DELIVERING QUALITY WITHOUT COMPROMISE

CORINTHIAN CAST STONE, INC.

Architectural Cast Stone Submittal Package

115 Wyandanch Avenue
Wyandanch, NY 11798
Phone: 631.920.2340
FAX: 631.920.2343
www.corinthiancaststone.com
www.corinthian-usa.com

CONTINUING EDUCATION AIA

1927 CAST STONE INSTITUTE

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Corinthian Cast Stone Inc. manufactures our Cast Stone products and performs our ancillary services in strict accordance with the Construction Specification Institute specification section 4270 and ASTM C1364-16E

In this submittal package, you will find the information as noted below. If you would like to learn more about Corinthian Cast Stone, Inc. or would like to review additional technical bulletins, please visit our website.

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Please visit us at

www.CorinthianCastStone.com

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Statement of Qualifications

Thank you for your interest in Corinthian Cast Stone. We are a leading manufacturer of Earth Moist (VDT-dry tamp) cast stone products, a supplier of natural stone (limestone, sandstone, brownstone, bluestone) and the ancellory products and services that are needed to complete the project.. We are a full service firm providing;

- Cast Stone Institute Certified Plant, inspected by an independent engineer to ensure compliance with industry standards and OSHA regulations.
- All Site personnel have appropriate OSHA and NYC and NYS licenses.
- Field Measuring services, Corinthian Cast Stone is the only cast stone manufacturer in the world to have a Laser Scan Metrology Department. We can accurately document full buildings (+- 2mm) or architectural artifacts (+_ 1/2mm).
- Shop drawing services, whether you need an SK drawing or a full set of prints, reviewed by our in house NYS licensed Architect..
- Engineering services, from simple help with anchoring suggestions to full PE – in house (state appropriate) stamped calculations.
- Pattern and Mold making services, Utilizing the laser scan metrology data and building 3d models of profiles or shapes we then proceed to one of the most technologically advanced mold shops in the industry; we can create or replicate anything from geometric shapes to the most complex organic forms. All done using computerized 3 and 5 axis CNC machines.
- Casting, Cast Stone, Precast Concrete or GFRC.
- Ancillary items: Anchors, fasteners, shims, color matched mortar, Prosoco band ® cleaners and other items required to install or wash down cast and natural stone
- Natural Stone – Corinthian is a leading supplier for custom fabricated Indian Limestone
- Shipping, every stone is palletized on a hardwood pallet layered in non-staining, dunnage material, and then shrink-wrapped in 12 month UV Stable shrink wrap. This extreme packaging ensures your stone gets to the site undamaged and stays that way while being staged at the site before installation.

Whether you are *renovating a landmark, building your dream home* or *constructing a commercial building* the advantages of Earth Moist Cast Stone (dry tamp cast stone) are unparallel.

- Fast lead times: Earth Moist (VDT-dry tamp) cast stone allows up to 100 pieces a day to be fabricated from one mold!
- Custom color matching: choose from Standard, Premium or Custom colors – **the choice is yours**!
- Custom shapes and sizes: choose Custom or our new Signature Stone – **you get what you want!**
- Exacting architectural detail: envision the detail of craftsmen from long ago, with the precision of today's technology.
- Proven through independent laboratory testing to exceed CSI specification section 4720 and ASTM section C-1364-10b.

Visit us at www.CorinthianCastStone.com for Technical Bulletins, Design Details, a Color Selection Guide and other helpful information.

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Pre Bid

- PRE BID SURVEY
- DIGITAL TAKE OFF
- ITEMIZED PROPOSAL

Field Measuring

- HIGH DEFINITION LASER SCAN FROM SUB MILLIMETER TO FULL BUILDINGS
- FIELD PERSONNEL HAVE 10 HR OSHA , NYC PIPE AND SUSPENDED SCAFFOLD CARDS.

Shop Drawings

- CATALOG CUTS OR FULL LAYOUT / SETTING DRAWINGS

Engineering

- DESIGN & CALCULATION OF ANCHOR / FASTENER SYSTEM TO BUILDING CODE STAMP AVAILABLE IN ALL 50 STATES

Architectural Stone Products:

- CAST STONE
- LIMESTONE
- PRECAST CONCRETE
- BLUESTONE_ NATURAL
- BROWNSTONE_ NATURAL
- GRANITE_ NATURAL
- GFRC_ GLASS FIBER REINFORCED CONCRETE
- FRP_ FIBERGLASS
- CAST STONE SAFETY TREADS WITH ABRASIVE INLAY NOSING

Ancillary Items

- ANCHORS _STAINLESS STEEL & HOT DIPPED GALVANIZED
- FASTENERS_SCREWS, TRUBOLT, TAPCON,
- EPOXY_ RED HEAD
- SHIMS _PLASTIC HORSESHOE AND STRIP STOCK

AGGREGATES – BAGGED, SUPER SACKED AND BULK

- CONCRETE, MASON SAND, TAN & WHITE

MORTARS AND PATCH KITS: CUSTOM AND STOCK COLORS:

- TYPE N & S. VENEER STONE MORTAR
- PIGMENTS FOR MORTAR, READYMIX
- PATCHKITS FOR MASONRY MATERIALS
- WR GRACE DRYBLOK MORTAR ADMIX

PROSOCO® CLEANERS AND SEALERS

- DESIGN & CALCULATION OF ANCHOR / FASTENER SYSTEM TO BUILDING CODE STAMP AVAILABLE IN ALL 50 STATES

Services and Ancillary Items

The services and ancillary items are available for purchase by your organization for projects that we supply and projects that require our primary materials and those that do not.

For instance; Have a brick job? We are happy to supply you with field measuring, shop drawings for rebar, grout and bond; engineering details for installation, pre-blended mortar and the Prosoco (R)wash down solution.

Plant Tours & AIA Credits

Visit our manufactory on Long Island NY, check out how laser scan metrology, CNC machines and computerized batching has changed the fabrication process.

EARN AIA/ CEU CREDITS

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115 Wyandanch Avenue
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January 01 2012

Re: The use of substitution materials (ie precast concrete in lieu of Cast Stone)

To whom it may concern:

Please be advised that not all "cast stone" is actually Cast Stone as defined by ASTM C1364, and the some of these products while costing less DO NOT CONFORM to the project specifications and put your company at risk.

The Project Specification section 04 72 00

- ***Spec section 04 07 20 Cast Stone.*** All physical requirements (and aesthetic) are spelled out in this section. The Architect / Owner has chosen to specify Cast Stone in Construction Specification Institute section 4720 and referencing ASTM specification C1364, demonstrating knowledge of product and usage thereof.

- ***The International Code Council (ICC)*** Family of Building Codes, including those for all structures, residential and others, has now been adopted in most States. These Codes are legally binding and supersede any other specification unless referenced in these documents.

  Most all materials in the Codes are referenced by definition and as per their ASTM number. In the past, Cast Stone has been referenced by definition only as a material that replicated natural stone with no ASTM requirement. This allowed for other products to be referenced in the Code under Cast Stone when it was not the same material.

  This is important for the Owners, Architects and the Cast Stone industry as the product will be clearly defined and separated from other products, such as adhered veneer and lesser quality precast/masonry products. An architect or designer who specifies Cast Stone will indeed get what they have intended.

  Not all of the Cast Stone industry necessarily complies with all of the requirements of ASTM C1364 (which includes a freeze thaw component).

- **ASTM 1364-10b Standard Specification for Architectural Cast Stone (this is an excerpt)**

  This standard is issued under the fixed designation C1364; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision.

  1. Scope

  1.1 This specification includes the physical properties, sampling, testing, tolerance, and appearance requirements for architectural cast stone.

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5. Physical Requirements

5.1 ***Compressive Strength***—At 28 days after manufacture, not less than 6500 psi (45 MPa), when tested in accordance with Test Method C1194.

5.2 ***Absorption, Cold Water***—At 28 days after manufacture, not greater than 6 %, when tested in accordance with Method A, Cold Water of Test Method C1195.

5.3 ***Absorption, Boiling Water***—At 28 days after manufacture, not greater than 10 %, when tested in accordance with Method B, Boiling Water Test of Test Method

5.6 ***Resistance to Freezing and Thawing*****:**

5.6.1 The manufacturer shall satisfy the purchaser that the units have adequate resistance to freezing and thawing either through proven field performance of similar products made from the same materials or through laboratory testing.

5.6.2 If laboratory testing is required, the cast stone shall be tested using Test Method 666/C666M, Procedure A, except the method of evaluation is to be based on cumulative percent loss in mass and not relative dynamic modulus of elasticity and durability factor (that is, do not measure the fundamental transverse frequency during testing). Follow the procedure modifications to Test Method C666/C666M in 5.6.2.1 through 5.6.2.5.

5.6.3 The CPWL shall be less than 5 % after 300 cycles of freezing and thawing.

ASTM C-666 specifies the cast stone unit MUST pass 300 cycles of freezing and thawing with less than 5% mass loss.

The take away is clear, if the specification calls out Cast Stone and references ASTM C1364, you are obligated to provide the product as specified. Make sure you vet your supplier and review their test data for conformance with ASTM C1364 before signing on the dotted line. Not to do so puts your company at risk.

Please call or email with any questions or concerns you may have.

Sincerely,

Jason Hirschhorn, President

Corinthian Cast Stone Inc.

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Cast Stone Certification – general for all products produced as cast stone by Corinthian Cast Stone Inc.

