MARMIRO STONES®

BY TURAN BEKISOGLU

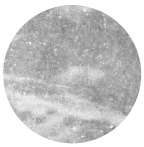
INSTALLATION GUIDELINES

VOLUME 4

Table of CONTENTS

OUR PRODUCTS

MARBLE PAVERS, COPING, & TREADS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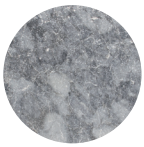
Antiqued


Afyon Cloud®
Sandblasted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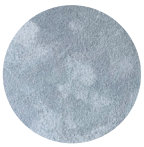
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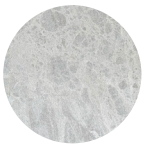
Sandblasted


Carya®
Sandblasted

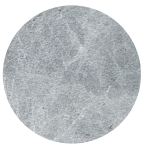

Crema Eda®
Antiqued


Crema Eda®
Sandblasted

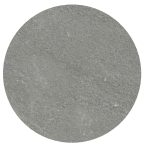

Crema Eda® Rosa
Antiqued


Crema Eda® Rosa
Sandblasted

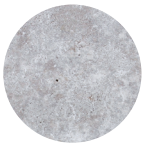

Crema Oliva®
Sandblasted


Orcca®
Vintage

TRAVERTINE AND SANDSTONE PAVERS, COPING, & TREADS


Marmiro® Bluestone
Flamed


Takoma Silver®
Antiqued


Grano®
Antiqued


Avena®
Antiqued

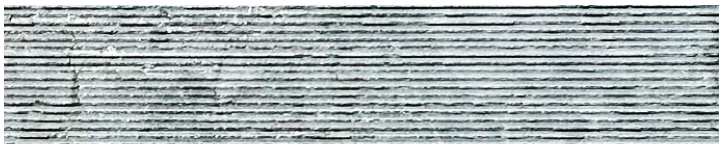

Terra
Antiqued

SCAN ME

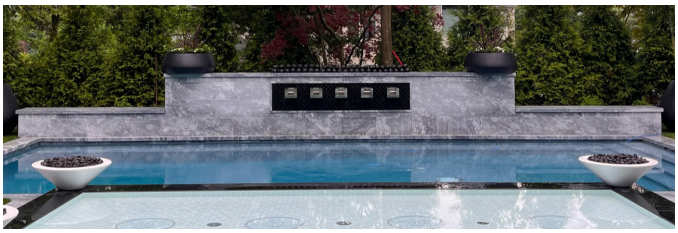
SCAN ME

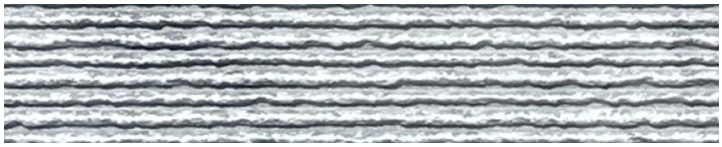
PRODUCT TEXTURES

Sandblasted: A lightly textured surface with modern, straight edges.
Pro Tip: *The rougher surface is the stone's natural top texture and should always be installed facing up.*

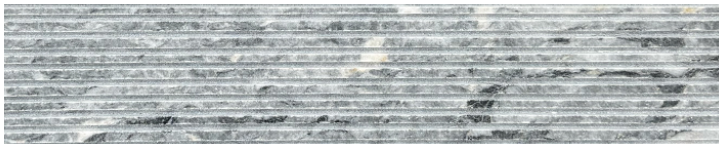


Bamboo: Striated, grooved texture.
Pro Tip: *The rougher surface is the stone's natural top texture and should always be installed facing up.*





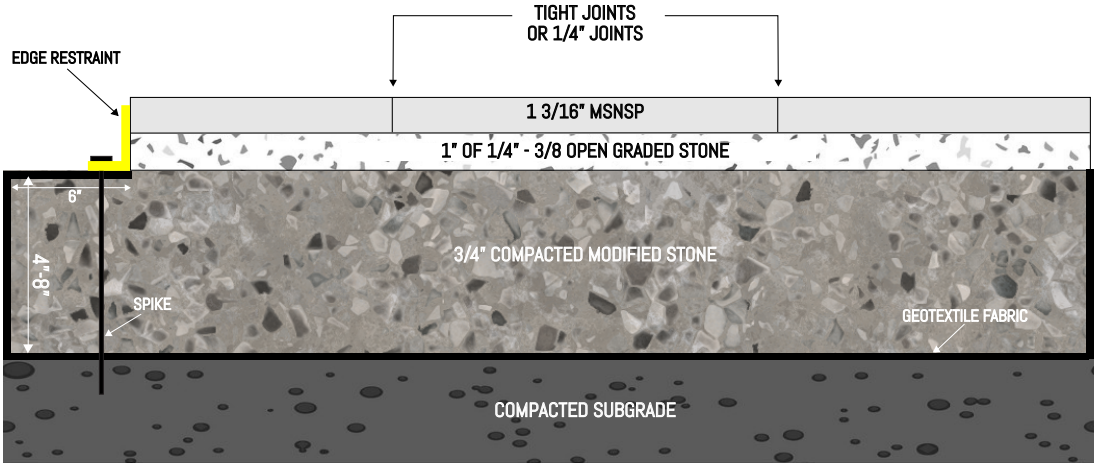
Wave: Uneven and irregular lines that convey a raw and unrefined aesthetic.
Pro Tip: *The rougher surface is the stone's natural top texture and should always be installed facing up.*



Groove: A dimensional and parallel texture for linear look.
Pro Tip: *The rougher surface is the stone's natural top texture and should always be installed facing up.*

DRY LAID ON MODIFIED BASE: 1 3/16”

MSNSP – Marmiro Stones Natural Stone Pavers – Pedestrian Application



WARNING

Installation of material is sign of acceptance.
No returns on open crates, custom orders, & products with custom packaging.
For unique job conditions, soil types and concrete slab reinforcement additional engineering may be needed.
Concrete sand or any additives mixed with sand and screenings hold moisture under Marmiro Stones® Natural Stone Pavers (MSNSP) and can affect the integrity of the stone. They are prohibited from being used as a bedding layer.
Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.

BASE THICKNESS & EXCAVATION DEPTHS PER APPLICATION - RESIDENTIAL

	Soil Type	
Project Type	Sand and/or Gravel	Silts or Clay
Pedestrian	4”-6”	6”-8”
Pedestrian Excavation Depths	6.5” - 8.5”	8.5”-10.5”
Driveway - Light Vehicular	10” - 14”	12” - 18”

*AASHTO – AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

*ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIAL

1) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, sprinkler lines and heads.

c. Excavate soils maintaining a slope of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your top of pavement.

d. Excavation should extend equal to the depth of excavation.
- Example: Base = 6”, Base & excavation should extend 6” past edge of pavement.

e. Depending on your soil type, compaction of your sub grade may be needed while maintaining the slope as mentioned above.

2) GEOTEXTILE

a. Install woven geotextile encapsulating the entire excavated area, including the vertical walls of the soil.

b. Be sure to overlap the geotextile a minimum of 2” in a shingle method that mimics the slope and flow of water.

3) SUBSTRUCTURE - BASE

a. Compact modified stone in 2”-3” lifts with a 4,500 lb. centrifugal force vibratory plate compactor bi-directional to obtain proper density.

b. It is strongly encouraged to make sure to apply water to the modified stone while compacting to ensure proper compaction is achieved. Compacting dry modified stone will not achieve proper compaction.

c. Final elevation of modified stone should be 2-1/4” below finished grade.

d. Substructure should not exceed +- 3/8” tolerance every 10’.

4) SETTING BED

a. Place 1" of the ¼"-3/8" clean stone (AASHTO* #8, AASHTO* #89, AASHTO* #9) for setting bed on top of modified base.

b. The following are not acceptable setting bed materials:

- Concrete Sand
- Mason Sand
- Dry Pack (Mixture of sand and dry laid cement)
- Screenings (A bi product of quarry materials)

►DO NOT use any of the above materials beneath Marmiro Stones® Natural Stone Pavers (MSNSP) as per TCNA and industry recommendations. These materials retain moisture and increase risk of efflorescence or freeze-thaw damage.

c. Set your 1" metal screed rails at an acceptable working width.

d. Screed the setting bed by pulling clean stone along the metal screed rails using an aluminum straight edge.

e. Remove the screed rails, place the setting bed material in the voids, and use a trowel to level with the setting bed.

f. Based on the pattern and job site conditions, choose your starting point that is most practical from the staging of materials.

g. MSNSP can be laid tight or with a ¼" joint depending on the pattern, while maintaining straight lines.

5) EDGE RESTRAINT

a. Remove excess bed material outside of the finished edge.

b. Options: Based on climate

- Low profile plastic or aluminum edging using 10" non-galvanized spikes every 8"-12".
- Mix Crete-Rail™ in bucket. Apply with a trowel according to manufacturer instructions.
- Concrete edge using a poly-modified bedding mortar applying more than halfway up the side of the natural stone paver angled down on a 45-degree through the bottom of the setting bed.

6) FINISHING

a. Jointing material

- Option one: Sweep fine mason sand (ASTM C-144) into joints.
- Option two: Leave the joints empty.
- Option three: Use fine polymeric sand for the joints.

7) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP it is best practice to use string lines and/or laser equipment to maintain square at the starting point and proper pitch.

c. Due to variations in natural stone, it is required to pull from multiple crates.

- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

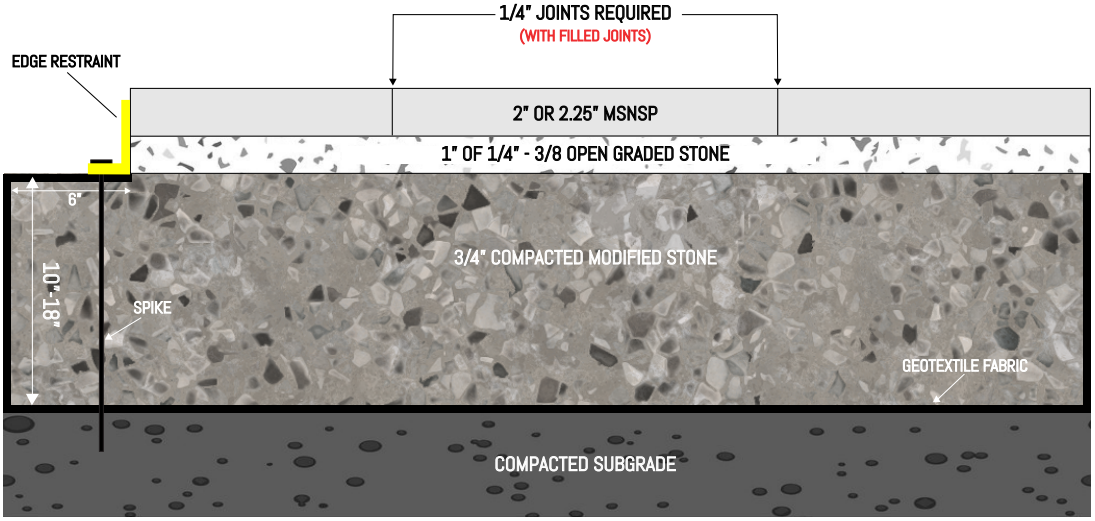
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

f. Sandblasted marble application: Use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

DRY LAID ON MODIFIED BASE: 2”-2.25”

MSNSP – Marmiro Stones Natural Stone Pavers - Light Vehicular Driveway



WARNING

STOP

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No returns on open crates, custom orders, & products with custom packaging.
For unique job conditions, soil types and concrete slab reinforcement additional engineering may be needed.
Concrete sand or any additives mixed with sand and screenings hold moisture under Marmiro Stones® Natural Stone Pavers (MSNSP) and can affect the integrity of the stone. They are prohibited from being used as a bedding layer.
Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.
2”&2.25” MSNSP must be laid with a 1/4” joint using spacers for light vehicular applications.

BASE THICKNESS & EXCAVATION DEPTHS PER APPLICATION - RESIDENTIAL

	Soil Type	
Project Type	Sand and/or Gravel	Silts or Clay
Pedestrian Base Thickness	4”-6”	6”-8”
Pedestrian Excavation Depths	6.5” - 8.5”	8.5”-10.5”
Driveway Base Thickness	10” - 14”	12” - 18”
Light Vehicular Excavation Depths	13” - 17”	15” - 21”

1) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, sprinkler lines and heads.

c. Excavate soils maintaining a slope of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your top of pavement.

d. Excavation should extend equal to the depth of excavation.
   - Example:Base = 6”, Base & excavation should extend 6” past edge of pavement.

e. Depending on your soil type, compaction of your sub grade may be needed while maintaining theslope as mentioned above.

2) GEOTEXTILE

a. Install woven geotextile encapsulating the entire excavated area, including the vertical walls of the soil.

b. Be sure to overlap the geotextile a minimum of 2” in a shingle method that mimics the slope and flow of water.

3) SUBSTRUCTURE - BASE

a. Compact modified stone in 4”-5” lifts with a 10,000 lb. centrifugal force vibratory plate compactor bi-directional to obtain proper density.

b. It is strongly encouraged to make sure to apply water to the modified stone while compacting to ensure proper compaction is achieved. Compacting dry modified stone will not achieve proper compaction.

c. Final elevation of modified stone should be 2-1/4” below finished grade.

d. Substructure should not exceed +- 3/8” tolerance every 10’.

4) SETTING BED

a. Place 1" of the ¼"-3/8" clean stone (AASHTO* #8, AASHTO* #89, AASHTO* #9) for setting bed on top of modified base.

b. The following are not acceptable setting bed materials:
   - Concrete Sand
   - Mason Sand
   - Dry Pack (Mixture of sand and dry laid cement)
   - Screenings (A bi product of quarry materials)

   ►DO NOT use any of the above materials beneath Marmiro Stones® Natural Stone Pavers (MSNSP) as per TCNA and industry recommendations. These materials retain moisture and increase risk of efflorescence or freeze-thaw damage.

c. Set your 1" metal screed rails at an acceptable working width.

d. Screed the setting bed by pulling clean stone along the metal screed rails using an aluminum straight edge.

e. Remove the screed rails, place the setting bed material in the voids, and use a trowel to level with the setting bed.

f. Based on the pattern and job site conditions, choose your starting point that is most practical from the staging of materials.

g. MSNSP **MUST** be laid with a ¼" joint using spacers, maintaining straight lines using strings or lasers. If laid with tight joint point loading will occur resulting in chipping.

5) EDGE RESTRAINT

a. Remove excess bedding material outside of the finished edge.

b. Options: Based on climate
   - Pave Tool's Hybrid HD Edging using a 10" non-galvanized stake installed using the Quick-E-Hammer attached to a hammer drill shank type: SDS Max – 6.9 joules of impact.
   - Mix Crete-Rail™ in bucket. Apply with a trowel according to manufacturer instructions, making sure you are applying 3" past the final pavement.
   - Concrete edge using a poly-modified bedding mortar, applying more than halfway up the side of the natural stone paver angled down on a 45-degree through the bottom of the setting bed.

6) FINISHING

a. Jointing Material
   - Option one: ¼"-3/8" Clean stone (AASHTO* #8, AASHTO* #89, AASHTO* #9).
   - Option two: Use high-quality polymeric sand for joint fill.

7) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.
   - French Pattern – Pull from 2-3 crates for proper blending.
   - Single size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

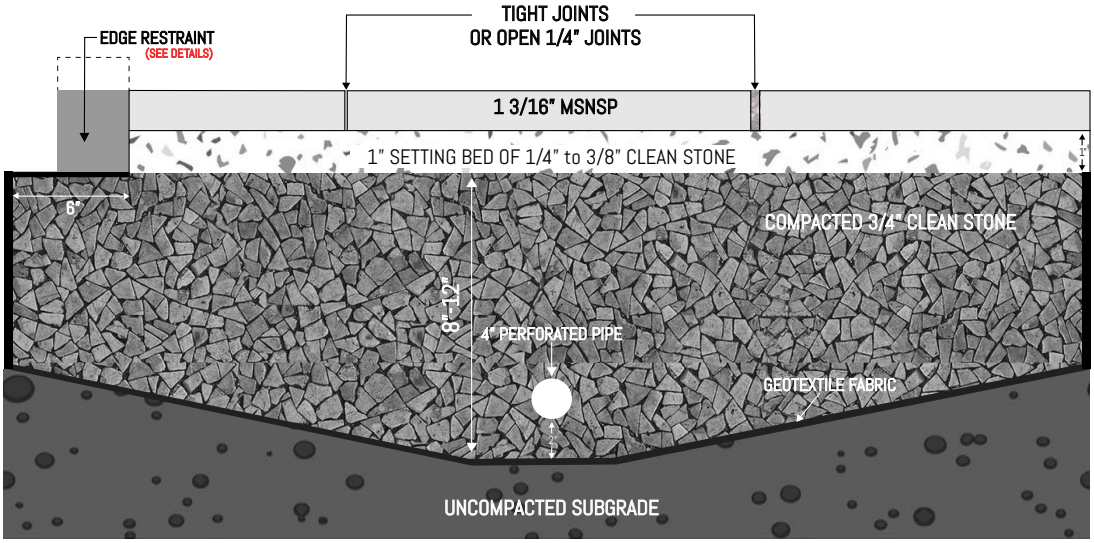
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

f. Sandblasted marble application: Use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

PARTIAL INFILTRATION PERMEABLE PAVEMENT SYSTEM: 1 3/16”

MSNSP – Marmiro Stones Natural Stone Pavers – Pedestrian Application



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Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.

BASE THICKNESS & EXCAVATION DEPTHS PER APPLICATION - RESIDENTIAL

	Soil Type	
Project Type	**Sand and/or Gravel**	**Silts or Clay**
Pedestrian	**4”-6”**	**6”-8”**
Pedestrian Excavation Depths	**10.5” - 12.5”**	**10.5” - 14'.5"**

***MARMIRO STONES NOTE**

Follow local code and the engineer’s hydrologic/structural design. Keep all open graded aggregates and joints free of fines at every stage.

SYSTEM OVERVIEW

Intent: Infiltrate first to sub grade; excess drains via a perforated under drain with a raised outlet for detention. Use this method when moderate native infiltration is warranted or where controlled release is required.

1) SITE PROTECTION

a. Erosion & sediment controls; stockpile stone on fabric/hard pads to prevent fines.

2) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, septic fields, sprinkler lines and heads.

c. Excavate soils maintaining a slope of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your top of pavement.

d. Excavation should extend equal to the depth of excavation.

- Example: Base = 6”, Base & excavation should extend 6” past edge of pavement.

e. Depending on your soil type, compaction of your sub grade may be needed while maintaining the slope as mentioned above.

