HARDSCAPE INSTALLATION GUIDELINES VOLUME 2

BY TURAN BEKISOGLU

MARMIRO STONES®
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CRAFTED WITH PASSION.®
1. Slope of subgrade and final elevation should be no less than 3/16" per foot, or 1.5%.
2. Install woven geotextile fabric on subgrade.
3. Tamp 4" - 6" of 3/4" modified stone to 98% standard proctor density. Depth of base varies per market.
4. Screed 1" of washed concrete sand or 1/4" - 3/8" open graded stone for the setting bed.
5. Install 1 3/16" *MSNSPs with tight joints.
6. Perform all cutting with a diamond blade.
7. Apply the reinforced concrete edge restraint or PVC edge restraint with 10" ungalvanized spikes along the outside edges.
8. Sweep overlay polymeric sand in the joints (install polymeric sand per manufacturer’s instructions, which are located on the back of the bag).
9. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat, not a polyurethane mat.
10. A vibratory roller is recommended when tamping sandblasted pavers.
11. Complete polymeric sand installation per manufacturer’s instructions.

*MSNSP - MARMIRO STONES® NATURAL STONE PAVER

*FOR TRAVERTINE APPLICATIONS MARMIRO STONES® RECOMMENDS 1/4" - 3/8" OPEN GRADED STONE FOR THE SETTING BED.
1. Slope of subgrade and final elevation should be no less than 3/16” per foot, or 1.5%.
2. Install woven geotextile fabric on subgrade.
3. Install 12”-18” of 3/4” modified stone to 98% standard proctor density compacted in 3”- 4” lifts.
   Depth of base varies per market.
4. Screed 1” of washed concrete sand or 1/4” - 3/8” open graded stone for the setting bed.
5. Install 2.25” *MSNPs with tight joints.
6. Perform all cutting with a diamond blade.
7. Apply the reinforced concrete edge restraint or PVC edge restraint with 10” ungalvanized spikes
   along the outside edges.
8. Sweep overlay polymeric sand in the joints (install polymeric sand per manufacturer’s
   instructions, which are located on the back of the bag).
9. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat,
   not a polyurethane mat.
10. A vibratory roller is recommended when tamping sandblasted pavers.
11. Complete polymeric sand installation per manufacturer’s instructions.

*2.25” DRIVEWAY PAVERS SHOULD ONLY BE USED FOR LIGHT VEHICULAR APPLICATIONS.

*MSNP - MARMIRO STONES® NATURAL STONE PAVER

*FOR TRAVERTINE APPLICATIONS MARMIRO STONES® RECOMMENDS 1/4” - 3/8” OPEN GRADED STONE FOR THE SETTING BED.
1. Slope of subgrade and final elevation should be no less than 3/16” per foot, or 1.5%.
2. Install woven geotextile fabric on subgrade.
3. Tamp 4"-6" of 3/4" open graded stone.
4. Pour 4"-6" of 3,500 PSI concrete with 1/4" rebar on 12" centers.
5. Screed 1" of concrete sand/cement dry mix for setting bed. 1 bag (94 lb.) of portland cement to 3 wheelbarrows of concrete sand.
6. Install 1 3/16" *MSNSPs with tight joints.
7. Perform all cutting with a diamond blade.
8. Apply the unreinforced concrete edge restraint.
9. Create a weeping hole in the unreinforced concrete edge restraint using a rope or PVC pipe at the lowest point to create drainage.
10. Sweep overlay polymeric sand in the joints (install polymeric sand per manufacturer’s instructions, which are located on the back of the bag).
11. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat, not a polyurethane mat.
12. A vibratory roller is recommended when tamping sandblasted pavers.
13. Complete polymeric sand installation per manufacturer’s instructions.

*MSNSP - MARMIRO STONES® NATURAL STONE PAVER

*FOR TRAVERTINE APPLICATIONS MARMIRO STONES® RECOMMENDS 1/4" - 3/8" OPEN GRADED STONE FOR THE SETTING BED.
1. Slope of subgrade and final elevation should be no less than 3/16" per foot, or 1.5%.
2. Install woven geotextile fabric on subgrade.
3. Tamp 4"- 6" of 3/4" open graded stone.
4. Pour 4"- 6" of 3,500 PSI concrete sand with 1/4" rebar on 12" centers.
5. Screed 1" of concrete sand/cement dry mix for setting bed. 1 bag (94 lb.) of portland cement to 3 wheelbarrows of concrete sand.
6. Install 2.25" *MSNSPs with tight joints.
7. Perform all cutting with a diamond blade.
8. Apply the unreinforced concrete edge restraint.
9. Create a weeping hole in the unreinforced concrete edge restraint using a rope or PVC pipe at the lowest point to create drainage.
10. Sweep overlay polymeric sand in the joints (install polymeric sand per manufacturer’s instructions, which are located on the back of the bag).
11. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat, not a polyurethane mat.
12. A vibratory roller is recommended when tamping sandblasted pavers.
13. Complete polymeric sand installation per manufacturer’s instructions.

*2.25" DRIVEWAY PAVERS SHOULD ONLY BE USED FOR LIGHT VEHICULAR APPLICATIONS.

*MSNSP - MARMIRO STONES® NATURAL STONE PAVER

*FOR TRAVERTINE APPLICATIONS MARMIRO STONES® RECOMMENDS 1/4" - 3/8" OPEN GRADED STONE FOR THE SETTING BED.
LOBASCIO SYSTEM WITH OPEN GRADED STONE FOR 1 3/16" PEDESTRIAN INSTALLATION

1. Slope of subgrade and final elevation should be no less than 3/16" per foot, or 1.5%.
2. Install woven geotextile fabric on subgrade.
3. Tamp 4"- 6" of 3/4" open graded stone.
4. Pour 4"- 6" of 3,500 PSI concrete with 1/4" rebar on 12" centers.
5. Screed 1" of 1/4" to 3/8" open graded stone for the bedding layer.
6. Install 1 3/16" *MSNSPs with tight joints.
7. Perform all cutting with a diamond blade.
8. Apply the unreinforced concrete edge restraint.
9. Create weep holes in the concrete edge restraint using string or PVC pipe at the lowest points to allow water to escape.
10. Sweep overlay polymeric sand in the joints (install polymeric sand per manufacturer’s instructions, which are located on the back of the bag).
11. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat, not a polyurethane mat.
12. A vibratory roller is recommended when tamping sandblasted pavers.
13. Complete polymeric sand installation per manufacturer’s instructions.