Corinthian Cast Stone Inc. (a Cast Stone Institute® Certified Plant.) certifies that the Custom Cast Stone fabricated for your project conforms to the following specifications:

All products are fabricated in accordance with Construction Specification Institute section CSI 4720 and ASTM C1364-16E

All Materials meet or exceed:

- ASTM C 1364 – 16E Standard Specification for Architectural Cast Stone (including all ASTM referenced subsections). ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Reinforced Concrete.
- ASTM C 33 – Standard Specification for Concrete Aggregates.
- ASTM C 150 - Standard Specification for Portland Cement.
- ASTM C 260 - Standard Specification for Air-Entrained Admixtures for Concrete.
- ASTM C 494 - Standard Specification for Chemical Admixtures for Concrete.
- ASTM C 666 – Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
- ASTM C 979 - Standard Specification for Coloring Pigments for Integrally Pigmented Concrete.
- Cast Stone Institute Technical Manual (Current Edition)
- ASTM C 1194 – Compressive Strength – at 28 days after manufacture, not less than 6500psi (45MPa), when tested in accordance with Test Method C 1194
- ASTM C 1195 – Absorption, Cold water – At 28 days after manufacture, not greater than 6 %, when tested in accordance with Method A, Cold Water of Test Method C 1195.
- Finish is to be that of Dry – Tamp (Earth Moist) Cast Stone - All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1 .32 in. (0.8 mm) and the density of such voids shall be less than three occurrences per any 1 in.2 (25 mm 2) and not obvious under direct daylight illumination from a 5-ft (1.5-m) distance, unless otherwise specified.

Respectfully,

Jason B Hirschhorn

Corinthian Cast Stone. Inc.
Jason B. Hirschhorn, President

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CAST STONE INSTITUTE®

Certificate of Excellence

Presented To

Corinthian Cast Stone, Inc.

This certifies that the company has met the strict criteria for plant certification and adheres to the high standards for quality as set forth by the Institute.

Valid Through December 31, 2017

Troy McCune, President

SAFETY DATA SHEET

Section 1: IDENTIFICATION

1.1 PRODUCT IDENTIFIER

Product Name: Cast Stone, Architectural Cast Stone

Product Code: 3272: Concrete Products, Except Block and Brick

1.2 RECOMMENDED USE OF CHEMICAL AND RESTRICTIONS ON USE

Use: Construction material used in building and hardscape applications.

1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Name/Address: Corinthian Cast Stone Inc

Telephone Number: 631.920.2340

1.4 EMERGENCY TELEPHONE NUMBER

Emergency Telephone Number:

Date of Preparation: **Version #:** 1.0

Section 2: HAZARD(S) IDENTIFICATION

2.1 CLASSIFICATION OF THE CHEMICAL ACCORDING TO OSHA HAZCOM 2012

Hazard class

Skin irritation 2
Eye irritation 2A
Skin sensitization 1
Carcinogenicity 1A
Specific target organ toxicity - Single exposure 3
Specific target organ toxicity - Repeated exposure 1

2.2 LABEL ELEMENTS ACCORDING TO OSHA HAZCOM 2012

Hazard Pictogram:

Signal Word: Danger

Hazard Statement: Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. Respirable dust may contain crystalline silica, known to cause cancer. May cause respiratory irritation. Causes damage to lungs through prolonged or repeated exposure.

Prevention: Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area. Do not breathe dust.

SAFETY DATA SHEET

Response:	If exposed or concerned: Get medical advice/attention. If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
Storage:	Not applicable.
Disposal:	Dispose of unused or unwanted concrete products in accordance with all local, regional, national and international regulations.

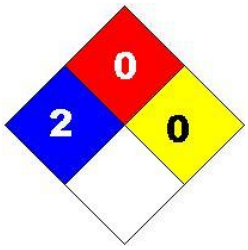
2.3 ADDITIONAL INFORMATION

Hazards not otherwise classified: Not applicable.

47 % of the mixture consists of ingredient(s) of unknown acute toxicity.

This product is a hazardous chemical as defined by NOM-018-STPS-2000.

Mexico Classification:



Blue = Health Red = Flammability Yellow = Reactivity White = Special

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

WHMIS Classification(s):

Class D2A - Carcinogenicity
Class D2A - Chronic Toxic Effects
Class D2B - Skin/Eye Irritant

WHMIS Hazard Symbols:

WHMIS Signal Word: WARNING

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 MIXTURES

Ingredient	UN #	H / F/ R / *	CAS No	Wt. %
Coarse aggregate	Not available.	Not available.	Not available.	15 - 60
Portland cement	Not available.	1/0/0	65997-15-1	10 - 30
Ashes (residues)	Not available.	Not available.	68131-74-8	0.1 - 30
Slags, ferrous metal, blast furnace	Not available.	Not available.	65996-69-2	0.1 - 30

SAFETY DATA SHEET

Water	Not available.	Not available.	7732-18-5	10 - 30
Silica, crystalline, quartz	Not available.	Not available.	14808-60-7	3 - 7
Ferric oxide	UN1376	1/0/0	1309-37-1	1 - 5
Calcium carbonate	Not available.	1/0/0	1317-65-3	1 - 5
Calcium hydroxide	Not available.	3/0/0	1305-62-0	1 - 5
Silica, amorphous, fumed	Not available.	Not available.	7631-86-9	1 - 5
Admixtures (organic and inorganic)	Not available.	Not available.	Not available.	0.1 - 1

The exact percentage (concentration) of composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.

* Per NOM-018-STPS-2000

Section 4: FIRST- AID MEASURES

4.1 DESCRIPTION OF THE FIRST AID MEASURE

Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses, if worn. If eye irritation persists: Get medical advice/attention.

Skin: If irritation occurs, flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.

Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.

Ingestion: Not a normal route of exposure. If swallowed, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Eye: Causes serious eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.

Skin: Causes skin irritation. Wear gloves when handling product to avoid drying and mechanical abrasion of the skin. May cause sensitization by skin contact.

Inhalation: Dust may cause respiratory tract irritation.

Ingestion: Not a normal route of exposure. May result in obstruction and temporary irritation of the digestive tract.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENTS NEEDED

Note to Physicians: Symptoms may not appear immediately.

Specific Treatments: In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

Section 5: FIRE-FIGHTING MEASURES

5.1 FLAMMABILITY

Flammability: Not flammable by WHMIS/OSHA/NOM-018-STPS-2000 criteria.

SAFETY DATA SHEET

5.2 EXTINGUISHING MEDIA

Suitable Extinguishing Media: Treat for surrounding material.

Unsuitable Extinguishing Media: Not available.

5.3 SPECIAL HAZARDS ARISING FROM THE CHEMICAL

Products of Combustion: May include, and are not limited to: oxides of carbon.

Explosion Data:

Sensitivity to Mechanical Impact: Not available.

Sensitivity to Static Discharge: Not available.

5.4 SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTERS

Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

6.2 METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING - UP

Methods for Containment: Pick up large pieces, then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

Methods for Cleaning-Up: Vacuum or sweep material and place in a disposal container. Use wet methods, if appropriate, to reduce the generation of dust. Provide ventilation if dust is generated.

Section 7: HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING

Handling: Avoid contact with skin and eyes. Good housekeeping is important to prevent accumulation of dust. Avoid generating and breathing dust. Use wet methods, if appropriate, to reduce the generation of dust. The use of compressed air for cleaning clothing, equipment, etc, is not recommended. Handle with care. When using do not eat or drink. (See section 8)

General Hygiene Advice: Launder contaminated clothing before reuse. Wash hands before eating, drinking, or smoking.

7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Storage: Avoid any dust buildup by frequent cleaning and suitable construction of the storage area. (See section 10)

SAFETY DATA SHEET

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 CONTROL PARAMETERS

Exposure Guidelines

Occupational Exposure Limits		
Ingredient	**OSHA-PEL**	**ACGIH-TLV**
Coarse aggregate	Not available.	Not available.
Portland cement	15 mg/m³ (total); 5 mg/m³ (resp)	1 mg/m³ (no asbestos and <1% crystalline silica, respirable fraction)
Ashes (residues)	Not available.	Not available.
Slags, ferrous metal, blast furnace	Not available.	Not available.
Water	Not available.	Not available.
Silica, crystalline, quartz	((10 mg/m^3)/(%SiO_2+2) (resp)) ((30 mg/m^3)/(%SiO_2+2) (total)) ((250)/(%SiO_2+5) mppcf (resp))	0.025 mg/m³
Ferric oxide	10 mg/m³	5 mg/m³ (iron oxide fume; dust as Fe)
Calcium carbonate	15 mg/m³ (total); 5 mg/m³ (resp)	10 mg/m³
Calcium hydroxide	15 mg/m³ (total); 5 mg/m³ (resp)	5 mg/m³
Silica, amorphous, fumed	80 mg/m³/%SiO_2	10 mg/m³
Admixtures (organic and inorganic)	Not available.	Not available.

8.2 EXPOSURE CONTROLS

Engineering Controls: When using product, provide local and general exhaust ventilation to keep airborne dust concentrations below exposure limits. Use wet methods, if appropriate, to reduce the generation of dust.

8.3 INDIVIDUAL PROTECTIVE MEASURES

Personal Protective Equipment:

Eye/Face Protection: Safety glasses or goggles are recommended when using product.

Skin Protection:

Hand Protection: Wear suitable gloves.

Body Protection: Wear suitable protective clothing.

Respiratory Protection: A NIOSH approved dust mask or filtering facepiece is recommended in poorly ventilated areas or when permissible exposure limits may be exceeded. Respirators should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134) and ANSI's standard for respiratory protection (Z88.2).

General Health and Safety Measures: Handle according to established industrial hygiene and safety practices. Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking.

SAFETY DATA SHEET

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Fully cured and hydrated concrete.
Color:	Not available.
Odor:	Odorless.
Odor Threshold:	Not available.
Physical State:	Solid.
pH:	Not available.
Melting Point/Freezing Point:	Not available.
Initial Boiling Point and Boiling Range:	Not available.
Flash Point:	Not available.
Evaporation Rate:	Not available.
Flammability:	Not flammable.
Lower Flammability/Explosive Limit:	Not available.
Upper Flammability/Explosive Limit:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Relative Density/Specific Gravity:	Not available.
Solubility:	Insoluble.
Partition coefficient: n-octanol/water:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Oxidizing Properties:	Not available.
Explosive Properties:	Not available.

Section 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

No dangerous reaction known under conditions of normal use.

10.2 CHEMICAL STABILITY

Stable under normal conditions of use.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS

No dangerous reaction known under conditions of normal use.

10.4 CONDITIONS TO AVOID

None known.

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10.5 INCOMPATIBLE MATERIALS

None known.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS

None known.

Section 11: TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

Likely Routes of Exposure: Skin contact, eye contact, and inhalation.

Symptoms related to physical/chemical/toxicological characteristics:

Eye: Causes serious eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.

