Bear, DE 19701

RGA # 12032

BID DOCUMENTS REGISTER

PLEASE PRINT CLEARLY

#09

Name of Company: BRISTOL INDUSTRIAL CORP.
Physical Address: 301 E. SILVER FOX RD
City, State: NEWARK, DE 19702
Contact: Felicia Enuha GC: YES [X] NO [ ]
EMAIL: Acristol@aol.com
Fax 302-292-1402
Phone: 302-292-1401 Date: 1/31/13

#10

Name of Company: DCA PLAN ROOM
Physical Address: 527 STANTON CHRISTIANA RD
City, State: NEWARK, DE 19713
Contact: GC: YES [ ] NO [X]
EMAIL: nhandlin@e-dca.org
Fax 302-994-8185
Phone: 302-994-7442 Date: 2/4/13

#11

Name of Company: McGRAW-HILL DODGE REPORTS
Physical Address: 3315 CENTRAL AVE
City, State: HOT SPRINGS, AR 71913-6138
Contact: PAT POLANOWSKI GC: YES [ ] NO [X]
EMAIL: dodge_document_MA@McGraw-Hill.com
Fax 484-369-5945
Phone: 717-993-6268 Date: 2/4/13

#12

Name of Company: ABC DELAWARE
Physical Address: 31 BLEVINS DR, SUITE B
City, State: NEW CASTLE, DE 19720
Contact: GC: YES [ ] NO [X]
EMAIL: ECAPODANNO@ABCDELAWARE.COM
Fax 302-323-1122
Phone: 302-328-1111 Date: 2/4/13

PLEASE PRINT CLEARLY

Christina School District
Newark High School - Toilet Room Renovations

RGGR ARCHITECTS

Christina School District, Eden Support Center
925 Bear-Corbitt Road
Bear, DE 19701

RGA # 12032

BID DOCUMENTS REGISTER

PLEASE PRINT CLEARLY

#13	Name of Company: Commonwealth Const. Co.		
	Physical Address: 2317 Pennsylvania Ave		
	City, State: Wilmington, DE 19806		
	Contact: BBooth@kcommonwealth.com	GC: YES ☒	NO ☐
	EMAIL: Bill Booth		
	Fax 654-2604		
	Phone: 654-6611	Date: 2-4-13	
#14	Name of Company: Ventresca Bros Inc		
	Physical Address: 2300 N. Dupont Hwy		
	City, State: New Castle DE 19720		
	Contact: Tony Ventresca	GC: YES ☒	NO ☐
	EMAIL: TVentresca@VentrescaBrosInc.com		
	Fax 302-658-2360		
	Phone: 302-658-6436	Date: 2/5/13	
#15	Name of Company: Bob Smith Contractors		
	Physical Address: 281 E. Evergreen St - Suite 1		
	City, State: West Grove, PA 19390		
	Contact: Lacy Clevenstine	GC: YES ☒	NO ☐
	EMAIL: Bids@BobSmithContractors.com		
	Fax 610-345-1318		
	Phone: 610-345-1314	Date: 2/6/13	
#16	Name of Company: Richard Y Johnson & Son Inc.		
	Physical Address: 18404 Johnson Rd. P.O. Box 105		
	City, State: Lincoln, DE 19960		
	Contact: Dean Johnson	GC: YES ☒	NO ☐
	EMAIL: DJohnson@RYJson.com		
	Fax 302-422-4696		
	Phone: 302-422-3732	Date: 2/7/13	

SECTION 08 71 00 – DOOR HARDWARE

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes furnishing and installation of door hardware for doors specified in "Hardware Sets" and required by actual conditions. Including screws, bolts, expansion shields, electrified door hardware, and other devices for proper application of hardware.

B. Where items of hardware are not specified and are required for intended service, such omission, error or other discrepancy shall be submitted to Architect fourteen calendar days prior to bid date for clarification by addendum.

C. Refer to Division 1 for alternates that may affect work of this Section.

D. Related Divisions:
   1. Division 08 00 00 Openings

1.02 REFERENCES

A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI):
   1. ANSI/BHMA A156.1 Butts & Hinges (2006)
   2. ANSI/BHMA A156.4 Door Controls – Closers (2008)
   3. ANSI/BHMA A156.6 Architectural Door Trim (2010)
   4. ANSI/BHMA A156.7 Template Hinge Dimensions (2009)
   5. ANSI/BHMA A156.8 Door Controls – Overhead Stops and Holders (2010)
   6. ANSI/BHMA A156.13 Mortise Locks & Latches (2005)
   7. ANSI/BHMA A156.15 Closer Holder Release Devices (2006)
   8. ANSI/BHMA A156.18 Materials & Finishes (2006)
   9. ANSI/BHMA A156.21 Thresholds (2009)
   10. ANSI/BHMA A156.22 Door Gasketing Systems (2005)
   11. ANSI/BHMA A156.28 Keying Systems (2007)
   12. ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames (2006)
   13. ANSI/BHMA A156.115W Hardware Preparation in Wood Doors with Wood or Steel Frames (2006)

B. International Code Council/American National Standards Institute (ICC/ANSI)/ADA:
   1. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities (2009)
   2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

C. Underwriters Laboratories, Inc. (UL):
   1. UL 10C Positive Pressure Fire Test of Door Assemblies
   2. UL 1784 Air Leakage Test of Door Assemblies
   3. UL/ULC Listed

