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Table of Contents

1	General.....	2
2	Normative references.....	3
3	Definitions.....	4
4	Conformance Requirements.....	6
5	Water.....	7
6	Transportation.....	8
7	Site management.....	9
8	Land reclamation and adaptive reuse.....	10
9	Corporate governance.....	11
10	Energy.....	13
11	Waste and by-products management.....	15
12	Safer chemical and materials management.....	15
13	Human health and safety.....	17
14	Innovation.....	19
	Annex A.....	21
	Annex B.....	23

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Natural Stone Council Standard

Sustainability Assessment for Natural Dimension Stone

1 General

1.1 Purpose

The purpose of the Sustainability Assessment for Natural Dimension Stone is to recognize sustainability practices in the natural stone industry. The Standard establishes a set of well-defined environmental, ecological, social responsibility and human health metrics through a multi-stakeholder, science based approach recognized by the green building movement as an indicator of leadership in sustainability performance. The Standard provides an important opportunity to educate key members of the design and building professions, end users, government, and environmental advocacy groups about the production of natural stone products. As a rating system this Standard creates a mechanism that differentiates natural stone companies that demonstrate environmental leadership through commitment to sustainable operations and continued innovation. This Standard considers national and international environmental, ecological, human health, and social responsibility requirements for stone quarrying and production.

This voluntary Standard emphasizes the disclosure of information necessary to mitigate negative impacts and promote efficiencies in the production of dimension stone products in a sustainable manner.

1.2 Scope

This Standard applies to natural stone quarried internationally or domestically, and the primary processing (as defined in 3) for that quarry stone claiming conformance to the Standard. This Standard covers criteria from quarry operation through primary processing.

This Standard establishes criteria to measure quarry operations as well as primary processing operations that produce natural stone. In practice, the operator can choose to apply this Standard to: quarry operations, primary processing or both. This Standard is intended to allow for participation from both domestic and international natural dimension stone producers.

1.3 Principles

This Standard was developed based on the following important principles.

1.3.1 Life cycle consideration

A life cycle approach was used to ensure that quarry operations and primary processing associated with a dimension stone product are considered when developing the criteria for this Standard.

1.3.2 Relationship with legislation

A prerequisite for claiming conformance with this Standard shall be that the quarrier or processor is in compliance with health and safety, environmental, and other relevant regulations that are applicable to the quarry operations or primary processing facilities claiming conformance.

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1.3.3 International trade aspects

The procedures and requirements included within this Standard are designed to enhance trade while maintaining a level of awareness with respect to environmental and social issues.

1.3.4 Scientific basis

The criteria contained in this Standard were developed and selected based on sound scientific and engineering principles intended to achieve credible, accurate, reproducible and measurable results.

1.3.5 Innovation

Use of this Standard is intended to support, not inhibit, innovation that maintains or has the potential to improve environmental and social responsibility.

1.3.6 Continuous improvement

This Standard is maintained by the consensus body to promote continuous improvement within the industry.

2 Normative references

The following documents contain provisions that, through reference, constitute provisions of this Standard. At the time this Standard was balloted, the editions listed below were valid. All documents are subject to revision, and parties are encouraged to investigate the possibility of applying the most recent editions of the documents indicated below.

Age Discrimination in Employment Act of 1967¹

ASTM C119 - 11 Standard Terminology Relating to Dimension Stone²

ASTM C1528-12a Standard Guide for Selection of Dimension Stone²

Civil Rights Act of 1991¹

Equal Pay Act of 1963¹

Globally Harmonised System (GHS). *The Globally Harmonized System of Classification and Labelling of Chemicals*³

¹ EEOC Headquarters, U.S. Equal Employment Opportunity Commission, 131 M Street, NE, Washington, DC 20507. <www.eeoc.gov>

² ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959 USA <www.astm.org>

³ US Department of Labor, Occupational Safety and Health Administration. <<http://www.osha.gov/dsg/hazcom/ghs.html>>

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International Labour Organization (IARC), Monographs on the Evaluation of Carcinogenic Risks to Humans, International Agency on the Research of Cancer⁴

Marble Institute of America Glossary⁵

State of California Environmental Protection Agency, Proposition 65, Safe Drinking Water and Toxic Enforcement Act of 1986 – Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. seq.⁶

Titles I and V of the Americans with Disabilities Act of 1990 (ADA)¹

Title VII of the Civil Rights Act of 1964¹

US Department of Health and Human Services, National Toxicology Program (NTP), Report on Carcinogens⁷

US Environmental Protection Agency (USEPA), Toxics Release Inventory (TRI) Program – Persistent, Bioaccumulative, and Toxic (PBT) Chemicals Rules⁸

US Occupational Safety and Health Administration (OSHA) – Regulated Toxic Metal or Carcinogen⁹

3 Definitions

authoritative list: An independent resource listing chemicals of concern for human or environmental health effects. For the purposes of this Standard, a list of Authoritative lists is provided in Annex A.

carcinogen: chemicals which cause cancer. Carcinogens are defined as those chemicals listed as known, probable, or possible human carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), the U.S. Environmental Protection Agency, or the Occupational Health and Safety Administration.

chemical of concern: A chemical identified through its listing on one or more authoritative human health and environmental hazards resources listed in Annex A.

⁴ International Agency for Research on Cancer (IARC), 150 Cours Albert Thomas, 69372 Lyon CEDEX 08, France. <<http://monographs.iarc.fr/index.php>>.

⁵ Marble Institute of America, 28901 Clemens Rd, Ste 100, Cleveland, OH 44145 <<http://www.marble-institute.com/>>

⁶ OEHHA (Office of Environmental Health Hazard Assessment), 1001 Street, P.O. Box 2815, Sacramento, CA 95812-2815. <<http://www.oehha.org/prop65>>

⁷ National Toxicology Program (NTP): U.S. Department of Health and Human Services, Public Health Service, Research Triangle Park, NC 27709. <<http://ntp.niehs.nih.gov/>>.