Skin: Causes skin irritation. Wear gloves when handling product to avoid drying and mechanical abrasion of the skin. May cause sensitization by skin contact.

Ingestion: Not a normal route of exposure. May result in obstruction and temporary irritation of the digestive tract.

Inhalation: Dust may cause respiratory tract irritation.

Acute Toxicity:

Ingredient	IDLH	LC50	LD50
Coarse aggregate	Not available.	Not available.	Not available.
Portland cement	5000 mg/m^3	Not available.	Not available.
Ashes (residues)	Not available.	Not available.	Oral > 2000 mg/kg, rat
Slags, ferrous metal, blast furnace	Not available.	Not available.	Not available.
Water	Not available.	Inhalation 90000 mg/m³/4h, rat	Oral >90000 mg/kg, rat Dermal >90000 mg/kg, rabbit
Silica, crystalline, quartz	Ca [25 mg/m^3 (cristobalite, tridymite); 50 mg/m^3 (quartz, tripoli)]	Not available.	Oral 500 mg/kg, rat
Ferric oxide	2500 mg Fe /m^3	Not available.	Oral >10000 mg/kg, rat
Calcium carbonate	Not available.	Not available.	Oral 6450 mg/kg, rat
Calcium hydroxide	Not available.	Not available.	Oral 7340 mg/kg, rat
Silica, amorphous, fumed	Not available.	Inhalation ≥58.8 mg/l/1h, rat	Oral >5000 mg/kg, rat Dermal >2000 mg/kg, rabbit
Admixtures (organic and inorganic)	Not available.	Not available.	Not available.

Calculated overall Chemical Acute Toxicity Values		
LC50 (inhalation)	**LD50 (oral)**	**LD50 (dermal)**
> 5 mg/l/4h, rat	> 2000 mg/kg, rat	> 2000 mg/kg, rabbit

Ingredient	Chemical Listed as Carcinogen or Potential Carcinogen (NTP, IARC, OSHA, ACGIH, CP65)*
Coarse aggregate	Not listed.
Portland cement	G-A4
Ashes (residues)	Not listed.
Slags, ferrous metal, blast furnace	Not listed.

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Water	Not listed.
Silica, crystalline, quartz	G-A2, I-1, N-1, O, CP65
Ferric oxide	G-A4, I-3
Calcium carbonate	Not listed.
Calcium hydroxide	Not listed.
Silica, amorphous, fumed	I-3
Admixtures (organic and inorganic)	Not listed.

* See Section 15 for more information.

11.2 DELAYED, IMMEDIATE, AND CHRONIC EFFECTS OF SHORT- AND LONG-TERM EXPOSURE

Skin Corrosion/Irritation: Causes skin irritation.

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory Sensitization: Based on available data, the classification criteria are not met.

Skin Sensitization: May cause an allergic skin reaction.

STOT-Single Exposure: Dust may cause respiratory tract irritation.

Chronic Health Effects:

Carcinogenicity: Respirable dust may contain crystalline silica, known to cause cancer.

Germ Cell Mutagenicity: Based on available data, the classification criteria are not met.

Reproductive Toxicity:

Developmental: Based on available data, the classification criteria are not met.

Teratogenicity: Based on available data, the classification criteria are not met.

Embryotoxicity: Based on available data, the classification criteria are not met.

Fertility: Based on available data, the classification criteria are not met.

STOT-Repeated Exposure: Causes damage to lungs through prolonged or repeated exposure. Respirable crystalline silica in the form of quartz or cristobalite from occupational sources is listed by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as a lung carcinogen. Prolonged exposure to respirable crystalline silica has been known to cause silicosis, a lung disease, which may be disabling. While there may be a factor of individual susceptibility to a given exposure to respirable silica dust, the risk of contracting silicosis and the severity of the disease is clearly related to the amount of dust exposure and the length of time (usually years) of exposure.

Aspiration Hazard: Based on available data, the classification criteria are not met.

Toxicologically Synergistic Materials: Not available.

Other Information: Not available.

SAFETY DATA SHEET

Section 12: ECOLOGICAL INFORMATION

12.1 ECOTOXICITY

Acute/Chronic Toxicity: No ecological consideration when used according to directions.

12.2 PERSISTENCE AND DEGRADABILITY

Not available.

12.3 BIOACCUMULATIVE POTENTIAL

Bioaccumulation: Not available.

12.4 MOBILITY IN SOIL

Not available.

12.5 OTHER ADVERSE EFFECTS

Not available.

Section 13: DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS

Disposal Method: This material must be disposed of in accordance with all local, state, provincial, and federal regulations.

Other disposal recommendations: Not available.

Section 14: TRANSPORT INFORMATION

14.1 UN NUMBER

DOT	TDG	NOM-004-SCT2-1994
Not regulated.	Not regulated.	Not regulated.

14.2 UN PROPER SHIPPING NAME

DOT	TDG	NOM-004-SCT2-1994
Not applicable.	Not applicable.	Not applicable.

14.3 TRANSPORT HAZARD CLASS (ES)

DOT	TDG	NOM-004-SCT2-1994
Not applicable.	Not applicable.	Not applicable.

14.4 PACKING GROUP

DOT	TDG	NOM-004-SCT2-1994
Not applicable.	Not applicable.	Not applicable.

14.5 ENVIRONMENTAL HAZARDS

Not available.

14.6 TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE

Not available.

14.7 SPECIAL PRECAUTIONS FOR USER

Do not handle until all safety precautions have been read and understood.

SAFETY DATA SHEET

Section 15: REGULATORY INFORMATION

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/ LEGISLATIONS SPECIFIC FOR THE CHEMICAL

Canada: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

US: SDS prepared pursuant to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012

Mexico: SDS prepared pursuant to NOM-018-STPS-2000.

SARA Title III				
Ingredient	**Section 302 (EHS) TPQ (lbs.)**	**Section 304 EHS RQ (lbs.)**	**CERCLA RQ (lbs.)**	**Section 313**
Coarse aggregate	Not listed.	Not listed.	Not listed.	Not listed.
Portland cement	Not listed.	Not listed.	Not listed.	Not listed.
Ashes (residues)	Not listed.	Not listed.	Not listed.	Not listed.
Slags, ferrous metal, blast furnace	Not listed.	Not listed.	Not listed.	Not listed.
Water	Not listed.	Not listed.	Not listed.	Not listed.
Silica, crystalline, quartz	Not listed.	Not listed.	Not listed.	Not listed.
Ferric oxide	Not listed.	Not listed.	Not listed.	Not listed.
Calcium carbonate	Not listed.	Not listed.	Not listed.	Not listed.
Calcium hydroxide	Not listed.	Not listed.	Not listed.	Not listed.
Silica, amorphous, fumed	Not listed.	Not listed.	Not listed.	Not listed.
Admixtures (organic and inorganic)	Not listed.	Not listed.	Not listed.	Not listed.

State Regulations

California Proposition 65:

This product contains Crystalline Silica, Quartz and may also contain trace amounts of other chemicals known to the State of California to cause cancer, birth defects or other reproductive harm which may be released upon sanding/cutting/grinding/drilling.

Global Inventories:

Ingredient	**Canada DSL/NDSL**	**USA TSCA**
Coarse aggregate	Not available.	Not available.
Portland cement	DSL	Yes.
Ashes (residues)	DSL	Yes.
Slags, ferrous metal, blast furnace	DSL	Yes.
Water	DSL	Yes.
Silica, crystalline, quartz	DSL	Yes.
Ferric oxide	DSL	Yes.
Calcium carbonate	NDSL	Yes.
Calcium hydroxide	DSL	Yes.
Silica, amorphous, fumed	DSL	Yes.
Admixtures (organic and inorganic)	Not available.	Not available.

SAFETY DATA SHEET

NFPA-National Fire Protection Association:	
Health:	2
Fire:	0
Reactivity:	0

HMIS-Hazardous Materials Identification System:	
Health:	2*
Fire:	0
Physical Hazard:	0

Hazard Rating: 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

SOURCE AGENCY CARCINOGEN CLASSIFICATIONS:

CP65 **California Proposition 65**

OSHA (O) **Occupational Safety and Health Administration.**

ACGIH (G) **American Conference of Governmental Industrial Hygienists.**
A1 - Confirmed human carcinogen.
A2 - Suspected human carcinogen.
A3 - Animal carcinogen.
A4 - Not classifiable as a human carcinogen.
A5 - Not suspected as a human carcinogen.

IARC (I) **International Agency for Research on Cancer.**
1 - The agent (mixture) is carcinogenic to humans.
2A - The agent (mixture) is probably carcinogenic to humans; there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals.
2B - The agent (mixture) is possibly carcinogenic to humans; there is limited evidence of carcinogenicity in humans in the absence of sufficient evidence of carcinogenicity in experimental animals.
3 - The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.
4 - The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.

NTP (N) **National Toxicology Program.**
1 - Known to be carcinogens.
2 - Reasonably anticipated to be carcinogens.

Section 16: OTHER INFORMATION

Date of Preparation: _____

Expiry Date: _____

Version: 1.0

Revision Date: _____

Disclaimer: We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind. The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.