D. Door and Hardware Institute (DHI):

1. DHI Publication – Keying Systems and Nomenclature (1989)
2. DHI Publication – Abbreviations and Symbols
3. DHI Publication – Installation Guide for Doors and Hardware
4. DHI Publication – Sequence and Format of Hardware Schedule (1996)

E. National Fire Protection Agency (NFPA)
1. NFPA 70 National Electrical Code (2005)
2. NFPA 80 Standard for Fire Doors and Other Opening Protective's (1999)
3. NFPA 101 Life Safety Code (2003)
4. NFPA 105 Standard for the Installation of Smoke Door Assemblies (2003)

F. Building Codes
1. IBC International Building Code (2006)
2. Local Building Code

1.03 SUBMITTALS

A. Submit in accordance with Conditions of the Contract and Division 1 Administrative Requirements.

B. Shop Drawings:
1. Hardware schedule shall be organized in vertical format illustrated in DHI Publications Sequence and Formatting for the Hardware Schedule. Include abbreviations and symbols page according to DHI Publications Abbreviations and Symbols. Complete nomenclature of items required for each door opening as indicated.
2. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of hardware.
3. Architectural Hardware Consultant (AHC), as certified by DHI, who shall affix seal attesting to completeness and correctness, shall review hardware schedule prior to submittal.

C. Submit manufacturer's catalog sheet on design, grade and function of items listed in hardware schedule. Identify specific hardware item per sheet, provide index, and cover sheet.

D. Coordination:
1. Distribute door hardware templates to related divisions within fourteen calendar days of approved hardware schedule.

E. Closeout Submittals: Submit to Owner in a three ring binder or CD if requested.
1. Warranties.
2. Maintenance and operating manual.
3. Maintenance service agreement.
4. Record documents.
5. Copy of approved hardware schedule.
6. Copy of approved keying schedule with bitting list.
7. Hardware supplier name, phone number and fax number.

1.04 QUALITY ASSURANCE

A. Hardware supplier shall employ an Architectural Hardware Consultant (AHC) as certified by DHI and a member of the seal program who shall be available at reasonable times during course of work for Project hardware consultation.

B. Door hardware shall conform to ICC/ANSI A117.1.
1. Handles, Pulls, Latches, Locks and operating devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.

C. Fire Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL 10C, unless otherwise indicated.

D. Fire Door Inspection: Prior to receiving certificate of occupancy have fire rated doors inspected by an independent certified Fire and Egress Door Assembly Inspector (FDAI), as certified by Intertek (ITS), a written report shall be submitted to Owner and Contractor. Doors failing inspection shall be adjusted, replaced or modified to be within appropriate code requirements.
Use for buildings under IBC 2009

E. 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.

F. Door hardware shall be certified to ANSI/BHMA standards as noted, participate and be listed in BHMA Certified Products Directory.

G. Substitution request: Refer to Division 1Substitutions for procedures to submit products meeting the requirements in this Section.

H. Pre-installation Meeting: Comply with requirements in Division 1 Section “Project Meetings.”
1. Convene meeting seven days before installation. Participants required to attend: Contractor, installer, material supplier and manufacturer representatives.
2. Include in conference decisions regarding proper installation methods and procedures for receiving and handling hardware.
3. Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment and facilities needed to make progress and avoid delays.

J. Within fourteen days of receipt of approved door hardware submittals contact Owner with representative from hardware supplier to establish a keying conference. Verify keyway, visual key identification, number of master keys and keys per lock. Provide keying system per Owners instructions.

K. Installer Qualifications: Specialized in performing installation of this Section and shall have five years minimum documented experience.

L. Hardware listed in 3.07- Hardware Schedule is intended to establish a type and grade.

1.05 DELIVERY, STORAGE AND HANDLING

A. Provide a clean, dry and secure room for hardware delivered to Project but not yet installed.

B. Furnish hardware with each unit marked and numbered in accordance with approved finish hardware schedule. Include door and item number for each type of hardware.

C. Pack each item complete with necessary parts and fasteners in manufacturer's original packaging.

D. Waste Management and Disposal
   1. Separate waste materials for reuse or recycling in accordance with Division 1.

1.06 WARRANTY

A. General Warranty: Owner may have under provisions of the Contract Documents and shall be an addition and run concurrent with other warranties made by Contractor under requirements of the Contract documents.

B. Special Warranty: Warranties specified in this article shall not deprive Owner of other rights. Contractor, hardware supplier, and hardware installer shall be responsible for servicing hardware and keying related problems.
   1. Ten years for manual door closers.
   2. Five years for mortise, auxiliary and bored locks.

C. Products judged defective during warranty period shall be replaced or repaired in accordance with manufacturer's warranty at no cost to Owner. There is no warranty against defects due to improper installation, abuse and failure to exercise normal maintenance.

PART 2 – PRODUCTS

2.01 HINGES

A. Hinges shall be of one manufacturer as listed for continuity of design and consideration of warranty, and shall be domestically manufactured in the USA.