3) GEOTEXTILE & DRAINPIPE

a. Do not compact sub grade soils. Install woven geotextile, encapsulating the entire excavated area, including the vertical walls of the excavated area using a shingle method overlapping a minimum of 4".

b. Install a 4" perforated pipe with holes facing down to capture excess water. Do not set pipe on bottom. Pipe should be exposed to daylight outside in excavated area to relieve water build up. If daylight is not optional, consider using a catch basin with a grate.

c. Provide clean outs when possible.

4) SUBSTRUCTURE - BASE

a. Install 8"-12" of ASTM #57 (3/4" clean) stone, compacting in 4" lifts using a vibratory plate compactor.

5) SETTING BED

a. Final elevation of base should be 2-1/4" below finished grade.

b. Set your 1" metal screed rails at an acceptable working width.

c. Place the 1/4"-3/8" clean stone (AASHTO #8, AASHTO #89, AASHTO #9) for setting bed on top of #57 base.

- Concrete sand is not recommended under MSNSP.
- Screenings are not recommended under MSNSP.

d. A good practice would be to place screed rails parallel to a fixed finished grade edge.

e. Screeding the setting bed: Pull clean stone along the metal screed rails using an aluminum straight edge.

f. Removing screed rails: Place setting bed material in the voids and use a trowel to level with the setting bed.

g. Based on the pattern and job site conditions, choose your starting point that is most practical from staging of materials.

h. During the installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

6) EDGE RESTRAINT

a. Options:

- Curbing
  - Natural stone edging placed in mortar bed.
  - Poured in place concrete curb.

7) FINISHING

a. Options for joint spacing:

- Tight joint – No material required for joint fill.
- Open joint using 1/4" or 3/8" spacers.
  - Sweep ¼" (or smaller) of clean/washed angular stone for joint fill.

8) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.

- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

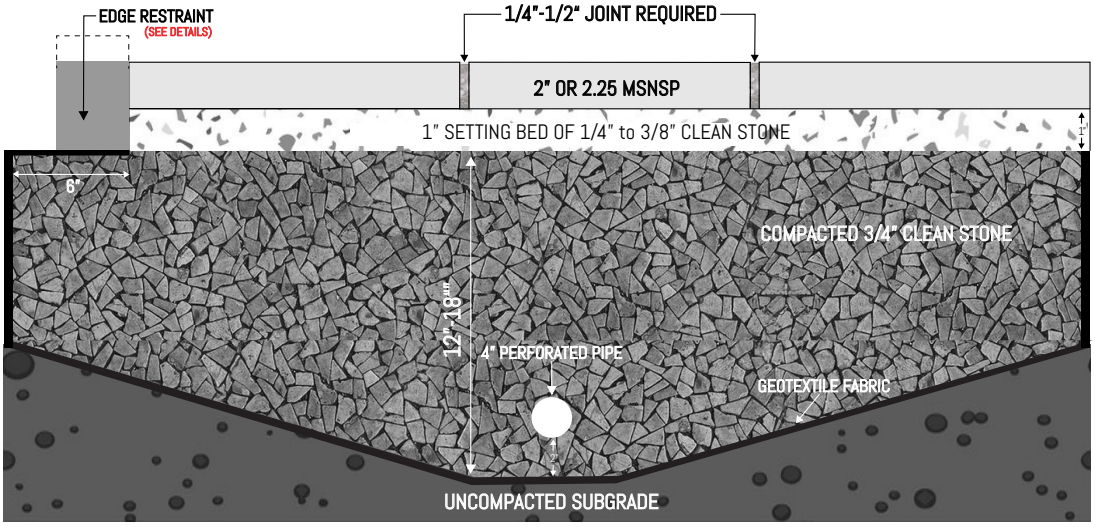
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

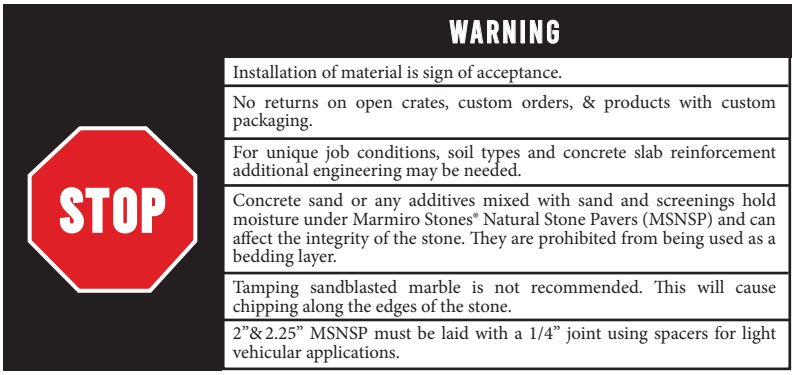
f. Sandblasted marble application: Use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

PARTIAL INFILTRATION PERMEABLE PAVEMENT SYSTEM: 2”-2.25”

MSNSP – Marmiro Stones Natural Stone Pavers - Light Vehicular Application





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Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.
2”&2.25” MSNSP must be laid with a 1/4” joint using spacers for light vehicular applications.

BASE THICKNESS & EXCAVATION DEPTHS PER APPLICATION - RESIDENTIAL		
	Soil Type	
Project Type	Sand and/or Gravel	Silts or Clay
Driveway – Light Vehicular	12”-16”	14”-18”

***MARMIRO STONES NOTE**

Follow local code and the engineer’s hydrologic/structural design. Keep all open graded aggregates and joints free of fines at every stage.

SYSTEM OVERVIEW

Intent: Infiltrate first to sub grade; excess drains via a perforated under drain with a raised outlet for detention. Use this method when moderate native infiltration is warranted or where controlled release is required.

1) SITE PROTECTION

a. Erosion & sediment controls; stockpile stone on fabric/hard pads to prevent fines.

2) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, septic fields, sprinkler lines and heads.

c. Excavate soils maintaining a slope of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your top of pavement.

d. Excavation should extend equal to the depth of excavation.
   - Example: Base = 6”, Base & excavation should extend 6” past edge of pavement.

e. Depending on your soil type, compaction of your sub grade may be needed while maintaining the slope as mentioned above.

3) GEOTEXTILE & DRAINPIPE

a. Do not compact sub grade soils. Install woven geotextile, encapsulating the entire excavated area, including the vertical walls of the excavated using a shingle method overlapping a minimum of 4".

b. Install a 4" perforated pipe with holes facing down to capture excess water. Pipe should be exposed to daylight outside in excavated area to relieve water build up. If daylight is not optional, consider using a catch basin with a grate.

c. Provide clean outs when possible.

4) SUBSTRUCTURE - BASE

a. Install 12"-18" of ASTM #57 (3/4" clean) stone, compacting in 4" lifts using a vibratory plate compactor.

b. If #2 or #3 stone is specified as a sub-base, please follow guidelines of plans provided by the town, engineer, or designer.

5) SETTING BED

a. Final elevation of base should be 2-1/4" below finished grade.

b. Set your 1" metal screed rails at an acceptable working width.

c. Place the 1/4"-3/8" clean stone (AASHTO #8, AASHTO #89, AASHTO #9) for setting bed on top of #57 base.
- Concrete sand is not recommended under MSNSP.
- Screenings are not recommended under MSNSP.

d. Set your 1" metal screed rails at an acceptable working width.

e. A good practice would be to place screed rails parallel to a fixed finished grade edge.

f. Screeding the setting bed: Pull clean stone along the metal screed rails using an aluminum straight edge.

g. Removing screed rails: Place setting bed material in the voids and use a trowel to level with the setting bed.

h. Based on the pattern and job site conditions, choose your starting point that is most practical from staging of materials.

i. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

6) EDGE RESTRAINT

a. Curbing
- Natural stone edging placed in mortar bed
- Poured in place concrete curb.
- Pave Tool's Hybrid HD Edging using a 10" steel (V shaped) stake installed using the Quick-E-Hammer attached to a hammer drill shank type: SDS Max – 6.9 joules of impact.

7) FINISHING

a. Open joint using 1/4" or 3/8" spacers.
- Sweep ¼" (or smaller) of clean/washed angular stone for joint fill.

►All driveway applications using Marmiro Stones® products MUST be laid with joint-using spacers. If product is laid with tight joint, point loading can occur which causes chipping or failure.

8) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.
- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

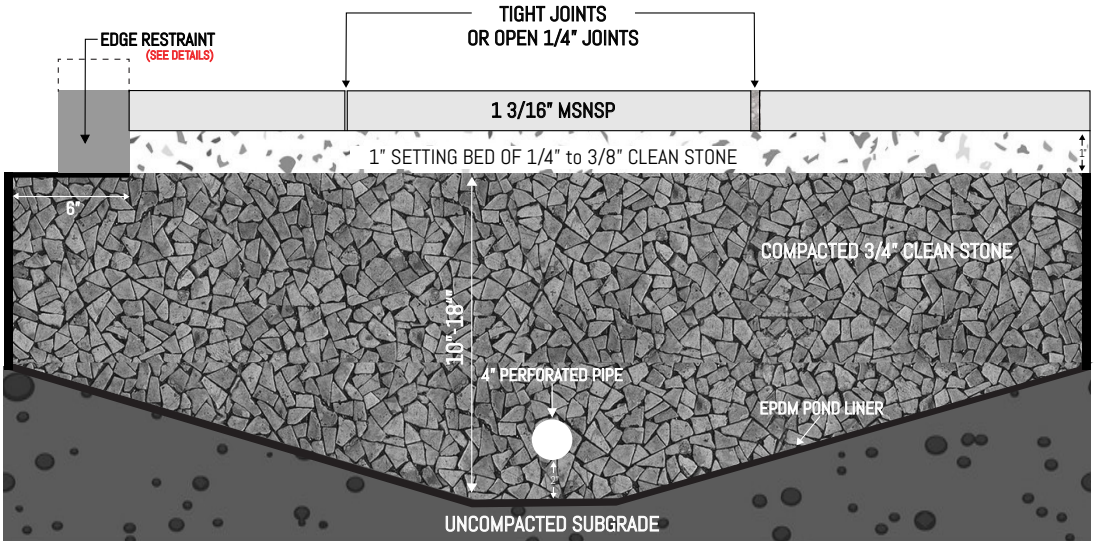
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

f. Sandblasted marble application: Use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

NO INFILTRATION PERMEABLE PAVEMENT SYSTEM: 1 3/16”

MSNSP – Marmiro Stones Natural Stone Pavers – Pedestrian Application



WARNING

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For unique job conditions, soil types and concrete slab reinforcement additional engineering may be needed.
Concrete sand or any additives mixed with sand and screenings hold moisture under Marmiro Stones® Natural Stone Pavers (MSNSP) and can affect the integrity of the stone. They are prohibited from being used as a bedding layer.
Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.

BASE THICKNESS & EXCAVATION DEPTHS PER APPLICATION - RESIDENTIAL

	Soil Type	
Project Type	**Sand and/or Gravel**	**Silts or Clay**
Pedestrian	**4”-6”**	**6”-8”**
Pedestrian Excavation Depths	**10.5” - 12.5”**	**10.5” - 14'.5"**

***MARMIRO STONES NOTE**

Follow local code and the engineer’s hydrologic/structural design. Keep all open graded aggregates and joints free of fines at every stage.

SYSTEM OVERVIEW

Intent: Fully contain stormwater above an impermeable liner; detain and pipe to storm drain for treatment — no discharge to native soils.

Use When: Poor/contaminated soils, high groundwater, or regulations prohibiting infiltration.

1) SITE PROTECTION

a. Erosion & sediment controls; stockpile stone on fabric/hard pads to prevent fines.

2) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, septic fields, sprinkler lines and heads.

c. Excavate soils maintaining a slope of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your top of pavement.

d. Excavation should extend equal to the depth of excavation.

- Example: Base = 6”, Base & Excavation should extend 6” past edge of pavement.

e. Depending on your soil type, compaction of your sub grade may be needed while maintaining the slope as mentioned above.

3) GEOTEXTILE & DRAINPIPE

a. Do not compact sub grade soils. Install woven geotextile, encapsulating the entire excavated area, including the vertical walls of the excavated area using a shingle method overlapping a minimum of 4".

b. Install a 4" perforated pipe with holes facing down to capture excess water. Do not set pipe on bottom. Pipe should be exposed to daylight outside in excavated area to relieve water build up. If daylight is not optional, consider using a catch basin with a grate.

c. Provide clean outs when possible.

4) SUBSTRUCTURE - BASE

a. Install 8"-12" of ASTM #57 (3/4" clean) stone compacting in 4" lifts using a vibratory plate compactor.

5) SETTING BED

a. Final elevation of base should be 2-1/4" below finished grade.

b. Set your 1" metal screed rails at an acceptable working width.

c. Place the 1/4"-3/8" clean stone (AASHTO #8, AASHTO #89, AASHTO #9) for setting bed on top of #57 base.
   - Concrete sand is not recommended under MSNSP.
   - Screenings are not recommended under MSNSP.

d. A good practice would be to place screed rails parallel to a fixed finished grade edge.

e. Screeding the setting bed: Pull clean stone along the metal screed rails using an aluminum straight edge.

f. Removing screed rails: Place setting bed material in the voids and use trowel to level with setting bed.

g. Based on the pattern and job site conditions, choose your starting point that is most practical from staging of materials.

h. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

6) EDGE RESTRAINT

a. Curbing
   - Natural stone edging placed in mortar bed.
   - Poured in place concrete curb.

7) FINISHING

a. Options for joint spacing:
   - Tight joint – No material required for joint fill.
   - Open joint using 1/4" or 3/8" spacers.
     - Sweep ¼" (or smaller) of clean/washed angular stone for joint fill.

8) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.
   - French Pattern – Pull from 2-3 crates for proper blending.
   - Single Size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

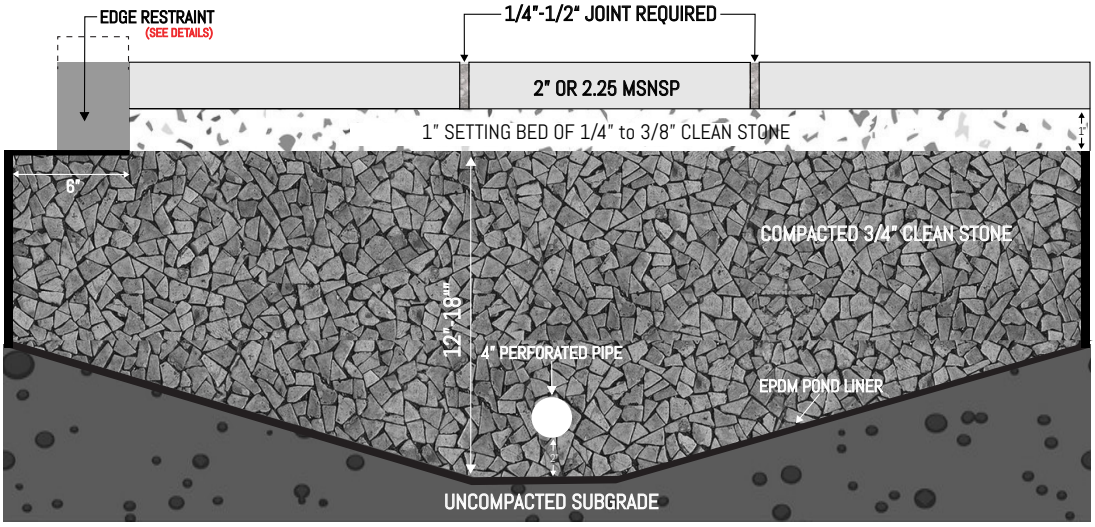
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

f. Sandblasted marble application: Use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

NO INFILTRATION PERMEABLE PAVEMENT SYSTEM: 2"- 2.25"

MSNSP – Marmiro Stones Natural Stone Pavers – Light Vehicular Application



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Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.

BASE THICKNESS & EXCAVATION DEPTHS PER APPLICATION - RESIDENTIAL		
	Soil Type	
Project Type	Sand and/or Gravel	Silts or Clay
Driveway – Light Vehicular	12"- 16"	14"- 18"

***MARMIRO STONES NOTE**

Follow local code and the engineer's hydrologic/structural design. Keep all open graded aggregates and joints free of fines at every stage.

SYSTEM OVERVIEW

Intent: Fully contain stormwater above an impermeable liner; detain and pipe to storm drain for treatment — no discharge to native soils.

Use When: Poor/contaminated soils, high groundwater, or regulations prohibiting infiltration.

1) SITE PROTECTION

a. Erosion & sediment controls; stockpile stone on fabric/hard pads to prevent fines.

2) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, septic fields, sprinkler lines and heads.

c. Excavate soils maintaining a slope of 3/16" per foot to allow for proper drainage. This slope should mimic the slope of your top of pavement.

d. Excavation should extend equal to the depth of excavation.

- Example: Base = 6", Base & excavation should extend 6" past edge of pavement.

e. Depending on your soil type, compaction of your sub grade may be needed while maintaining the slope as mentioned above.

3) GEOTEXTILE & DRAINPIPE

a. Install impermeable (EPDM) pond liner encapsulating the entire excavated area, including the vertical walls of the excavated area using a shingle method, overlapping and sealing seams per manufacturer guidelines.

b. Install a 4" perforated pipe with holes facing down to capture excess water. Pipe should be exposed to daylight outside in excavated area to relieve water build up. If daylight is not optional, consider using a catch basin with a grate.

c. Provide clean outs when possible.

4) SUBSTRUCTURE - BASE

a. Install 12-18" of ASTM #57 (3/4" clean) stone compacting in 4" lifts using a vibratory plate compactor.

b. If #2 or #3 stone is specified as a sub-base, please follow guidelines of plans provided by town, engineer, or designer.

5) SETTING BED

a. Final elevation of base should be 2-1/4" below finished grade.

b. Place the 1/4"-3/8" clean stone (AASHTO #8, AASHTO #89, AASHTO #9) for setting bed on top of #57 base.
- Concrete sand is not recommended under MSNSP.
- Screenings are not recommended under MSNSP.

c. Set your 1" metal screed rails at an acceptable working width.

d. A good practice would be to place screed rails parallel to a fixed finished grade edge.

e. Screeding the setting bed: Pull clean stone along the metal screed rails using an aluminum straight edge.

f. Removing screed rails: Place setting bed material in the voids and use a trowel to level with the setting bed.

g. Based on the pattern and job site conditions, choose your starting point that is most practical from the staging of materials.

h. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

6) EDGE RESTRAINT

a. Curbing
- Natural stone edging placed in mortar bed
- Poured in place concrete curb.
- Pave Tool's Hybrid HD Edging using a 10" steel (V shaped) stake installed using the Quick-E-Hammer attached to a hammer drill shank type: SDS Max – 6.9 joules of impact.

7) FINISHING

a. Open joint using 1/4" or 3/8" spacers.
- Sweep ¼" or smaller of clean/washed angular stone for joint fill.

►All driveway applications using Marmiro Stones® products MUST be laid with joint-using spacers. If product is laid with tight joint, point loading can occur which causes chipping or failure.

8) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.
- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

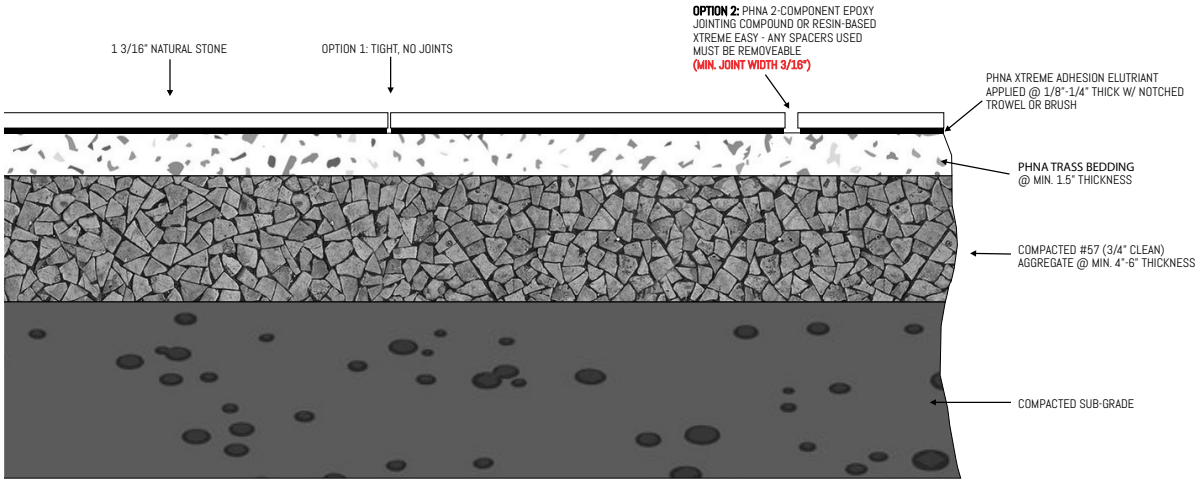
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

f. Sandblasted marble application: Use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

TRASS PERMEABLE PAVEMENT: 1 3/16”

MSNSP – Marmiro Stones Natural Stone Pavers – Pedestrian Application



WHAT IS THE TRASS PAVING SYSTEM?

GFTK develops high-end building chemicals for circulation areas of all kinds. A pioneer in epoxy resin mortar systems, the company set an industry milestone in 1985 with VDW 800—the world’s first epoxy paving jointing mortar, offering simple, quick, eco-friendly, and durable paving solutions. Since then, its product range has expanded to meet every hardscaping need. Today, the PHNA Full Paving System combines three products to form a bound, permeable, and frost-resistant system for pavers, tiles, and natural stone.

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Clean and washed aggregate can only be used for this application. Any fines can slow down the permeability of the system and alter the mix of the Trass System.
Vibratory plate tamping is **NOT** needed for this application. This can alter the Trass bedding layer and crack the natural stone units.

BENEFITS	
✓ Highly permeable	✓ Perfect for porcelain installations
✓ Freeze-Thaw resistant	✓ Wet-Laid permeable system
✓ No efflorescence	✓ Acts as a structural slab
✓ Pedestrian and heavy vehicular rated	✓ Creates a monolithic system

1) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, septic fields and sprinkler lines and heads.

c. Dig soils to depth between 9”-12”, maintaining a minimum slope of 1/8” to a maximum of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your final elevation.

d. Depending on your soil type, compaction of your sub grade may be needed while maintaining the slope as mentioned above.

2) GEOTEXTILE & DRAINPIPES

a. Install woven geotextile, encapsulating the entire excavated area, including the vertical walls of the soil.

b. Be sure to overlap the geotextile a minimum of 2” in a shingle method that mimics the slope and flow of water.

c. Install a 4” perforated pipe with holes facing down to capture excess water. Pipe should be exposed to daylight outside the excavated area to relieve water build up. If daylight is not optional, consider using a catch basin with a grate.

3) SUBSTRUCTURE - BASE

a. Install 6”- 8” of ASTM #57 (3/4” clean) stone, compacting using a vibratory plate compactor in both directions.

4) SETTING BED

a. PHNA Xtreme Trass Bedding Compound (VDW 480)
- Use 1/8”-3/8” clean stone aggregate (AASHTO #9, AASHTO #89, AASHTO #8, AASHTO #78) for setting bed on top of #57 base.
- A cement mixer is highly recommended to mix the aggregate and Trass bedding compound for fast and easy mixing.
- Mixing ratio should be a maximum of 1:4 to a minimum of 1:6 (Trass: Aggregate)

(1) Ratios
- 1:4 = One 55 lb. bag of Trass bedding mortar (VDW 480) to four five-gallon buckets of aggregate.
- 1:5 = One 55lb. bag of Trass bedding mortar (VDW 480) to five five-gallon buckets of aggregate.
- 1:6 = One 55lb. bag of Trass bedding mortar (VDW 480) to six six-gallon buckets of aggregate.

(2) Add 2-3 liters (3/4 gallon) of clean water in cement mixer, then add aggregate and 75% of the Trass bedding mortar - in that order.

(3) While cement mixer is turning, SLOWLY add remaining water of an estimated eight additional liters, (2 gallons) totaling 11 liters, (2.9 gallons) and the remaining 25% of the Trass bedding mortar.
*NOTE- if aggregate is wet, the amount of water needed may be less depending on saturation.

(4) Mix until it becomes earth-moist for a total mixing time of 4-5 minutes, the mortar is slightly shiny, and can be formed into a loose ball.

(5) It is recommended to use the entire bag of bedding compound when possible.

b. Application
- Apply the mixed bedding mortar manually to a 1.5" thickness, using screed rails for pedestrian traffic only. (Thicker bedding layer needed for light vehicular loads).
- Screed only in small working areas, as you do not want the bedding layer to dry.
*NOTE- If exposed bedding layer starts to dry, lightly mist area to keep moist.
- Mix the Xtreme Adhesion Elutriant (VDW 495) in a five-gallon bucket with a mixing paddle. Mix to the consistency of typical mortar.
- Apply the Xtreme Adhesion Elutriant with a 1/4” notched trowel to the back of the stone, making sure there is at least 95% coverage.
- Remove excess Elutriant from all sides and edges of stone before laying the product in place.

5) FINISHING

a. Jointing material
- Option one: Sweep fine masons sand (ASTM C-144) into joints.
- Option two: Leave the joints empty.

6) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.
- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

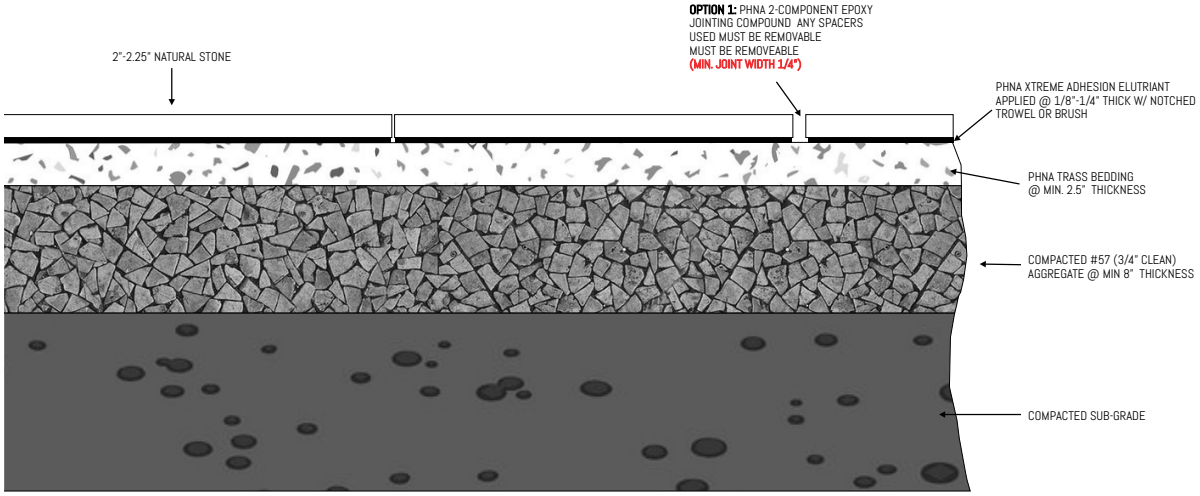
d) Vibratory plate compaction equipment is NOT needed for the finished surface. It is only needed for the base layer in this application.

e) For all stone types, use a white non-marking mallet to set the stones.

f) Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

TRASS PERMEABLE PAVEMENT: 2”-2.25”

MSNSP – Marmiro Stones Natural Stone Pavers – Light Vehicular Application



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Clean and washed aggregate can only be used for this application. Any fines can slow down the permeability of the system and alter the mix of the Trass System.
Vibratory plate tamping is **NOT** needed for this application. This can alter the Trass bedding layer and crack the natural stone units.

BENEFITS	
✓ Highly permeable	✓ Perfect for porcelain installations
✓ Freeze-Thaw resistant	✓ Wet-Laid permeable system
✓ No efflorescence	✓ Acts as a structural slab
✓ Pedestrian and heavy vehicular rated	✓ Creates a monolithic system

1) EXCAVATION

a. Please be sure to call 811 or your local utility companies to ensure utility lines are marked correctly before any excavation has begun.

b. If lines are found, please take proper precautions with the customer to ensure utility lines will not be disturbed. This includes, but is not limited to, septic fields and sprinkler lines and heads.

c. Dig soils to depth between 9”-12”, maintaining a minimum slope of 1/8” to a maximum of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your final elevation.

d. Depending on your soil type, compaction of your sub grade may be needed while maintaining the slope as mentioned above.

2) GEOTEXTILE & DRAINPIPES

a. Install woven geotextile, encapsulating the entire excavated area including the vertical walls of the soil.

b. Be sure to overlap the geotextile a minimum of 2” in a shingle method that mimics the slope and flow of water.

c. Install a 4” perforated pipe with holes facing down to capture excess water. Pipe should be exposed to daylight outside the excavated area to relieve water build up. If daylight is not optional, consider using a catch basin with a grate.

3) SUBSTRUCTURE - BASE

a. Install a minimum of 8” of ASTM #57 (3/4” clean) stone, compacting using a vibratory plate compactor in both directions.

4) SETTING BED

a. PHNA Xtreme Trass Bedding Compound (VDW 480)

- Use 1/8”-3/8” clean stone aggregate (AASHTO #9, AASHTO #89, AASHTO #8, AASHTO #78) for setting bed on top of #57 base.
- A cement mixer is highly recommended to mix the aggregate and Trass bedding compound for fast and easy mixing.
- Mixing ratio should be a maximum of 1:4 to a minimum of 1:6 (Trass: Aggregate)

(1) Ratios
- 1:4 = One 55lb. bag of Trass bedding mortar (VDW 480) to four five- gallon buckets of aggregate

(2) Add 2-3 liters (3/4 gallon) of clean water in cement mixer, then add aggregate and 75% of the Trass bedding mortar - in that order.

(3) While cement mixer is turning, SLOWLY add remaining water of an estimated eight additional liters, (2 gallons) totaling 11 liters, (2.9 gallons) and the remaining 25% of the Trass bedding mortar.
*NOTE- If aggregate is wet, the amount of water needed may be less depending on saturation.

(4) Mix until it becomes earth-moist for a total mixing time of 4-5 minutes, the mortar is slightly shiny, and can be formed into a loose ball.

(5) It is recommended to use the entire bag of bedding compound when possible.

b. Application

- Apply the mixed bedding mortar manually at a 2.5" thickness, using screed rails for light vehicular traffic only.
- Minimum ¼” joint must be applied to entire application in vehicular application.
- Screed only in small working areas as you do not want the bedding layer to dry.
*NOTE - If exposed bedding layer starts to dry, lightly mist area to keep moist.
- Mix Xtreme Adhesion Elutriant (VDW 495) in a five-gallon bucket with a mixing paddle. Mix to the consistency of typical mortar.
- Apply the Xtreme Adhesion Elutriant with a 1/4” notched trowel to the back of the stone, making sure there is at least 95% coverage.
- Remove excess Elutriant from all sides and edges of stone before laying the product in place.

5) FINISHING

a. Jointing material

- Apply the two-component epoxy jointing compound (Xtreme Easy VDW 840 Plus) in the minimum ¼” joint -please be sure all spacers are removed first.
- Follow manufacturer's instructions.

6) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.

- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

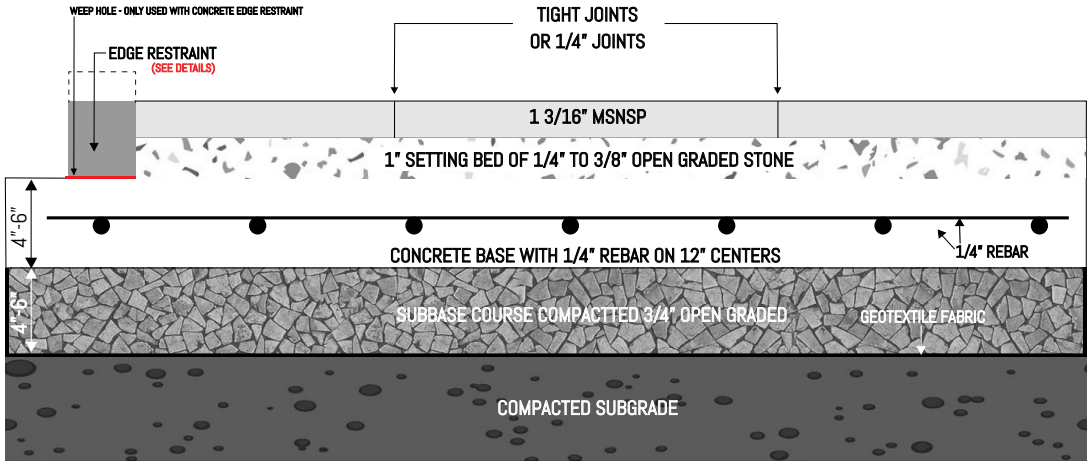
d) Vibratory plate compaction equipment is NOT needed for the finished surface. It is only needed for the base layer in this application.

e) For all stone types, use a white non-marking mallet to set the stones.

f) Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

LOBASCIO SYSTEM: 1 3/16”

MSNSP – Marmiro Stones Natural Stone Pavers – Pedestrian Application



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Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.

1) SITE PREPARATION & EXCAVATION

a. Call Before You Dig
- Always contact 811 or your local utility locating service to mark underground utilities before any excavation. Include discussions with the client about irrigation lines, drainage, and sprinkler heads.

b. Excavation & Slope
- Excavate to a depth of 10.5”–12.5”, accounting for all layers, and maintaining a consistent slope of 3/16” per foot away from structures for effective drainage. This slope must be consistent from sub grade to final grade.

c. Sub Grade Preparation
- Compact native sub grade soil using a vibratory plate compactor to achieve a uniform, stable base.
- Maintain slope throughout compaction.
- Install a woven geotextile fabric, fully encapsulating the excavated area, including vertical sidewalls, to stabilize soil and prevent sub-base migration. **(Refer to Diagram)**

d. Sub Base Installation
- Place and compact a minimum of 4” of ASTM #57 stone (3/4" clean angular stone) as the sub-base layer.

e. Concrete Slab (Bonded or Unbonded Systems)
- Pour a 3500-PSI concrete slab, reinforced with ½” rebar on 12” centers.
- For heavy-duty applications, a minimum thickness of 6” is recommended. For pedestrian applications, 4” may be sufficient.
- Finish the concrete with a slope matching final grade: 3/16” per foot minimum.

2) SETTING BED & PAVER INSTALLATION

a. Elevation Allowance
- Ensure the finished concrete surface sits 2-1/4" below finished grade to accommodate setting bed and stone thickness.

b. Setting Bed Material
- Use clean, angular stone, such as AASHTO #8, #89, #9 (1/8"–3/8" stone) for the setting bed.
- ►DO NOT use concrete sand or stone screenings beneath Marmiro Stones Natural Stone Pavers (MSNSP), as per TCNA and industry recommendations. These materials retain moisture and increase risk of efflorescence or freeze-thaw damage.

c. Screed Rail Setup
- Use 1" metal screed pipes set to working widths and aligned with finished elevation.
- Set screed rails parallel to a fixed reference line or hard edge for consistent layout. **(See Diagram)**

d. Screeding the Bed
- Screed the bedding layer using a straight aluminum edge.
- After screeding, remove the rails and fill voids with additional setting stone. Level with a trowel.

3) STONE INSTALLATION

a. Layout & Staging
- Select your starting point based on pattern and logistics.
- Use string lines or laser alignment to ensure square, straight runs. Maintain consistent joint spacing across the project.

b. Joint Spacing
- MSNSP can be installed butt-jointed (tight) or with a 1/4" joint, depending on the aesthetic and pattern.
- Use spacers if uniform joint width is required.

c. Blending & Aesthetic Consistency
- Due to natural variation in stone, blend from multiple crates during installation to ensure color and texture consistency.

d. Cutting
- Use a wet-cut diamond blade saw for all modifications. Wet cutting reduces dust, prevents chipping, and creates cleaner edges.

e. Setting & Tapping
- Use a white non-marking rubber mallet to set travertine and marble – this is especially important for tight joint applications.
- Avoid dark-colored mallets to prevent marking or staining.

f. Edge Restraint
- Natural stone edging placed in mortar bed.
  - ⊙ Weep holes should be placed through edge restraint to allow water to escape.
- Crete-Rail™, as it allows for water permeability and prevents shifting or heaving.

3) STONE INSTALLATION

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.
- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

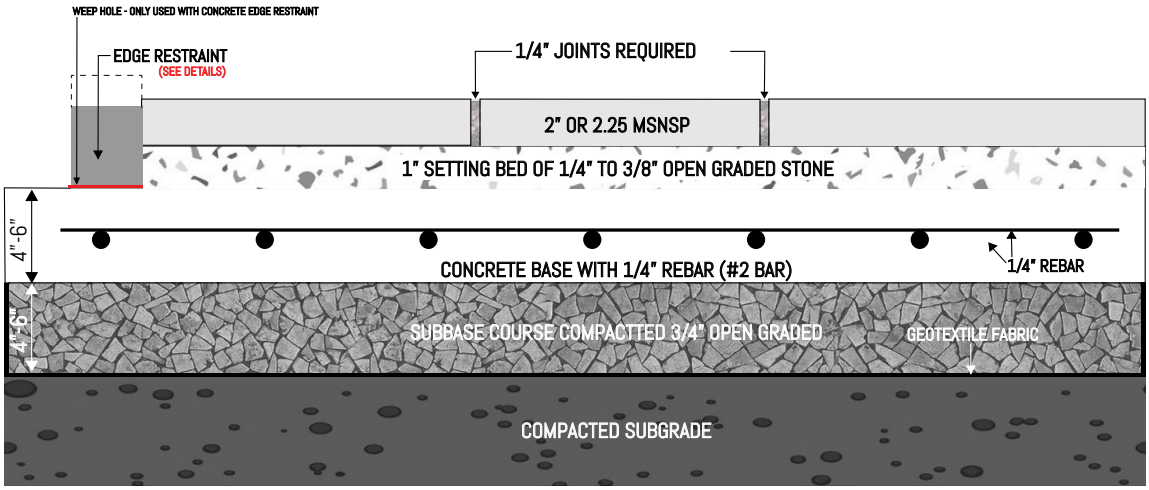
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

f. Sandblasted marble application: use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

LOBASCIO SYSTEM: 2”- 2.25"

MSNSP – Marmiro Stones Natural Stone Pavers – Light Vehicular Application



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Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.