*MSNSP - MARMIRO STONES® NATURAL STONE PAVER
1. Slope of subgrade and final elevation should be no less than 3/16" per foot, or 1.5%.
2. Install woven geotextile fabric on subgrade.
3. Tamp 4”- 6” of 3/4” open graded stone.
4. Pour 4” - 6” of 3,500 PSI concrete sand with 1/4” rebar on 12” centers.
5. Screed 1” of 1/4” to 3/8” open graded stone for the bedding layer.
6. Install 2.25" *MSNSPs with tight joints.
7. Perform all cutting with a diamond blade.
8. Apply the unreinforced concrete edge restraint.
9. Create weep holes in the concrete edge restraint using string or PVC pipe at the lowest points to allow water to escape.
10. Sweep overlay polymeric sand in the joints (install polymeric sand per manufacturer’s instructions, which are located on the back of the bag).
11. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat, not a polyurethane mat.
12. A vibratory roller is recommended when tamping sandblasted pavers.
13. Complete polymeric sand installation per manufacturer’s instructions.

*2.25” DRIVEWAY PAVERS SHOULD ONLY BE USED FOR LIGHT VEHICULAR APPLICATIONS.

*MSNSP - MARMIRO STONES® NATURAL STONE PAVER
1. Install woven geotextile fabric on subgrade. Slope of subgrade, if required should mirror final elevation.
2. Place 8” - 12” of ¾” open graded compacted in 3”- 4” lifts.
3. Screed 1” of 1/4” to 3/8” open graded stone for the setting bed.
4. Install 1 3/16” *MSNSPs with a minimum of 3/8” joint.
5. Perform all cutting with a diamond blade.
6. Sweep 1/4” open graded stone 1/4” below the surface in the joints to allow surface water to drain through the system.
7. Apply the reinforced concrete edge restraint along the outside edges.
8. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat, not a polyurethane mat.
9. A vibratory roller is recommended when tamping sandblasted pavers.

*Permeable pavements are site specific and should be installed per engineered drawing.

*MSNSP - Marmiro Stones® Natural Stone Paver
1. Install woven geotextile fabric on subgrade.
2. Place 12" - 18" of 3/4" open graded compacted in 3"- 4" lifts.
3. Screed 1" of 1/4" to 3/8" open graded stone for the setting bed.
4. Install 1 3/16" *MSNSPs with a minimum of 3/8" joint.
5. Perform all cutting with a diamond blade.
6. Sweep 1/4" open graded stone 1/4" below the surface in the joints to allow surface water to drain through
7. Apply the reinforced concrete edge restraint along the outside edges.
8. Tamp the antiqued pavers with a four horsepower vibratory plate compactor, using a rubber mat, not a polyurethane mat.
9. A vibratory roller is recommended when tamping sandblasted pavers.

*Permeable pavements are site-specific and should be installed per engineered drawing.

*2.25" DRIVEWAY PAVERS SHOULD ONLY BE USED FOR LIGHT VEHICULAR APPLICATIONS.

*MSNSP - MARMIRO STONES® NATURAL STONE PAVER
1. Slope of subgrade and final elevation should be no less than 3/16” per foot, or 1.5%.
2. Install woven geotextile fabric on subgrade.
3. Tamp 4”- 6” of 3/4” open graded stone.
4. Pour 4”- 6” of 3,500 PSI concrete with 1/4” rebar on 12” centers.
5. Mix and install 3/4” - 1” mason sand with Type S cement for the setting bed.
6. Perform all cutting with a diamond blade.
7. Back-butter each *MSNSP with thinset before laying on the mortar setting bed.
8. Install the 1 3/16” MSNSPs, creating a 1/8” - 3/8” mortar or grout joint using spacers.
9. Add mortar or sanded grout into joints (1/8” - 3/8” joint). Sponge off excess mortar from the joints (color can be added to mortar if needed).

**Optional Installation** - Install MSNSP with 1/8” mortar or grout joint using spacers.

1. Install a 1/16”-1/8” non-sanded exterior grout in joint. Sponge off excess grout from the joints.

**Note:** All wet laid applications must have mortar or grout in the joints.

*MSNSP - MARMIRO STONES® NATURAL STONE PAVER*
1. Lay out all coping pieces before installing. Make necessary cuts using a diamond blade.
2. Apply 1/16" thinset on the top of the bond beam.
3. Mix and apply 3/4" - 1" mason sand and Type S cement for the setting bed.
4. Apply 1/16" smooth thinset on the bottom of the coping pieces.
5. Make sure to set an overhang of 2" from the bond beam to the front edge of the coping.
7. Place the mortar or sanded grout in a 1/4" - 3/8" joint. Sponge off the excess from the joints.

*MSNSPC - MARMIRO STONES® NATURAL STONE POOL COPING
STANDARD GUNITE POOL TILE INSTALLATION

1. Lay out all tile pieces on top of the coping pieces before installing. Make any necessary cuts with a grinder using a diamond blade.
2. Mix equal parts of marble dust and Type S white cement.
3. Apply the tile 1/8" from the bottom of the coping.
4. Use a wooden block to distribute pressure to set all the tiles equally to the bond beam.
5. Mix equal parts of marble dust and Type S white cement for the joints.
6. Use a rubber trowel to apply the grout in the joints.
7. Wipe off excess mortar twice or more with a clean sponge.
8. Wipe off the haze with a dry cloth.
1. Waterproof the CMU block with a liquid waterproof system.
2. Apply a mortar mix for the scratch coat. Mix 1 bag of portland cement, 1/4 bag of lime, and 24 shovelfuls of mason sand.
3. Apply MSNSTV in a leveled line, working from the bottom up.
4. Place MSNSTV with no mortar joint, creating a tight fit. *(See below for installation with grout joint)*
5. Perform all cuts with a grinder using a diamond blade.
6. Apply veneer mortar to the back of MSNSTV.
7. Wipe off excess cement on the face of the stone.