End of Safety Data Sheet

Pennoni
PENNONI ASSOCIATES INC.
CONSULTING ENGINEERS

Project No.: **CRTH-1401**

Report Date: **September 27, 2017**

Client: **Mr. Jason Hirschhorn**
Address: **Corinthian Cast Stone**
115 Wyandanch Ave.
Wyandanch, NY 11798

Project Name: **Corinthian Cast Stone**

Date Received: **September 14, 2017**

Unit Specification: **ASTM C1364**

Unit Designation and Description: **Architectural Cast Stone**
Cast Stone

Laboratory Number: **10- 153712**

Summary of Test Results

ASTM C1194 - Compressive Strength of Architectural Cast Stone

Specimen Cast Date: **8/28/2017**

Date of Compression Testing: **9/25/2017**

Age when Tested: **28** days

Individual Unit Test Results

Specimen No.	Compressive Strength		Specification
	lbs	psi(gross)	
4	37656	9600	
5	39888	10070	
6	40834	10310	
Average	**39459**	**9990**	**6500 psi (min.)**

Specimen No.	Density (lb/ft^3)	
	SSD	Oven Dry
4	143.1	139.4
5	144.7	140.8
6	145.7	142.1
Average	**144.5**	**140.8**

Dimensions (in)			
Specimen No.	Length	Width	Height
1	2.03	1.94	2.04
2	1.98	2.00	2.05
3	2.03	1.93	2.05
4	2.01	1.95	2.01
5	2.02	1.96	2.05
6	2.02	1.96	2.06

ASTM C1195 - Absorption of Architectural Cast Stone

Specimen Cast Date: **8/28/2017**

Test Method: **A, Cold Water Test**

Specimen No.	Absorption	Specification
	%	
1	2.7	
2	2.7	
3	2.6	
Average	**2.6**	**6 % (max.)**

Test Method: **B, Boiling Water Test**

Specimen No.	Absorption	Specification
	%	
1	6.9	
2	7.0	
3	7.1	
Average	**7.0**	**10 % (max.)**

Specimen No.	Absorption Weights (g)	
	Oven Dry	SSD-Cold Wtr
1	294.66	302.48
2	300.77	308.90
3	300.13	307.87

Remarks: The above samples were tested according to ASTM C1194 and C1195. This set meets the compressive strength and absorption requirements of ASTM C1364.

Chas M. Snyder, PE
Laboratory Manager

AAP AASHTO R18

NATIONAL CONCRETE MASONRY ASSOCIATION
RESEARCH & DEVELOPMENT LABORATORY

13750 Sunrise Valley Drive
Herndon, VA 20171- 4662
703. 713. 1900 Main
703. 713. 1910 Fax
www.ncma.org

May 25, 2017

Jamie Farris
Corinthian Cast Stone
115 Wyandanch Ave.
Wyandanch, NY 11798

Mr. Farris,

Enclosed please find a report of testing performed by the National Concrete Masonry Association Research and Development Laboratory on the following products:

Report Number	Unit Description
17-226	Architectural Cast Stone Mark: '5 x 18 x 18 inch Cast Stone Sample'

Please note that the contents of this report are not to be reproduced, except in full, without the written approval of the NCMA Research and Development Laboratory.

We are constantly improving our services and would greatly appreciate any feedback regarding your experience with NCMA's Research and Development Laboratory. We have set up an online survey, which can be found at: http://www.surveymonkey.com/s/DDFPZT9. After taking the online survey, make use of the many resources available at our website, www.ncma.org. There you will find the latest industry news and events, a searchable directory of products and services, a vast collection of literature on the design, implementation, and marketing of manufactured concrete products and hardscape systems, as well as a list of the available laboratory services for future testing.

The National Concrete Masonry Association Research and Development Laboratory is dedicated to the scientific testing and research of concrete masonry products and systems. We take pride in meeting your product certification and evaluation requirements and look forward to continuing to service your testing needs for years to come.

Thank you for choosing NCMA's Research and Development Laboratory. Please feel free to contact me directly with any comments or questions at 703-713-1900 or nlang@ncma.org.

Sincerely,

Nicholas R. Lang
Director of Business Development

NATIONAL CONCRETE MASONRY ASSOCIATION
RESEARCH & DEVELOPMENT LABORATORY

13750 Sunrise Valley Drive
Herndon, VA 20171- 4662
703. 713. 1900 Main
703. 713. 1910 Fax
www.ncma.org

Sampling and Testing Architectural Cast Stone

Job No.: 17-226A
Report Date: 2/20/2017

Client: Corinthian Cast Stone
Address: 115 Wyandanch Ave
Wyandanch NY 11798

Testing Agency: National Concrete Masonry Association
Research and Development Laboratory
Address: 13750 Sunrise Valley Drive
Herndon, VA 20171-4662

Unit Specification: ASTM C1364-16e1

Sampling Party: Corinthian Cast Stone

Date Samples Received: 2/7/2017

Unit Designation/Description:
Architectural Cast Stone
Mark: '5 x 18 x 18 inch Cast Stone Sample'

Date of Casting: 1/18/2017

Summary of Test Results:

Physical Property	Tested Values		ASTM C1364-16e1 Required Values	
Compressive Strength:	9940	psi	6500	psi minimum
Cold Water Absorption:	2.9	%	6.0	% maximum

The client delivered one 5 x 18 x 18 inch sample piece of architectural cast stone for testing. The following test specimen were cut from the submitted sample: (3) - 2 x 2 x 2 inch absorption specimens, (3) - 2 x 2 x 2 inch compression specimens, and (3) - 3 x 4 x 16 inch freeze-thaw durability specimens. The results of these tests are summarized above, with individual results listed below.

Absorption Specimens

*Absorption values are determined in accordance with *Method A (Cold Water Test)* as outlined in ASTM C1195-03(2011).

Age of Specimen at Start of Testing: 27 days

Date Tested: 2/14/2017 to 2/16/2017

	Avg Width in.	Avg Height in.	Avg Length in.	Received Wt, W_R lb	Saturated Surface-Dry Wt, W_S lb	Oven-Dry Wt, W_D lb	Absorption %
Unit #1a	2.04	2.04	2.03	294.4	302.8	294.2	2.9
Unit #2a	2.03	2.04	2.03	296.8	305.9	296.7	3.1
Unit #3a	2.03	2.06	2.02	306.7	315.0	306.6	2.7
Average	2.03	2.05	2.03	299.3	307.9	299.2	2.9

Compression Specimens

*Compressive strength values are determined in accordance with ASTM C1194-03(2011).

Age of Specimen: 28 days

Date Tested: 2/15/2017

	Avg Width in.	Avg Height in.	Avg Length in.	Received Wt, W_R lb	Maximum Compressive Load lb	Tested Compressive Strength psi
Unit #1b	2.05	2.05	2.00	303.3	46470	11310
Unit #2b	2.02	2.06	2.01	300.6	41300	10160
Unit #3b	2.02	2.06	2.01	285.4	34020	8360
Average	2.03	2.06	2.01	296.4	40600	9940

Comments: 1) These units comply with the compressive strength and cold water absorption requirements of ASTM C1364-16e1.

Nicholas R. Lang
Director of Business Development

NATIONAL CONCRETE MASONRY ASSOCIATION
RESEARCH & DEVELOPMENT LABORATORY

13750 Sunrise Valley Drive
Herndon, VA 20171- 4662
703. 713. 1900 Main
703. 713. 1910 Fax
www.ncma.org

ASTM C1262-16 Test Report
Freeze-Thaw Durability

Job No.: 17-226B
Report Date: 5/25/2017

Client: Corinthian Cast Stone
Address: 115 Wyandanch Ave
Wyandanch NY 11798

Testing Agency: National Concrete Masonry Association
Research and Development Laboratory
Address: 13750 Sunrise Valley Drive
Herndon, VA 20171-4662

Unit Specification: ASTM C1364-16e1

Sampling Party: Cast Stone Institute

Unit Designation/Description:
Architectural Cast Stone

Mark: '5 x 18 x 18 inch Cast Stone Sample'

Date Samples Received: 2/7/2017
Date of Casting: 1/18/2017

Date Testing Began: 2/16/2017

Age of Specimen at Start of Testing: 29 days

Test Specimen Dimensions: 3 x 4 x 16 in.
Specimen Sample Location: Bottom molded horizontal surface of the test sample

Test Media: WATER

Unit No.	Received Weight, (g)	Calculated Oven-Dry Initial Wt. (g)
1c	7381.4	7186.6
2c	7376.1	7167.2
3c	7457.8	7251.2

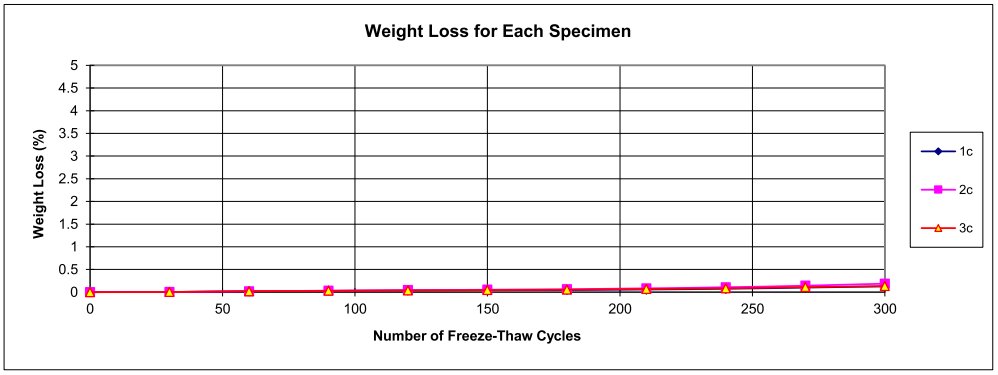
Note: Initial weight calculated as sum of final oven-dry weight of specimen plus oven-dry weight of all collected residue.

Accumulative Residue Weight (g)

Unit No.	Cycle No.:	0	30	60	90	120	150	180	210	240	270	300
1c		0.0	0.4	1.4	2.2	2.7	3.2	3.5	4.1	5.3	7.4	9.2
2c		0.0	0.3	1.1	2.3	3.1	4.0	4.5	5.9	7.6	10.4	13.4
3c		0.0	0.3	1.3	2.3	2.7	3.3	3.9	4.9	6.1	7.9	9.7

Cumulative Percent Mass Loss (%)

Unit No.	Cycle No.:	0	30	60	90	120	150	180	210	240	270	300
1c		0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
2c		0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2
3c		0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1



Comments: 1) These units comply with freeze-thaw durability requirements of ASTM C1364-16e1 for architectural cast stone. That criterion requires that the cumulative percent mass loss (CPWL) is less than 5% after 300 cycles of freezing and thawing.

Nicholas R. Lang
Director of Business Development

FEDERAL WHITE CEMENT INC.