1) SITE PREPARATION & EXCAVATION

a. **Call Before You Dig**
- Always contact 811 or your local utility locating service to mark underground utilities before any excavation. Include discussions with the client about irrigation lines, drainage, and sprinkler heads.

b. **Excavation & Slope**
- Excavate to a depth of 10.5”–12.5”, accounting for all layers, and maintaining a consistent slope of 3/16” per foot away from structures for effective drainage. This slope must be consistent from sub grade to final grade.

c. **Sub Grade Preparation**
- Compact native sub grade soil using a vibratory plate compactor to achieve a uniform, stable base.
- Maintain slope throughout compaction.
- Install a woven geotextile fabric, fully encapsulating the excavated area, including vertical sidewalls, to stabilize soil and prevent sub-base migration. **(Refer to Diagram)**

d. **Sub Base Installation**
- Place and compact a minimum of 4” of ASTM #57 stone (3/4" clean angular stone) as the sub-base layer.
- This should extend ½ the total depth of the bass and sub-base outside the finished edge.
  - Example: 4” sub-base + 6” base = 10”. 5” should extend beyond the finished width.

e. **Concrete Slab (Bonded or Unbonded Systems)**
- Pour a 3500-PSI concrete slab, reinforced with ½” rebar on 12” centers.
- For heavy-duty applications, a minimum thickness of 6” is recommended.
- Finish the concrete with a slope matching final grade: 3/16” per foot minimum.

2) SETTING BED & PAVER INSTALLATION

a. Elevation Allowance
- Ensure the finished concrete surface sits 2-1/4” below finished grade to accommodate setting bed and stone thickness

b. Setting Bed Material

- Use clean, angular stone, such as AASHTO #8, #89, #9 (1/8”–3/8” stone) for the setting bed.
- ►DO NOT use concrete sand or stone screenings beneath Marmiro Stones Natural Stone Pavers (MSNSP), as per TCNA and industry recommendations. These materials retain moisture and increase risk of efflorescence or freeze-thaw damage.

c. Screed Rail Setup

- Use 1” metal screed pipes set to working widths and aligned with finished elevation.
- Set screed rails parallel to a fixed reference line or hard edge for consistent layout. **(See Diagram)**

d. Screeding the Bed

- Screed the bedding layer using a straight aluminum edge.
- After screeding, remove the rails and fill voids with additional setting stone. Level with a trowel.

3) STONE INSTALLATION

a. Layout & Staging

- Select your starting point based on pattern and logistics.
- Use string lines or laser alignment to ensure square, straight runs. Maintain consistent joint spacing across the project.

b. Joint Spacing

- MSNSP MUST be laid with a 1/4” - 3/8” joint using spacers maintaining straight lines. If laid with tight joint, point loading and chipping will occur.
- Use spacers to maintain consistent joint width.

c. Blending & Aesthetic Consistency

- Due to natural variation in stone, blend from multiple crates during installation to ensure color and texture consistency.

d. Cutting

- Use a wet-cut diamond blade saw for all modifications. Wet cutting reduces dust, prevents chipping, and creates cleaner edges.

e. Setting & Tapping

- Use a white non-marking rubber mallet to set travertine and marble – this is especially important for tight joint applications.
- Avoid dark-colored mallets to prevent marking or staining.

f. Edge Restraint

a. Options

- Natural stone edging placed in mortar bed.
  - ◎ Weep holes should be placed through edge restraint to allow water to escape.
- Poured in place concrete curb
  - ◎ Weep holes should be placed through edge restraint to allow water to escape.
- Crete-Rail™ (or similar), as it allows for water permeability and prevents shifting or heaving.

4) BEST PRACTICES

a. A good practice would be to place screed rails parallel to a fixed finished grade edge.

b. During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.

c. Due to variations in natural stone, it is required to pull from multiple crates.

- French Pattern – Pull from 2-3 crates for proper blending.
- Single Size – Pull from 4 crates for proper blending.

d. Antiqued travertine application: Use a vibratory plate compactor with rubber mat or vibratory roller.

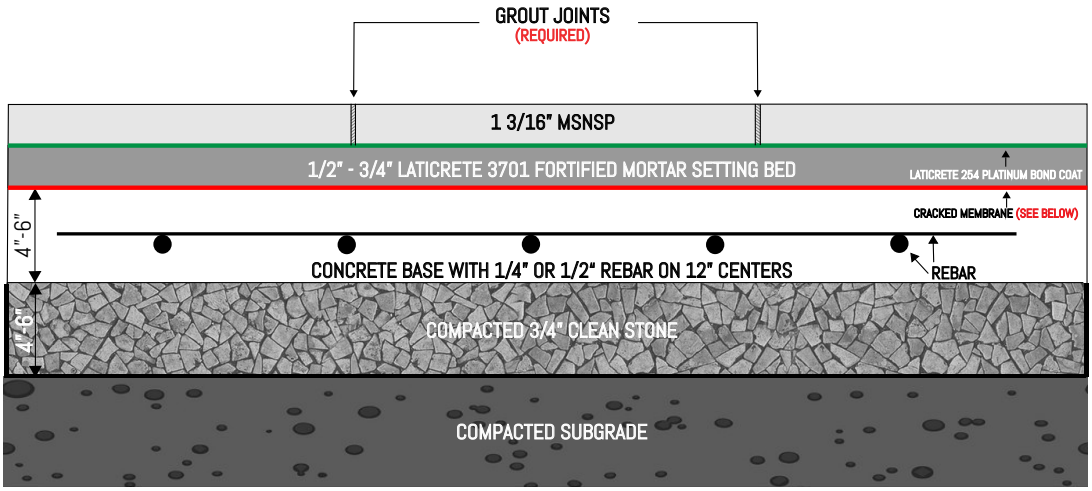
e. Antiqued & Vintage marble application: Use a vibratory plate compactor with rubber mat or vibratory roller.

f. Sandblasted marble application: use a white non-marking mallet to set the stones.

g. Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.

WET LAID: 1 3/16"

MSNSP – Marmiro Stones Natural Stone Pavers – Pedestrian



WARNING

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For unique job conditions, soil types and concrete slab reinforcement additional engineering may be needed.
Concrete sand or any additives mixed with sand and screenings hold moisture under Marmiro Stones® Natural Stone Pavers (MSNSP) and can affect the integrity of the stone. They are prohibited from being used as a bedding layer.
Tamping sandblasted marble is not recommended. This will cause chipping along the edges of the stone.

1) SITE PREPARATION & EXCAVATION

a. **Call Before You Dig**
- Always contact 811 or your local utility locating service to mark underground utilities before any excavation. Include discussions with the client about irrigation lines, drainage, and sprinkler heads.
- Dig soils to depth between 10.5” - 12.5” maintaining a slope of 3/16” per foot to allow for proper drainage. This slope should mimic the slope of your final elevation.

b. **Excavation & Slope**
- Excavate to a depth of 10.5”–12.5”, accounting for all layers, and maintaining a consistent slope of 3/16” per foot away from structures for effective drainage. This slope must be consistent from sub grade to final grade.

c. **Sub Grade Preparation**
- Compact native sub grade soil using a vibratory plate compactor to achieve a uniform, stable base.
- Maintain slope throughout compaction.
- Install a woven geotextile fabric, fully encapsulating the excavated area, including vertical sidewalls, to stabilize soil and prevent sub-base migration.

d. **Sub Base Installation**
- Place and compact a minimum of 4” of ASTM #57 stone (3/4" clean angular stone) as the sub-base layer.

e. **Concrete Slab (Bonded or Unbonded Systems)**
- Pour a 3500-PSI concrete slab, reinforced with ½” rebar on 12” centers.
- For heavy-duty applications, a minimum thickness of 6” is recommended; for pedestrian applications, 4” may be sufficient.
- Finish the concrete with a slope matching final grade: 3/16” per foot minimum.

2) SETTING BED & PAVER INSTALLATION

a. Elevation Allowance
- Ensure the finished concrete surface sits 2-1/4" below finished grade to accommodate setting bed and stone thickness

3) SETTING BED MATERIAL

a. Final elevation of concrete base should be 2" below finished grade.

b. Surface Preparation
- All surfaces should be between 40°F (4°C) and 90°F (32°C) and structurally sound, clean and free of all dirt, oil, grease, laitance, paint, concrete sealers, or curing compounds. Dry, dusty concrete slabs or masonry should be dampened and excess water swept off. Installation may be made on a damp surface.

c. Mortar Setting Bed (Minimum ½" – 1" Maximum)
- Laticrete® 3701 Fortified Mortar

(1) Use approximately 4.8-5.0 qts (4.5-4.7 L) of water for 25 lbs. (11.3 kg) of powder. To mix smaller quantities, use 3.7 parts powder to 1 part water.

(2) Allow mortar to slake for 5 minutes. Remix without adding any more water or powder. During use, stir occasionally to keep mix fluffy. Do not temper with water.

(3) Due to the fiber-reinforced formula, back buttering the stone is not required.

- Bonded Mortar Bed - Installation
  - Before placing mortar, apply a slurry bond coat made from 254 Platinum. While the slurry bond coat is wet, spread the mortar and compact well. If placing tile immediately, apply a slurry bond coat, made from 254 Platinum in the mortar. While the slurry bond coat is wet and sticky, place the tile and beat in well.

d. Expansion Joint
- If expansion joints are present, they shall be provided through the tile work from all construction or expansion joints in the substrate. Do not cover expansion joints with mortar.
- Based on the pattern and job site conditions, choose your starting point that is most practical from staging of materials.
  - During installation of MSNSP, it is best practice to use string lines or laser equipment to maintain square at the starting point.
- Be sure to remove excess bedding mortar along exposed edges before ending the day.
- MSNSP must be installed with at least 1/8" to 1/4" joint using spacers depending on the pattern while maintaining straight lines.
- Due to variations in natural stone, it is required to pull from multiple crates
- Perform all cutting using a diamond blade. Cutting wet can provide a smoother cut and may decrease chipping on MSNSP.
- ONLY use a white non-marking mallet to set the stones.
- Grouting the joints is required for all wet laid applications.
  - Grout installation can be done after a minimum of 24 hours curing time at 70°F.
  - Laticrete® PERMACOLOR® Grout (1/8"- 1/4" Joint)

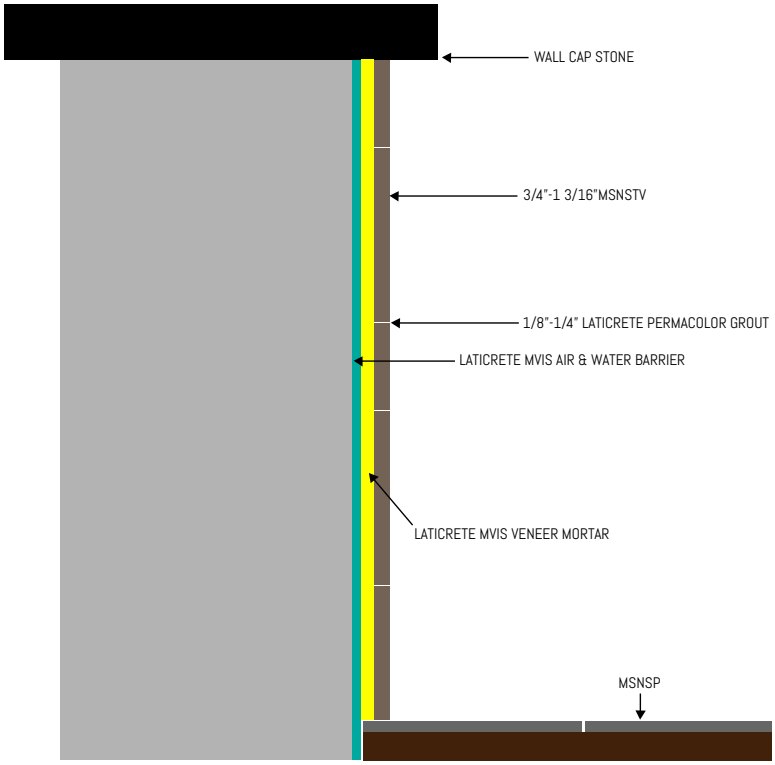
(1) Use approximately 2.4–2 .6 quarts (2.3 L–2.5 L) of clean potable water for 25 lbs. (11.3 kg) of PERMACOLOR® grout. Place water in a clean five-gallon mix bucket and add grout powder. Mix with a slow speed drill mixer (300 rpm) for one minute.

(2) Clean tile surface with a damp sponge. Spread with a sharp, firm rubber grout float or wall float for narrow wall joints. To remove excess grout, hold the float at a 90° angle and pull it at a 45° angle diagonally across the joints to avoid pulling out the material.
*Note - If the grout begins to stiffen during installation, remix with drill mixer for 10–15 seconds. Do not add more water.

(3) Begin initial cleaning by lightly wiping down entire area to be cleaned with a damp sponge. Wash with a damp sponge (not wet). Work diagonally toward the joints. Allow to dry three hours at 70°F (warmer days will have a faster dry time). For second cleaning, use a damp sponge or dry cloth to remove remaining grout haze.

THIN VENEER WALL APPLICATION (CONCRETE CAST-IN PLACE WALL)

MSNSTV - Marmiro Stones Natural Stone Thin Veneer



WARNING

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These requirements align with NCMA/MVMA, the Natural Stone Institute, TMS 402/602, ICC-ES, and key ASTM/ANSI standards. Always follow local code and the project engineer's direction.
Epoxy mesh-backed stone is used to increase the strength of the stone for shipping. All epoxy mesh-backed veneer should be removed with a grinder before installation.
Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of the stone without removal of epoxy meshed-back stone for installation on a concrete wall.

***MSNSTV - MARMIRO STONES NATURAL STONE THIN VENEER**

CONCRETE CAST-IN PLACE

1) SUBSTRATE PREP

a. Concrete must be 28-day cured, sound, clean, and free of form oils/cures/paints. Mechanically abrade dense/steel-troweled or contaminated surfaces, (industry's best practice).

b. Optional, but recommended for bulk-water and crack isolation: Apply Laticrete® MVIS™ Air & Water Barrier to the prepared concrete per Laticrete® DS 661.0; mesh/treat transitions.

c. Optional Metal Lath
- If using metal lath method, please be sure to use galvanized metal lath using corrosive resistant anchors.

d. Apply a scratch coat over lath using Laticrete® 3701 Fortified Mortar Bed
- *Note - On clean, sound concrete/CMU, Laticrete® generally promotes direct-bond Laticrete® MVIS installations (no lath) with their mortars; lath/scratch is an alternative when the wall is contaminated or can't be adequately prepared.

2) SETTING MORTARS (SELECT PER SUBSTRATE / CONDITIONS)

- Apply One of the following mortars based on application:
  - Laticrete® MVIS™ Veneer Mortar (polymer-fortified, non-sag).
  - Laticrete® MVIS™ Hi-Bond Veneer Mortar (high-bond, exterior, long open time).
  - Laticrete® 254 PLATINUM™ (alternative for dense concrete/critical bonds).

3) SETTING THE STONE

- Use one of the following Laticrete® setting mortars (mix with water only; follow DS specs):
  - MVIS™ Veneer Mortar (polymer-fortified, non-sag) or MVIS™ Hi-Bond Veneer Mortar for high-bond, exterior work.
  - For exceptionally dense/smooth concrete, 254 PLATINUM™ is an approved alternative. This should be used for water applications.

    ►Trowel a full bed and back-butter each unit to achieve complete coverage; beat in. (ASTM C1780)

4) EPOXY-BACKED STONE

Choose one of these options below:

a. Laticrete® LATIPOXY® 300
- Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of stone to concrete wall.
- Mixing: Pour LATAPOXY® 300 Adhesive Part A and Part B into a clean mixing pail and mix thoroughly. Add LATAPOXY® 300 Part C Filler Powder and mix to a smooth, trowelable consistency. Mortar is ready for use immediately after mixing.
- Application: Apply mortar to the substrate with the flat side of the trowel, pressing firmly to work into surface. Comb on additional mortar with the notched side.

b. Remove back mesh with a grinder.
- Then proceed using one of the mortars listed in #3 above.

5) MORTAR JOINT OPTIONS

a. Place MSNSTV (typical is 4" & 6" height material) with no mortar joint, creating a tight fit.

b. MSNSTV 3"/6"/9" system is designed for a 3/8" grout joint.
- Be sure to use spacers to maintain consistent joint spacing.
- Before starting to grout, remove spacers and debris in grout joints and remove dust and dirt using a wet sponge. Do not leave water sitting in joints.
- Mixing: Use approximately 2.4–2.6 quarts (2.3 L–2.5 L) of clean potable water for 25 lbs. (11.3 kg) of PERMACOLOR® Grout. Place water in a clean mixing container and add grout powder. Mix with a slow speed drill mixer (300 rpm) for one minute. Wait for five minutes and remix with drill for one minute.
- Apply: Using a grout bag, apply grout to joints filling completely. Use a 3/8" flat slicker jointer or jointing tool to give a concave look.
- Cleaning: Begin initial cleaning by lightly wiping down entire area to be cleaned with a damp sponge. Wash with a damp sponge (not wet). Work diagonally toward the joints. Allow to dry three hours at 70°F, (warmer days will have a faster dry time). For second cleaning, use a damp sponge or dry cloth to remove remaining grout haze.

6) BEST PRACTICES

a. Base clearances - Maintain clearances to shed water: Typically, 4" above earth, 2" above paved, ½" above walking surfaces, sharing the same foundation.

b. Use MSNSTV: Pull from multiple crates for blending. Do not install saturated/frozen stone.

c. Exterior installations should target essentially 100% contact with tight edges; avoid "center void doughnuts" aka: picture framing.

d. Follow product temperature limits: Protect from freezing, rapid drying, or direct rain until cured.

e. Use polymer-modified mortars for exterior wall applications.