⁸ US EPA - TRI Reporting Center, PO Box 10163, Fairfax, VA 22038. <<http://www.epa.gov/triinter/lawsandregs/pbt/pbtrule.htm>>.

⁹ US Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210. <www.osha.gov>.

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dimension stone¹⁰: naturally occurring stone used as units or dimension blocks that have been cut and finished to specifications. This excludes such natural stone as is processed for use as crushed stone, fines, or powder for any purpose, or as aggregate or chemical raw materials. For purposes of this Standard, the term is used interchangeably with *natural stone*.

environmentally preferable – An alternative chemical, material, or manufacturing process that significantly mitigates a potential human health or environmental hazard.

idle quarry operations: A quarry or area of a quarry that is inactive for a period of at least 12 months (i.e., not currently hosting stone production operations or other support activities).

material of concern: A material identified through its listing on one or more authoritative human health and environmental hazards resources listed in Annex A.

mutagen: means a chemical that produces a mutagenic effect on an exposed human or animal. For the purposes of this Standard, a mutagen is defined as a substance that is evaluated to be a Category 1A, 1B, or 2 substance as per the GHS Germ Cell Mutagenicity (2007).

personal protective equipment – Specialized clothing or equipment worn by employees for protection against health and safety hazards. Personal protective equipment is designed to protect parts of the body, i.e., eyes, head, face, hands, feet, and ears.

physical hazard: A chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas. A chemical that meets the criteria outlined in Appendix B to §1910.1200—Physical Hazard Criteria of OSHA 29 CFR 1910.1200.

primary processing: Quarried blocks that are cut to specific dimensions in preparation for the next process. This may occur at the same location as the quarry operations or at another offsite processing location. For the purposes of this Standard, primary processing includes the sawing, application of finishes, coatings, or other surface treatments applied to the to the cut piece of dimension stone, and the packaging or other preparation for shipment (dock ready). It excludes shipment from the factory.

priority chemical of concern: Chemicals considered to be carcinogenic, mutagenic, reproductive toxins, potential endocrine disruptors, or Persistent Bioaccumulative or Toxic (PBT) as identified through its listing on one or more of the “priority chemicals of concern” lists in Annex A.

quarry block: Rough stone as it comes from a quarry, which may be dressed (trimmed) or sawn for shipment.⁵

quarry operations: Development of site including removal of overburden and natural stone from the deposit and activities occurring at that location or other locations captured under these operations. This includes (but not limited to) trimming quarry blocks if trimming occurs at the same location where the stone is extracted.

¹⁰ ASTM C119-11 *Standard Terminology Relating to Dimension Stone*

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recycled water: Water that has been captured and reused one or more times for onsite operations prior to being returned to the natural hydrologic system.

reproductive toxin: Chemicals known to cause reproductive toxicity in humans, defined as those listed by the State of California CAL-EPA Proposition 65 – Known to cause cancer or reproductive toxicity (see Annex A).

secondary chemical of concern: Chemicals considered to be asthmagens, ozone depleting substances, or chemicals with concerns for acute toxicity, chronic toxicity and other environmental effects (other than PBTs) as identified through its listing on one or more “secondary chemical of concern” lists in Annex A.

sludge: The settleable solids (and some water) separated during treatment of wastewater.

4 Conformance Requirements

4.1 Elements

This Sustainability Assessment Standard is divided into basic categories consisting of credits that are potentially available to organizations seeking to demonstrate compliance with the Standard. For quarry operations and processors, each section covers focus areas including water, energy, reclamation (waste), corporate governance and others. The criteria are aligned with the portion of a dimension stone’s life cycle that includes initial extraction through the point of shipping from the primary processor.

4.2 Intended users of this Standard

Quarry operators and processors are able to claim conformance to this Standard. Specifiers, designers, architects, governmental agencies, consumers, and others may utilize the Standard as a reference by which to measure and qualify the producers of dimension stone and primary processors.

4.3 Criteria

Each section has one or more prerequisites that are required as the minimum performance against this Standard. Once all requirements are met, users achieve additional points toward multiple levels of achievement in each category. In addition 1.3.2 shall be a prerequisite for this Standard.

4.4 Achievement levels

In order to claim any level of conformance, all prerequisite criteria shall be met. The achievement levels are as follows:

- **Silver:** All prerequisite criteria.
- **Gold:** All prerequisite criteria and a minimum of 5 points in any category.
- **Platinum:** All prerequisite criteria and a minimum of 9 points in any category.

Points to achieve Gold or Platinum may be in any category.

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4.5 Boundaries

The quarry operation or processing shall include a declaration of the boundary covered under application to this Standard. For quarry operators, the declaration shall include a site map identifying at a minimum the physical boundaries of the quarry, all areas where active, past or future operations are being conducted, and identifying all relevant environmental considerations (e.g. streams, rivers, riparian waterways, etc). The declaration shall also list all locations, both on-site and off-site, that support these operations and processes (e.g. administration offices, equipment repair facilities). Processors shall include with their application a declaration listing all on- and off-site facilities essential to the continuous primary processing of natural stone. A site map shall be submitted as outlined in 7.1 for site management plan to define boundaries utilized for conformance to this Standard.

5 Water

The intent of this section is to minimize or manage consumption and reuse of this valuable resource and protect water quality. Criteria in this section apply to both quarry and primary processing.

5.1 Required - water inventory

The quarry operator or processor shall complete an inventory of water use including identification of both quantity of water used and quantity consumed, organized by water source (e.g., municipal potable, direct rainwater captured for reuse, on-site wells, or reclaimed grey water) measured annually. Seasonal effects of evaporation shall be counted as zero net water use as they are being put back into the environment.