February 5, 2018

LABORATORY TEST REPORT

Sample Source: Portland Type I December 2017 INVENTORY

ASTM C 150 STANDARD REQUIREMENTS Tables 1 and 3

CHEMICAL, %

Item	Spec. Limit	Value
SiO_2	A	21.84
Al_2O_3	A	4.20
Fe_2O_3	A	0.22
CaO	A	64.35
MgO	6.0 max.	0.98
SO_3	3.5 max.[J]	3.30
Ign. Loss	3.5 max.[k]	2.98
Na2O	A	0.13
K2O	A	0.22
Insol. Res.	0.75 max.	0.47
CO2 %	A	1.60
Limestone	5.0% max.	3.7
%CaCO3 of Limestone		99.00
Potential:		
C_3S	A	53
C_2S	A	26
C_3A	A	11
C_4AF	A	1

PHYSICAL

Item	Spec. Limit	Value
Air, vol. %	12 max	5.04
Fineness		
Blaine, m^2/kg	280 min	510
Autoclave %		
Expansion	0.80 max.	0.03

Compressive Strength, PSI

		PSI	Mpa
1-day	A	2504	17.3
3-day	1750 min	4990	34.4
7-day	2760 min	6100	42.1
28-day	A	7240	49.9

Vicat Set Time, minutes

Initial Not less than 45 min	112
Not more than 375 min.	

[A] *Not Applicable*

[J] *When C3A is more than 8%*

[k] With limestone addition, otherwise limit 3%

We certify that the above-described cement, at the time of shipment, meets the chemical and physical requirements of the current applicable specification ASTM C-150 and current Federal specifications. We are not responsible for improper use or workmanship.

CERTIFIED MATERIAL TEST REPORT

GERDAU

US-ML-SAYREVILLE
NORTH CROSSMAN ROAD
SAYREVILLE, NJ 08872
USA

CUSTOMER SHIP TO	CUSTOMER BILL TO
METAL PARTNERS REBAR LLC 156 NORTHFIELD AVE EDISON,NJ 08837-3855 USA	METAL PARTNERS INTERNATIONAL 55 S MAIN STREET NAPERVILLE,IL 60540-8500 USA

GRADE	SHAPE / SIZE	DOCUMENT ID:
60 (420)	Rebar / #3 (10MM)	0000006981

LENGTH	WEIGHT	HEAT / BATCH
40'00"	4,512 LB	**61109044**/03

SALES ORDER	CUSTOMER MATERIAL N°	SPECIFICATION / DATE or REVISION
4389693/000010	X-10-42-4000	ASTM A615/A615M-15 E1

CUSTOMER PURCHASE ORDER NUMBER	BILL OF LADING	DATE
8167	1331-0000050166	11/01/2016

CHEMICAL COMPOSITION

C %	Mn %	P %	S %	Si %	Cu %	Ni %	Cr %	Mo %	Sn %	V %	CEqvA706 %
0.45	0.66	0.032	0.045	0.20	0.42	0.14	0.21	0.029	0.014	0.016	0.59

MECHANICAL PROPERTIES

YS PSI	YS MPa	UTS PSI	UTS MPa	G/L Inch	G/L mm
66062	455	101874	702	8.000	200.0
67111	463	102500	707	8.000	200.0

MECHANICAL PROPERTIES

Elong. %	BendTest
13.00	OK
12.00	OK

GEOMETRIC CHARACTERISTICS

%Light %	Def Hgt Inch	Def Gap Inch	DefSpace Inch
4.80	0.019	0.082	0.249
5.00	0.019	0.079	0.250

COMMENTS / NOTES

The above figures are certified chemical and physical test records as contained in the permanent records of company. We certify that these data are correct and in compliance with specified requirements. This material, including the billets, was melted and manufactured in the USA. CMTR complies with EN 10204 3.1.

BHASKAR YALAMANCHILI
QUALITY DIRECTOR

JOSEPH T HOMIC
QUALITY ASSURANCE MGR.

LANXESS

Product Information

Bayferrox® Synthetic Iron Oxide Pigments

Specification Requirements for Coloring Concrete Products

Colored concrete and precast concrete products have experienced tremendous growth rates around the world. The most widely used pigments for coloring these products are synthetic iron oxides due to their outstanding price/performance ratio. At low dosages, they can turn gray concrete into a wide range of earth tone colors, which show virtually no fading even after years of exposure.

Bayferrox synthetic iron oxide pigments are made by LANXESS Corporation, and each of our manufacturing sites has ISO certification. The pigments must meet stringent color and quality specification parameters set forth by LANXESS and the American Society for the Testing of Materials (ASTM) designation C979. These specifications are closely monitored at the Bayferrox pigments production facilities in Germany and Brazil, and in our quality assurance laboratories. A full range of high quality iron oxide pigments (yellows, reds, blacks, and browns) is produced for various applications. Bayferrox pigments meet the following requirements of ASTM Designation C979, *Standard Specification for Pigments for Integrally Colored Concrete:*

	Test	Test Method
1.	Water Wettability	ASTM C979 7.1
2.	Alkali Resistance	ASTM C979 7.2
3.	Total Sulfates	ASTM C979 7.3
4.	Water Solubility	ASTM C979 7.4
5.	Atmospheric Curing Stability	ASTM C979 7.5
6.	Light Resistance	ASTM C979 7.6
7.	Effects on Concrete	
	A. 28-days Compressive Strength	ASTM C979 7.7.5
	B. Initial or Final Set	ASTM C979 7.7.3
8.	Color Match of Shipment	ASTM C979 7.8

The chart on the reverse side of this sheet lists the results of data that has been collected on the use of Bayferrox pigments in integrally colored concrete using the ASTM test methods.

Bayferrox pigments have proven to be an excellent choice for coloring concrete products such as:

Concrete blocks and bricks	Segmental retaining wall units
Paving stones / interlocking pavers	Grout
Roof tiles	Colored mortar cement
Patio slabs	Stucco
Precast architectural concrete	Ready-mixed concrete
Other precast products	Fiber cement products

Shade of Bayferrox pigments	Yellows			Reds			Blacks			Browns		
Test	Straight Pigment	Loading 0.5%	6.0%	Straight Pigment	Loading 0.5%	6.0%	Straight Pigment	Loading 0.5%	6.0%	Straight Pigment	Loading 0.5%	6.0%
Water-Wettability (ASTM C979 7.1)	P	N/A	N/A	P	N/A	N/A	P	N/A	N/A	P	N/A	N/A
Alkali Resistance (ASTM C979 7.2)	R	N/A	N/A	R	N/A	N/A	R	N/A	N/A	R	N/A	N/A
Total Sulfates (ASTM C979 7.3)	0.3-0.7%	N/A	N/A	0.05-0.13%	N/A	N/A	0.2-0.7%	N/A	N/A	0.3-0.7%	N/A	N/A
Water Solubility (ASTM C979 7.4)	0.15-0.35%	N/A	N/A	0.2-0.4%	N/A	N/A	0.3-0.6%	N/A	N/A	0.3-0.6%	N/A	N/A
Atmospheric Curing Stability (ASTM C979 7.5)	N/A	R	R	N/A	R	R	N/A	R	R	N/A	R	R
Light Resistance (ASTM C979 7.6)	N/A	R	R	N/A	R	R	N/A	R	R	N/A	R	R
Effect on Setting of Concrete (ASTM C979 7.7.3)	N/A	N/A	i* | f* -15 | +5	N/A	N/A	i* | f* -25 | -10	N/A	N/A	i* | f* +5 | +25	N/A	N/A	i* | f* -25 | +25
Effect on Compressive Strength (ASTM C979 7.7.5)	N/A	N/A	102%**	N/A	N/A	106.5%	N/A	N/A	106%	N/A	N/A	106.5%
Color Match of Shipment (ASTM C979 7.8)	ΔE* <1.0	N/A	N/A	ΔE* <1.0	N/A	N/A	ΔE* <1.5	N/A	N/A	ΔE* <1.5	N/A	N/A

LEGEND: P = Passed
R = Resistant
ΔE* = Color difference according to CIELAB (see ASTM D2244)

*deviation in minutes Standard = -60/+90
i = initial f = final
**Control (unpigmented) = 100%
N/A – Not Applicable

Bayferrox® is a registered trademark of Bayer AG, Germany.

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this publication. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g., material safety data sheets and product labels. Consult your LANXESS Corporation representative or contact LANXESS's Product Safety and Regulatory Affairs Dept., Pittsburgh, PA.

Note: The information contained in this bulletin is current as of January 2007. Please contact LANXESS Corporation to determine if this publication has been revised.

LANXESS

LANXESS Corporation
111 RIDC Park West Drive
Pittsburgh, PA 15275
1-800-LANXESS (526-9377)

www.Bayferrox.com
www.US.LANXESS.com

DESIGN TIPS – TECHNICAL BULLETIN #37

JOB SITE HANDLING AND INSTALLATION [1 OF 2]

The on-site personnel should be familiar with the applicable sections of the Cast Stone Institute® Specifications and the Project Specification pertaining to delivery, storage, setting, patching, cleaning, pointing, caulking and sealing. In case of a conflict between the two specifications, the Project Specification should prevail. Where the Project Specification may not include a particular issue, the Industry Standards should be followed.

The following checklist has been developed for Cast Stone installations.

1. Prior to delivery there should be a set of the approved shop drawings and the approved color and texture sample on file. All test reports specified should be submitted as required.

2. Upon delivery, all Cast Stone should be checked for chips, cracks, stains, or broken pieces. Any damage should be noted on the delivery slips and communicated to the manufacturer or the sales representative.

3. Color and texture should be inspected in accordance to approved color sample or mock-up panel set up at the job site. In general, the color and texture of the Cast Stone delivered to the job site should be approximately equal to the approved sample when viewed in good typical daylight conditions at a ten foot distance. (*See technical literature on Inspection and Acceptance.*)

4. Storage of Cast Stone should be above the ground on non-staining planks or pallets. The storage site should be away from heavy construction traffic. Cast Stone stored for an extended period of time should be kept on pallets or non-staining planking and covered with non-staining tarpaulins. Allow for air circulation.

5. Prior to setting, insure climatic conditions are within thermal limitations of mortar. Mortar retarders and accelerators should be used according to manufacturer's directions but not with patching material. Set stone in full mortar joints and fill all dowel holes and anchor slots completely with mortar. Insure uniform joint widths within specifications tolerances.