**Optional Installation** - Install MSNSTV with 1/4" - 3/8" mortar or grout joint using spacers.
   1. Add mortar or grout into joints (1/4" - 3/8" joint). Sponge off excess mortar or grout from the joints (color can be added to mortar if needed).
1. Staple the tar paper, making sure to overlap each section by 4” starting from the bottom up.
2. Staple the moisture barrier on top of the tar paper- do not overlap. Follow manufacturer’s guidelines.
3. Nail or screw the wire lath over the moisture barrier.
4. Place veneer mortar on the wire lath for the scratch coat application.
5. Apply MSNSTV in a leveled line, working from the bottom up.
6. Apply veneer mortar to the back of MSNSTV.
7. Perform all cuts with a grinder using a diamond blade.
8. Wipe off excess cement on the face of the stone.
9. Place MSNSTV with no mortar joints, creating a tight fit. *(See below for installation with grout joint)*

**Optional Installation** - Install MSNSTV with 1/4” - 3/8” mortar or grout joint using spacers.

1. Add mortar or grout into joints (1/4” - 3/8” joint). Sponge off excess mortar or grout from the joints (color can be added to mortar if needed).

*MSNSTV - MARMIRO STONES® NATURAL STONE THIN VENEER*
HEAT TESTING RESULTS

Testing took place in Carlstadt, New Jersey. On July 16, 2019, the temperature was 95°, and on August 5, 2019, the temperature was 80°. Our products were tested in direct sunlight for the duration of both days. This chart gives a range of temperatures for each product and finish.

<table>
<thead>
<tr>
<th>Product</th>
<th>Finish</th>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crema Eda®</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Finish</td>
<td>110° - 125°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Enhanced</td>
<td>125° - 140°</td>
</tr>
<tr>
<td>Crema Eda® Rosa</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Finish</td>
<td>110° - 125°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Enhanced</td>
<td>125° - 140°</td>
</tr>
<tr>
<td>Afiyon Cloud®</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Finish</td>
<td>110° - 125°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Enhanced</td>
<td>125° - 140°</td>
</tr>
<tr>
<td>Deep Blue®</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Finish</td>
<td>110° - 125°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Enhanced</td>
<td>125° - 140°</td>
</tr>
<tr>
<td>Terra</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td>Takoma Silver™</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td>Grano®</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Finish</td>
<td>110° - 125°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Enhanced</td>
<td>125° - 140°</td>
</tr>
<tr>
<td>Grano® Silver</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td>Avena®</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td>Crema Oliva™</td>
<td>Antiqued Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td></td>
<td>Sandblasted Finish</td>
<td>110° - 125°</td>
</tr>
<tr>
<td>Titanium</td>
<td>Sandblasted Finish</td>
<td>110° - 125°</td>
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<tr>
<td></td>
<td>Sandblasted Enhanced</td>
<td>125° - 140°</td>
</tr>
<tr>
<td>Orcca®</td>
<td>Vintage Finish</td>
<td>95° - 110°</td>
</tr>
<tr>
<td>Karbon™</td>
<td>Flamed Finish</td>
<td>95° - 110°</td>
</tr>
</tbody>
</table>

Disclaimer: Applicable to Marmiro Stones® Products,

The following product and installation information is provided to assist Marmiro’s customers with installation, maintenance and usage decisions. These tests were conducted by Marmiro Stones® using a laser temperature gun in its own facilities, which remain separate and apart from a thermal testing laboratory. It is understood that the installation, maintenance, and usage employed by each customer is outside the direction and control of Marmiro Stones® and as such, is strictly and completely the choice and responsibility of each customer and their installer. It is important to note that the temperatures illustrated in this chart will vary based on these factors. Marmiro Stones® expressly disclaims any and all asserted claims which may arise directly from information contained in this document(s), including but not limited to, loss of rights, materials, personal injury, or other potential injury.
Marmiro Stones, Inc. has no control over the buyer’s selection or use of any stone. Prior to using or permitting the use of our products, the buyer must determine the suitability of the products for the intended use and assumes all risk and liability whatsoever in connection therewith. The buyer must also determine the slip resistance suitability and maintainability as Marmiro Stones, Inc. is not responsible for any losses or damages sustained by the buyer, or any other person, as a result of improper installation or misapplication of our products. Please refer to the ASTM standards for more specific information concerning stone or paver specifications. Marmiro Stones, Inc. and its agents and employees are held harmless against any loss, damage, claim, suit, liability, judgement, or expense arising out of, or in connection with, any injury, damage, or loss to any property, or violation of any applicable laws or regulations resulting from, or in connection with, the sale, transportation, installation, or use of our products by the buyer.

**TECHNICAL SPECIFICATIONS**

**Compressive Strength ASTM - C170**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Antiqued</th>
<th>Sandblasted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crema Eda® Marble</td>
<td>13,453 psi</td>
<td>1,808 psi</td>
</tr>
<tr>
<td>Crema Eda® Rosa Marble</td>
<td>12,675 psi</td>
<td>13,434 psi</td>
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<tr>
<td>Afyon Cloud® Marble</td>
<td>10,968 psi</td>
<td>10,208 psi</td>
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<tr>
<td>Deep Blue® Marble</td>
<td>12,082 psi</td>
<td>11,929 psi</td>
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<tr>
<td>Terra Travertine</td>
<td>8,645 psi</td>
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<tr>
<td>Grano® Travertine</td>
<td>7,891 psi</td>
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<tr>
<td>Grano® Silver Travertine</td>
<td>7,891 psi</td>
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<tr>
<td>Avena® Travertine</td>
<td>9,287 psi</td>
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<tr>
<td>Takoma Silver™ Travertine</td>
<td>11,639 psi</td>
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</tr>
<tr>
<td>Crema Oliva™ Limestone</td>
<td>15,110 psi</td>
<td>14,868 psi</td>
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**Flexural Strength ASTM - C880**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Antiqued</th>
<th>Sandblasted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crema Eda® Marble</td>
<td>N/A</td>
<td>1,284 psi</td>
</tr>
<tr>
<td>Crema Eda® Rosa Marble</td>
<td>N/A</td>
<td>1,466 psi</td>
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<tr>
<td>Afyon Cloud® Marble</td>
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<td>1,308 psi</td>
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<td>Deep Blue® Marble</td>
<td>N/A</td>
<td>1,878 psi</td>
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<td>Terra Travertine</td>
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<tr>
<td>Avena® Travertine</td>
<td>1,232 psi</td>
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<tr>
<td>Takoma Silver™ Travertine</td>
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</tr>
<tr>
<td>Crema Oliva™ Limestone</td>
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<td>2,341 psi</td>
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**Co-Efficient of Friction ASTM - C1028 (Antiqued Stones)**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Antiqued Dry</th>
<th>Antiqued Wet</th>
</tr>
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<tbody>
<tr>
<td>Crema Eda® Marble</td>
<td>0.74</td>
<td>0.87</td>
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<tr>
<td>Crema Eda® Rosa Marble</td>
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<td>0.77</td>
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<td>Terra Travertine</td>
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<td>Grano® Silver Travertine</td>
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<tr>
<td>Takoma Silver™ Travertine</td>
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</tr>
<tr>
<td>Crema Oliva™ Limestone</td>
<td>0.70</td>
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### Co-Efficient of Friction ASTM - C1028 (Sandblasted Stones)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sandblasted Dry</th>
<th>Sandblasted Wet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crema Eda® Marble</td>
<td>0.91</td>
<td>0.87</td>
</tr>
<tr>
<td>Crema Eda® Rosa Marble</td>
<td>0.89</td>
<td>0.95</td>
</tr>
<tr>
<td>Afyon Cloud® Marble</td>
<td>0.97</td>
<td>1.04</td>
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<td>Deep Blue® Marble</td>
<td>0.99</td>
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<tr>
<td>Terra Travertine</td>
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<td>Grano® Travertine</td>
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<td>0.96</td>
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<td>Avena® Travertine</td>
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<td>N/A</td>
</tr>
<tr>
<td>Takoma Silver™ Travertine</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Crema Oliva™ Limestone</td>
<td>0.7</td>
<td>0.8</td>
</tr>
</tbody>
</table>