5.2 Recycled water (maximum 2 points)

A quarry operator or processor shall earn the points as detailed below. For processors that do not utilize water in the processing of dimension stone shall qualify for the required criterion as well as 2 points as shown under 5.2.2 and 5.2.3.

5.2.1 Required - A minimum of 25% of the water accounted for in the inventory for processing or quarry operations is captured and recycled.

5.2.2 Optional – 26% to 89% of the water accounted for in the inventory for processing or quarry operations are captured and recycled. (1 points)

5.2.3 Optional - 90% or more of the water accounted for in the inventory for processing or quarry operations is captured and recycled. (2 points)

5.3 Water use management

A quarry operator or processor can earn points by participating in a water reduction program (e.g., minimize one pass water use, water footprinting, WRI), enhanced water treatment, sludge management, or impact adjusted water use. For processors that do not utilize water, they shall qualify for points under 5.3.1 (2 points) and 5.3.2 (1 point).

5.3.1 Optional - enhanced water treatment (maximum 2 points)

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Demonstrate on-site systems that result in enhanced treatment of discharge water. Enhanced treatment shall be demonstrated by whether the quality of water released from the facility to the publicly owned treatment works (POTW) or directly to the environment, is of a quality better than the quality of the supplied water according to established applicable permits or regulations. Quarry operators and processors shall earn points, (maximum of 2 points) as detailed below:

- 1) Quality of discharged water is demonstrated to meet local tertiary wastewater treatment standards (e.g., per permit requirements) (1 point);
- 2) Quality of discharged water is demonstrated to meet State drinking water level standards (2 points); or
- 3) Where no permits or regulations are applicable, the quarry operator or processor shall qualify for 1 point under this criterion by demonstrating that the quality of water discharged to the environment from their facility meets the Federal EPA's NPDES (National Pollutant Discharge Elimination System) requirements.

5.3.2 Optional – enhanced sludge management

The quarry operator and processor shall demonstrate operation of a sludge management system that exceeds the requirements of local and state law. Acceptable options include those that divert sludge from traditional disposal options in favor of environmentally acceptable reuse applications (e.g., in building of light-duty roads, re-vegetation, berming, runoff management, or pond liners). (1 point)

5.4 Optional – water reuse

The quarry operator and processor shall document 25% input water sourced from rainwater, grey water, or other source that is not potable (i.e., municipal, onsite wells). (1 point)

Processors that do not utilize water shall qualify for 1 point under 5.4.

6 Transportation

For the purposes of this section, transportation shall be defined as the operation of transporting stone from the quarry or processing facility to the next step whether it be processing, block storage, or other location. Criteria in this section apply to both quarry and primary processing.

6.1 Required – Transportation activity tracking and management program

The quarry operator and processor shall establish and implement a tracking mechanism for transportation on a per shipment basis and a program to manage and continually improve the efficiency of transportation of dimension stone. The program should set goals and identify methods for maximizing the efficiency of transportation and minimizing environmental impacts. This program and tracking shall include at a minimum the following:

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- 1) Distance and mode per shipment;
- 2) Weight and Capacity of load per shipment (e.g., LTL);
- 3) Freight carrier per shipment;
- 4) Annual tonnage and number of shipments;
- 5) Annual amount of packaging and/or transportation materials consumed by type of product (e.g., block, slab);
- 6) Methods for maximizing shipping efficiency (e.g., intelligent loading, logistics planning);
- 7) Identification of opportunities for sustainable packaging and shipping solutions;
- 8) Measurement and evaluation process (e.g., performance measures, monitoring shipments); and
- 9) Documentation of a communication plan to product supply chain.

6.2 Required – Chain of Custody Documentation

The quarry or processor shall implement documentation and a tracking system capable of tracing each dimension stone product to its origin, a process known as chain of custody. Qualifying documentation shall accompany each product being shipped from the facility.

7 Site management

This section addresses the sustainable management of both idle and active quarry sites with on-going operations as well as processor operations to encourage responsible environmental management of impacts associated with daily operations. For the purposes of this Standard, a site shall be considered idle if it has been inactive for a period of at least 12 consecutive months.

7.1 Required - site management plan

The quarry operator and processor shall develop and maintain a site specific management plan covering all active and idle on-site operations or processing. Specifically, the plan at a minimum shall address the following aspects, if applicable:

- 1) Site cleanliness and organization (e.g., designate material storage plan);
- 2) Minimization of erosion and runoff (e.g., maintain topsoil in any area not in use, maintain maximum vegetation coverage and replant any areas not in use);
- 3) Measures to control dust (e.g., through regularly scheduled observation and control);
- 4) Safety messages displayed such as “No trespassing” or other signage required by jurisdiction having authority;

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- 5) Fencing and gates or other closure mechanisms to discourage entry while the site is inactive or other means required by jurisdiction having authority;
- 6) Means for safe exit should accidental entry occur into the quarry or operations site or other means as required by jurisdiction having authority;
- 7) Secure equipment in the quarry or processing area to prevent damage unauthorized use, or other as required by jurisdiction having authority;
- 8) Locked storage and buildings to prevent unauthorized entry;
- 9) Removal of hazardous materials and waste storage of hazardous materials; and
- 10) Removal of empty containers for recycle or reuse.