B. Standards: Products to be certified and listed by the following:
   1. Butts and Hinges: ANSI/BHMA A156.1
   2. Template Hinge Dimensions: ANSI/BHMA A156.7

C. Butt Hinges:
   1. Hinge weight and size unless otherwise indicated in hardware sets:

a. Doors up to 36” wide and up to 1-3/4” thick provide hinges with a minimum thickness of .134” and a minimum of 4-1/2” in height.
b. Doors from 36” wide up to 42” wide and up to 1-3/4” thick provide hinges with a minimum thickness of .145” and a minimum of 4-1/2”” in height.
c. For doors from 42” wide up to 48” wide and up to 1-3/4” thick provide hinges with a minimum thickness of .180” and a minimum of 5” in height.
d. Doors greater than 1-3/4” thick provide hinges with a minimum thickness of .180” and a minimum of 5” in height.
e. Width of hinge is to be minimum required to clear surrounding trim.

2. Base material unless otherwise indicated in hardware sets:
   a. Exterior Doors: 304 Stainless Steel, Brass or Bronze material.
   b. Interior Doors: Steel material.
   c. Fire Rated Doors: Steel or 304 Stainless Steel materials.
   d. Stainless Steel ball bearing hinges shall have stainless steel ball bearings. Steel ball bearings are unacceptable.

3. Quantity of hinges per door unless otherwise stated in hardware sets:
   a. Doors up to 60”in height provide 2 hinges.
   b. Doors 60” up to 90” in height provide 3 hinges.
   c. Doors 90” up to 120” in height provide 4 hinges.
   d. Doors over 120” in height add 1 additional hinge per each additional 30” in height.
   e. Dutch doors provide 4 hinges.

4. Hinge design and options unless otherwise indicated in hardware sets:
   a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
   b. Out-swinging exterior and out-swinging access controlled doors shall have non-removable pins (NRP) to prevent removal of pin while door is in closed position.
   c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
   d. Provide mortar boxes for frames that require any electrically modified hinges if not an integral part of frame.
   e. When shims are necessary to correct frame or door irregularities, provide metal shims only.

5. Acceptable Manufactures:

	Standard Weight	Heavy Weight
a. Hager	BB1279/BB1191 BB1168/BB1199	
b. Bommer	BB5000/BB5002	BB5004/BB5006

2.02 LOCKS AND LATCHES (GRADE 1 MORTISE)

A. Locks and latches shall be of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Product to be certified and listed by following:
   1. ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
   2. UL/cUL Labeled and listed for functions up to 3 hours for single doors up to 48” in width and up to 96” in height.
   3. UL10C/UBC 7-2 Positive Pressure Rated.
   4. ICC/ANSI A117.1.

C. Lock and latch function numbers and descriptions of manufactures series as listed in hardware sets.

D. Material and Design:
   1. Lock cases from fully wrapped, 12 gauge steel, Zinc dichromate for corrosion resistance.
   2. Non-handed, field reversible without opening lock case.
   3. Armor fronts are to be self-adjusting to accommodate a square edge door or a standard 1/8” beveled edge door.

E. Latch and Strike:
   1. Stainless Steel latch bolt with minimum of ¾” throw and deadlocking for keyed and exterior functions.
   2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4” x 4-7/8” with proper lip length to protect surrounding trim.
   3. Deadbolts to be 1-3/4” total length with a minimum of a 1” throw and ¾” internal engagement when fully extended and made of Stainless Steel material.

H. Acceptable Manufactures:
   1. Hager Companies: 3830 Series.
   2. Schlage: L400 Series.
   3. Sargent: 4870 Series

2.03 CYLINDERS AND KEYING

A. Cylinders shall be of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Manufacturer shall meet the following:
   1. Auxiliary Locks: ANSI/BHMA A156.5
   2. DHI Handbook “Keying systems and nomenclature” (1989)

C. Cylinders:
   1. Manufacturer’s standard tumbler type.
   2. Shall be furnished with cams/tailpieces as required for locking device that is being furnished for project.

D. Keying:
   1. Contact Owner with representative from hardware supplier to establish a keying conference. Verify keyway, visual key identification, number of master keys and keys per lock. Provide keying system per Owners instructions.
   2. Copy of Owners approved keying schedule shall be submitted to Owner and Architect with documentation of which keying conference was held and Owners sign-off.
   3. Provide a bitting list to Owner of combinations as established, and expand to twenty five percent for future use or as directed by Owner.
   4. Key to existing Corbin Russwin MK only.
   5. Keys to be shipped to Owner's representative, individually tag per keying conference.

E. Acceptable manufactures:
   1. Hager with Corbin Russwin Keyway
   2. Corbin Russwin

2.04 PUSH/PULL PLATES

A. Push and pull plates shall be of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Manufacturer to be certified by the following:
   1. Architectural Door Trim: ANSI/BHMA A156.6
   2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

C. Push plates: .050" thick, square corner and beveled edges with counter sunk screw holes. Width and height as stated in hardware sets.

D. Acceptable Manufactures:
   1. Hager Companies: 30S
   2. Rockwood
   3. Trimco

E. Pull plates: .050" thick, square corner and beveled edges. Width and height as stated in hardware sets, ¾" diameter pull, with clearance of 2-1/2" from face of door.

F. Acceptable Manufactures:
   1. Hager Companies: H33J
   2. Rockwood
   3. Trimco

2.05 CLOSERS (ALUMINUM BODY GRADE 1)

A. Shall be product of one manufacturer. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendations for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating.