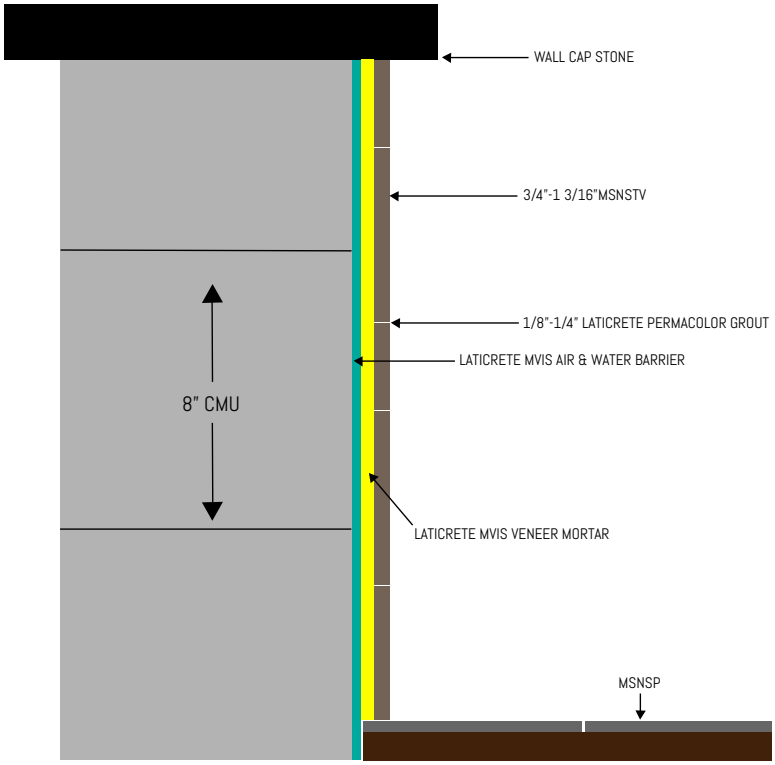
f. Do not bridge structural/expansion joints with mortar or stone; continue the joint through the veneer with backer-rod & sealant.

g. Do not rely on a thin "dot and dab." Full coverage is required. Periodically pull a piece to check.

h. Do not set stone in freezing temperatures, on saturated substrates, or in driving rain—follow mortar product temperature/cure limits.

THIN VENEER WALL APPLICATION (CMU WALL)

MSNSTV – Marmiro Stones Natural Stone Thin Veneer



WARNING

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These requirements align with NCMA/MVMA, the Natural Stone Institute, TMS 402/602, ICC-ES, and key ASTM/ANSI standards. Always follow local code and the project engineer's direction.
Epoxy mesh-backed stone is used to increase the strength of the stone for shipping. All epoxy mesh-backed veneer should be removed with a grinder before installation.
Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of the stone without removal of epoxy meshed-back stone for installation on a concrete wall.

***MSNSTV - MARMIRO STONES NATURAL STONE THIN VENEER**

CMU WALL

1) SUBSTRATE PREP

a. Clean CMU's to free of bond-breakers; rake/flush joints. Skim/fill to plane where needed (e.g., render parge) to meet flatness, (industry's best practice).

b. Optional WRB (water resistant barrier)/AWB (Air & Water Barrier) Or Laticrete® Hydro Ban® over CMU for additional water control. This is not a code substitute for framed WRB, but it is beneficial on exposed walls. Use Laticrete® MVIS™ Air & Water Barrier for best results.

c. Optional Metal Lath
- If using this metal lath method, please be sure to use galvanized metal lath using corrosive resistant anchors.
- Apply a scratch coat over lath using Laticrete 3701 Fortified Mortar Bed.

*NOTE - On clean, sound concrete/CMU, Laticrete generally promotes direct-bond Laticrete® MVIS™ installations (no lath) with their mortars; lath/scratch is an alternative when the wall is contaminated or can't be adequately prepared. Use Laticrete® MVIS™ Lite Wall Float for the scratch coat.

2) SETTING MORTARS (SELECT PER SUBSTRATE/CONDITIONS)

a. Apply One of the following mortars based on application.
   - Laticrete® MVIS™ Veneer Mortar (polymer-fortified, non-sag).
   - Laticrete® MVIS™ Hi-Bond Veneer Mortar (high-bond, exterior, long open time).
   - Laticrete® 254 PLATINUM™ (alternative for dense concrete/critical bonds).

3) SETTING THE STONE

a. Use one of the following Laticrete® setting mortars (Mix with water only; follow data sheet specs):
   - MVIS™ Veneer Mortar (polymer-fortified, non-sag) or MVIS™ Hi-Bond Veneer Mortar for high-bond, exterior work.
   - For exceptionally dense/smooth concrete, 254 PLATINUM™ is an approved alternative. This should be used for all water applications.
   - Trowel a full bed and back-butter (skim coat) each unit to achieve 100% coverage and full contact with the structure. Beat in. (ASTM C1780).

4) EPOXY-BACKED STONE

Choose one of these options below:

a. Laticrete® LATIPOXY® 300
   - Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of stone to concrete wall.
   - Mixing: Pour LATAPOXY® 300 Adhesive Part A and Part B into a clean mixing pail and mix thoroughly. Add LATAPOXY® 300 Part C Filler Powder and mix to a smooth, trowelable consistency. Mortar is ready for use immediately after mixing.
   - Application: Apply mortar to the substrate with the flat side of the trowel, pressing firmly to work into surface. Comb on additional mortar with the notched side.

b. Remove back mesh with a grinder.
   - Then proceed using one of the mortars listed in #3 above.

5) MORTAR JOINT OPTIONS

a. Place MSNSTV (typical is 4" & 6" height material) with no mortar joint, creating a tight fit.

b. MSNSTV 3"-6"-9" system is designed for a 3/8" grout joint.
   - Be sure to use spacers to maintain consistent joint spacing.
   - Before starting to grout, remove spacers and debris in grout joints and remove dust and dirt using a wet sponge. Do not leave water sitting in joints.
   - Mixing: Use approximately 2.4–2.6 quarts (2.3 L–2.5 L) of clean potable water for 25 lbs. (11.3 kg) of PERMACOLOR® Grout. Place water in a clean mixing container and add grout powder. Mix with a slow speed drill mixer (300 rpm) for one minute. Wait for five minutes and remix with drill for one minute.
   - Apply: Using a grout bag, apply grout to joints filing completely. Use a 3/8" flat slicker jointer or jointing tool to give a concave look.
   - Cleaning: Begin initial cleaning by lightly wiping down entire area to be cleaned with a damp sponge. Wash with a damp sponge (not wet). Work diagonally with the joints. Allow to dry three hours at 70°F, (warmer days will have a faster dry time). For second cleaning, use a damp sponge or dry cloth to remove remaining grout haze.

6) BEST PRACTICES

a. Base clearances - Maintain clearances to shed water: Typically, 4" above earth, 2" above paved, ½"above walking surfaces, sharing the same foundation.

b. Use MSNSTV: Pull from multiple crates for blending. Do not install saturated/frozen stone.

c. Exterior installations should target essentially 100% contact with tight edges; avoid "center void doughnuts" aka: picture framing.

d. Follow product temperature limits: Protect from freezing, rapid drying, or direct rain until cured.

e. Use polymer-modified mortars for exterior wall applications.

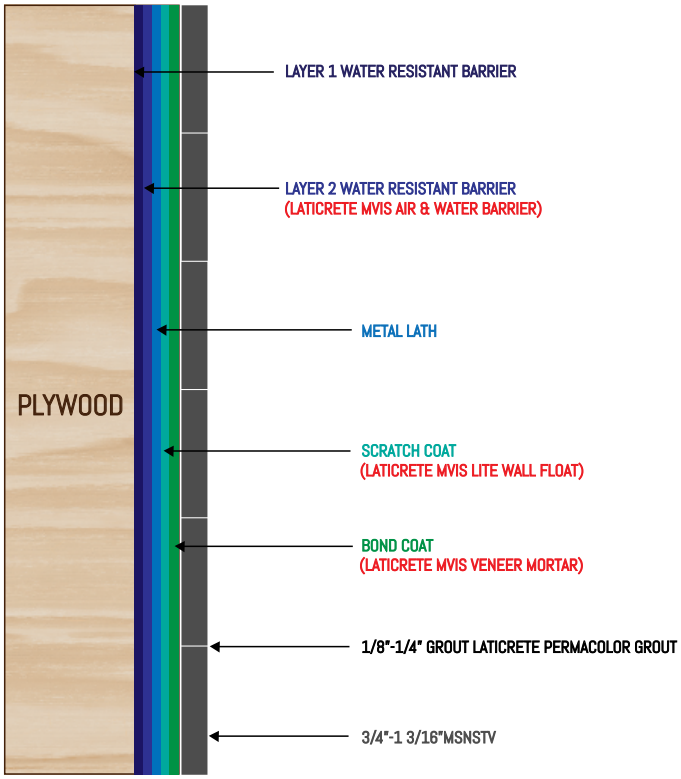
f. Do not bridge structural/expansion joints with mortar or stone; continue the joint through the veneer with backer-rod & sealant.

g. Do not rely on a thin "dot and dab." Full coverage is required. Periodically pull a piece to check.

h. Do not set in stone in freezing temperatures, on saturated substrates, or in driving rain—follow mortar product temperature/cure limits.

THIN VENEER WALL APPLICATION (PLYWOOD WALL)

MSNSTV – Marmiro Stones Natural Stone Thin Veneer



WARNING

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These requirements align with NCMA/MVMA, the Natural Stone Institute, TMS 402/602, ICC-ES, and key ASTM/ANSI standards. Always follow local code and the project engineer's direction.
Epoxy mesh-backed stone is used to increase the strength of the stone for shipping. All epoxy mesh-backed veneer should be removed with a grinder before installation.
Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of the stone without removal of epoxy meshed-back stone for installation on a concrete wall.

STANDARDS AND INDUSTRY REFERENCES

1. ASTM C847 (metal lath)
2. ASTM C926 (scratch coat)
3. ASTM C1063 (lath installation & weep screed)
4. ASTM C1325 (cement board)
5. ICC-ES AC376 (exterior cement board recognition)

***MSNSTV - MARMIRO STONES NATURAL STONE THIN VENEER**

APPLICATION - ADHERED TO MARMIRO STONES THIN VENEER OVER EXTERIOR SHEATHING

1) SUBSTRATE, FRAMING, AND BASE CLEARANCES

a. Verify framing and sheathing. Framing must meet project structural/deflection requirements. Install exterior sheathing per the sheathing manufacturer's instructions.

b. Provide code clearances at the base:Hold the veneer/weep screed a minimum 4" above grade or 2" above paved surfaces. (May be ½" above a walking surface supported by the same foundation).

2) PRIMARY WEATHER/AIR BARRIER & DRAINAGE LAYER

a. Wrap the wall: Provide two separate layers of WRB over wood sheathing, lapped shingle-fashion and integrated with all flashings. (Where permitted by

b. Laticrete® WRB/Air Barrier (when a fluid-applied WRB/AB is specified): Apply MVIS™ Air & Water Barrier over the exterior sheathing/WRB assembly.

3) WEEP SCREED

a. Install a foundation weep screed at the base of framed walls: Lap the WRB over the screed flange per ASTM C1063/industry details.

b. This is done when plywood application meets CMU or there's a poured in place concrete wall (foundation).

4) METAL LATH AND SCRATCH COAT

a. Lath: Install galvanized, self-furring metal lath conforming to ASTM C847, fastened to framing with corrosion-resistant fasteners and laps/attachments per ASTM C1063.

b. Scratch coat: Apply a cement-plaster scratch coat in accordance with ASTM C926 to fully embed the lath and form horizontal scoring on vertical walls. Allow to cure per standard and project conditions.
   - Apply Laticrete® MVIS™ Lite Wall Float, (listed for use as a scratch or finish coat in place of Type S/N) mixed with water only. Build up to plane as needed, (up to approx. ¾" in one lift).

   *Note: On clean, sound masonry or concrete backings, lath/scratch is often not required, but framed walls require lath/scratch, unless the cement board option below is used (and approved).

c. Alternate substrate (where approved): Exterior cement board.
   - Cement board option: In lieu of lath/scratch, install exterior-rated cementitious backer units that comply with ASTM C1325 and are recognized for exterior use under ICC-ES AC376. Fasten per the board manufacturer's exterior sheathing instructions.
   - Setting mortars over cement board: Use only polymer-modified thin-set mortars meeting ANSI A118.4/ A118.15, (no Type S/N as a setting bed). Appropriate Laticrete® choices include MVIS™ Hi-Bond Veneer Mortar or MVIS™ Veneer Mortar.

5) SETTING THE STONE (ALL SUBSTRATES)

a. Pre-check moisture & layout: Ensure the substrate (scratch coat or cement board) is dry and clean. Confirm base clearances and movement joint locations at dissimilar materials/openings.

b. Bond coat selection (exterior):
   - Standard exterior work: MVIS™ Hi-Bond Veneer Mortar for maximum non-sag and bond.
   - Alternate: MVIS™ Veneer Mortar (polymer-fortified).
   - Follow product data sheets for mixing (with water only) and open time.

c. Apply a full setting bed and back-butter each unit as needed to achieve essentially 100% contact (no voids/"doughnuts") aka: picture framing. Periodically remove a freshly set unit to verify coverage.

d. Unit placement: Press/slide the veneer into the wet mortar bed to collapse ridges and set. Support temporarily if needed until initial set.

6) MORTAR JOINTS

a. Place MSNSTV (typical is 4" & 6" height material) with no mortar joint, creating a tight fit.
   - If a mortar joint is needed or designed in for aesthetics, follow guidelines below.

b. MSNSTV 3"-6"-9" system is designed for a 3/8" grout joint.
   - Be sure to use spacers to maintain consistent joint spacing.
   - Before starting to grout, remove spacers and debris in grout joints and remove dust and dirt using a wet sponge. Do not leave water sitting in joints.
   - **Mixing:** Use approximately 2.4–2.6 quarts (2.3 L– 2.5 L) of clean potable water for 25 lbs. (11.3 kg) of PERMACOLOR® grout. Place water in a clean mixing container and add grout powder. Mix with a slow speed drill mixer (300 rpm) for one minute. Wait for five minutes and remix with drill for one minute.
   - **Apply:** Using a grout bag, apply grout to joints filling completely. Use a 3/8" flat slicker jointer or jointing tool to give a concave look.

7) BEST PRACTICES

a. Base clearances - Maintain clearances to shed water: Typically, 4" above earth, 2" above paved, ½"above walking surfaces, sharing the same foundation.

b. Use MSNSTV: Pull from multiple crates for blending. Do not install saturated/frozen stone.

c. Exterior installations should target essentially 100% contact with tight edges; avoid "center void doughnuts" aka: picture framing.

d. Follow product temperature limits: Protect from freezing, rapid drying, or direct rain until cured.

e. Use polymer-modified mortars for exterior wall applications.

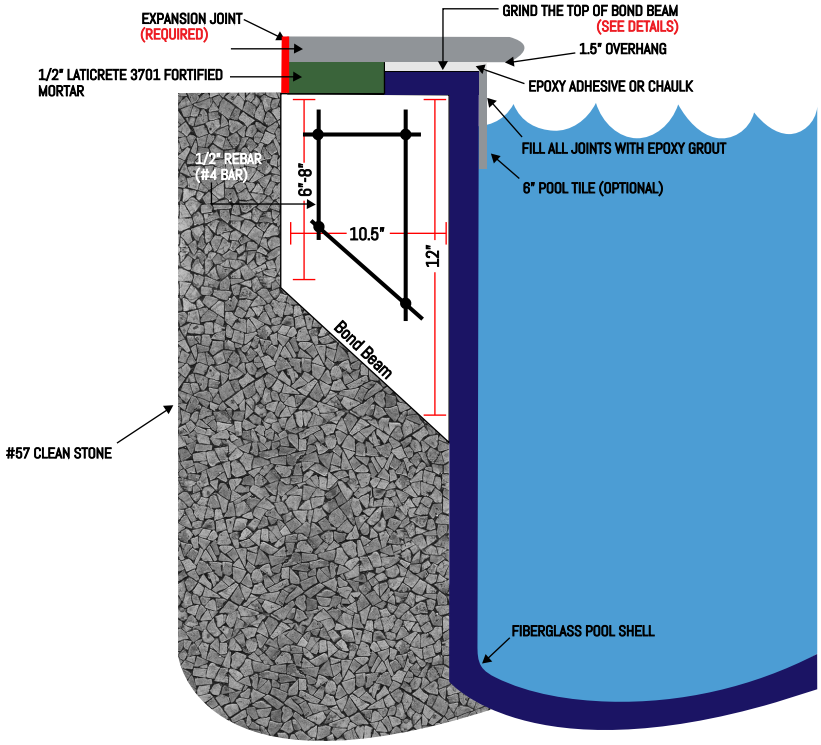
f. Do not bridge structural/expansion joints with mortar or stone; continue the joint through the veneer with backer-rod & sealant.

g. Do not rely on a thin "dot and dab." Full coverage is required. Periodically pull a piece to check.

h. Do not set in stone in freezing temperatures, on saturated substrates, or in driving rain—follow mortar product temperature/cure limits.

POOL TILE: 6”X6” TO 6”X24” (FIBERGLASS POOLS)

MSNSPT - Marmiro Stones Natural Stone Pool Tile



WARNING

STOP

Epoxy mesh backed stone is used to increase the strength of stone due to natural veining.

Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of stone to concrete wall.

1. SURFACE PREPARATION

a. The surface of the fiberglass pool needs to be clean, smooth and free from any dirt, debris or loose materials. The water level should be lowered 1.5’ below the bottom of the tile.

2) TILE LAYOUT

a. Before installing the tiles, a layout needs to be planned out to ensure the tiles are aligned properly and the design is uniform. This can be done by leaving 1/8” below the bottom of the coping.

3) TILE CUTTING

a. The tiles need to be cut according to the design and layout using a tile saw with a diamond blade. It is important to wear safety goggles and gloves during this process.

4) TILE ADHESIVE

a. A specialty adhesive, LATIPOXY® 300 by Laticrete®, should be applied to the back of the tile. The LATIPOXY® should be applied evenly and not too thick.

5) TILE INSTALLATION

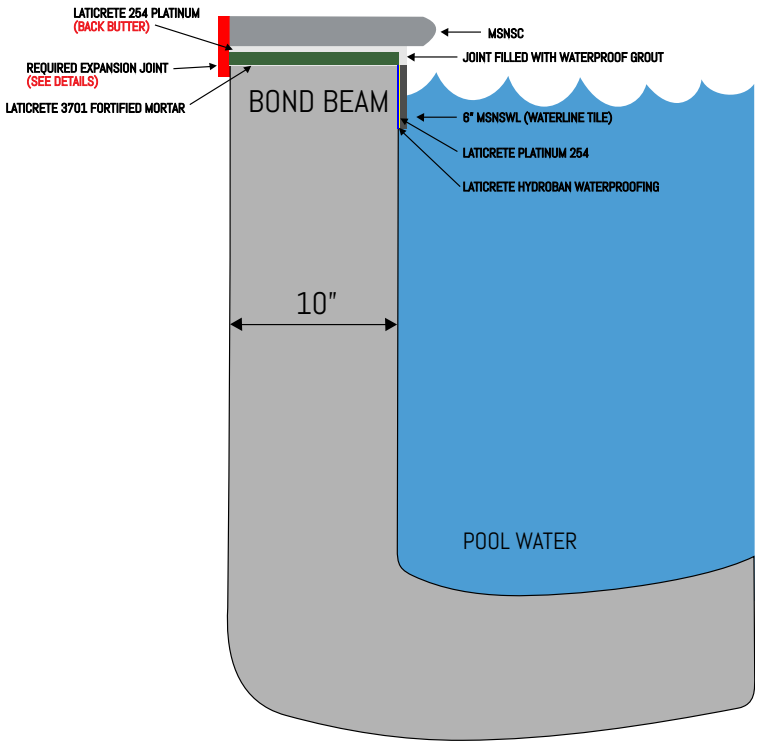
a. The tiles are then installed onto the prepared fiberglass surface. Be sure to leave 1/8” space beneath the bottom of the coping. A tile spacer can be used to maintain consistent spacing between the tiles.