6. Ensure that all specified flashing and dampproofing is installed. Flashing pierced by stone anchors must be sealed either by metal thimble, grommet or approved sealant.

7. Concrete should never be poured against unprotected Cast Stone. Where poured in place, concrete is placed against Cast Stone sills, separate with appropriate material prior to pouring concrete.

8. Stone anchors must meet specified standards and be non-corrosive. Stone slots to receive anchors should be completely filled with mortar.

9. Prior to setting insure that the surfaces set in mortar are drenched with water. This will secure a good bond and help to prevent mortar shrinkage.

10. Weep holes must be installed over windows, at relieving angles and at the V bottom of walls. No mortar drippings shall be allowed in the wythe between back of stone and face of back-up structure.

11. All head joints at coping and sills, and joints at column covers, soffits, and, in general, all stone sections with projecting profiles, exposed top joints or rigid suspension connections to the supporting structure should be sealant joints. Only the ends of load bearing lug sills shall be set in a full bed of mortar to prevent cracking from future wall settlement. After setting, prime the joints, insert properly sized backup rod and gun in sealant.

12. All trim items except parapet coping must align with control joints. Do not bridge coping over expansion joints.

13. Cast Stone should be handled to minimize chipping. Care must be taken not to bump the stone into anything. Handle stones with the wide portion of the cross section in the vertical position to minimize breakage.

14. After setting, columns, pilasters, entry jambs, window sills and all stone with projecting profiles should be protected during the remaining construction.

15. During construction, cover open walls when rain is anticipated.

DESIGN TIPS – TECHNICAL BULLETIN #37

JOB SITE HANDLING AND INSTALLATION [2 OF 2]

16. Chipped Cast Stone must be patched by skilled mechanics. A trial patch must be approved before general patching is to commence.

17. Planter coping, fountain coping, swimming pool coping, treads, risers, stone pieces at grade, and pavers should be treated with a silane or siloxane water repellent after setting. This will minimize the likelihood of dirt and groundwater entering the surface of the stone; a frequent cause of staining, efflorescence and enhancement of crazing. Check that water repellent does not affect color or texture when dry.

18. Load bearing units should be reinforced as necessary. They may not be designed to be handled in a different orientation than they will be installed in the structure. Lintels and large panels must be kept vertical.

CARE & MAINTENANCE – TECHNICAL BULLETIN #39

CLEANING

During construction, prevention against staining is mandatory and becomes the best solution for a clean finished project. Every effort should be taken to protect the Cast Stone during storage, setting, and after installation. Storage of Cast Stone should be above ground on non-staining planks or pallets. The storage site should be away from heavy construction traffic. Cast Stone stored for an extended period of time should be kept on pallets or non-staining planking and covered with non-staining tarpaulins. After setting, columns, pilasters, entry jambs, windowsills and all stone with projecting profiles should be protected with non-staining materials during the remaining construction.

Regardless of the degree of care exercised during construction, a final washdown will be needed and, normally, whatever is specified to clean the brickwork will adequately clean the Cast Stone. A variety of commercial cleaners are available and most contain detergents combined with mild solutions of phosphoric and/or muriatic acids. Extreme care should be taken when applying acidic cleaners to areas where joints are left open or where sealant is used as jointing material. The sealant manufacturer should be contacted to ascertain compatibility with cleaning materials. Acids left behind the stone on masonry wythe may cause corrosion problems later on.

The most common stains due to construction are dirt and mortar. Dirt can be removed by scrubbing with a mild detergent and water. Mortar stains require brushing a solution of one part hydrochloric acid to six parts water on the stain. Soak the stone with water prior to adding any acid solution to prevent surface burning. Consult the brick supplier prior to applying acids to trim items. Insure that lower stone courses are frequently drenched with water because as acid is rinsed down the wall it can gather strength when reapplied. Take necessary steps to protect windows, door and grade materials.

When unusual stains are encountered, the same procedures, which are recommended to clean concrete, will normally clean Cast Stone. The Portland Cement Association publishes a guide for the removal of stains in concrete. The most important step to stain removal is identifying the stain and its cause. There are degreasers and paint removers readily available. Any treatment should be tested on a small inconspicuous area prior to cleaning the main units.

Dunnage materials used in the packing and transport of Cast Stone can leave stains (or clean spots) after becoming wet. Wood packaging products can transfer resins to the surface, which may be easily removed. However, solid dunnage made from fresh timber can cause dunnage marks, which become difficult to remove. Packing and dunnage materials should always allow the exposed surfaces to breathe, especially when stones are palletized or placed into storage shortly after manufacture. This will avoid color differential due to moisture becoming trapped on the surface of the stone.

Power washing and sandblasting are not recommended procedures for cleaning Cast Stone. Metal fiber brushes are not to be used for scrubbing Cast Stone.

DESIGN TIPS – TECHNICAL BULLETIN #53

CAST STONE AND THE LEED™ RATING SYSTEM [1 OF 4]

INTRODUCTION

Sustainable design has become one of the most prominent trends in the building industry. Designers aiming for a more environmentally-friendly building design often turn to building rating systems to help them assess the environmental impact of a building and its components. The most widely used system in the U.S. is the LEED™ Rating System.

The U.S. Green Building Council (USGBC) first developed the LEED Rating system in 1998. LEED stands for Leadership in Energy and Environmental Design. The LEED Rating System was developed to provide a method to define and measure what are commonly called "green buildings". From its inception as a pilot program for new buildings in 1998 to the present, the LEED Rating System has expanded and grown dramatically. There are currently seven different LEED rating systems under development or in use corresponding to different types of construction, including existing buildings, commercial interiors, homes, schools, and others. The most widely used rating system in the U.S. is currently LEED-NC for New Construction and Major Renovations. While each rating system is distinct, most of the topics covered can be grouped into the same general categories. This Bulletin examines the requirements of LEED-NC version 2.2 and their relevance to cast stone.

THE USE OF CAST STONE

Cast stone is used primarily on the exterior of buildings. Cast stone veneer may be used alone or as an integral part of a clay or concrete masonry veneer. Cast stone may also be used as an accent or trim material on the exterior of buildings sheathed with other materials such as synthetic stucco. Other opportunities for use of cast stone include caps and copings on building walls and landscape walls, stair treads, and column covers. Though not common, cast stone can also be used as pavers and in interior applications. Many of these applications can be part of a strategy to earn points under the LEED Rating System.

THE LEED™ RATING SYSTEM

LEED-NC version 2.2 is organized into five environmental categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality; plus an innovation and design category to recognize exceptional performance or areas not covered in the other categories. Each category may contain mandatory prerequisites as well as voluntary credits that are worth points toward a building project's certification. Figure 1 shows the percentage of points in each of the five environmental categories.

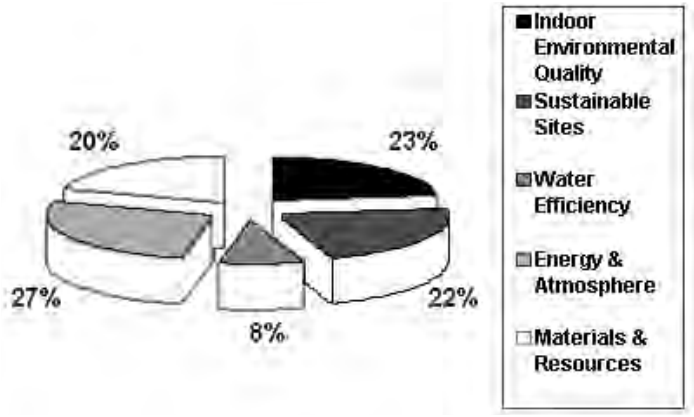


FIGURE 1: LEED-NC POINT DISTRIBUTION

CERTIFICATION

A building project must earn at least 26 points out of a possible 69 to be LEED certified. In the LEED Rating System, the more points a building project earns, the "greener" the building. The USGBC recognizes four levels of LEED certification (Figure 2).

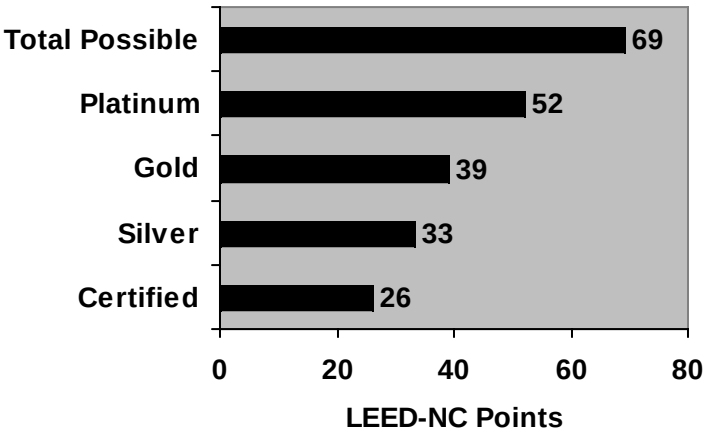


FIGURE 2: LEED-NC CERTIFICATION LEVELS

EARNING LEED POINTS

Cast stone masonry can make a significant contribution toward earning LEED points on a project. While no one product or material alone can earn LEED points, (Certified wood is the only product that can earn 1 point through its use under Materials & Resources Credit 7.) cast stone masonry can be used as part of a strategy to earn points in at least 10 credits. It is important to remember that the calculations for these credits require inclusion of the entire building projects and materials to determine the percent of qualifying material.

DESIGN TIPS – TECHNICAL BULLETIN #53

CAST STONE AND THE LEED™ RATING SYSTEM [2 OF 4]

SUSTAINABLE SITES

This category addresses issues associated with site preparation as well as impacts on surrounding areas after construction is complete. A total of 14 points are available in the Sustainable Sites category. Cast stone may play a role in strategies associated with 4 of these credit points.

Credit 2 - Development Density (1 pt) -

The intent of this credit is to encourage development in urban areas with existing infrastructure. Masonry materials are often used for urban infill development because of their appearance, size and scale, fire ratings, as well as for benefits in space required for construction. Cast stone masonry can often be installed without the use of a crane, thus helping to minimize the need for large equipment on site.