B. Standards: Manufacturer to be certified by the following:
   1. BHMA Certified ANSI A156.4 Grade 1
   2. ADA Complaint ANSI A117.1
   3. UL/cUL Listed up to 3 hours
   4. UL10C Positive Pressure Rated
   5. UL10B Neutral Pressure Rated

C. Material and Design:
   1. Provide aluminum non-handed bodies with full plastic covers.
   2. Closer shall have separate staked adjustable valve screws for latch speed, sweep speed, and backcheck.
   3. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting.
   4. Double heat-treated steel, tempered springs.
   5. Precision machined, heat-treated steel piston.
   6. Triple heat-treated steel spindle.
   7. Full rack and pinion operation.

D. Mounting:
   1. Out swing doors shall have surface parallel arm mount closers except where noted on hardware schedule.
   2. In swing doors shall have surface regular arm mount closers except where noted on hardware schedule.
   3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
   4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.

E. Size closers in compliance with requirements for accessibility (ADDAG). Comply with following maximum opening force requirements.
   1. Interior hinged openings: 5.0 lbs.
   2. Fire rated and exterior openings shall have minimum opening force allowable by authority having jurisdiction.

F. Fasteners: Provide self-drilling and tapping wood screws, machine screws and sex nuts and bolts for each closer.

G. Acceptable manufactures:
   1. Hager Companies: 5200 Series.
   2. Norton: 8000 Series.
   3. Sargent: 1330 Series.

2.06 PROTECTIVE TRIM

A. Size of protection plate: Single doors, size two inches less door width (LDW) on push side of door, and one inch less on pull side of door. For pairs of doors, size one inch less door width (LDW) on push side of door, and ½ inch on pull side of door.
   1. Kickplates 10" high or sized to door bottom rail height
   2. Mop Plates 4" high.
   3. Armor Plates 36" high.

B. Standards: Manufacturer shall meet requirements for:
   1. Architectural Door Trim: ANSI/BHMA A156.6
   2. UL

C. Material and Design:
   1. 0.050" gage stainless steel
   2. Corners shall be square. Polishing lines or dominant direction of surface pattern shall run across the door width of plate.
   3. Bevel top, bottom and sides uniformly leaving no sharp edges. Edges shall be de-burred.
   4. Countersink holes for screws. Screws holes shall be spaced equidistant eight inches CTC, along a centerline not over ½ inch in from edge around plate. End screws shall be a maximum of 0.53 inch from corners.

D. UL label stamp required on protection plates when top of plate is more than 16 inches above bottom of door on fire rated openings. Verify door manufactures UL listing for maximum height and width of protection plate to be used.

E. Acceptable Manufactures:
   1. Hager Companies: 194S
   2. Rockwood
   3. Burns

2.07 STOPS AND HOLDERS

A. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted in concrete floor or masonry walls shall have stainless steel machine screws and lead expansion shields.

B. Standards: Manufacturer shall meet requirements for:
   1. Auxiliary Hardware: ANSI/BHMA A156.16

C. Acceptable Manufactures:

	Convex	Concave	Floor
1. Hager Companies	232W	236W	242F
2. Rockwood			
3. Burns			

D. Overhead Stops and Holders: Provide overhead stop and holders for doors that open against equipment, casework sidelights and other objects that would make wall stops/holders and floor stops/holders inappropriate. Provide sex bolt attachments for mineral core wood door applications.

E. Standards: Manufacturer shall be certified by the following:
   1. Overhead Stops and Holders: ANSI/BHMA A156.8 Grade 1

F. Acceptable Manufactures:

	Heavy Duty Surface	Heavy Duty Concealed
1. Hager Companies	7000-S	7000-C
2. Rixson	9 Series	6 Series
3. Glynn Johnson	90 Series	100 Series

2.08 DOOR GASKETING AND WEATHERSTRIP

A. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide non-corrosive fasteners for exterior applications.
   1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
   2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
   3. Door bottoms: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
   4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.
   5. Drip Guard: Apply to exterior face of frame header. Lip length to extend 4” beyond width of door.

B. Standards: Manufacturer shall meet requirements for:
   1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22

C. Smoke-Labeled Gasketing: Comply with NFPA 105 listed, labeled, and acceptable to authorities having jurisdiction, for smoke control indicated.
   1. Provide smoke labeled gasketing on 20 minute rated doors and on smoke rated doors.

D. Fire-Rated Gasketing: Comply with NFPA 80 listed, labeled, and acceptable to Authorities Having Jurisdiction, for fire ratings indicated.

2.09 THRESHOLDS

A. Set thresholds for exterior and acoustical openings in full bed of sealant with lead expansion shields and stainless steel machine screws complying with requirements specified in Division 7 Section “Joint Sealants”. Notched in field to fit frame by hardware installer. Refer to Drawings for special details.

B. Standards: Manufacturer to be certified by the following:
   1. Thresholds: ANSI/BHMA A156.21
   2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).

C. Acceptable Manufactures:
   1. Hager Companies: 412S
   2. Zero

3. Reese

2.10 SILENCERS

A. Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame and four per Dutch door frame.