### Freeze and Thaw ASTM - C666

<table>
<thead>
<tr>
<th>Sample</th>
<th>Results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crema Eda® Marble</td>
<td>Pass</td>
<td>No cracks or deformations noted.</td>
</tr>
<tr>
<td>Crema Eda® Rosa Marble</td>
<td>Pass</td>
<td>No cracks or deformations noted.</td>
</tr>
<tr>
<td>Afyon Cloud® Marble</td>
<td>Pass</td>
<td>No cracks or deformations noted.</td>
</tr>
<tr>
<td>Deep Blue® Marble</td>
<td>Pass</td>
<td>No cracks or deformations noted.</td>
</tr>
<tr>
<td>Terra Travertine</td>
<td>Pass</td>
<td>No cracks or deformations noted.</td>
</tr>
<tr>
<td>Grano® Travertine</td>
<td>Pass</td>
<td>No cracks or deformations noted.</td>
</tr>
<tr>
<td>Grano® Silver Travertine</td>
<td>Pass</td>
<td>No cracks or deformations noted.</td>
</tr>
</tbody>
</table>

### Water Absorption ASTM - C97

<table>
<thead>
<tr>
<th>Sample</th>
<th>Antiqued Water Absorption %</th>
<th>Sandblasted Water Absorption %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crema Eda® Marble</td>
<td>0.17</td>
<td>0.19</td>
</tr>
<tr>
<td>Crema Eda® Rosa Marble</td>
<td>0.17</td>
<td>0.16</td>
</tr>
<tr>
<td>Afyon Cloud® Marble</td>
<td>0.17</td>
<td>0.16</td>
</tr>
<tr>
<td>Deep Blue® Marble</td>
<td>0.17</td>
<td>0.18</td>
</tr>
<tr>
<td>Terra Travertine</td>
<td>1.98</td>
<td>N/A</td>
</tr>
<tr>
<td>Grano® Travertine</td>
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</tr>
<tr>
<td>Grano® Silver Travertine</td>
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</tr>
<tr>
<td>Avena® Travertine</td>
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<tr>
<td>Takoma Silver™ Travertine</td>
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</tr>
<tr>
<td>Crema Oliva™ Limestone</td>
<td>0.60</td>
<td>0.44</td>
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</table>

### Density ASTM - C97

<table>
<thead>
<tr>
<th>Sample</th>
<th>Antiqued Density</th>
<th>Sandblasted Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crema Eda® Marble</td>
<td>168.5 lbs/ft³</td>
<td>167.4 lbs/ft³</td>
</tr>
<tr>
<td>Crema Eda® Rosa Marble</td>
<td>168.3 lbs/ft³</td>
<td>169.3 lbs/ft³</td>
</tr>
<tr>
<td>Afyon Cloud® Marble</td>
<td>162.4 lbs/ft³</td>
<td>164.2 lbs/ft³</td>
</tr>
<tr>
<td>Deep Blue® Marble</td>
<td>163.8 lbs/ft³</td>
<td>167.4 lbs/ft³</td>
</tr>
<tr>
<td>Terra Travertine</td>
<td>153.1 lbs/ft³</td>
<td>N/A</td>
</tr>
<tr>
<td>Grano® Travertine</td>
<td>154.7 lbs/ft³</td>
<td>152.0 lbs/ft³</td>
</tr>
<tr>
<td>Grano® Silver Travertine</td>
<td>154.7 lbs/ft³</td>
<td>N/A</td>
</tr>
<tr>
<td>Avena® Travertine</td>
<td>145.8 lbs/ft³</td>
<td>N/A</td>
</tr>
<tr>
<td>Takoma Silver™ Travertine</td>
<td>151.0 lbs/ft³</td>
<td>N/A</td>
</tr>
<tr>
<td>Crema Oliva™ Limestone</td>
<td>162.8 lbs/ft³</td>
<td>162.1 lbs/ft³</td>
</tr>
</tbody>
</table>
GLOSSARY OF STONE INDUSTRY TERMS

A

Absorption - The amount of water absorbed by a stone, expressed as a percentage by weight.

Acid Wash - A treatment applied to the face of a stone to achieve a texture or finish that is distressed. Most acidic chemical treatments are effective only when applied to calcareous stone varieties.

Adhered - Used in reference to stone veneer, secured and supported by adhesion of an approved bonding material over an approved backing.

Admixture - A material other than water, aggregates, lime or cement, that is added to concrete or mortar at the time of mixing. Admixtures are typically added to function as water repellents, coloring agents, or to adjust the curing rate of the concrete or mortar.

Aggregate - A small mass of rock, having occurred naturally (as in sand or gravel) or by means of manufacture (as in a crushed aggregate product), used either in a loose, non-cohesive state, or as an ingredient in mortar or concrete products.

Alkaline - Pertains to a highly basic, as opposed to acidic, substance; for example, hydrogen or carbonate of sodium or potassium.

Anchor - A corrosion resistant metal fastener used for securing dimensional stone to a structure or adjacent stone units. Anchor types for stonework include those made of flat stock (straps, dovetails) and round stock (rod cramp, rod anchor, eyebolt and dowel).