Credit 5.2 - Maximize Open Space (1pt) -

The intent of this credit is to reduce the development footprint, including hardscape, parking, roads, etc. associated with the site. By building with materials such as cast stone, which do not require large open areas around the building perimeter during construction, the development footprint can be kept to a minimum and much of the surrounding land left undisturbed.

Credit 7.1 - non-roof Heat Island (1 pt) -

The intent of this credit is to reduce the retention of heat due to dark colored surfaces by providing shade, using open grid pavement or using hardscape materials that are light in color for a minimum of 50% of the sites hardscape. Using cast stone hardscape as caps on landscaping walls, stair treads, and pavers with a solar reflectance index (SRI) of 29 or higher is one option for earning this point. Cast stone made with ordinary portland cement has an SRI around 35. Cast stone made with white portland cement generally has an SRI of 86. [Ref. Green Building Design with Architectural Precast article]

Credit 7.2 - roof Heat Island (1 pt) -

The intent of this credit is the same as for Credit 7.1, but addresses roofs. This credit can be earned by utilizing reflective roofing materials for at least 75% of the roof's surface or installing a vegetated roof over at least 50% of the roof or some combination of both. Cast stone pavers can provide access via a walking surface as part of a vegetated, solar or other roof, or they can be used on their own. Non-vegetated roofs with slopes equal to or less than 2:12 must have an SRI rating of 78 while roofs with slopes of greater than 2:12 must have an SRI of at least 29.

ENERGY & ATMOSPHERE

The Energy and Atmosphere credit covers a variety of issues related to energy use associated with heating and cooling buildings including reduction in energy use, ozone reduction and use of renewable energy. There are three mandatory prerequisites and six voluntary credits that have a total of 17 points associated with them. The thermal mass associated with cast stone and other masonry materials can help reduce the amount of energy used for heating and cooling a building. There is one prerequisite and one credit associated with this intent.

Prerequisite 2 - minimum energy performance (0 pt) -

As part of a masonry wall, cast stone can mitigate temperature swings and help achieve the require energy performance particularly when interior masonry is left exposed.

Credit 1 - Optimize energy performance (up to 10 pt) -

As part of a masonry wall, cast stone can be used to help reduce the amount of energy consumed by the building. The benefit of thermal mass is best recognized when using an energy modeling tools such as BLAST or EnergyPlus.

MATERIALS & RESOURCES

The intent of this category is to conserve the use of resources, encourage recycling, and reduce construction waste. There are a total of 13 points available in the Materials and Resources category. Cast stone can help earn up to 11 points in this category.

Credits 1.1, 1.2, 1.3 - Building Reuse (1 pt each) -

The intent of these credits is encourage the renovation and reuse of existing buildings and interiors. Credits 1.1 and 1.2 cover the reuse of a building's structure and façade. Masonry buildings, many of which incorporate cast stone details, are good candidates for reuse. In addition, cast stone features on the building interior such as columns, fireplace mantels and surrounds, stair treads, etc. are good candidates for reuse as part of Credit 1.3.

DESIGN TIPS – TECHNICAL BULLETIN #53

CAST STONE AND THE LEED™ RATING SYSTEM [3 OF 4]

Credits 2.1 and 2.2 - Construction Waste Management (1pt each) -
The intent of these credits is to eliminate construction waste from landfills. Up to 2 points can be earned for recycling or salvaging specified amounts of construction waste. On-site waste from cast stone elements is limited primarily to packaging materials. Cast stone elements are carefully detailed and exact amounts are delivered to the site so that waste stone is nearly eliminated. However, this credit is not presently structured to account for materials that do not have any or little on-site waste. It may be possible to meet the intent of this credit or an Innovation and Design credit for utilizing materials such as cast stone that have little on-site waste. The use of Innovation and Design credits are discussed later in this Bulletin. Any waste cast stone elements that are present can be crushed and used as aggregate or fill.

Credits 3.1 and 3.2 - Materials Reuse (up to 2 pt) -
These credits award points for the use of salvaged materials at a specified amount. Salvaged cast stone elements can be reused to help earn this credit. Anchoring details that allow for disassembly can facilitate this. Larger elements not set in mortar are especially suited for salvaging. In addition, cast stone can be repaired to conceal damage that may occur during disassembly and removal.

Credits 4.1 and 4.2 - Recycled Content (up to 2 pt) -
Points can be earned if the value of the recycled content of materials on a project is a least 10% for one point or 20% for two points. The recycled content of all building materials on the project must be determined to earn this credit. Cast stone elements can help earn this credit when they incorporate recycled materials into their mix, most often as aggregates or supplementary cementitious materials. Pre-consumer (post-industrial) recycled materials that may be incorporated into cast stone include recycled aggregate or slag that can be used as an aggregate, and supplementary cementitious materials like fly ash. Color may be affected by incorporation of recycled materials, so contacting the cast stone manufacturer is recommended.

Credits 5.1 and 5.2 - Regional Materials (up to 2 pt) -
The intent of these credits is to encourage use of materials that are extracted and manufactured within a region. One point is awarded if 10% of the total value of construction materials comes from regional sources and two points if that value is 20%. Raw materials used in the manufacture of cast stone include the constituent materials such as cement, aggregate and water; wood, fiberglass, rubber and other materials used for forms; and steel, plastic and foam packaging materials. Most cast stone is locally produced and many raw materials are extracted or harvested within 500 miles of a project site. Exceptions to this may be cement and other materials used in the molding or packaging process. Most shipments are sent by truck

INDOOR ENVIRONMENTAL QUALITY
This category aims to ensure quality indoor air among other goals. One way to achieve this is by reduction or elimination of volatile organic compounds (VOCs) in materials used in the interior of a building.

Credit 4 - Low-Emitting Materials (up to 4 pt) -
Credit 4 covers emissions from four subcategories: adhesives and sealants; paints and coatings; carpet systems; and composite wood products. Each subcategory is worth one point. Only two of these are relevant to the use of cast stone: paints and coatings and carpet systems. While all of these subcategories are structured to keep the measured amount of VOCs of a building product below a specified limit using industry standards for measurement and specification, the intent of each is to reduce the amount of VOCs in the building interior. In this way, cast stone, like other masonry materials that do not contain any VOCs, meets the intent of eliminating VOC's from the indoor environment when used on exposed interior walls or floors.

INNOVATION AND DESIGN PROCESS
The Innovation and Design Process category is intended in part to award up to 4 points in Innovation in Design for exceptional performance in one of the existing LEED credit categories, or recognize innovation in areas not explicitly covered by LEED. One area not currently covered by LEED-NC in the United States is the use of durable materials. LEED-NC Canada has incorporated a credit to recognize the use of durable materials, and USGBC has indicated that this credit can be earned in the U.S. through the Innovation in Design credits. Another example of the use of the Innovation in Design credits is to meet the intent of the Indoor Environmental Quality category by using cast stone and other masonry materials to minimize the VOC content in a building. Improved Indoor Environmental Quality can also be achieved by reducing the possibility of mold growth by using materials such as cast stone and masonry that are not a food source

CAST STONE AND THE LEED™ RATING SYSTEM [4 OF 4]

for mold, and by controlling moisture intrusion in a building. Similarly, it may be possible to receive an Innovation in Design credit for meeting the intent of the Construction Waste credit by reducing or eliminating on-site waste by utilizing materials such as cast stone that are delivered to the site in the exact quantities to be used, with little or no waste.

SUMMARY

The LEED-NC Rating System is one of the most commonly used tools in the U.S. for assessing the impact of a building and its components on the environment. LEED covers five environmental categories with credits in each that add to a total of 69 possible points. Cast stone, like other masonry materials, can play a role in strategies designed to achieve many of these credits, particularly in the Materials and Resources category.

Designers utilizing the LEED-NC Rating System are encouraged to look for opportunities and the synergy that can occur when cast stone masonry is chosen for use on a project.

WRITTEN BY

Christine A. Subasic, P.E., LEED A.P. is a consulting architectural engineer at C. Callista Subasic in Raleigh, NC, specializing in sustainable design and masonry.

Ms. Subasic has been a member of The Masonry Society (TMS) since 1992 and a member of the Board of Directors since 2002. She serves on the Architectural Practices committee, the Design Practices committee, and is a founding member of the Sustainability Committee. Ms. Subasic also represents TMS on the U.S. Green Building Council and is a member of the Green Globes ANSI Standard Development Committee.

CORINTHIAN RESTORATION MORTAR™

Sculpting and Patching Horizontal, Vertical and Overhead Repair Mortar

MANUFACTURER:

Corinthian Cast Stone Inc.
115 Wyandanch Ave, Wyandanch NY 11798
631-920-2340 • 631-920-2343
info@corinthian-usa.com

PRODUCT DESCRIPTION:

CORINTHIAN RESTORATION MORTAR is a single component, Portland Cement-based, polymer-modified material designed to restore and rehabilitate vertical and overhead stone surfaces and profiles without the need for costly form work. The fast setting, low shrinkage and high strength of CORINTHIAN RESTORATION MORTAR allow it to be placed and sculpted to final shape in a single application up to 2" in thickness. CORINTHIAN RESTORATION MORTAR is laboratory formulated for specific substrates.

USES:

- Horizontal, vertical and overhead repairs of Cast Stone, Limestone, Brownstone and Sandstone.
- Sculpt and/or repair extrusions and organic shapes on the existing substrate
- Patch to feather edge.

ADVANTAGES:

- **Freeze-thaw resistant**
- **Single component**: mix with water only
- **Customizable color and texture**: factory blending of custom colors and aggregates including mica; ensuring a finished product that closely resembles the natural stone being repaired.
- **Tenacious bond:** apply from feather edge up to 2" in single application — no need to cut back area to be patched.
- **Carvable**: make repairs without costly forming
- **Free of chlorides**, gypsum and heavy metal, sulfate resistant

INSTALLATION:

Surface Preparation:

Surfaces to be repaired must be structurally sound, clean and free of dust, dirt, oils, paints and all other contaminants that will prevent proper bond. Remove all loose material and rust from corroded rebar by wire brushing, chipping, sandblasting or waterblasting.