7.2 Enhanced site management planning

Additional points shall be earned if the site management plan for on-going operations is supplemented with the following:

7.2.1 Optional – ecosystem boundaries

The quarry operator and processor shall establish ecosystem boundaries to promote conservation (e.g., in a site preservation plan, keep disturbed area as small as possible and ensure vehicles keep to designated paths, research local wildlife populations, mitigate downstream effects from surface water diversion, minimize removal of native vegetation). (1 point)

7.2.2 Optional - environmental impact assessment

The quarry operator and processor shall conduct an independent assessment of environmental impacts of current and planned quarrying operations. In addition to typical impacts, the plan shall identify any potential impacts on biodiversity, endangered species, and critical habitats. To qualify for the points, the results of the impact assessment shall be used to inform other aspects of the site management plan, which shall describe how the plan acts to minimize or prevent identified impacts. Impact assessments performed as part of the site acquisition process meet this requirement, so long as it was performed by an independent third party, and within the past 5 years. (2 points)

7.3 Optional - verification of site management plan

The quarry operator and processor shall document verification of the site management plan conducted by an independent third party organization (e.g., professional engineer, or accredited organization) within the last year (and on an annual basis) that they shall be in compliance with the site management plan for on-going operations as required in 7.1. (1 point)

8 Land reclamation and adaptive reuse

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This section addresses responsible and sustainable reclamation of a quarry site once operations have ceased.

8.1 Required – post-closure reclamation plan

The quarry operator shall develop and maintain a quarry-specific reclamation plan that shall include a description of actions to be taken by the operator at the time of quarry closure for each of the following:

- 1) Site cleanup (e.g. removal of equipment, storage tanks, septic tanks, and all garbage and debris);
- 2) Infrastructure removal – (e.g. removal of buildings, utilities, capping of wells);
- 3) Site safety (e.g. protective barriers (if applicable), signs);
- 4) Restoration of site including adaptive reuse approaches - (e.g., restoring of roads, block areas, storage yards);
- 5) Ecosystem restoration- (e.g. re-vegetation, slope reconstruction, natural drainage); and
- 6) Monitoring the site according to post quarrying land use objectives.

8.2 Optional – community involvement

The quarry operator shall document a post-closure reclamation plan with documented involvement of local community organizations including government and local citizens groups. To qualify for this criterion, the resulting plan shall be posted or in some other way made publicly available. (2 points)

8.3 Optional - exemplary site closure

The quarry operator shall demonstrate the successful closure of a site consistent with sustainable post-closure planning. The qualifying reclamation shall have met each of the following to qualify for this criterion:

- 1) Site reclamation shall have addressed each of the requirements listed in 8.1;
- 2) Site reclamation or adaptive reuse shall have been consistent with the needs of the local community or have been carried out in consideration of the local ecosystem to minimize future impacts; and
- 3) Site closure and reclamation shall have been completed within the past 5 years.

Both sustainable site reclamation and adaptive reuse approaches are allowable under this criterion. Demonstrated post closure care shall occur at the quarry claiming conformance (if currently owned by the company). (2 points)

9 Corporate governance

Criteria in this section shall apply to both quarry and primary processing company owned assets.

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9.1 Required - prohibitions on forced labor

The quarry operator and processor shall document that it does not engage in or permit the use of forced or compulsory labor (per ILO Conventions 29 and 105¹¹). To meet this requirement, the declaration shall encompass all corporate operations of the applicant, including all sites and quarries.

9.2 Required - prohibitions on child labor

The quarry operator and processor shall document that it does not operate facilities that do not follow the ILO Convention 182¹¹. To meet this requirement, the declaration shall encompass all corporate operations of the applicant, including all sites and quarries.

9.3 Required - prevention of discrimination

The quarry operator and processor shall document that it does not engage in or support discrimination in the employment process. Examples include but are not limited to:

- Title VII of the Civil Rights Act of 1964 (Title VII)¹, which prohibits employment discrimination based on race, color, religion, sex, or national origin;
- The Equal Pay Act of 1963 (EPA)¹, which protects men and women who perform substantially equal work in the same establishment from sex-based wage discrimination;
- The Age Discrimination in Employment Act of 1967 (ADEA)¹, which protects individuals who are 40 years of age or older;
- Title I and Title V of the Americans with Disabilities Act of 1990 (ADA) as amended 2008¹, which prohibit employment discrimination against qualified individuals with disabilities in the private sector, and in state and local governments;
- Sections 501 and 505 of the Rehabilitation Act of 1973¹, which prohibit discrimination against qualified individuals with disabilities who work in the federal government; and
- The Civil Rights Act of 1991¹, which, among other things, provides monetary damages in cases of intentional employment discrimination.

9.4 Optional - employee participation

The quarry operator and processor shall document company-supported employee activities within the community and/or involvement in community outreach. Company-supported employee activities consist of community service work performed by company employees on its behalf for that purpose, excluding activities deemed political in nature; community service work performed, education activities, financial contributions, excluding activities deemed political in nature are all examples of meeting this criterion. (1 point)

9.5 Optional - social accountability

¹¹ International Labor Organization <www.ilo.org>

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The quarry operator and processor shall have implemented a social accountability plan for their facility. The social accountability plan shall include, but not be limited to, the following:

- 1) fair hiring practices;
- 2) education for applicable employees in this subject area;
- 3) corporate ethics;
- 4) receipt of gifts; and
- 5) insider trading.

To qualify, the implementation of the plan shall be supported by documentation. (2 points)

10 Energy

This section addresses energy used during quarry operations and processing of stone. Renewable energy and reduction of energy are important facets of sustainability. Through energy reduction, effects of greenhouse gas emissions on the environment and human health are also addressed in this section. Criteria in this section apply to both quarry and primary processing.

10.1 Required - energy inventory

The quarry operator and processor shall complete an inventory of energy use including the quantity and type of energy consumed (e.g. diesel, local power grid) organized by location or function (e.g. external shipping by truck, power use by building). Inventory shall include both electricity and fuel usage and identify factors important to consumption (e.g. number of tons shipped, hours of operation, etc). Energy shall be reported in energy per unit processed (e.g. KWh per ton of stone produced)

10.2 Energy management

A quarry operator and processor shall earn points by implementing an energy management program (e.g., Energy Star), managing their carbon footprint, or through the implementation of measures directly resulting in a reduction in energy use.