B. Standards: Manufacturer shall meet requirements for:
   1. Auxiliary Hardware: ANSI/BHMA A156.16

C. Acceptable Manufactures:

	Hollow Metal Frame	Wood Frame
1. Hager Companies:	307D	308D
2. Rockwood:		
3. Trimco:		

2.11 SIGNAGE

A. Shall be of one manufacturer as listed for continuity of design and consideration of warranty.

B. Standards: Manufacturer shall meet requirements for:
   1. Signage: ANSI/BHMA A156.16
   2. Grade 2 Braille Translation conforming to section 4.3 requirements

C. Materials and Design: Provide 0.125” thick plastic. Size of sign to be 6” x 8” fastened with double-sided pressure sensitive tape.

D. Acceptable Manufacturers:
   1. Hager Companies: 368M/W, 368U
   2. Rockwood
   3. Trimco

2.12 FINISHES

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples.

B. Comply with base material and finish requirements indicated by ANSI/BHMA A156.18 designations in hardware schedule.

PART 3 – EXECUTION

3.01 EXAMINATION

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

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

3.02 INSTALLATION

A. Install hardware per manufacturer's instructions and in compliance with:
1. NFPA 80.
2. NFPA 105.
3. ICC/ANSI A117.1.
4. ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames
5. ANSI/BHMA A156.115W Hardware Preparation in Wood Doors with Wood or Steel Frames
6. DHI Publication – Installation Guide for Doors and Hardware
7. UL10C/UBC7-2
8. Local building code.
9. Approved shop drawings.
10. Approved finish hardware schedule.

B. Do not install surface mounted items until finishes have been completed on substrates involved. Set unit level, plumb and true to line location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

3.03 FIELD QUALITY CONTROL

A. Material supplier to schedule final walk through to inspect hardware installation ten business days before final acceptance of Owner. Material supplier shall provide a written report detailing discrepancies of each opening to General Contractor within seven calendar days of walk through.

3.04 ADJUSTMENT, CLEANING AND DEMONSTRATING

A. Adjustment: Adjust and check each opening to ensure proper operation of each item of finish hardware. Replace items that cannot be adjusted to operate freely and smoothly or as intended for application at no cost to Owner.

B. Cleaning: Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no cost to Owner.

C. Demonstration: Conduct a training class for building maintenance personnel demonstrating the adjustment, operation of mechanical and electrical hardware. Special tools for finished hardware to be turned over and explained usage at this meeting.

3.05 PROTECTION

A. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from the manufacture until Owner accepts Project as complete.

3.06 HARDWARE SETS

A. Guide: Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, performance, exposure, and like characteristics of door hardware, and may not be complete. Provide door hardware required to make each set complete and operational.

B. Hardware schedule does not reflect handing, backset, method of fastening and like characteristics of door hardware and door operation.

C. Review door hardware sets with door types, frames, sizes and details on drawings. Verify suitability and adaptability of items specified in relation to details and surrounding conditions.

3.07 HARDWARE SCHEDULE

Heading 1
Door # A101, A102, B101, B102, C101, C102
Each opening to receive

Qty	Type	Description	Finish
3 ea.	Hinges	BB1199 4.5" x 4.5"	US32D
1 ea.	Classroom Deadlock	3833S x Corbin Russwin Keyway	US26D
1 ea.	Push Plate	30S 4" x 16"	US32D
1 ea.	Pull Plate	H33J 4" x 16"	US32D
1 ea.	Closer	5200 HD	ALM
1 ea.	Kick Plate	194S x 2" LDW	US32D
1 ea.	Mop Plate	194S x 1" LDW	US32D
3 ea.	Silencers	307D	Gray Rubber
1 ea.	Threshold	412S	MIL
1 ea.	Sign	368M/W	W3

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Thin-set epoxy terrazzo at locations noted on drawings.

B. Related Sections include the following:

1. Division 7 Section "Joint Sealants” for sealants installed with terrazzo.
2. Division 3 Section “Concrete”

1.3 SUBMITTALS

A. Product Data: For each type of terrazzo and accessory indicated.

B. Shop Drawings: Include terrazzo fabrication and installation requirements. Include plans, elevations, sections, component details, and attachments to other Work. Show layout of the following:

1. Divider and control- and expansion-joint strips.
2. Base and border strips.
3. Abrasive strips.
4. Stair treads, risers, and landings.
5. Precast terrazzo jointing and edge configurations.
6. Terrazzo patterns.

C. Samples for Verification: For each type, material, color, and pattern of terrazzo and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare samples of same thickness and from same material to be used for the Work in size indicated below:

1. Epoxy Terrazzo: 6-inch- (150-mm-) square samples.
2. Precast Epoxy Terrazzo: 6-inch- (150-mm-) square samples.
3. Accessories: 6-inch- (150-mm-) long samples of each exposed strip item required.

D. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

E. Qualification Data: For Installer.

F. Material Test Reports: For epoxy terrazzo.

G. Material Certificates: For epoxy terrazzo, in lieu of material test reports, when permitted by Architect, signed by manufacturers.

H. Maintenance Data: For epoxy terrazzo to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer (applicator) who is acceptable to epoxy terrazzo manufacturer to install manufacturer's products.

1. Engage an installer who is certified in writing by terrazzo manufacturer as qualified to install manufacturer's products.
2. Engage an installer who is a contractor member of NTMA.

B. Source Limitations: Obtain primary terrazzo materials through one source from a single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.

C. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of aggregate from one source with resources to provide materials of consistent quality in appearance and physical properties.