Clean surfaces to be treated by vacuuming, with compressed air or thoroughly brushing to remove small particles and dust. Prime all exposed metal and cleaned rebar with a slurry of CORINTHIAN RESTORATION MORTAR. Mix slurry coat by adding CORINTHIAN RESTORATION MORTAR to clean water to a batter-like consistency and brush coat all exposed surfaces to receive CORINTHIAN RESTORATION MORTAR. Prior to application, all surfaces should be saturated, making sure there is no standing water remaining. Any acid-based cleaning solution must be neutralized before priming.

Mixing:

Mix 5 parts CORINTHIAN RESTORATION MORTAR to 1 part clean potable water (10 pounds material to 1 quart of water, 50 pounds to 5 quarts). Keep mix to a heavy, putty-like consistency.

Mix only until completely blended and free of lumps. If using a drill mixer to blend material use a slow speed high torque drill at no more than 500-650 RPM. Add material to water in bucket or mortar mixer, but add water to material if hand mixing smaller batches.

Do not mix more material than can be placed in 10 minutes. Do not retemper after initial mixing.

Placement:
Trowel on immediately. Vertical or overhead patches greater than 2" in depth may need to be built up in successive layers. If layering deep patches, scratch surface of each layer. Allow previous layer to tighten (5-10 minutes) before building another layer. Dampen first layer before applying second. Overfill patch and shave to shape. CORINTHIAN RESTORATION MORTAR can be shaved with a trowel for up to 1 to 2 hours after initial set (temperature and humidity dependent). For best match finish to natural stone, do not post finish the patch with a damp sponge, brush or steel trowel as this will change the color and texture of the repair.

Curing:
During the first 48 hours, it is best to keep the patch covered or damp to prevent excessive loss of water.

Coverage:
(1) lb. will yield approx. 17 cubic inches.
(2) lbs. will cover approx. 1/2 sq. ft. @ 1/2" thick.
(20) lbs. will cover approx. 5 sq. ft. @ 1/2" thick.
(50) lbs. will cover approx. 12 1/2 sq. ft. @1/2" thick.

Packaging:
Packaging available in three convenient sizes:
P2: plastic jug containing approx. 2 lbs. of material.
P20: plastic pail containing approx. 20 lbs. of material.
P50: plastic pail containing approx. 50 lbs. of material.

Color:
Available in both standard and custom colors and textures.

LIMITATIONS:
Product is temperature sensitive regarding set time; below 60EF set is slower, above 80EF set is faster. In hot weather, cool surface to be patched with cold water and use cold water for mixing. Do not apply CORINTHIAN RESTORATION MORTAR when dry product or surface temperature is below 40EF. Dry product and surface can be warmed with a torch. Do not use "antifreeze" or set accelerator solutions. Do not add any concrete additives. Protect from precipitation for at least 4 hours.

CAUTION:
Contains Portland Cement CAS # 65997-15-1. Freshly mixed cement products may cause skin injury. Avoid contact with skin where possible and wash exposed areas promptly with water. If any product gets into the eye, rinse immediately and repeatedly with water. If ingested, do not induce vomiting and get prompt medical attention. Also contains Sand CAS # 14808-60-7. Avoid breathing dust. Prolonged exposure to dust may cause delayed lung injury (silicosis) or cancer IARC Class 2A. Wear NIOSH approved mask for silica dust.

Keep Out Of Reach Of Children.

WARRANTY:
Due to the use of this product beyond our control, we assume no liability for damages of any kind, and the user accepts the product "as is" and without warranties, expressed or implied, from either Corinthian Cast Stone Inc. or its agents. The suitability of the product for an intended use shall be solely up to the user. Our only obligation shall be to replace or pay for any material proved defective, with our liability limited to the purchase price of materials supplied by us.

TECHNICAL DATA:

Compressive Strength (ASTM C-109)		
	1 day	2675 psi
	7 days	6810 psi
	28 days	7025 psi
Flexural Strength (ASTM C-348)		
	1 day	575 psi
	7 days	1260 psi
	28 days	1680 psi
Tensile Strength (ASTM C-190)		
	1 day	270 psi
	7 days	465 psi
	28 days	520 psi
Shear Bond Strength (ASTM C-882)		
	7 days	1140 psi
	28 days	1800 psi

Shrinkage (ASTM C-157)		
	28 days	-0.045%
Freeze Thaw Resistance (ASTM C-666)		
	50 cycles	excellent
Gardner Impact		
	28 days	greater than 158" lbs.
Entrained Air Content (ASTM C-231)		
	Wet	5.3%
Water Penetration (ASTM E-514)		
	3-day soak	1/2 inch
pH		
	Wet	12

Corinthian Cast Stone Inc. 115 Wyandanch Ave, Wyandanch NY 11798
PHONE: 631-920-2340 **FAX:** 631-920-2343 **WEBSITE:** www.corinthian-usa.com

Revised June/2013

CORINTHIAN CAST STONE, INC.

PRODUCT LINE

ARCHITECTURAL STONE PRODUCTS:	Custom Fabrication	Express Trim Kits™
CAST STONE	✔	✔
LIMESTONE	✔	✔
PRECAST CONCRETE	✔	
BLUESTONE_ NATURAL _NEW YORK & PENNSYLVANIA	✔	
BROWNSTONE_ NATURAL _AMERICAN, BRITSH & CHINESE	✔	
GRANITE_ NATURAL _VERMONT	✔	
GFRC_ GLASS FIBER REINFORCED CONCRETE	✔	
FRP_ FIBERGLASS	✔	
CAST STONE STAIR TREADS WITH SAFETY NOSING	✔	
PRECAST CONCRETE LINTELS	✔	

ANCHORS AND FASTENERS:	Custom order	Stock
ANCHORS/CLIPS, STAINLESS STEEL OR HOT DIPPED GALVANIZED	✔	
FASTENERS, STAINLESS STEEL, HOT DIPPED GALVANIZED OR ZINC PLATED	✔	
EPOXY – RED HEAD A7_ 9 OZ. & 28 OZ. TUBES	✔	✔
SHIMS – HARD PLASTIC – HORSE SHOE & RECTANGULAR	✔	✔

AGGREGATES – BAGGED, SUPER SACKED AND BULK		
BLOND MASON SAND		✔
BLOND CONCRETE SAND		✔
WHITE GUNITE SAND	✔	
WHITE MASON SAND		✔
WHITE CONCRETE SAND		✔

MORTARS AND PATCH KITS: CUSTOM AND STOCK COLORS		
MORTAR TYPE N & S	✔	✔
MORTAR VENEER STONE	✔	✔
PIGMENT FOR MORTAR, CONCRETE AND PLASTER	✔	✔
PATCH KITS FOR CAST STONE, PRECAST AND NATURAL STONE	✔	✔
W.R. GRACE® DRY BLOCK MORTAR ADDITIVE	✔	

CORINTHIAN RESTORATION MORTAR – is a single component, Portland Cement based, polymer modified material designed to restore and rehabilitate vertical and overhead stone surfaces and profiles without the need for costly form work. The fast setting, low shrinkage and high strength of CORINTHIAN RESTORATION MORTAR allow it to be placed and sculpted to final shape in a single application up to 2" in thickness. CORINTHIAN RESTORATION MORTAR is laboratory formulated for specific substrates.

www.restorationmortar.com **Custom and stock colors available.**

	Custom order	Stock
PROSOCO® CLEANERS AND SEALERS THE ENTIRE PRODUCT LINE IS AVAILABLE THROUGH CORINTHIAN CAST STONE; HOWEVER THESE ARE SOME OF THE MORE POPULAR ITEMS:	✔	
101 Lime Solvent — Concentrated cleaner for red and other dark-colored brick, concrete and tile surfaces that are not subject to metallic staining.	✔	
600 — General purpose cleaner removes excess mortar and construction dirt from brick, masonry, tile and most concrete surfaces.	✔	✔
Manufactured Stone Cleaner — Non-etching cleaner removes excess mortar and common construction soiling from new installations of manufactured stone.	✔	
Vana Trol® — Removes excess mortar and construction dirt from buff, gray and brown brick, natural stone, colored mortar and concrete surfaces subject to metallic staining.	✔	✔
Heavy Duty Restoration Cleaner — Concentrated product removes heavy atmospheric staining from brick, granite, sandstone, terra cotta, exposed aggregate concrete and other surfaces.	✔	
Light Duty Restoration Cleaner — Gel cleaner removes light-to-moderate atmospheric and oxidation staining from most dense masonry surfaces.	✔	
Restoration Cleaner — Removes moderate-to-heavy atmospheric staining from brick, granite, sandstone, terra cotta, exposed aggregate concrete and many other unpolished masonry surfaces.	✔	
Natural Stone Treatment WB — Water-based protective treatment guards limestone, marble, travertine and most masonry surfaces against water invasion, damage and staining	✔	
Siloxane PD — Water-based protective treatment weatherproofs color-sensitive concrete & masonry. Effective alternative to solvent-based treatments.	✔	
SL100 Water Repellent — Non-solvent water repellent provides maximum penetration, unbeatable coverage rates and invisible, breathable protection for masonry and concrete.	✔	
Sacrificial Coating SC-1 — Invisible, breathable graffiti barrier blocks graffiti penetration & staining on most building surfaces.	✔	
FORM LINERS AND MOLDS:	**Custom order**	**Stock**
Pour in place	✔	
Precast, Cast Stone, Fiberglass, GFRC, Plaster	✔	✔

CORINTHIAN CAST STONE ALSO OFFERS THE FOLLOWING SERVICES:

- ✔ FIELD MEASURING
- ✔ 3D SCANNING ENTIRE SITES AND BUILDINGS - ACCURACY +_ 2MM
- ✔ 3D SCANNING FOR ARCHITECTURAL REPLICATION AND ART PRODUCTION - ACCURACY +_ ½ MM
- ✔ PROFESSIONAL ENGINEERING – DESIGN AND STAMP OF ANCHOR / FASTENER SYSTEM
- ✔ MOLD MANUFACTURING
- ✔ CNC MILLING -3 AXIS AND 5 AXIS.
- ✔ PRIVATE LABEL MANUFACTURING- CAST STONE, PRECAST, METALS, ACRYLICS, WOOD PRODUCTS

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