10.2.1 Required – energy management program

The quarry operation and processor shall establish and implement a program to systematically improve energy consumption and associated greenhouse gas emissions. The quarry or processing facility shall measure and track energy consumption by energy source and purpose of consumption, identify opportunities and methods for reducing energy use, establish target goals, quantify changes, and monitor progress. This program shall cover but not limited to the following topics:

- 1) Equipment operation and maintenance (e.g. minimizing idle times, improved maintenance, replacement of inefficient equipment);
- 2) Transportation and logistics (e.g. maximizing shipping loads, utilizing advanced logistics); and
- 3) Office and administration energy and lighting.

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This program shall have 1, 3, and 5 year benchmarks based on percentage reduction, and shall be reported publicly (e.g. corporate sustainability report, website posting). Alternatively, this criterion shall be met if the quarry operator or processor has earned Energy Star Challenge recognition, or international equivalent.

10.2.2 Optional – energy reduction (maximum 3 points)

The quarry operator or processor shall demonstrate the successful reduction of energy use (i.e. fuel or electrical power) per product processed. Methods for reducing energy include, but are not limited to, process modification, operational changes, efficient use of equipment and materials, and conservancy measures.

- a) Achieved reduction of 10 - 20% of energy inventory (1 point);
- b) Achieved reduction of 21 - 40% of energy inventory (2 points total); or
- c) Achieved reduction of greater than 40% of energy inventory (3 points total).

All reductions shall be measured relative to total energy (e.g., KWh/ton of stone), as determined in 10.1, and shall be measured and documented to receive credit.

10.3 Optional – Carbon management

The quarry operation or processor shall perform a carbon footprint analysis of its operations. Boundaries of the analysis shall include the manufacturing and transportation stages of the product life-cycle, as well as all stages upstream including materials extraction and processing and energy generation. Analysis shall include carbon emissions associated with all of the following:

- Manufacturing processes directly related to stone production;
- On-site and off-site transportation during production; and
- Off-site support and administrative processes.

To qualify, carbon footprint shall have been performed in the last 3 years and shall be documented in a report meeting the specifications of ISO 14064 compliant report. Carbon footprint shall be performed using any commercially available software package or by a credible, qualified third party. (1 point)

10.4 Optional – renewable and alternative energy sourcing (maximum 2 points)

The quarry operator or processor shall demonstrate the use of renewable energy in its operations. Renewable energy sources include energy derived from water, wind, and solar sources, as well as the use of renewable fuels such as biodiesel and those derived from sources such as switch grass.

- a) Achieved reduction of 1-10% of total energy use (1 point); or
- b) Achieved reduction of 11 - 20% of total energy use (2 points total).

All reductions are measured relative to total energy use for entire operation, as determined in 10.1, and shall be measured and documented to receive credit.

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11 Waste and by-products management

The quarry or processing facility shall document product waste reduction, recycling and reclamation rates, green technology procured, and programs implemented so that points can be awarded as outlined below. Criteria in this section apply to both quarry and primary processing.

11.1 Required – inventory of solid waste

The quarry operator or processor shall create an inventory of solid waste generated. The inventory shall characterize the nature of the waste (e.g. scrap stone), the annual quantity generated, the source of the waste (e.g. stone cutting), the percent or quantity reclaimed or recycled, and the disposal, storage, or reclaim method.

11.2 Required - waste management program

The quarry operation or processor shall establish and implement a program to systematically reduce or eliminate waste. The quarry or processing facility shall document product waste reduction and elimination, recycling, and reclamation rates, green technology procured and programs implemented. This program shall cover but not limited to the following topics:

- Material yield improvement;
- Alternative use for processing waste;
- Management of solid waste including collection, separation, disposal and/or recycling;
- Recycling of goods used in processing; and
- Office waste reduction.

This program shall establish 1, 3, and 5 year benchmarks based on percentage reduction, and be reported publicly (e.g. corporate sustainability report, website posting).

11.3 Optional- demonstrated waste reduction

The quarry operator or processor shall demonstrate the successful reduction of solid waste generated based on the inventory in 11.1. Methods for reducing waste include but are not limited to process modification, operational changes, efficient use of materials, and use of more sustainable materials (measured as per ton of waste produced).

- a) Achieved reduction of 10 - 24% of solid waste inventory (1 point);
- b) Achieved reduction of 25 - 50% of solid waste inventory (2 points total); or
- c) Achieved reduction of greater than 50% of solid waste inventory (3 points total).

Reductions shall be measured and documented in the last five years to receive credit.

12 Safer chemical and materials management

The following requirements shall apply to all company and onsite operations of the quarry and processing associated with the on-site production of dimension stone. Criteria in this section apply to both quarry and primary processing.

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12.1 Required - chemical inventory

The quarry and processor shall have and maintain an inventory of all materials and products used in quarry operations and primary processing associated with the on-site production of dimension stone. Materials and products listed in the inventory shall be limited to those that end up in the process effluent for processing or quarry operations and shall not include maintenance chemicals. Such an inventory shall at a minimum include the following, if applicable:

- 1) Material Safety Data Sheet (MSDS) reportable product ingredients as defined by OSHA 29 CFR 1910.1200) listed with chemical name and Chemical Abstract Service Registry Number (CASRN);
- 2) MSDS reportable chemicals shall be reviewed and all chemicals of concern (primary and secondary) shall be identified (see Annex A);
- 3) Supplier including the manufacturer and distributor;
- 4) Use and storage onsite;
- 5) Annual quantity purchased;
- 6) Maximum quantity stored (unit of measure);
- 7) MSDS reportable physical hazards associated with the material or product shall be identified.