Antiqued Finish - A finish that replicates rustic or distressed textures. Produced through tumbling to simulate the naturally occurring effects.

Ashlar / French Pattern - A stone facade of generally square or rectangular units having sawed or dressed beds.

ASTM International - An international standards organization that develops and publishes voluntary consensus technical standards for a wide range of material, products, systems, and services.

B

Back Anchor - Any of a variety of anchors that extends from the back surface of a stone panel, as opposed to anchors that penetrate the edges of a stone panel.

Backsplash - A vertical covering of the wall where a countertop surface meets the wall surface, designed to protect the wall from moisture. Backsplashes range from a few inches in height to “full height backsplashes” that extend from the countertop surface to the underside of the upper cabinets.

Base - In masonry, the bottom course of a stone wall, or the vertical first member above grade or a finished floor.
**Bed Joint** - A horizontal joint between stones, usually filled with mortar or sealant.

**Bed** - The top or bottom of a joint, natural bed; surface of stone parallel to its stratification.

**Book Match Pattern** - A vein matching technique where opposite faces of adjacent slabs are exposed, producing a repeating mirror image of the veining trend of the material. Book matched material is most commonly polished to allow the greatest visibility of the veining character of the stone.

**Bridge Saw** - A saw that travels along a beam, or “bridge,” which travels atop two rails. These saws are typically powerful and fitted with large diameter blades. A rotating table is positioned below the saw, allowing for skew cuts, and the saw arbor typically rotates, allowing for angled cuts.

**Brushed Finish** - A subtly textured surface finish achieved by wet brushing a stone with a coarse rotary-type abrasive brush.

**Bullnose** - Convex rounding of a stone edge, such as a stair tread or countertop.

**Bush Hammering** - A process which produces textured surfaces with small, evenly spaced pits produced by hand or pneumatic hammer. The spacing between the pits is often defined as “6-cut,” “4-cut,” etc.

**Butt Joint** - An external corner formed by two stone panels with one finished edge in a lap joint configuration.

**Buttering** - Placing mortar on stone units with a trowel before setting them into position.

**Calibration** - Within the stone industry, the process in which stone slabs or units are abraded to achieve a more precise thickness tolerance (-/+ 1mm) than what would normally be produced by standard sawing techniques. The term is most frequently used in the production of stone tile, which must have limited thickness variation to allow installation using thinset adhesive. The term “gauge” is essentially synonymous, although is more commonly used to describe less precise techniques.

**Carve** - To shape a solid material such as stone by precisely cutting it with a tool.

**Caulk** - To seal a joint with an elastomer, adhesive compound.

**Chiseled Edge** - The rustic, aged appearance produced by mechanically chipping the stone edge.

**CNC Machine** - A computer numeric controlled, multi-axis, vertical spindle machine designed to use rotating milling and profiling tools to produce shapes, cut-outs, holes, finishes, and various other operations in stone that are otherwise accomplished by more labor intensive techniques.

**Compressive Strength (ASTM C170)** - A measure of the resistance of the stone to crushing loads, generally tested per ASTM-C170.

**Coping** - A stone used as a cap on freestanding walls.

**Core** - The cylindrical mass of stone that results from drilling a hole in stone with a hollow core bit, often times used as a sampling technique in quarries.
**Damp Proofing** - One or more coatings of a compound that is impervious to water. Usually applied to the back or face of the stone, or the back of the wall at or near grade.

**Diamond Wire Saw** - A machine using cable of various diameters and lengths, impregnated with diamond dust or more commonly fitted with cylindrical diamond coated segments. Diamond wire saws are used in quarrying, slabbing, and contour sawing operations.

**Digital Templating** - A process for virtual, digital measurement of site conditions which eliminates the need to make physical templates. Digital templating information can be interfaced with various CAD and CNC systems to allow rapid transfer and utilization of the information.

**Drip** - A groove or slot cut beneath and slightly behind the forward edge of a projecting stone member, such as a sill, lintel, or coping, to cause water to drop at that location and prevent water from running down the face of the wall.

**Dry Stack** - In rubble masonry construction, a self supporting wall erected without mortar.

**Durability** - The measure of the ability of natural building stone to endure and to maintain its essential and distinctive characteristics of strength, resistance to decay, and appearance, while exposed to the elements encountered in its application environment.

**Eased Edge** - A slightly arised, chamfered, or radius edge to eliminate the sharpness of the fabricated stone edge.

**Edge Profile** - The specific contour to which an exposed edge has been shaped, normally for decorative purposes.

**Efflorescence** - A salt deposit, in the form of a white powder residue, that forms on the surface of stone, brick, or mortar. It is caused by alkalis leached from the masonry or soil, and carried to the surface by moisture.

**Elevation** - A drawing of the vertical faces and elements of a structure, either interior or exterior.

**Engineered Stone** - A man-made product composed of a blend of natural minerals (generally quartz), and man-made agents (such as polyester, glass, epoxy, and other such ingredients).

**Epoxy Resin** - A flexible, usually exothermic curing resin made by the polymerization of an epoxied; used as an adhesive.

**Etched** - A decorative surface pattern created by a variety of methods, produced either by chemical or mechanical methods.

**Expansion / Construction Joint** - A flexible joint between stone units, designed to expand or contract to accommodate movements due to temperature change or dynamic structural movement.
Fabricated - Used in reference to dimension stone, it means having undergone cutting, machining, or other processes in order to refine the product for its intended application, manufactured and ready for installation.

Face - The exposed surface of stone on a structure.

Filling - A trade expression used to indicate the filling of natural voids in stone units with cements or synthetic resins and similar materials.

Finish - Process applied to the exposed surfaces of dimension stone during fabrication to achieve the desired aesthetic and/or performance characteristics of the stone. The finish may be applied early or late in the fabrication sequence.

Fissure - An industry term describing any naturally occurring separation along crystalline boundaries visible in exposed surfaces of the stone. Note that the industry use of this term is different than the scientific, geological use of this term.

Flexural Strength - A bending strength test, normally performed per the ASTM C880 test method, in which a sample of stone of the project thickness is supported by two support rods, creating a span of at least 10 times the thickness, and loaded to failure by two rods positioned at quarter points of the stress experienced by the stone sample at the time of specimen failure, and expressed as a force per unit area.

Flooring - Stone used as an interior pedestrian walking surface.