6) GROUT APPLICATION

a. Using Laticrete® SPECTRALOCK® Pro Grout Premium, spread grout using a sharp edged, firm rubber grout float. Work the grout diagonally across the joints, packing them full. “Cut” excess grout off the tile surface using the edge of the float held at a 90° angle like a squeegee, stroking diagonally to avoid pulling grout out of filled joints.
   - Once grout has been spread, wait approximately 20 minutes before cleaning, (or within one hour of initial mixing of product). Wait longer at colder temperatures. Add initial wash cleaning additive to two gallons of clean water and mix until fully dissolved. Do not mix cleaning additive with grout.
   - Instead of a sponge, the use of a damp, well wrung, folded terry cloth towel can be helpful to remove excess grout while smoothing joints less than 1/8" (3 mm) on walls. Use light pressure when using folded terry cloth towel.

POOL TILE: 6”X6” TO 6”X24” (GUNITE POOLS)

MSNSPT - Marmiro Stones Natural Stone Pool Tile



* NOTE 1/8" - 1/4" MORTAR JOINT BETWEEN COPING PIECES

WARNING

STOP

Epoxy mesh-backed stone is used to increase the strength stone for shipping. All epoxy mesh-backed veneer should be removed with a grinder before installation.

Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of stone without removal of epoxy meshed-back stone for installation on concrete wall.

1) SURFACE PREPARATION

a. Gunite/shotcrete shell cured, sound, and free of laitance, curing compounds, form oils, efflorescence, paint, or sealers. Grind/shotblast/waterblast to a clean, open surface profile if needed.

b. If there are deflections in the gunite wall +/- 3/8” render/float the waterline zone to plane using LATICRETE® 3701 Fortified Mortar Bed. Feather and straighten to the tile module; allow to cure.

c. Waterproofing: Apply HYDRO BAN® (liquid) over the prepared render in two coats to the required wet-film thickness, continuing a few inches above and below the tile band. Treat inside/outside corners and penetrations per Hydro Ban Datasheet from Laticrete Allow full cure.

d. Substrate condition before bonding: Surface dry, clean, dust-free; ambient and substrate within product temperature limits.

2) TILE LAYOUT

a. Control Lines: Strike a level datum for the top of tile (account for final water level, coping drip, and skimmer frames).

b. Module & balance: Center the pattern between features (skimmers, returns, ladders) to minimize slivers; pre-mark movement/soft joints at corners, long runs, and changes of plane.

c. Joint width: Set joint width to suit the Marmiro tile size (typ. 1/8” – 3/16 “)

3) TILE CUTTING

a. Use a fine, continuous-rim wet blade appropriate for porcelain or glass. Ease sharp edges; keep cuts square to avoid lippage at the waterline.

b. Dry-fit critical pieces: Pre-fit around fittings and terminations; maintain sealant gaps where the layout calls for soft joints.

4) TILE ADHESIVE

a. For Marble, Granite, other dense stone stone including porcelain; LATICRETE 254 PLATINUM® (ANSI A118.15) thin-set. Trowel size to achieve near-full coverage.

b. For epoxy backed stones, mosaics and glass; LATAPOXY® 300 epoxy adhesive. Favor epoxy where the tile manufacturer requires it or for fully submerged, chemical-exposed bands.

c. Note:
- Mix mortars/epoxy strictly per Laticrete Datasheet; respect pot life and open time.
- Do not use mastics or unmodified mortars in submerged work.

5) TILE INSTALLATION

a. Apply a tight coat of adhesive into the substrate, then comb with the smallest notch that still achieves essentially 100% contact after beating-in.

b. Back-butter: Skim the backs of tile (especially glass) to eliminate voids.

c. Press and slide tile slightly to collapse ridges; beat-in with a beating block. Lift a stone periodically to confirm full contact (no voids/doughnuts) making sure you have wet to wet contact.

6) GROUT INSTALLATION

a. Using Laticrete® SPECTRALOCK® Pro Grout Premium, spread grout using a sharp edged, firm rubber grout float. Work the grout diagonally across the joints, packing them full. “Cut” excess grout off the tile surface using the edge of the float held at a 90° angle like a squeegee, stroking diagonally to avoid pulling grout out of filled joints.
- Once grout has been spread, wait approximately 20 minutes before cleaning, (or within one hour of initial mixing of product). Wait longer at colder temperatures. Add initial wash cleaning additive to two gallons of clean water and mix until fully dissolved. Do not mix cleaning additive with grout.
- Instead of a sponge, the use of a damp, well wrung, folded terry cloth towel can be helpful to remove excess grout while smoothing joints less than 1/8" (3 mm) on walls. Use light pressure when using folded terry cloth towel.

7) GROUT APPLICATION

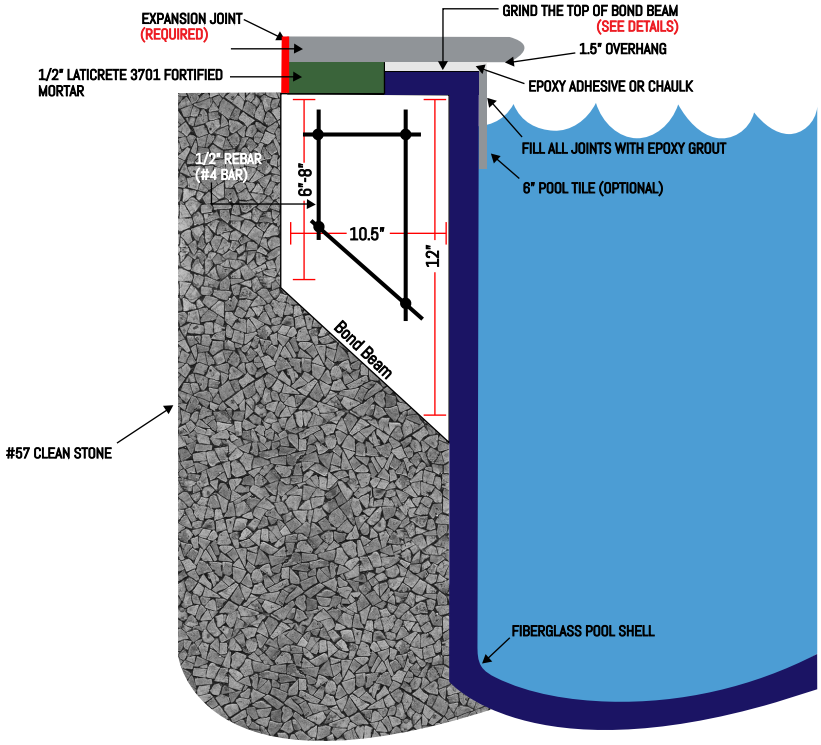
a. Options:
- SPECTRALOCK® epoxy grout. (chemicals/stain resistance).
- PERMACOLOR® (cement) high-performance grout.

b. Placement:
- Pack joints full and strike flush.
- Spread grout using a sharp edged, firm rubber grout float. Work the grout diagonally across the joints, packing them full. “Cut” excess grout off the tile surface using the edge of the float held at a 90° angle like a squeegee, stroking diagonally to avoid pulling grout out of filled joints.
- Once grout has been spread, wait approximately 20 minutes before cleaning, (or within one hour of initial mixing of product). Wait longer at colder temperatures. Add initial wash cleaning additive to two gallons of clean water and mix until fully dissolved. Do not mix cleaning additive with grout.
- Instead of a sponge, the use of a damp, well wrung, folded terry cloth towel can be helpful to remove excess grout while smoothing joints less than 1/8" (3 mm) on walls. Use light pressure when using folded terry cloth towel.

c. Cure to immersion:
- Observe immersion cure times before filling the pool (typ. ≈10 days epoxy; ≈14 days cement, at 70 °F). Fill gradually and balance water chemistry to avoid shock.
- Spread grout using a sharp edged, firm rubber grout float. Work the grout diagonally across the joints, packing them full. “Cut” excess grout off the tile surface using the edge of the float held at a 90° angle like a squeegee, stroking diagonally to avoid pulling grout out of filled joints.

POOL & SPA COPING (FIBERGLASS POOLS)

MSNSC – Marmiro Stones Natural Stone Coping



WARNING

STOP

Epoxy mesh-backed stone is used to increase the strength of stone due to natural veining. This must be removed with a grinder before installation.

Laticrete® LATIPOXY® 300 Adhesive is required for long-term adhesion of the stone to Fiberglass shell .

1) PREPARATION

a. Inspect the fiberglass shell & concrete collar.

b. Confirm the shell is level, fully backfilled, and braced, per the pool manufacturer's procedure before collar or coping work begins. Verify plumbing penetrations and skimmer height.

c. Inspect the concrete bond beam at the pool perimeter – it must be sound, clean, and recessed to accommodate the coping thickness and mortar. Scarify concrete to promote adhesion.

d. Isolation from the fiberglass shell: Plan a continuous soft joint (backer rod + sealant) between the coping and the fiberglass lip/gelcoat – do not rigidly bond coping to the shell.

e. With a cup grinder, grind the top bond beam of the fiberglass shell to make sure we get a good bond of the adhesive from the fiberglass to the stone.

2) COPING LAYOUT

a. Dry-fit MSNSC around the pool, planning all corners and curves first.

b. Establish a slight slope away from the pool and a consistent overhang.

c. Expansion joints: Coping-to-deck expansion joint (typically ½"), using backer rod + Laticrete® LATASIL™.

d. Account for a 1"–1 ½" overhang at the fiberglass lip (backer rod + Laticrete® LATASIL™).

3) SETTING BED & BACK-BUTTER

a. Mortar Bed (Wet-laid look on concrete collar)
   - Pre-dampen collar (concrete bond beam) and slurry bond coat with Laticrete® 254 PLATINUM™ just ahead of placement to the concrete bond beam.

b. Fiberglass Bond Beam
   - Apply adhesive – Two options:
     (1) BOSS® Pro 801 Silicone
     (2) Laticrete® LATASIL™

c. Back-Butter
   - Trowel a thin, even slurry/back-butter of Laticrete® 254 PLATINUM™ to the coping's underside immediately before placement.
   - Timing matters: Set while both the collar slurry and the stone back are fresh (not skinned) to ensure full wet contact.
   - Press/Tap with a rubber mallet to achieve continuous bedding.
   - Only spread what you can cover in 5–10 minutes, re-skimming if any skinning occurs.

4) INSTALLATION

a. Corners & Curves
   - Set corners first. For mitered corners, leave about ¼" for grout.
   - For curved sections, use smaller pieces or adjust joint widths to maintain a smooth radius.

b. Maintain Joint Width
   - Do not butt-joint the stone. Use spacers to keep joints uniform.
     - Typical joint: 1/16" minimum to ½" maximum, depending on stone calibration.

5) FINISHING

a. Grout Joints (Required)
   - After the mortar sets, grout with Laticrete®'s PERMACOLOR® (cement) or SPECTRALOCK® (epoxy). Fill fully and strike flush; clean with water and a sponge. Epoxy is highly stain-resistant in splash zones.

b. Isolation & Expansion Joints
   - Fiberglass lip soft joint: Under coping at the top of fiberglass shell.
     - Seal with BOSS® Pro 801 Silicone or Laticrete® LATASIL®
   - Deck Expansion Joint
     - Maintain a ½" joint between coping and deck. Place backer rod at the bottom of coping and add Laticrete® LATASIL® on top of the backer rod.
     - Clean the top expansion joint, making a smooth clean joint.

6) BEST PRACTICES

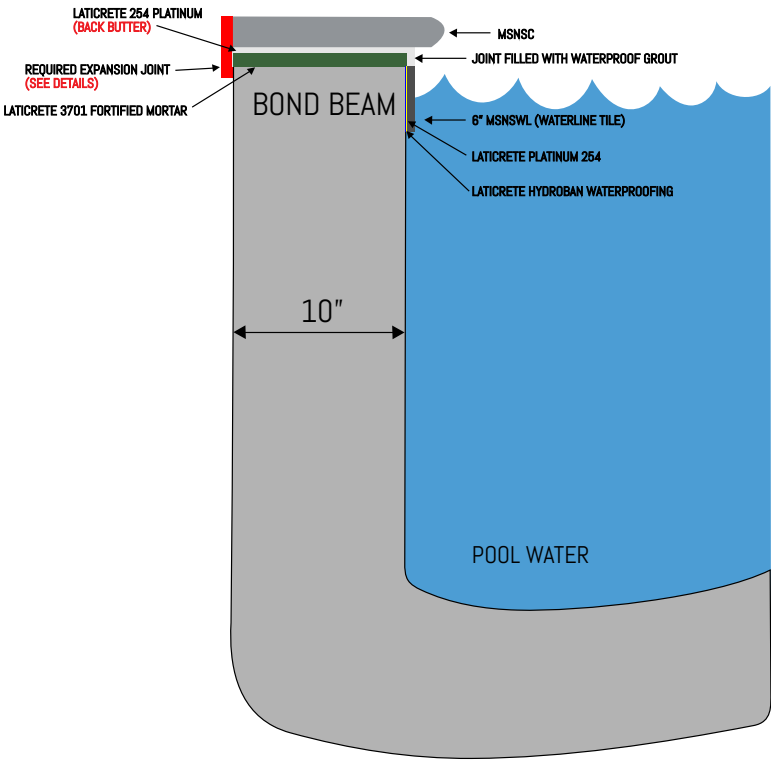
a. Never rigidly bond coping to the fiberglass shell – always maintain an isolation joint.

b. Keep collar and mortars clean and free of release agents; pre-dampen porous concrete before bonding.

c. If installing waterline tile, prioritize placing it before the coping and follow the shell manufacturer's adhesive/grout guidelines, (epoxy is often recommended).

POOL & SPA COPING (GUNITE POOLS)

MSNSC – Marmiro Stones Natural Stone Coping



* NOTE 1/8" - 1/4" MORTAR JOINT BETWEEN COPING PIECES

WARNING

STOP

Epoxy mesh backed stone is used to increase the strength of stone due to natural veining.

Laticrete® LATIPOXY® 300 Adhesive is required for long term adhesion of stone to concrete wall.

PREPARATION

1) INSPECT AND CLEAN THE BOND BEAM

a. Scarify the top of the concrete bond beam to promote adhesion and check that it is sound and level. Remove soil, mortar, form release agents, laitance, and other contaminants by scraping and washing. Pools should be cleaned of dust, oil, paint, and curing compounds before applying any membrane. Pre-wet dusty concrete surfaces to obtain saturation in dry conditions. Fill voids and repair cracks with a polymer-fortified thin set or mortar.

2) OPTIONAL WATERPROOFING OF THE BOND BEAM WITH LATICRETE® HYDRO BAN®:

a. For added protection against moisture intrusion and to prepare the vertical face for waterline tile, apply Hydro Ban® after cleaning the bond beam. Hydro Ban® is a liquid, self-curing, waterproofing that forms a flexible, seamless coating suitable for swimming pools and water features.

b. Ensure the substrate temperature is between 45–90°F (10–32 °C) during application and for 24 hours thereafter. Surfaces must be structurally sound and free of dirt, grease, paint, and concrete sealers.

c. If the concrete is rough or uneven to start, smooth it out. Use a wet sponge immediately before application to remove airborne dust and lower surface temperature for better adhesion.

d. Pre-treat cracks, cold joints, coves, floor/wall transitions, and penetrations with a liberal coat of Hydro Ban® or poly-modified thin set and a strip of 6" (150 mm) anti-fracture fabric where movement is expected.

e. Apply two uniform coats with a brush or roller, each at a wet thickness of 1/64" – 1/32", (approx. 0.4–0.6 mm). Allow the first coat to dry to the touch, (color changes from sage to olive green) before applying the second. Do not apply more than two coats. Avoid limited area waterproofing; submerged installations require a continuous "waterproof pan effect", rather than a strip at the waterline.

f. After the final coat has dried, (typically 1–2 hours at 70°F) the membrane may be flood tested or covered with mortar. When dry, thin set tile adhesive may be applied directly on the membrane for the coping and waterline tile.

3) COPING LAYOUT

a. Dry fit coping units around the pool to determine how pieces meet at corners and curves. Account for a ½"–1" expansion joint between the coping/mortar bed and the adjacent deck. Use string lines and a level to plan a slight slope away from the pool and a consistent overhang.

4) SETTING BED & BACK BUTTER

a. Polymer-Modified Mortar
- Install coping on a mortar bed made with a polymer-modified mortar. Products such as Laticrete® 3701 Mortar are freeze-thaw stable and bond well to horizontal substrates. Pre-wet the Hydro Ban® membrane or concrete bond beam, and apply a bedding layer to prepare for coping installation.

b. Spread Mortar Properly
- Only spread as much mortar as can be covered within 5–10 minutes, Avoid letting the surface skin over.
- Apply an even layer of thin set on the back of the natural stone coping unit using a slurry of the 3701 fortified mortar or Laticrete® 254 PLATINUM™ thin set.
- Ensure maximum adhesion, making sure the 3701 and thin set/slurry on back of stone are wet and not skinned over. Any dryness may result in a separation over time.
- Press the coping units into place and tap with a rubber mallet to achieve full contact.

c. Set the Slope and Overhang
- Use the mortar bed to finetune each stone's height and slope. For curved pools, use smaller units, or adjust joint widths to maintain an even radius.

5) INSTALLATION

a. Coping Units and Corners
- Install corners first. Mitered corners leave about ¼". space for grout. For tight joint corners or curved sections, maintain consistent joints and align pieces with the dry layout.

6) MAINTAINING JOINT WIDTH

a. Coping Units and Corners
- Do not butt stones tightly together - joints allow for size variation and movement. A minimum of 1/16" grout joint and a maximum of ½". Joints of ¼" - ½" may be necessary for larger or irregular stones. Use spacers to keep joints uniform.