12.2 Required - chemical management plan

The quarry and processor shall have and maintain a chemical management plan based on the chemical inventory identified in 12.1 that shall include the following elements:

- Document and demonstrate how materials and products identified as physical hazards and materials and products containing chemicals of concern are stored, handled, and disposed in a manner consistent with national and international guidelines and regulations.
- Safety training for workers responsible for handling materials and products identified as physical hazards and materials and products containing chemicals of concern or for those working in the immediate area that can reasonably and potentially be exposed. Training shall include the information on the use of personal protective equipment.

12.3 Optional - chemical management program

The quarry and processor shall have and implement a safer chemical and materials management program that establishes priorities for replacing or reducing the use or generation of chemicals and materials of concern from applicants operations with environmentally preferable alternatives. The program shall include at a minimum the following elements: (2 points total)

- Assigned priorities to chemicals of concern based on their overall human health and environmental health concerns and their potential for oral, inhalation, or dermal exposure to workers (see Safety Data Sheet for exposure potential);

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- Measureable goals and timelines for replacement or reduction;
- Established baselines for chemical or material use against which progress can be quantified and reported;
- Defined roles and responsibilities for personnel and staff responsible for executing the plan;
- Assigned priorities to products with physical hazard concerns;
- Defined process for identifying and evaluating potential environmentally preferable alternatives; and
- Schedule for reporting progress.

12.4 Optional - reduction of chemicals of concern (maximum 5 points)

The quarry and processor shall demonstrate *the absence of chemicals of concern* by:

- Elimination of all priority chemicals of concern (see annex A) (3 points); and
- Elimination of 3 of top 5 secondary chemicals by volume on the inventory in 12.1 (2 points).

13 Human health and safety

In all aspects of quarry operations and processing, human health and safety are important facets of sustainability. Criteria in this section apply to both quarry and primary processing.

13.1 Required - occupational safety plan

The quarry operator or processor shall document a safety plan adequate to insure that workers are provided with a safe and healthy work environment. Such a plan shall include, but not be limited to the following:

- 1) Occupational and process safety training for both full and part-time workers, as well as any contractors that work on-site.
- 2) Emergency preparedness and response plan that addresses the health and safety of workers during emergency situations.
- 3) A system for tracking, classifying, and reporting occupational injuries and work related illness.
- 4) Documented procedures for safeguarding workers from potentially hazardous machinery (e.g., using barriers, interlocks, periodic inspection, and maintenance).
- 5) Documented procedures to identify, evaluate, and control worker exposure to chemical, biological and physical agents.

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- 6) Documented procedures to identify, evaluate, and control general safety hazards (e.g., electrical, fire, slip-trip-fall hazards).

13.2 Improved workplace safety (maximum 2 points)

The quarry operator or processor shall demonstrate using industry accepted documentation (e.g., OSHA Form 300 Log of Work-Related Injuries and Illnesses¹², Mine Safety and Health Administration (MSHA)¹³) an improvement in occupational injuries, as compared to previous year. A site demonstrating zero recorded injury or work-related illness also qualifies as meeting this criterion. (1 point each: injury or work-related illness, maximum 2 points)

13.3 Management of air quality

13.3.1 Required - air emissions inventory

The quarry operator or processor shall create an inventory of air emissions including both point (i.e. fixed place) and mobile sources. The inventory shall include a description of each source (e.g. heavy equipment) the type of expected emissions (e.g. diesel fumes), and the likely location of the source. Inventory shall consider the presence of any ozone depleting substances, as well as other more typical emissions. Quantities of emissions can be estimated or measured, but shall not be required to be tested.

13.3.2 Required – Air emissions management plan

The quarry operation or processor shall a plan to systematically control and reduce air emissions, where possible. The plan shall include, but not be limited to, the following elements:

- 1) Identification of the source and type of emissions;
- 2) Identify key parameters such as fuel type, hours of idling, etc that contribute to air emissions
- 3) Establish site-specific best practices/procedures for minimizing emissions during facility or site operations, and ways to minimize periods of unproductive idling or operation;
- 4) Document and track required maintenance of equipment and other sources that contribute to air emissions;
- 5) Communicate of the plan through training or other methods to employees integral in plans implementation.
- 6) Track the effectiveness of the plan through the tracking of key metrics allowing the estimation of emissions over time.

¹² U.S. Department of Labor, Occupational Safety & Health Administration, 200 Constitution Ave., NW, Washington, DC 20210 <www.osha.gov>

¹³ Mine Safety and Health Administration (MSHA), 1100 Wilson Boulevard, 21st Floor Arlington, VA 22209-3939 <www.msha.gov>

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14 Innovation

In order to facilitate continuous improvement, this Standard recognizes there are efforts that advance or improve the industry. Under the innovation section, four methods for achievement of points toward the achievement level are described. Until the Standard addresses the innovation utilized to qualify for points under this section, the quarry or processor are able to continue to be awarded points toward achievement levels for that innovation.

14.1 Optional – health and safety (maximum 2 points)

The quarry operator or processor shall document and demonstrate innovation leading to overall improved environmental and/or human health safety. Innovations include those related to equipment improvement, process modifications, operational changes, or some other innovation. To qualify, innovations allowable under this credit include, shall meet one or more of the following:

- a) 10% or greater improvement in a human health or environmental related metric;
- b) 10% or greater improvement in the operating efficiency resulting in an overall improvement to human health or the environment;
- c) Reduction or elimination of greater than 10% or air emissions;
- d) Improvements directly resulting in increased occupational safety; and
- e) Improved efficiency in chemical use resulting in a 10% reduction in overall chemical purchasing.

Alternatively, a company who applies for credit under this innovation section if they demonstrate a clear environmental or human health benefit, and demonstrate that benefit through modeling (e.g. LCA, emissions modeling) developed by an independent third party.