D. NTMA Standard: Comply with NTMA Guide Specification and written recommendations for terrazzo type indicated unless more stringent requirements are specified.

E. Mockups: Install mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.

1. For epoxy terrazzo, install mockups of at least 100 sq. ft. (9 sq. m) of typical flooring and base condition for each color and pattern in locations directed by Architect.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to terrazzo including, but not limited to, the following:

1. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review special terrazzo designs and patterns.
4. Review dust-control procedures.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.

B. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

C. Close spaces to traffic during epoxy terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.

D. Control and collect dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.

1. Provide dustproof partitions and temporary enclosures to limit dust migration and to isolate areas from noise.

PART 2 - PRODUCTS

2.1 EPOXY TERRAZZO

A. Products: Subject to compliance with requirements, provide one of the following:

1. ChemRex, Inc./SKW-MBT; Novalite.
2. Crossfield Products Corp., Dex-O-Tex Division; Cheminert Terrazzo.
3. General Polymers Corporation; Terrazzo 1100.
4. Key Resin Company; Key Epoxy Terrazzo.
5. Master Terrazzo Technologies, LLC; Morricite.
6. Polymerica Incorporated; MasterPiece ETS.
7. Quadrant Chemical Corporation; Quadset Epoxy Terrazzo.

B. Thickness: 1/4 inch (6.4 mm).

C. Color & Pattern: Provide the following colors and pattern:

1. Pattern to match existing.
2. Refer to finish drawings and finish schedule for the extent of pattern.

D. Materials:

1. Flexible Reinforcing Membrane: Manufacturer's resinous membrane for substrate crack preparation and reflective crack reduction.

a. Reinforcement: Fiberglass scrim.

2. Primer: Product of manufacturer recommended for substrate and use indicated. Primer shall be of 100% solids; No solvent containing primers are allowed.
a. Provide moisture mitigation primer as recommended by epoxy manufacture.

3. Epoxy Resin: Manufacturer's standard recommended for use indicated and in color required for mix indicated.

a. Physical Properties without Aggregates:

1) Hardness: 65 to 85 per ASTM D 2240, Shore D.
2) Minimum Tensile Strength: 3000 psi (20.68 MPa) per ASTM D 638 for a 2-inch (50.8-mm) specimen made using a "C" die per ASTM D 412.

3) Minimum Compressive Strength: 10,000 psi (68.95 MPa) per ASTM D 695, Specimen B cylinder.
4) Chemical Resistance: No deleterious effects by contaminants listed below after 7-day immersion at room temperature per ASTM D 1308.

a) Distilled water.
b) Mineral water.
c) Isopropanol.
d) Ethanol.
e) 0.025 percent detergent solution.
f) 1.0 percent soap solution.
g) 10 percent sodium hydroxide.
h) 10 percent hydrochloric acid.
i) 30 percent sulfuric acid.
j) 5 percent acetic acid.

b. Physical Properties with Aggregates: For resin blended with Georgia White marble, ground, grouted, and cured per requirements in NTMA's "Guide Specification for Epoxy Terrazzo," comply with the following:

1) Bond strength: ACI 403 – 528 psi, Complete failure in concrete.
2) Impact resistance: MIL-D-3134 Para. 3.15 – No cracking or loosening, indentation .005 in.
3) Indentation resistance: MIL-D-3134 Para. 3.16 – No indentation.
4) Critical radiant flux: NFPA 253/FTMS 372/ ASTM E-648 – Greater than 1.07 Watts/Cm^3 , class I interior finish.
5) Flammability: ASTM D-635 – Self extinguishing, extent of burning 0.25 inches.
6) Co-efficient of linear expansion: ASTM D-696 – 14x10-6 in,in,/^oF.
7) Resistance to elevated temperature: MIL-D-3134 Para 3.6 – No flow, no slip.
8) Abrasion resistance: ASTM D-4060 – 0.70 gm. Loss.

4. Marble Chips: Complying with NTMA gradation standards for mix indicated and containing no deleterious or foreign matter.

a. Hardness: Ha-10 minimum per ASTM C 241.
b. 24-Hour Absorption Rate: Less than 0.75 percent.
c. Dust Content: Less than 1.0 percent by weight.

5. Divider-Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use and acceptable to terrazzo manufacturer.
6. Finishing Grout: Resin based; 100% solids. No solvent containing cement or latex grouts is allowed.
7. Seal Coat: Slip resistant, thin-coat terrazzo sealer of or approved by terrazzo manufacturer.

E. Mix: Comply with NTMA’s “Guide Specification for Epoxy Terrazzo” and manufacturer's written instructions for component proportions and mixing.

1. Color and Pattern: Match Architect's samples

2.2 DIVIDER AND ACCESSORY STRIPS

A. Thin-Set Divider Strips: Angle or T type, 1/4-inch (6.4 mm) deep.

1. Material: 16 gauge White zinc alloy.
2. Top Width: 1/4 inch (6.4 mm).

B. Control-Joint Strips: Separate, double L-type angles, positioned back to back, that match material, thickness, and color of divider strips and in depth required for topping thickness indicated.

C. Accessory Strips: Match divider-strip width, material, and color unless otherwise indicated. Use the following types of accessory strips as required to provide a complete installation:

1. Edge beads for exposed edges of terrazzo.

2.3 MISCELLANEOUS ACCESSORIES

A. Patching and Fill Material: Resinous product of or approved by terrazzo manufacturer and recommended by manufacturer for application indicated.