Gang Saw - A mechanical device employing a series of parallel reciprocating saw blades to cut stone blocks into slabs of predetermined thickness. The most common variety of gang saw used in the stone industry uses a slurry containing steel shot as the abrasive medium; but diamond segments mounted to steel blades are commonly used in gang sawing softer stone such as marble or limestone.

Gauge - Any process, although most frequently grinding, done to reduce the effects of the tolerances of stone slab thickness. Gauging may be done to a precise thickness with a specific tolerance, or may simply be done to two or more stones until the thickness of the lot is uniform.

Granite - A very hard, crystalline, igneous rock, gray to pink in color, composed of feldspar, quartz, and lesser amounts of dark ferromagnesium materials. Gneiss and black “granites” are similar to true granites in structure and texture, but are composed of different minerals.

Grind - To remove portions of stone material by any abrasive method. Grinding may be part of producing a finish, shaping a profile, achieving a specific dimension, creating flatness between adjacent installed pieces, or part of a restorative effort.
Hardness - In stones, hardness most frequently refers to a stone’s resistance to abrasion, particularly abrasion due to foot traffic, as tested by either ASTM-C241 or C1353. In minerals, hardness generally refers to the mineral’s rank within the Moh’s Scale of Mineral Hardness.

Hearth -
1. The floor of a fireplace together with an adjacent area of fire-resistant material that extends into the room.
2. An area permanently floored with fire-resistant material beneath and surrounding a stove.

Hearth Stone - Originally the single large stone or stones used for the hearth, now most commonly used to describe the stone in front of the fire chamber, and many times extending on either or both sides of the front of the fire chamber.

Honed - A satin-smooth surface finish with little or no gloss.

Impregnators - Any applied repellent that penetrates the stone, and resides below the plane of the finished surface. Impregnators may be hydrophobic (water-repellent), oiliophobic (oil repellent), or both, and are used in some stone varieties to increase stain resistance.

Isolation Joint - A joint separating a concrete slab from another element, such as a column or wall.

Joint - A space between installed stone units or between a dimension stone and the adjoining material.

Laser - An acronym for Light Amplification by Stimulated Emission of Radiation which produces an intense narrow beam of coherent, monochromatic light. Lasers are used in the stone industry for a variety of cutting machine alignment aids, layout aids, and leveling instruments.

Limestone - A sedimentary rock composed primarily of calcite or dolomite. The varieties of limestone used as dimension stone are usually well consolidated, and exhibit a minimum of graining or bedding direction.

Live Load - The portion of a load on a structural member that is variable, such as occupants, furniture, traffic, and wind.
Maintenance - Cleaning and/or other remedial activity performed on a scheduled basis: daily, weekly, etc. in order to remove dirt, dust, and other contaminants that degrade the stone’s appearance and/or performance.

Marble - A metamorphic crystalline rock composed predominantly of crystalline grains of calcite, dolomite, or serpentine, and capable of taking a polish.

Masonry -
1. Built up construction, usually individual units set in mortar.
2. A branch of construction dealing with plaster, concrete construction, and the laying up of stone, brick, tile and other such units with mortar.

Milling - In the stone industries, comprehensive term for processing quarry blocks through sawing, planning, turning and cutting techniques to finished stone.

Miter - Any condition of stone veneer, coping, paving strips, etc. where a corner condition is accomplished by two stones with angular cuts, with the angles of the cuts being equal to the bisection of the total angle.

Mockup - A sample section of stonework that is installed, often including other related construction components, for the purpose of obtaining designer and owner approval prior to commencement of quarrying, fabricating, or installation of stonework.

Moisture Barrier - Any material, such as specially treated paper or plastic sheeting, which is impervious to water; used in walls to stop moisture from entering and thus preventing condensation.

Molding - Decorative stone deviating from a plane surface by projections, curved profiles, recesses, or any combination thereof.

Mortar - A mixture of cement paste and fine aggregate used in setting stone units or filling joints between stone units. Mortar may contain masonry cement, or may contain hydraulic cement with lime (and possibly other admixtures) to afford greater plasticity and workability than are attainable with standard portland cement mortar.

Mosaic - A decorative installation, usually a graphic or artwork display, made up of an assemblage of small units of different colored stones or glass to create the total image or pattern.

Natural Stone - A product of nature. A stone such as granite, marble, limestone, slate, travertine, or sandstone that is formed by nature, and is not artificial or manmade.

Ogee - A stone molding roughly resembling an “S” shape with a reverse curved edge: concave above, convex below.

Open-Graded Stone - Is an angular washed stone removed of fines in which the sizes can vary. Void space will constitute between 30-40%.
Palletize - To stack and secure stone units to a pallet for ease, safety, and efficiency in handling and transport.

Panel - A term used to describe either a single unit of fabricated stone veneer, or a preassembled panel including multiple stone units affixed to a structural panel framework.

Patina - The change in color or texture of the surface of natural stone due to age or exposure to various elements.

Paver - A single unit of fabricated stone for use as an exterior paving material.

Paving - Stone used as an exterior wearing surface, as in patios, walkways, driveways, etc.

Pedestal - In classical architecture, the support for a column or statue, consisting of a base, dado, and cap.

Polished Finish - A glossy, highly reflective surface finish that brings out the full color and character of the stone.

Polishing - A process utilizing abrasives in a combination with specific polishing powers and/or chemicals to produce a glossy, highly reflective surface finish on the stone.

Polishing Pads - Small diameter flexible disks with embedded abrasives used with hand-held tools or small portable machines for the polishing of stone. These pads may be used in combination with compounds, and may be used either wet or dry.

Poultice - Any absorbent material (powder, cloth, etc) used in a saturated condition with water solvent based fluids and applied to a stone surface for the purpose of removing embedded stains.

Quarry -

(Noun) - The physical site, open or underground, where stone is extracted from the earth.
(Verb) - The process of extracting stone from an open pit or underground mine.

Quartz - A silicon dioxide mineral that occurs in colorless and transparent or colored hexagonal crystals or in crystalline masses. One of the hardest minerals of abundance in stones such as sandstone, granite, and quartzite.

Quartzite - A dense, hard metamorphic quartz based stone typically formed from sandstone. In some deposits, intrusion of minerals during the formation process creates unusual coloration.

Rain Screen - A curtain wall system in which the outer facade shields, or “screens,” rain from infiltrating the wall cavity, but is not actually sealed. The cavity is air pressure equalized with the outside air, avoiding pressure differences that would otherwise draw water into the cavity. Minor amounts of water that penetrate the rain screen are evacuated via weep systems designed into the system.
**Refinishing** - The process of insitu finishing of existing stonework to return it to its near original appearance.