To qualify for credit, improvements shall be documented, quantified, exceed any local or federal requirements, and shall not qualify for a point under another criterion in this Standard (i.e., resulting in double counting), including innovation credits in 14.2, 14.3 and 14.4. A total of two innovations shall be allowed under this criterion. (1 point each innovation, 2 points total)

14.2 Optional – Transportation

The quarry operator or processor shall document and demonstrate innovative processes that improve the transportation efficiency and the associated environmental impacts. To qualify, improvements shall be documented, quantified, and shall not qualify for a point under another criterion in this section or under 14.1 (i.e., shall not result in double-counting). (1 point)

14.3 Optional – Storm water discharge management plan

The quarry operator or processor shall develop an innovative approach to improving, eliminating, or both for storm water discharge and storm water quality for their operations or processing facility. (1 point)

14.4 Optional – waste reclamation or reuse



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The quarry operator or processor shall document and demonstrate innovative processes or approaches that result in the reclamation, reuse, or recycle of currently generated solid waste. Innovations include, for example, those related to process or technology innovations, new market development, new product development, and partnerships with potential consumers of the desired waste stream. To qualify, improvements shall be documented, quantified, exceed all applicable local and federal requirements, and shall not qualify for a point under another criterion in this section or under criterion 14.1 (i.e., shall not result in double-counting). (1 point)

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Annex A Informational Sources¹⁴

The following resources are all considered authoritative sources of environmental and human health hazard data.

A.1 Priority Chemicals of Concern

CAL-EPA Proposition 65 – Known to cause cancer or reproductive toxicity.
State of California Environmental Protection Agency, Office of Environmental Health Hazard Assessment <OEHHA> (http://www.oehha.ca.gov/prop65/prop65_list/Newlist.html)

ECHA REACH SVHC - Reason for inclusion: Carcinogenic, Toxic for Reproduction, Mutagenic, Endocrine activity or PBT European Union - European Chemicals Agency
<http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp>

European Commission Directive 76/769 Carcinogen, mutagens, and reproductive Toxins (CMRs):

- a) Carcinogen: Category 1 or 2 or GHS Category 1A or 1B
- b) Mutagen: Category 1 or 2 or GHS Category 1A or 1B
- c) Reproduction: Category 1 or 2 or GHS Category 1A or 1B

<http://ec.europa.eu/enterprise/sectors/chemicals/classification/index_en.htm>

European Union Priority List of suspected endocrine disruptors (prioritized for further testing).

- a) Chemicals prioritized by the European Union for testing for endocrine disruption. DHI. 2007.
- b) Study on Enhancing the Endocrine Disruptor Priority List with a Focus on Low Production Volume Chemicals.
- c) Category 1 or category 2 endocrine disruptors.

<http://ec.europa.eu/environment/endocrine/documents/final_report_2007.pdf>

<<http://ecb.jrc.ec.europa.eu/esis/index.php?PGM=pbt>>

IARC Cancer Monographs, International Agency for Research on Cancer, World Health Organization

- a) IARC – Group1 Carcinogenic to Humans
- b) Group 2A Probably carcinogenic to humans

<<http://monographs.iarc.fr/ENG/Classification/index.php>>

US Environmental Protection Agency, Toxics Release Inventory Program.

- a) US EPA Toxic Release Inventory (TRI) Persistent, Bioaccumulative, and Toxic Substances.

<http://www.epa.gov/triinter/trichemicals/pbt%20chemicals/pbt_chem_list.htm>

US Dept of Health & Human Services, National Institutes of Health, National Institute of Environmental Health Sciences, National Toxicology Program (NTP), Center for the Evaluation of Risks to Human Reproduction

- a) Clear evidence of adverse effects- developmental toxicity or
- b) Clear evidence of adverse effects - reproductive toxicity

<<http://cerhr.niehs.nih.gov/chemicals>>

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US Dept of Health & Human Services, National Institutes of Health, National Institute of Environmental Health Sciences, National Toxicology Program. US NIH NTP Report on Chemicals:

- a) Known to be a human carcinogen or
- b) Reasonably anticipated to be a human carcinogen.

<<http://ehis.niehs.nih.gov/roc>>

US EPA & US Department of Labor, Occupational Safety and Health Administration:

- a) US OSHA Carcinogens

<<http://www.epa.gov/triexplorer/list-chemical-osha.htm>>

A.2 Secondary chemicals of concern

Association of Occupational and Environmental Clinics (AOEC) Exposure Code List [30].

- a) AOEC Asthmagens – Sensitizer induced asthmagens (Rs or Rrs)

<<http://www.aoec.org/tools.htm>>

European Union - European Chemicals Agency

- a) ECHA REACH SVHC - Reason for inclusion:vPvB

<http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp>

United Nations Environment Programme. *Montreal Protocol on Substances that Deplete the Ozone Layer*. UNEP. 1987. Last amended September, 1997.

- a) Montreal Protocol Ozone Depleting Substances: Group 1 and Group 2

<http://www.unep.ch/ozone/mont_t.htm>

US Environmental Protection Agency, Ozone Layer Depletion Program

- a) US EPA Ozone Ozone Depleting Substances- Class I and Class II

<<http://www.epa.gov/spdpublic/science/ods/index.html>>

US Environmental Protection Agency, Toxics Release Inventory Program

- a) US EPA Toxic Release Inventory (TRI) – Acute, Chronic (non-cancer) effects, Environmental

<http://www.epa.gov/tri/trichemicals/hazardinfo/hazard_categories.pdf>

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Annex B **(informative)¹⁴**

Key elements of a certification program for Environmentally preferable and sustainable dimension stone

B.1 General

Declaring conformance to this Standard identifies that a quarry operator and/or processor proceeds in a sustainable and/or environmentally preferable manner. Conformance to this Standard alone does not imply certification. The quarry operator and/or processor can provide additional public confidence regarding the attainment of these goals by undertaking independent conformity assessment (certification).