7) FINISHING

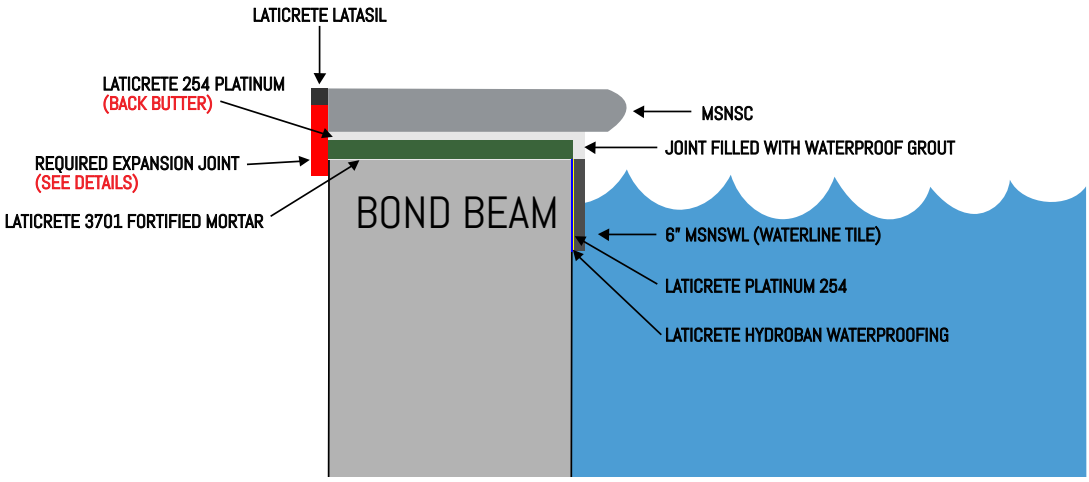
a. Grouting Coping Joints
- After the mortar sets, grout the joints with a high-performance grout, (such as Laticrete's PERMACOLOR® or SPECTRALOCK® PRO). Fill joints fully and strike flush. Remove residue with a sponge and water.

b. Expansion Joint
- Leave a ½" gap between the coping and deck. See installation instructions on expansion joints following this section.

8) BEST PRACTICES

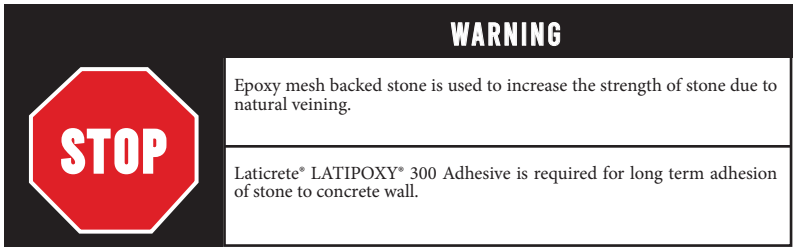
a. Inspect coping joints and caulk annually; regrout if cracks appear. Keep the expansion joint sealed to prevent water infiltration and freeze-thaw damage.

POOL COPING & EXPANSION JOINTS (GUNITE POOLS)



WHY IS AN EXPANSION JOINT REQUIRED?

Natural stone coping is installed directly on the pool's bond beam, which is relatively rigid. The decking material, however, is subject to thermal expansion, settlement, and freeze thaw cycles. Without a gap and flexible sealant between them, movement in the deck can exert force on the coping and bond beam, causing cracks or spalling. This risk exists regardless of whether the deck is natural stone, poured concrete, or a manufactured paver system; therefore, Marmiro Stones® insists that every pool deck incorporates a proper expansion joint behind the coping.



RECOMMENDED CONSTRUCTION

1) EXPANSION JOINT DIMENSIONS AND TIMING

a. Expansion Joint Dimensions and Timing
- Form a continuous gap around the perimeter of the pool, typically ½"–1" inch wide, and extending the full depth of the deck. If a concrete slab is used for decking, wait at least 30 days after pouring the deck before caulking to allow for initial curing and shrinkage.

2) PREPARATION

a. Before sealing the expansion joint, clean the sides of the joint thoroughly. Remove any old caulk, debris, dirt, or loose material using a razor knife or wire brush and let the joint dry completely.

3) BACKER ROD INSTALLATION

a. Insert a closed cell foam backer rod or preformed expansion joint filler so it sits about 3/8" below the surface. This controls the depth of the sealant and allows it to flex properly.
* NOTE: Do not fill the joint with sand or polymeric sand. Industry guides warn against using sand because it does not compress and will transfer deck movement to the coping. Polymeric sand, commonly used between pavers, cures to a semi rigid mass and is therefore NOT PERMITTED in Marmiro Stones® installations as an expansion joint material.

4) ELASTOMERIC SEALANT

a. Over the backer rod, apply a pool-grade, elastomeric caulk (like Laticrete® LATASIL™ silicone or another -based sealant) to a depth of roughly ¼"–⅜". Tape off the coping and deck edges for a clean line, fill the joint and smooth, then remove tape before the sealant skins over. Self-leveling sealants are generally best for horizontal joints.

5) MAINTENANCE

a. Inspect the expansion joint annually. Replace or repair the caulk whenever it cracks, pulls away or deteriorates; most elastomeric caulks last five to ten years. Keep the joint free of dirt, plants, and standing water so it can compress and expand properly.

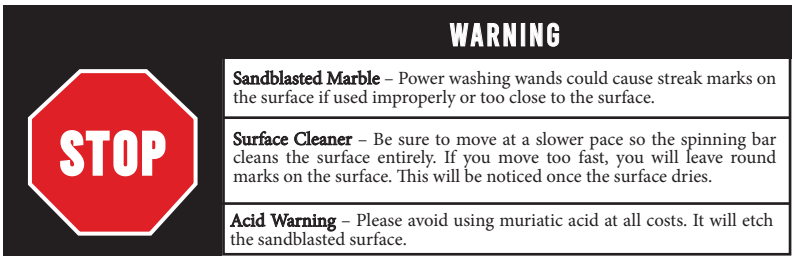
6) BEST PRACTICES

a. A properly constructed expansion joint is critical to protect the pool's bond beam, waterline tile, and Marmiro Stones® coping. It allows the deck to expand and contract independently, and keeps moisture and debris from infiltrating and damaging the structure.

b. Marmiro Stones® requires an expansion joint between our natural stone coping and any type of pool deck natural stone, concrete, or man made products — and specifically prohibits the use of polymeric sand as joint filler.

c. Following the preparation, backer rod and elastomeric sealant steps outlined above will help ensure the long-term beauty and performance of your pool surround.

MAINTENANCE OF MARMIRO STONES® NATURAL STONES



CLEANING DAY 1

1) OVERVIEW OF STAINS THAT MAY BE PRESENT ON THE JOB

a. Rust
b. Efflorescence
c. Leaf/Organics
d. Oil Stains

2) PROJECT HAS JOINTS (ANTIQUED, SANDBLASTED, OR VINTAGE FINISH)

a. Cold water using a surface cleaner with adjustable pressure.
b. Wet the surface in a small workable area - this is the dilution process.
c. Apply GST International's Clean Concrete cleaner with a pump sprayer evenly in the wet area.
d. Apply GST International's Pro-Grade cleaner with a pump sprayer evenly in the wet area.
e. Allow it to sit on surface for 2-5 minutes, depending on weather conditions. DO NOT let the cleaner dry on the surface.
f. Scrub the surface using a stiff bristle brush in a north and south then east and west direction.
g. Using the surface cleaner, start at the lowest point of the pitch following the grade in a straight line and moving the surface cleaner east and west, overlapping each pass by 6".
h. In the same area, move the surface cleaner north and south overlapping each pass by 6".
i. Once each section is complete, hose off excess suds/cleaner and dirt.
j. Repeat this process overlapping each section as needed.

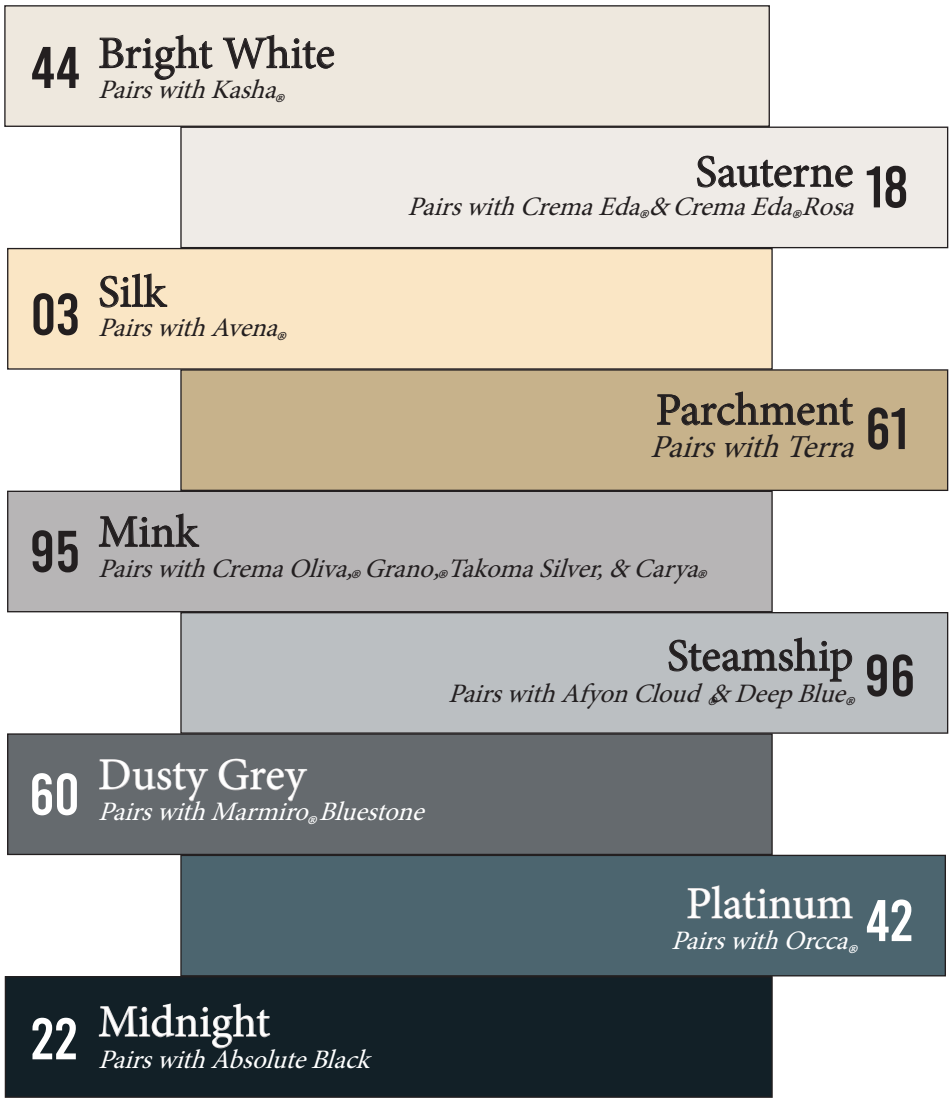
3) PROJECT WITH NO JOINTS (ANTIQUED, SANDBLASTED, OR VINTAGE FINISH)

a. Hot water using a surface cleaner with the highest pressure.
b. Wet the surface in a small workable area -this is the dilution process.
c. Apply GST International's Clean Concrete cleaner with a pump sprayer evenly in the wet area.
d. Apply GST International's Pro-Grade cleaner with a pump sprayer evenly in the wet area.
e. Allow it to sit on surface for 2-5 minutes, depending on weather conditions. DO NOT let the cleaner dry on the surface.
f. Scrub the surface using a stiff bristle brush in a north and south then east and west direction.
g. Using the surface cleaner, start at the lowest point of the pitch following the grade in a straight line and moving the surface cleaner east and west, overlapping each pass by 6".
h. In the same area, move the surface cleaner north and south overlapping each pass by 6".
i. Once each section is complete, hose off excess suds/cleaner and dirt.
j. Repeat this process overlapping each section as needed.

COVERAGES FOR LATICRETE® PRODUCTS				
Product	**Bag Size**	**1/4" Notched Trowel**	**1/2" Notched Trowel**	**Adhered Masonry Method**
MVIS™ Veneer Mortar	40 lb.	55-65 SF	42-50 SF	28-33 SF
MVIS™ Hi-Bond Veneer Mortar	50 lb.	60-70 SF	40-45 SF	30-33 SF
MVIS™ Air & Water Barrier	5 gal.	N/A	N/A	250 SF (2 Coats)
PLATINUM™ 254	50 lb.	60-70 SF	35-40 SF	N/A
3701 Fortified Mortar Bed	60lb.	N/A	N/A	12 SF at 1/2" Thick bed 6 SF at 1" Thick bed
Hydro Ban® XP	5 gal.	N/A	N/A	N/A

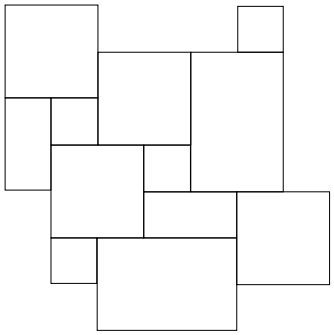
USES FOR LATICRETE® PRODUCTS			
Product	**Area**	**Suitable Substrates**	**Limitations**
MVIS™ Veneer Mortar	40 lb.	55-65 SF	42-50 SF
MVIS™ Hi-Bond Veneer Mortar	50 lb.	60-70 SF	40-45 SF
MVIS™ Air & Water Barrier	5 gal.	N/A	N/A
PLATINUM™ 254	50 lb.	60-70 SF	35-40 SF
3701 Fortified Mortar Bed	• Interior and exterior applications • Submerged applications • Wet and dry applications • Bonded and non-bonded thick bed mortar applications • Conventional thick bed mortar applications • Concrete repairs	• Brick masonry • Cement backer board • Cement mortar bed • Cement plaster • Cement terrazzo • Ceramic tile and stone • Concrete • Concrete masonry	• Adhesives/mastics, mortars and grouts for ceramic tiles, pavers, brick, and stone are not replacements for waterproofing membranes. • For veneer installations using this product, consult local building code requirements regarding limitations and installation system specifications.
Hydro Ban® XP	• Interior and exterior • Swimming pools, fountains, and water features	• Cement backer board • Cement mortar bed • Cement plaster • Concrete • Brick masonry • Ceramic tile & stone	• Do not bond to OSB, particle board, interior glue plywood, luan plywood, Masonite®, or hardwood surfaces. • Do not use over dynamic expansion joints, structural cracks, or cracks with vertical differential movement. • Do not use over cracks >1/8" (3 mm) in width. • Do not expose unprotected membrane to sun or weather for more than 30 days.

GROUT COLOR CHART
By Laticrete

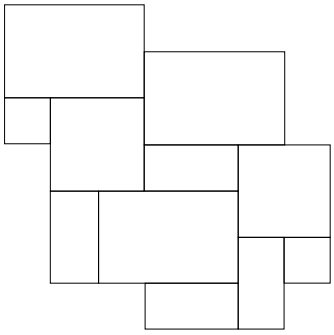


**We recommend Permacolor® Grout by Laticrete® for its high performance and consistent color. Choosing the right grout color is just as important as selecting the stone itself—it can enhance or soften the overall look of your project. These suggested grout colors are based on our standard product colors and should be used as a helpful guide.*

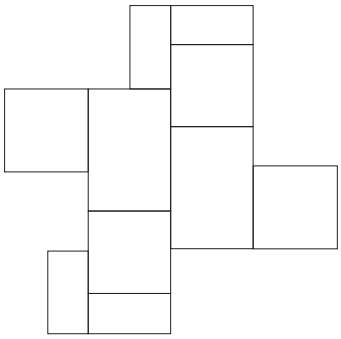
PATTERN Layouts



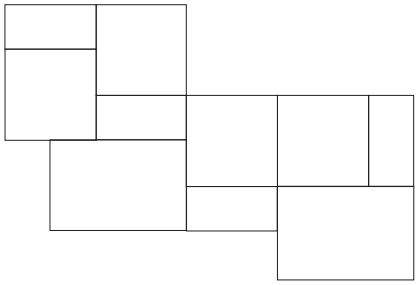
8” French Pattern



12” Washington Pattern



12” Gateway Pattern x 2.25”
(Option 1 out of 5)



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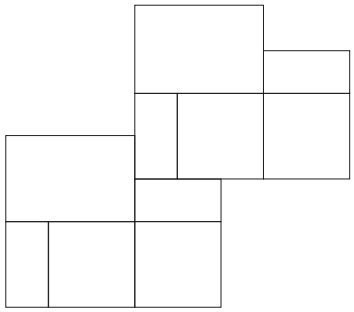
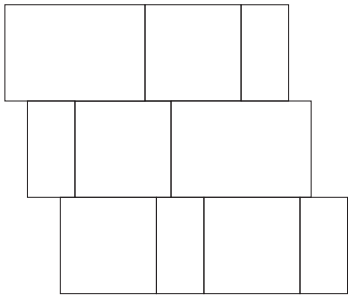
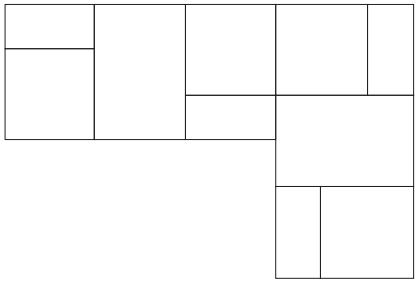
(Option 2 out of 5)



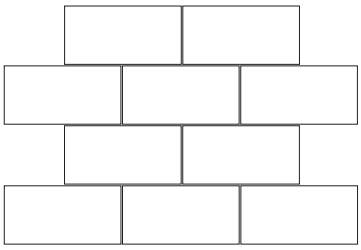
12” Gateway Pattern x 2.25”
(Option 3 out of 5)



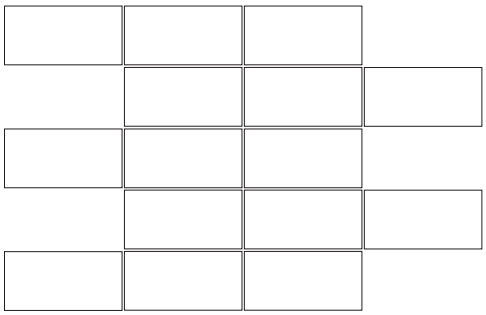
12” Gateway Pattern x 2.25”
(Option 4 out of 5)



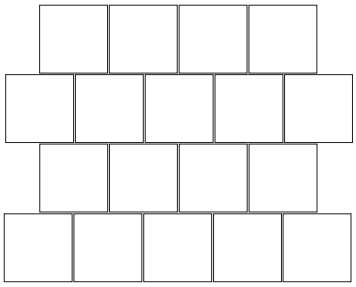
12” Gateway Pattern x 2.25”
(Option 5 out of 5)



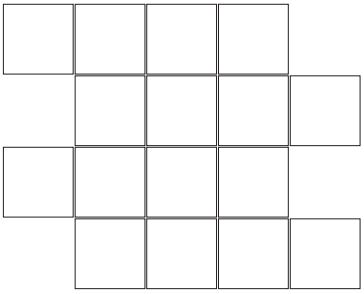
Rectangle Running Bond Pattern



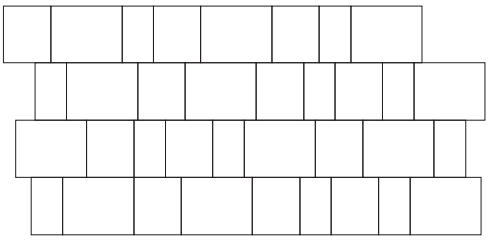
Rectangle Stacked Pattern



Square Running Bond Pattern



Square Stacked Pattern



McKeon Pattern

ETHICAL PRACTICES & Certifications

At Marmiro Stones, we pride ourselves on maintaining the highest standards of ethical business practices, sustainability, and responsibility in all aspects of our operations. Our policies include strong commitments to fair competition and the protection of intellectual property, ensuring a secure and ethical business environment for all stakeholders. Below is an overview of our commitments and the measures we take to ensure fairness, environmental stewardship, and community support:

1. ETHICAL BUSINESS CONDUCT

Our ethical guidelines are built on principles of honesty, fairness, respect, confidentiality, and social responsibility. We:

- Promote transparency and accountability in all operations.
- Foster trust with clients, suppliers, and other stakeholders through open communication.
- Protect trade secrets and respect intellectual property rights while expecting the same from our partners.
- Avoid any manipulation of the market, products, or pricing to maintain healthy competition.