B. Abrasive Strips: Silicon carbide or aluminum oxide in epoxy-resin binder set in channel, 1/2 inch (12.7 mm) wide by depth required by terrazzo thickness and matching divider-strip material.

C. Joint Sealants: Recommended by terrazzo and sealant manufacturers and complying with requirements in Division 7 Section "Joint Sealants."

D. Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by cleaner manufacturer for use on terrazzo type indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

3.2 PREPARATION

A. Clean substrates of substances that might impair epoxy terrazzo bond, including oil, grease, and curing compounds.

B. Provide clean, dry, and neutral substrate for terrazzo application. Determine dryness characteristics by performing moisture tests recommended by terrazzo manufacturer.

1. Concrete: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with epoxy terrazzo.

a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
b. Repair damaged and deteriorated concrete according to terrazzo manufacturer's written recommendations.

2. Concrete Masonry Units: Fill voids and chipped areas with mortar mix to produce smooth, plumb surface.

C. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.

1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

3.3 EPOXY TERRAZZO INSTALLATION

A. General:

1. Comply with NTMA's written recommendations for terrazzo and accessory installation.
2. Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions and NTMA's "Guide Specification for Epoxy Terrazzo."
3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.
4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

B. Flexible Reinforcing Membrane:

1. Prepare and prefill substrate cracks with membrane material.
2. Install membrane to produce full substrate coverage in areas to receive terrazzo.
3. Reinforce membrane with fiberglass scrim.
4. Prepare membrane according to manufacturer's written instructions before applying substrate primer.

C. Primer: Apply to terrazzo substrates according to manufacturer's written instructions.
1. All new epoxy terrazzo over existing or new on grade concrete slabs shall receive moisture mitigation primer.

D. Divider and Accessory Strips: Install in locations indicated in adhesive setting bed without voids below strips.

1. Control-Joint Strips: Install back to back directly above substrate control joints.

a. Install with 1/4-inch (6.4-mm) gap between strips and install sealant in gap.

E. Abrasive Strips: Install with surface of abrasive strip positioned 1/32 inch (0.8 mm) higher than terrazzo surface.

F. Fine Grinding: Grind with 120 or finer grit stones until all grout is removed from surface. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding. Produce surface with a minimum of 70 percent aggregate exposure.

G. Remove and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.

H. Construction Tolerances: Limit variation in terrazzo surface from level to 1/4 inch in 10 feet (6.4 mm in 3 m).

3.4 CLEANING AND PROTECTING

A. Remove grinding dust from installation and adjacent areas.

B. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow to dry thoroughly.

C. Seal surfaces according to NTMA's written recommendations. Apply sealer as recommended by terrazzo manufacturer and according to sealer manufacturer's written instructions.

D. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09402

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes: modification and repair of existing Cementitious Terrazzo.

1. Section Includes: modification and repair of existing Cementitious Terrazzo.
2. Coordinate interface with epoxy terrazzo.
3. Grind, Grout polish, and seal existing terrazzo floors.

B. Related Sections include the following:

1. Division 3 Section "Concrete”
2. Division 9 Section “Epoxy Terrazzo Flooring”

C. Refer to Section 01230 – ALTERNATES for listing of Bid alternates that may affect the work described herein

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical information and installation instructions for accessory items and materials.

B. Shop Drawings: Show layout of divider strips, control joint strips and base and border strips.

1. Show large scale details of precast terrazzo jointing and edge conditions, and showing elevation and plan layouts. Include anchorage and other special features.

C. Samples:

1. Submit 6" square samples of each pattern and color of precast terrazzo.
2. Submit minimum 6" long samples of each type accessory item.

1.4 QUALITY ASSURANCE

A. NTMA Standards: Comply with specified provisions and recommendations of National Terrazzo and Mosaic Association, Inc. (NTMA) for the type of installation required except where specified otherwise.

B. Installer: Experienced in the type of Work required for a minimum of five (5) years.

C. Appearance Criteria: Match existing

D. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to terrazzo including, but not limited to, the following:
2. Inspect and discuss condition of substrate and other preparatory work performed by other trades.

a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
b. Review special terrazzo designs and patterns.
c. Review dust-control procedures.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Maintain temperature above 50 deg F (10 deg C) for 48 hours before and during terrazzo installation.

B. Weather Limitations: Proceed with rustic terrazzo installation only when forecasted weather conditions permit work to be performed according to NTMA's written recommendations and temperatures remain above 45 deg F (7.2 deg C).

C. Field Measurements: Verify actual dimensions of construction contiguous with precast terrazzo by field measurements before fabrication.

D. Control and collect dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.

1. Provide dustproof partitions and temporary enclosures to limit dust migration and to isolate areas from noise.

2 PRODUCTS

2.1 TERRAZZO MATERIALS

A. Portland Cement: ASTM C 150, Type I, except as modified to comply with NTMA requirements for compressive strength. Obtain cement from a single source for each required color.

1. Provide non-staining white cement for terrazzo matrix, tinted as required.
2. Provide standard gray cement for underbed.