**Reinforcement** - Any element, metal, fiberglass, stone, etc. that is embedded in or applied to the stone panel for the purpose of increasing strength.

**Rock Faced** - A rustic finish for veneer stone created with a split or chiseled face, and dressed along the stone’s perimeter to produce convex projection.

**Saddle Thresholds** - Symmetrical shapes designed to span a given area, usually under a door.

**Sample** - An actual piece of dimension stone in a small size used to demonstrate the general color, markings, and finish of a given variety of stone.

**Sandblasted** - A matte-textured surface finish produced by small particles (“sand”) striking the stone surface at high velocities.

**Sandstone** - Sedimentary rocks usually composed of quartz cemented with silica, iron oxide or calcium carbonate. Sandstones range from very soft and friable to very hard and durable, depending on the depth at which it was buried and the nature of the cement. Generally, the most durable sandstones are cemented with silica. Sandstone has a wide range of colors or textures.

**Sawed Edge** - A clean-cut edge generally achieved by cutting with a diamond blade.

**Sawed Face** - A finish obtained from the process used in the cutting of the blocks, slabs, or other units of building stone without further embellishment. It varies in texture from smooth to rough, and is typically named for the type of material used in sawing, e.g. diamond, sand sawn, chat sawn, and shot sawn.

**Scratch Coat** - A rough coating of plaster scratched before it is quite dry to ensure the adherence of the next coat.

**Screed** - A flat board or other straight piece used to level freshly placed concrete, mortar, or sand by sliding it over prepositioned guides that determine the height of the concrete or mortar.

**Sealer Enhancer** - A product that is designed to enrich, brighten and enhance the color and/or character of the stone. Stone enhancers are more frequently used on honed or textured surfaces where the stone color and/or character are muted by the finish. Enhancers are also used to match the color of an exposed slab edge to that of a resin treated slab face.

**Sealer** - A protective coating or treatment which prevents or retards foreign liquid or matter from penetrating the stone by closing the pores in the surface.

**Sealing** - The process of applying a sealer.

**Setting** - The installation of dimension stone units.

**Sill** - The bottom horizontal part of a window or opening in a structure.
Slab - A flat “sheet-like” section of natural stone sawn to a prescribed thickness, with length and width determined by the size of the quarry block from which it was sawed. Slabs will generally receive a face finish and further fabrication processes to become usable dimension stone products.

Slate - A very fine grained metamorphic rock derived from sedimentary shale rock, with excellent parallel cleavage, and entirely independent of original bedding, slate may be split easily into relatively thin slabs.

Slope - A surface of which one end or side is at a higher level than another; a rising or falling surface.

Soapstone - A talc-rich stone with a “soapy” feel, used for hearths, tabletops, chemical-resistant laboratory tops, stove facings, and cladding; known for its heat, chemical, and stain resistant properties.

Split - Division of a rock by cleavage.

Split-faced Stone - Stone on which the face has been broken to an approximate plane.

Stone - Sometimes synonymous with rock, but more properly applied to individual blocks, masses or fragments taken from their original formation or considered for commercial use. In commercial use, the term stone is more frequently used, while scientifically, geologists and petrographers more frequently use the term rock.

Subbase - Layer of aggregate material laid on the subgrade; often the main load-bearing layer of the pavement.

Subgrade - Below the subbase, the native material underneath pavement.

Temp - To pack a substance down or into something firmly.

Template - A pattern for a repetitive marking or fabricating operation.

Thin Stone - Dimension stone units that are 2” (50 mm) or less in thickness.

Tile - A thin modular stone unit, less than ¾” (20 mm) thick, and not exceeding 24” (600 mm) in its greatest dimension.

Travertine - A variety of limestone formed by chemical precipitate from hot springs. Some varieties of travertine take a polish and are known commercially as marble. ASTM-C119 classifies travertine in both the limestone and the marble groupings.

Thread - A flat stone used as the top (horizontal) walking surface on steps.

Tumbled Finish - A weathered, aging finish created when the stone is tumbled with sand, pebbles or steel bearings.

Vein Cut - A cut in a quarried stone that is perpendicular to the natural bedding plane, exposing the veining of the material.
**Vein** - A layer, seam, or narrow irregular body of mineral material contrasting the surrounding material in either color, texture, or both.

**Veneer** - A non-structural facing of stone, interior or exterior, serving as ornamentation and a weather barrier.

**W**

**Water Jet** - A machine which uses extremely high pressure water and an abrasive substance to cut stone materials in complex and exacting slabs or tile.

**Water Table** - A course that projects from the face of a wall, generally near grade and having a beveled top and a drip cut in the projecting underside, to deflect water.

**Waterproofing** - See Damp Proofing.

**Weep Holes** - Openings for drainage in veneer joints or in the structural components supporting the veneer.
INSTALLATION AND MAINTENANCE
Frequently Asked Questions

Q. How do I remove mildew and algae from my MSNSP?
A. Option 1: Bleach
• Wet surface with hose
• Apply bleach
• Scrub surface with a hard bristle brush
• Hose off surface

Option 2: Simple Green
• Wet surface with hose
• Apply Simple Green
• Scrub surface with a hard bristle brush
• Hose off surface

Option 3:
• If either of these two methods do not work, Marmiro Stones® recommends Clean Concrete and Pro Grade. Please contact Pat McCrindle of GST International for more information.
  Phone: 609-744-6894
  E-mail: pmccrindle@gstinternational.com

Q. How do I remove rust from my MSNSP?
A. Use RSR-2000 by Alpha Advantage. Follow the manufacturer’s instructions on the back of the tube.

Q. How do I remove leaf stains from my MSNSP?
A. Your average leaf stains can easily be power washed out.

Q. How do I remove oil & grease from my MSNSP?
A. Use a scrub brush and either Palmolive dish soap or a degreaser from your local hardware store.

Q. How do I remove tire marks from my MSNSP?
A. Use hot water and a scrub brush.

Q. How do I remove food, wine, or juices from my MSNSP?
A. Use hot water and a scrub brush.

Q. Can I power wash my patio?
A. Yes – we recommend a surface cleaner for all horizontal applications, and a wide-angle wand for all vertical applications.
• When dealing with the sandblasted finishes, test a small area, not getting too close to the surface of the product where you can potentially remove the finish and create streaks.
• It is important to note that power washing can possibly blow out polymeric sand in the joints – the joints may need to be refilled afterward. Refill joints based on the manufacturer’s instructions.