2. FAIR TREATMENT OF EMPLOYEES

We are committed to providing a safe, fair, and respectful workplace for all employees. Key measures include:

- Providing clear warning signs across facilities to prevent workplace accidents.
- Offering visual training materials and conducting regular safety drills to ensure preparedness.
- Delivering on-the-job training tailored to specific roles and responsibilities. Key aspects of our employee practices include:
    - Ensuring compliance with labor laws, including fair wages, social security (SGK), and leave entitlements.
    - Providing all employees with their legal rights, such as fair compensation, insurance, and leave.
    - Encouraging equal opportunities and a discrimination-free environment.
    - Providing safety measures like warning signs, visual training materials, on-the-job training, and regular drills.

3.TRANSPARENT SUPPLIER AND CUSTOMER RELATIONS

We maintain fair and transparent relationships with suppliers and customers by:

- Treating all suppliers equally, using written documentation to govern procurement activities.
- Objectively evaluate supplier proposals based on predefined specifications and selection criteria.
- Ensuring all clients are invoiced based on transparent pricing and offering equal service standards under similar conditions.
- Delivering products that meet agreed-upon quality standards and customer expectations.

4. ECO-FRIENDLY AND SUSTAINABLE PRACTICES

Sustainability is integral to our operations, particularly in quarrying and energy usage. Our initiatives include:

- Implementing waste management and treatment facilities for biological and water waste.
- Installing Solar Energy Systems (SES) at our Sivrihisar and Afyon factories, covering a substantial portion of our energy needs. Additional projects are underway at our Denizli facility and Sivrihisar site.
- Transitioning a significant portion of our forklift and vehicle fleet to electric systems, reducing our carbon footprint.
- Following clearly defined procedures to minimize environmental impact during the extraction of blocks from quarries.

5. HEALTH AND SAFETY STANDARDS

We prioritize the health and safety of our employees by adhering to both legal and ethical safety practices. Measures include:

- Conducting comprehensive workplace hazard assessments to identify and mitigate risks.
- Providing clear warning signs across facilities to alert employees to potential hazards.
- Offering visual training materials to ensure employees understand safety procedures effectively.
- Conducting periodic safety drills to prepare for emergencies and reinforce safety protocols.
- Delivering on-the-job training tailored to specific roles and responsibilities to ensure safety at every level.
- Maintaining detailed records of safety initiatives and audits to track progress and identify areas for improvement.
- Actively implementing safety policies from the hiring process through to the employee's final day. Measures include:
    - Conducting workplace hazard assessments and implementing necessary precautions.
    - Providing visual training materials, on-the-job training, and periodic drills.
    - Maintaining detailed records of all safety initiatives.
    - Ensuring that safety policies are actively implemented from recruitment to the final day of employment.

6. COMMUNITY AND SOCIAL RESPONSIBILITY

We actively engage in initiatives that contribute to society and support the communities in which we operate. These include:

- Making donations and providing aid to address community needs.
- Building strong relationships with local communities to foster trust and collaboration.
- Ensuring all business relationships are built on transparency and ethical principles.

7. COMMITMENT TO ENVIRONMENTAL RESPONSIBILITY

We take significant steps to ensure our operations are environmentally responsible, including:

- Using renewable energy for a large portion of our electricity needs through solar power installations.
- Regularly investing in eco-friendly technologies to enhance sustainability.
- Employing advanced wastewater treatment systems to minimize environmental impact.

DOCUMENTATION:

The entire business processes, forms, job descriptions, directives, procedures, and regulations are defined.

FUTURE INITIATIVES

To further enhance our practices, we plan to:

- Achieve 100% renewable energy usage across all facilities.
- Collaborate with third-party auditors to validate compliance with international standards.

Marmiro Stones remains dedicated to delivering high-quality products with a strong foundation of ethical, sustainable, and socially responsible practices. Should you require more detailed information or specific documentation, we would be happy to provide it.

TECHNICAL Specifications

COMPRESSIVE STRENGTH ASTM - C170

Sample	Antiqued	Sandblasted
Crema Eda® Marble	13,453 psi	12,080 psi
Crema Eda® Rosa Marble	12,675 psi	13,434 psi
Kasha® Marble	N/A	18,200 psi
Afyon Cloud® Marble	10,968 psi	10,208 psi
Deep Blue® Marble	12,082 psi	11,929 psi
Terra Travertine	8,645 psi	N/A
Grano® Travertine	7,891 psi	7,945 psi
Avena® Travertine	9,287 psi	N/A
Takoma Silver® Travertine	11,639 psi	N/A
Crema Oliva® Marble	15,110 psi	14,868 psi
Orcca® Marble (Vintage)	N/A	14,933 psi
Carya® Marble	N/A	10,325 psi
Marmiro® Bluestone Sandstone (Flamed)	N/A	14,133 psi

FLEXURAL STRENGTH ASTM - C880

Sample	Antiqued	Sandblasted
Crema Eda® Marble	N/A	1,284 psi
Crema Eda® Rosa Marble	N/A	1,466 psi
Kasha® Marble	N/A	1,295 psi
Afyon Cloud® Marble	N/A	1,308 psi
Deep Blue® Marble	N/A	1,878 psi
Terra Travertine	1,878 psi	N/A
Grano® Travertine	1,587 psi	N/A
Avena® Travertine	1,232 psi	N/A
Takoma Silver® Travertine	1,364 psi	N/A
Crema Oliva® Marble	N/A	2,341 psi
Orcca® Marble (Vintage)	N/A	2,083 psi
Carya® Marble	N/A	1,200 psi
Marmiro® Bluestone Sandstone (Flamed)	N/A	1,785 psi

FREEZE AND THAW ASTM - C666

Sample	Results	Notes
Crema Eda® Marble	Pass	No cracks or deformations noted.
Crema Eda® Rosa Marble	Pass	No cracks or deformations noted.
Kasha® Marble	Pass	No cracks or deformations noted.
Afyon Cloud® Marble	Pass	No cracks or deformations noted.
Deep Blue® Marble	Pass	No cracks or deformations noted.
Terra Travertine	Pass	No cracks or deformations noted.
Grano® Travertine	Pass	No cracks or deformations noted.
Avena® Travertine	Pass	No cracks or deformations noted.
Takoma Silver® Travertine	Pass	No cracks or deformations noted.
Crema Oliva® Marble	Pass	No cracks or deformations noted.
Orcca® Marble (Vintage)	Pass	No cracks or deformations noted.
Carya® Marble	Pass	No cracks or deformations noted.
Marmiro® Bluestone Sandstone (Flamed)	Pass	No cracks or deformations noted.

WATER ABSORPTION ASTM - C97

Sample	Antiqued Water Absorption %	Sandblasted Water Absorption %
Crema Eda® Marble	0.17	0.19
Crema Eda® Rosa Marble	0.17	0.16
Kasha® Marble	N/A	0.52
Afyon Cloud® Marble	0.17	0.16
Deep Blue® Marble	0.17	0.18
Terra Travertine	1.98	N/A
Grano® Travertine	2.12	2.24
Avena® Travertine	1.71	N/A
Takoma Silver® Travertine	0.52	N/A
Crema Oliva® Marble	0.60	0.44
Orcca® Marble (Vintage)	N/A	2.90
Carya® Marble	N/A	0.83%
Marmiro® Bluestone Sandstone (Flamed)	N/A	1.76%

DENSITY ASTM - C97

Sample	Antiqued Density	Sandblasted Density
Crema Eda® Marble	168.5 lbs/ft³	167.4 lbs/ft³
Crema Eda® Rosa Marble	168.3 lbs/ft³	169.3 lbs/ft³
Kasha® Marble	N/A	162.8 lbs/ft³
Afyon Cloud® Marble	162.4 lbs/ft³	164.2 lbs/ft³
Deep Blue® Marble	163.8 lbs/ft³	167.4 lbs/ft³
Terra Travertine	153.1 lbs/ft³	N/A
Grano® Travertine	154.7 lbs/ft³	152.0 lbs/ft³
Avena® Travertine	145.8 lbs/ft³	N/A
Takoma Silver® Travertine	151.0 lbs/ft³	N/A
Crema Oliva® Marble	162.8 lbs/ft³	162.1 lbs/ft³
Orcca® Marble (Vintage)	N/A	168.8 lbs/ft³
Carya® Marble	N/A	168.5 lbs/ft³
Marmiro® Bluestone Sandstone (Flamed)	N/A	160.5 lbs/ft³

DISCLAIMER

Marmiro Stones, Inc. has no control over the buyer's selection, installation, or use of any stone. Prior to using or permitting the use of our products, the buyer must determine the suitability, slip resistance, and maintainability of the products for the intended application and assumes all risk and liability in connection therewith. 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, misapplication, or misuse of our products.

Information concerning temperature ranges illustrated in this catalog reflects measurements taken by Marmiro Stones on September 1, 2022 and September 9, 2022 in Carlstadt, New Jersey, using a laser temperature gun at our own facilities, which are not a certified thermal testing laboratory. These results should not be solely relied upon when selecting products, as temperatures will vary depending on installation, maintenance, usage, and environmental factors, all of which remain the responsibility of the customer and their installer.

Marmiro Stones, Inc. expressly disclaims any and all claims arising out of or in connection with the sale, transportation, installation, or use of our products, or from reliance on information contained in this document(s), including but not limited to, loss of rights, materials, personal injury, or other damages. The buyer agrees to hold Marmiro Stones, Inc., its agents, and employees harmless against any loss, damage, claim, suit, liability, judgment, or expense related thereto. For more detailed information concerning stone or paver specifications, please refer to the applicable ASTM standards. Incorporated by reference are all terms and conditions contained within this catalog.

SCAN ME

PERMEABLE
Pavement System

STONE TYPE	STONE FINISH	PATTERN	STONE THICKNESS	ADDITIONAL INFORMATION	INFILTRATION RATE INCH PER HOUR
Marble	Antiqued	French Pattern	1 3/16”	Tight Joint	719.2 IN. / HR.
Marble	Sandblasted	French Pattern	1 3/16”	Tight Joint	378.9 IN. / HR.
Marble	Antiqued	6”x12” Herringbone	2” / 2.25”	1/4” Joint	451.8 IN. / HR.
Marble	Sandblasted	French Pattern	1 3/16”	1/4” Joint	587.4 IN. / HR.
Marble	Sandblasted	24”x24”, 16”x16” 12”x12”, Stacked Bond	1 3/16”	1/4” Joint	597.3 IN. / HR.
Travertine	Antiqued	16”x24”, 12”x24” Running Bond 24”x24”	1 3/16”	1/4” Joint	719.2 IN. / HR.
Travertine	Reclaimed	Gateway Pattern®	2” / 2.25”	1/4” Joint	503.5 IN. / HR.
Marble	Sandblasted	16”x24”, 12”x24” 24”x24” Running Bond	1 3/16”	3/8” Joint	489.5 IN. / HR.
Travertine	Antiqued	24”x24”, 16”x16” 12”x12”, Stacked Bond	1 3/16”	3/8” Joint	597.3 IN. / HR.
Granite	Waterblasted	4”x 4” Running Bond	2”	1/4” Joint	881.0 IN. / HR.

STANDARD TEST METHOD IS ASTM C1781 FOR SURFACE INFILTRATION RATE OF PERMEABLE UNIT PAVEMENT SYSTEMS.

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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.

HEAT Testing

Testing was conducted in Carlstadt, New Jersey. On September 1, 2022, the temperature reached 84°F, and on September 9, 2022, it was 80°F. All products were exposed to direct sunlight throughout both days. The chart below shows the temperature range for each product and finish.

AFYON CLOUD®
Antiqued Finish
Sandblasted Finish
Sandblasted with Invisible Sealer
Sandblasted with Enhanced Sealer

AVENA®
Antiqued Finish

CARYA®
Sandblasted Finish
Sandblasted with Invisible Sealer
Sandblasted with Enhanced Sealer

CREMA®EDA
Antiqued Finish
Sandblasted Finish
Sandblasted with Invisible Sealer
Sandblasted with Enhanced Sealer

CREMA EDA®ROSA
Antiqued Finish
Sandblasted Finish
Sandblasted with Invisible Sealer
Sandblasted with Enhanced Sealer

CREMA OLIVA®
Antiqued Finish
Sandblasted Finish
Sandblasted with Invisible Sealer
Sandblasted with Enhanced Sealer

DEEP BLUE®
Antiqued Finish
Sandblasted Finish
Sandblasted with Invisible Sealer
Sandblasted with Enhanced Sealer

GRANO®
Antiqued Finish

KASHA®
Sandblasted Finish
Sandblasted with Invisible Sealer
Sandblasted with Enhanced Sealer

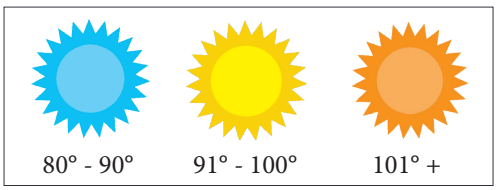
MARMIRO® BLUESTONE
Bluestone Flamed
Bluestone Flamed Invisible Sealer
Bluestone with Enhanced Sealer

ORCCA®
Vintage Finish
Vintage with Invisible Sealer
Vintage with Enhanced Sealer

PORCELAIN
Light Porcelain Shade
Medium Porcelain Shade
Dark Porcelain Shade

TAKOMA SILVER®
Antiqued Finish

TERRA
Antiqued Finish



ADDITIONAL Products

LATICRETE® MULTIMAX™ LITE

The ultimate, lightweight one-step, polymer fortified, Large and Heavy Tile mortar for interior and exterior installation of ceramic tile, porcelain tile, glass tile, stone, quarry tile, pavers, and brick.

GRABO - VACUUM LIFTER

Smoothly transfer various flooring installations, piece by piece. Handle tiles and landscaping elements with care as you move them from one area to another.

LATICRETE® PERMACOLOR®

Grout is a high-performance, fast-setting polymer-fortified grout that provides a tile grout joint that is dense and hard. PERMACOLOR® Grout is color-consistent and features built-in Microban® antimicrobial protection to keep the grout surface looking newer for longer.

HIDE® SKIMMER COVERS

The HIDE® Cover Kits is easy to install on-site and incorporates the same surrounding hardscape material into the cover. The cover sits perfectly flush with the surface finish, providing a sophisticated, integrated finish in your landscape project.

LATICRETE® MVIS (MASONRY VENEER INSTALLATION SYSTEM)

Laticrete® MVIS products include adhesives, air and water barriers, pointing mortars and sealants. Using the MVIS system provides you with a permanent, high strength installation that is freeze/thaw stable and protected from water intrusion. We guarantee it! Our MVIS products are backed by either the LATICRETE® 15 Year System Warranty* or 25 Year System Warranty*.

WARMING Trends

By using Warming Trends' brass burner systems in our firebowls, you get consistent flame height, easier ignition, and a high-end finish that elevates your outdoor experience.

Manual Ignition

Auto Ignition

THE DO'S
And Don'ts

Do's

- Good practice to take pictures of product tags on crates for records of each job.
- Always inspect material before opening crates of Marmiro Stones®.
- Vibratory plate compactor for pedestrian areas with a centrifugal force rating between 3,000-4,500 lbs. with no more than 4" lifts.
- Reversible vibratory plate compactor for light vehicular areas with a centrifugal force rating greater than 8,000 lbs, between 4"-6" lifts.
- Expansion joints are required between back of pool coping and Marmiro Stones® natural stone pavers on pool deck. See pool coping guideline page for details.
- A minimum ¼" joint is required for all driveway paver installations using Marmiro Stones natural stone pavers. Jointing sand or clean stone is required in joint.
- Make sure an expansion joint is between the coping and decking, as well as grout between each coping piece.
- When installing, lay coping out based on color range prior to mudding down.
- Butter the back of each stone fully when mudding down.
- Wipe up excess sealer upon applying prior to it drying.
- Clean the installed area prior to sealing.
- When installing French Pattern, be sure to pull from 2-3 crates at a time for best blending.
- When installing single size pieces, be sure to pull from 3-4 crates at a time for best blending.

Don'ts

- Do not use vibratory equipment on top of sandblasted marble or travertine.
- Do not lay driveway pavers without a joint. Must have a minimum of ¼" joint.
- Do not glue coping pieces on concrete gunite pool bond beam.
- Do not lay the sandblasted side of the marble or travertine down. The sandblasted side is the finished side.
- Do not lay the bamboo finished side (grooved surface) of the marble or travertine down. Do not apply mortar to this side - this is the finished side. Apply the veneer mortar to the smooth side of the stone.
- Do not use acid.
- Do not powerwash without testing a sample.

EDUCATION
Center

At Marmiro Stones, we believe knowledge is just as important as craftsmanship. That's why we're committed to educating the industry on proper methods of installing natural stone and helping professionals understand its unique characteristics. Our goal is to ensure every project is built to last.

HOW WE HELP:

- On site job reviews and support
- Hands-on training events
- Educational seminars at trade shows
- Third-party product testing
- Comprehensive installation guidelines

SCAN ME

INSTALLATION GUIDELINES

SCAN ME

YOUTUBE CHANNEL


WITH PASSION.
STONES.

MARMIRO STONES®

BY TURAN BEKISOGLU

US HEADQUARTER & DESIGN STUDIO

790 WASHINGTON AVE, CARLSTADT, NJ 07072

Schedule Your Visit

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Schedule Your Visit

201-933-6461

DESIGN STUDIO TN

210 MARYETTA ST, CROSSVILLE, TN 38555

Schedule Your Visit

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