B. Sand: ASTM C 33.

C. Water: Clean, free of oil, soluble salts or other deleterious substances.

D. Aggregate: Natural, sound, crushed marble chips without excessive flats or flakes, complying with NTMA requirements.

E. Matrix Pigments: Pure mineral or synthetic pigments, resistant to alkalies and non-fading. Mix pigments with matrix to provide required colors.

F. Underbed Reinforcement: Galvanized welded wire fabric, 2" x 2" -WO.3 x WO.3 (16 ASW gage or 0.0625" diam.); comply with ASTM A 185 and ASTM A 82 except for minimum wire size.

G. Isolation Membrane: Polyethylene film, complying with ASTM D 2103, not less than 4.0 mils thick.

2.2 TERRAZZO ACCESSORIES

A. Divider Strips: Depth and style required for terrazzo type and thickness.

1. Angle or "T" - type for adhesive bonding to substrate except where set into underbed.
2. Unless otherwise indicated, use divider strips with 1/4" wide top, white zinc alloy.

B. Accessory Strips: Match width, material and color of divider strips, unless otherwise indicated. Provide following types of accessory strips as required for complete installation. Base bead and cove base dividers.

C. Control Strips: Double or split units, 1/8" wide, of same material and color as divider strips with 1/8" wide full-depth elastomeric sealant filler, laminated between strips.

D. Divider Strip Adhesive: Trowelable mixture of fine sand and bonding agent, specially compounded by manufacturer for this use.

E. Curing Compound: Liquid membrane-forming compound, complying with ASTM C 309, Type I.

F. Cleaner: Liquid, neutral chemical cleaner, with Ph factor between 7 and 10, of formulation recommended by sealer manufacturer for type of terrazzo used, and complying with NTMA requirements.

G. Interior Floor Sealer: Not required for Caesar Rodney School District.

2.3 TERRAZZO PROPORTIONS

A. Underbed: 1 part Portland cement to 4 ½ parts sand and sufficient water to provide workability at as low a slump as possible.

B. Topping: one 94-pound bag of Portland cement to 200 pounds marble chips and approximately 5 gallons of water. Color pigment to be added as necessary to Match existing terrazzo not to exceed 2 pounds per bag of cement. Add sufficient water to provide workability at as low a slump as possible.

3 EXECUTION

3.1 INSPECTION

A. Installer must examine the areas and conditions under which the terrazzo work is done to be installed, including checking slab for cracks, and notify the Contractor in writing of conditions

detrimental to the proper and timely completion of the Work. Start of Work will evidence acceptance.

3.2 PREPARATION

A. Clean and prepare substrate to comply with NTMA Specifications for type of terrazzo application indicated. Clean substrate of loose chips and foreign matter. Grind concrete substrate to provide surfaces within tolerances required by NTMA for type of terrazzo application.

3.3 REMOVAL

A. Strip existing sealers from all contiguous areas

B. Remove existing damaged terrazzo and as required to accommodate new work. Carefully remove to nearest divider strip so as to minimize damage to existing work to remain. Prepare substrate for new terrazzo installation.

3.4 BASIC INSTALLATION

A. For cementitious terrazzo, comply with NTMA recommendations for proportioning mixes, installation of strips, and for placing, curing, grinding, grouting and finishing.

B. Match existing terrazzo bedding as required

C. Install divider and accessory strips in adhesive setting bed, in accordance with manufacturer's instructions, without voids below strips. Provide mechanical anchorage as required for adequate attachment of strips to substrate.

D. Provide control joints where indicated by installing angle-typed divider strips back-to-back with filler between strips, flush with finish floor.

3.5 CEMENTITIOUS TERRAZZO

A. Sand Cushion Terrazzo: Comply with NTMA "Guide Specification" for Sand Cushion Terrazzo".

B. Bonded Terrazzo: Comply with NTMA "Guide Specification for Bonded Terrazzo". Prepare sub-slab surfaces to insure positive bonding with underbed. Thoroughly clean areas of foreign matter immediately before placing bond coat. Place underbed while bond coat is still plastic.

C. Surfacing: Grout cured terrazzo topping in accordance with NTMA Specifications. Delay grinding and finishing until heavy trade work is completed and construction traffic through the area is restricted. Finish by fine grinding with abrasive grit of size specified by NTMA, or as otherwise required matching Architect's sample.

3.6 FINISHING

A. Rough Grinding: After curing the terrazzo should be ground with 24 grit stones or comparable diamond pates. After initial grinding follow with 80 grit stone.

B. Grouting: After rough grinding the floor shall be cleaned and thoroughly rinsed. Remove excess rinse water and grout floor and all voids completely using Portland cement color and pigments identical to those used in topping.

C. CURING: After grout has attained initial; set cure for minimum 72 hours.

D. Fine Grinding: Grind with 120 or finer grit stones until all grout is removed from surface. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding. Produce surface with a minimum of 70 percent aggregate exposure or match existing adjacent surfaces.

E. Existing terrazzo shall be ground, re-grouted & polished same as new terrazzo.

3.7 CLEANING, SEALING, AND PROTECTION

A. Remove grinding dust from installation and adjacent areas.

B. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow to dry thoroughly.

C. Seal surfaces according to NTMA's written recommendations. Apply sealer as recommended by terrazzo manufacturer and according to sealer manufacturer's written instructions.

D. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure terrazzo is without damage or deterioration at time of Substantial Completion

END OF SECTION 09405