Q. What is the cause of water marks on my MSNSP?
A. Due to the variables in nature, natural stone can tend to hold moisture, causing water marks. This does not affect the structural integrity of the product and will dissipate over time.
Q. What type of grout do I use on my MSNSP?
A. Sanded / Unsanded grout: When using sanded grout, allow for 1/8" grout joint or more. When using unsanded grout, allow for 1/8" grout joint or less.
Polymeric sand: Any size grout joint is acceptable. Tamping is recommended to consolidate all sand into the joints.

Q. Which side is the finished side of my MSNSP?
A. When determining the finished side of the stone vs. the back side of the stone, you will note blade marks on the back side. If this is not clear on some pieces, please consult with your sales rep for clarification.

Q. How can I achieve an eased edge detail on my straight edge MSNSP?
A. Sandpaper: Wrap sandpaper around a wooden block and lightly run along the edge.
Variable speed grinder: Run 150-220 grit sandpaper lightly along the edge.

Q. Will sealing change the slip co-efficiency of my MSNSP?
A. When applied correctly, the sealer will not change the slip co-efficiency of the product, unless purchasing a sealer specifically with the intention of changing the texture.
Please note once the product has met its maximum absorption, any additional liquids may sit on the surface, causing puddles. This can then freeze into ice during the colder temperatures.

Q. Can I get my MSNSP pre-sealed from the factory?
A. No – sealer is applied on site post-installation.

Q. Does sealing my MSNSP with an enhancer make it hotter?
A. Yes – testing is recommended before making the final decision on the type of sealer to use for your space.

Q. Is it necessary to seal my MSNSP?
A. It is not necessary to seal, however, to improve the longevity of your MSNSP, there are multiple solvent-based, penetrating sealers on the market that offer additional protection to your product in regard to staining, acid rain, repelling water, and nature’s elements.
- Different types of sealers will alter the aesthetic of your MSNSP.

Q. How often do I have to seal my MSNSP?
A. This will depend on the client – some clients like to clean and re-seal every year, some clients seal one time and never seal again. Reapplication is based upon natural variables such as traffic, sunlight, and natural elements. On average, you should re-seal every 2-4 years.

Q. Should the stone be grouted or sealed first?
A. Always grout -> clean -> seal.

Q. How can I properly drill a hole into my MSNSP?
A. Use a diamond tip core bit and water.
To specifically drill holes for a pool cover, please ask your sales rep for our construction detail sheet.

Q. Can I use a deicer on my MSNSP?
A. Yes – calcium chloride is recommended.
Q. How can I fill a pitting in my MSNSP?
A.  
1. Crush larger pieces of your MSNSP used on the project into an ultra-fine powder.  
2. Mix the powdered stone with an epoxy.  
3. Add Superior V-Max SV-9 hardener per manufacturer’s instructions.  
4. Fill in pitting with your mix using a putty knife.  
5. Clean off excess surrounding the pit.  
   • Note: The area should be completely clean and dry beforehand.

Q. Can radiant heat be used under my MSNSP?
A. Yes. Any MSNSP will work with radiant heat, no matter the thickness or application.

Q. Can I plow my MSNSP?
A. Use a shovel or snow blower if possible. If a plow is needed, a rubber bottom is recommended.

STEPS TO CLEAN BEFORE SEALING:
DAY ONE:
1. Apply clean concrete, then Pro Grade. Use a soft scrub brush where you have rust or other staining.  
2. Use 200-250° hot water with a 4000 PSI power washer with a surface cleaner.  
3. Clean off dirt/debris with cold water and a spray handle.  
4. Apply polymeric sand where needed – if there is no mortar joint, no polymeric sand is needed.

DAY TWO:
1. The area must be completely dry to apply the sealer. Blow off any leaves, dirt, or debris.  
2. Use a low-pressure hand pump and apply sealer slowly, moving in a circular motion, (such as the Olympic rings).  
3. If the surface is too slippery, a product called “NO SLIP” can be added to the sealer in a separate bucket. These products must be mixed for at least one minute.  
4. We recommend rolling this on, as the sprayer will clog with this mixture.

SEALING / GROUTING:
• Enhancing sealer: This product will enhance the color and rejuvenate the appearance of tumbled, honed, acid-washed, sandblasted, flamed, textured, and other stone surfaces. This creates protection and a finished “wet look.”

• Matte sealer: This product is the original penetrating sealer designed for the protection of all medium to dense porous surfaces. It forms an invisible barrier that is resistant to moisture and stains while allowing vapor to escape. Matte sealers are not a surface coating and will not alter the natural look. This creates protection and a finished “dry look.”

*As a safety precaution, gloves and goggles are recommended whenever working with and installing natural stone.

Disclaimer: Applicable to Marmiro Stones® Products & Suggested Installation Guidelines

The following installation information is provided to assist Marmiro’s customers with installation, maintenance and usage decisions. It is understood that the installation, maintenance and usage employed by each customer is outside the direction and control of Marmiro Stones® and as such, is strictly and completely the choice and responsibility of each customer and their installer. Marmiro Stones® expressly disclaims any and all asserted claims which may arise directly from information contained in this document(s), including but not limited to, loss of rights, materials, personal injury or other potential injury. Marmiro Stones® and its agents and employees are held harmless against any loss, damage, claim, suit, or loss to any property, or violation of any applicable laws or regulations resulting from, or in connection with, the sale, transportation, installation or use of our products by the buyer.
“STUDY NATURE, LOVE NATURE, STAY CLOSE TO NATURE. IT WILL NEVER FAIL YOU.”

- FRANK LLOYD WRIGHT
## RECOMMENDED INSTALLATION METHODS

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<td>Dry Laid on Modified Stone Base for 1 3/16&quot; Pedestrian Installation</td>
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<td>Dry Laid on Modified Stone Base for 2.25&quot; Driveway Installation</td>
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<td>Lobascio System for 1 3/16” Pedestrian Installation</td>
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<td>1 3/16” Permeable Pavement Pedestrian Installation</td>
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<td>2.25” Permeable Pavement Driveway Installation</td>
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<td>Wet Laid Installation</td>
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*Please note • indicates recommended installation type based upon product. If you have any additional questions or concerns please reach out to our team at support@marmiro.com.