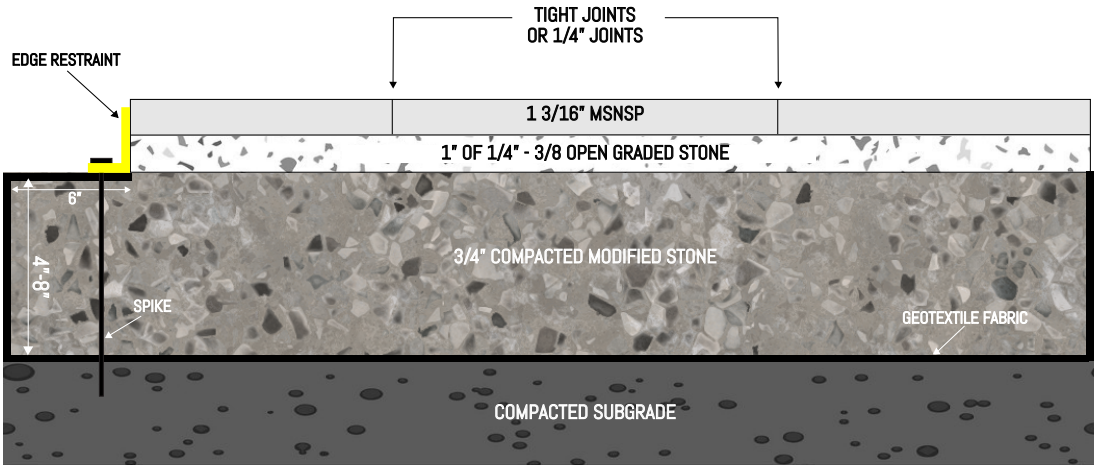
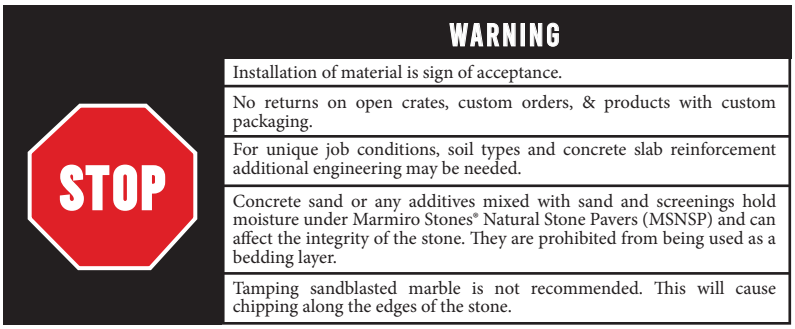
DRY LAID ON MODIFIED BASE: 1 3/16"

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.
   - NOTE: Compaction is particularly important around pool decks when back filling underground pipes using suitable soils. Failure to do so may cause settlement in the surface, causing cracking and chipping.

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, sitting on the base.

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.