B.2 Certification process

B.2.1 Selection of conformity assessment body

The quarry operator and/or processor identifies a certification organization qualified by National Stone Council to perform the conformity assessment of the product(s) assessment process for conformance with this Standard.

B.2.2 Conformity assessment to this Standard

The certifying organization performs the necessary functions to determine whether the quarry operator and/or processor's operations conform to the specified criteria. This may involve activities such as an audit of the quarry and/or facility or review of documentation for assessing conformance with the specified criteria.

B.2.3 Issuance of product(s) certification

If the dimension stone(s) has been demonstrated adequately to meet the specifications described in this Standard, and any issues of nonconformance have been addressed, the certifying organization provides a dimension stone certification to the quarry operator and/or processor. This may include the provision of documentation of certification of the dimension stone to the quarry operator and/or processor, as well as inclusion of the dimension stone on any publicly available lists of certified products maintained by the certifying organization. The certifying organization instructs the quarry operator and/or processor regarding appropriate use of the registered certification mark of the certifying organization.

B.2.4 Monitoring of product(s) conformance

At intervals determined by the certifying organization, the continued conformance of the certified product(s) to the specified criteria is monitored using periodic audits and document review or both.

¹⁴ The information contained in this annex is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this annex may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.



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Annex C
Scorecard
 (normative)

5 Water							
CHECKLIST			Criteria	Required or Optional	Description	max poss. points	
Yes	No	comment					
			5.1	Required	Water inventory	R	
			5.2		Recycled Water (maximum 2 points) Quarry or processor may only earn points from 5.2.2 OR 5.2.3		
			5.2.1	Required	A minimum of 25% of the water accounted for in the inventory for processing or quarry operations is captured and recycled.	R	
			5.2.2	Optional	26% to 89% of the water accounted for in the inventory for processing or quarry operations are captured and recycled.	1	
			5.2.3	Optional	90% or more of the water accounted for in the inventory for processing or quarry operations is captured and recycled.	2	
			5.3		Water use management		
			5.3.1	Optional	Enhanced water treatment: discharge water quality	2	
			5.3.2	Optional	Enhanced sludge management: diversion of sludge to environmentally preferable or reuse applications	1	
			5.4	Optional	Water reuse: input from other sources that are not potable	1	
						Total points for Water	6



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6 Transportation						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			6.1	Required	Activity tracking and management program in place for continuous improvement and data collection	R
			6.2	Required	Chain of Custody documentation	R
Total points for Transportation						0

7 Site management						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			7.1	Required	Site management plan covering maintenance and operations.	R
			7.2	Enhanced site management planning		
			7.2.1	Optional	Ecosystem boundaries to promote conservation	1
			7.2.2	Optional	Environmental impact assessment for current and planned operations	2
			7.3	Optional	Verification of site management plan through independent third party organization	1
Total points for Site management						4



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8 Land reclamation and adaptive reuse						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			8.1	Required	Post-closure reclamation plan	R
			8.2	Optional	Community involvement with development of post closure plan	1
			8.3	Optional	Exemplary site closure reclamation plan with documented involvement of local community	2
Total points for Land reclamation and adaptive reuse						3

9 Corporate governance						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			9.1	Required	Prohibition on forced labor - documented	R
			9.2	Required	Prohibition on child labor - documented	R
			9.3	Required	Prevention on discrimination - documented	R
			9.4	Optional	Employee participation in company supported activities in the community or community outreach/service work.	1
			9.5	Optional	Social accountability plan in place	2
Total points for Corporate governance						3



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10 Energy						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			10.1	Required	Energy inventory including quantity and type of energy consumed	R
			10.2	Energy management		
			10.2.1	Required	Energy management program to improve energy consumption and GHG emissions; measure and track energy data.	R
			10.2.2	Optional	Energy reduction: 10-20% of energy inventory; 21-40% of energy inventory; or greater than 40% energy inventory (maximum 3 points)	3
			10.3	Optional	Carbon management - carbon footprint analysis of operations	1
			10.4	Optional	Renewable energy sourcing - reduction in energy use by switching to renewable or alternative sources (maximum 2 points)	2
Total points for Energy						6



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11 Waste and by-product management						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			11.1	Required	Inventory of solid waste generated characterizing the nature of the waste, annual quantity, source and percentage/quantity reclaimed or recycled and disposal, storage or reclaim method	R
			11.2	Required	Waste management program to reduce or eliminate waste	R
			11.3	Optional	Demonstrated waste reduction (maximum 3 points) – Achieved reduction of 10 - 24% of solid waste inventory (1 point); – Achieved reduction of 25 - 50% of solid waste inventory (2 points total); or – Achieved reduction of greater than 50% of solid waste inventory (3 points total).	3
Total points for Waste and by-product management						3

12 Safer chemical and materials management						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			12.1	Required	Chemical inventory of materials and chemicals used in operations.	R
			12.2	Required	Chemical management plan based on the inventory	R
			12.3	Optional	Chemical management program for priorities to replace or reduce the use or generation of chemicals of concern	2
			12.4	Optional	Reduction/Elimination of chemicals of concern	5
Total points for Safer chemical and materials management						7



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13 Human health and safety						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			13.1	Required	Occupational safety plan for safe working environment	R
			13.2	Optional	Improved workplace safety using data for less injuries or illness (1 point for each, 2 maximum)	2
13.3 Management of air quality						
			13.3.1	Required	Air emissions inventory and description of sources	R
			13.3.2	Required	Air Emissions Management plan	R
Total points for Human health and safety						2

14 Innovation						
checklist			Criteria	Required or Optional	Description	max poss. points
Yes	No	comment				
			14.1	Optional	Health and Safety	2
			14.2	Optional	Transportation	1
			14.3	Optional	Storm water discharge management plan	1
			14.4	Optional	Waste reclamation or reuse	1
Total points for Innovation						5