Paths & Walkways

BRICK, STONE AND GRAVEL

Types of Unit Pavers

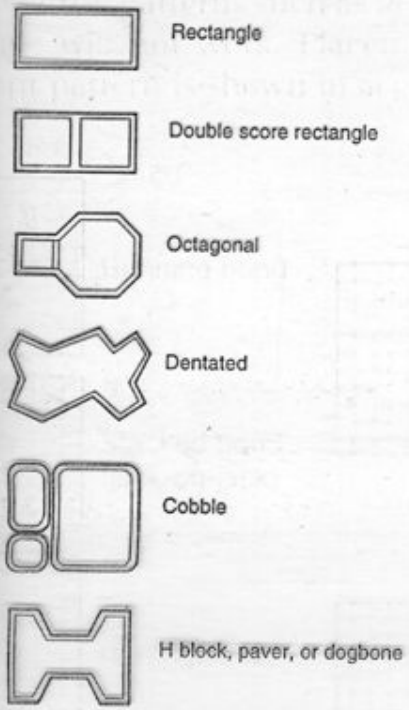
- 1. Baked Clay Brick, Paving Brick, Pavers
- 2. Concrete Pavers
- 3. Interlocking Paving Blocks
- 4. Tumbled Pavers
- 5. Open cell pavers
- 6. Resilient Pavers
- 7. Builders Brick

Brick

- Today Manufactured from clay or shale that is mined. Pulverized, mixed, molded or cut to size.
- Dried then fired in a kiln for several hrs to days at 1600 - 2000°
- Longer the fired the harder the brick.

Clay Brick

- Rectangular, fired paving brick, 4” x 8” x 2 ½”
- Range of colors from white, cream tones, to oranges, reds and browns & charcoal.
- No mortar holes, strength of up to 5,000 lbs. psi.



24-8 Interlocking concrete paver shapes.

Paving Patterns

Examples of common paving patterns and the pavers that work best in those patterns are identified in Figure 24–1. Certain paving materials may allow only one pattern due to the special shapes in which they are manufactured. Use caution when purchasing brick pavers. If the units are not modular (length twice as long as width), patterns such as herringbone and basket weave will not work. Placement order for each pavement pattern is shown in accompanying figures.

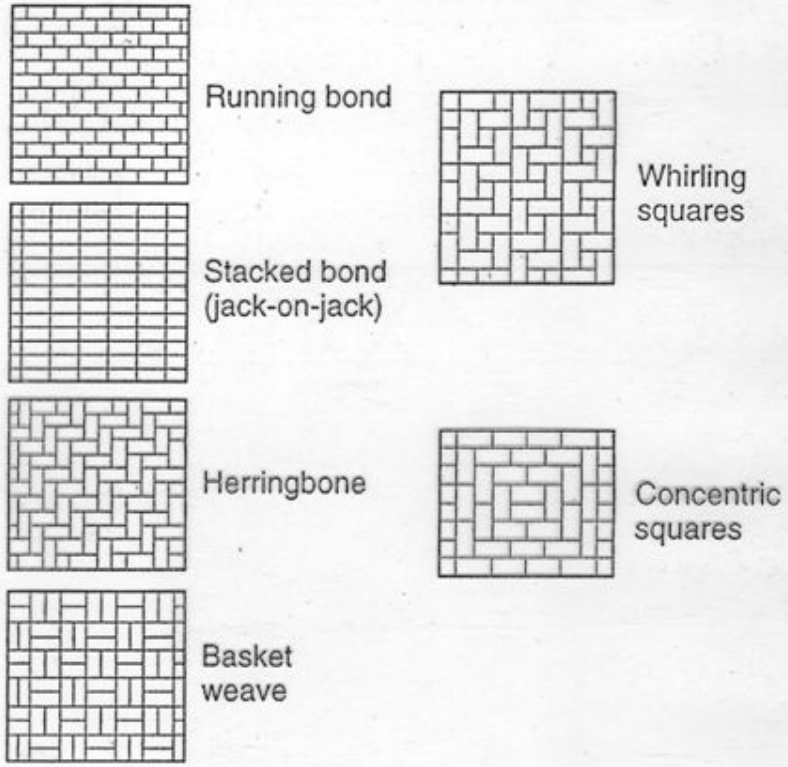
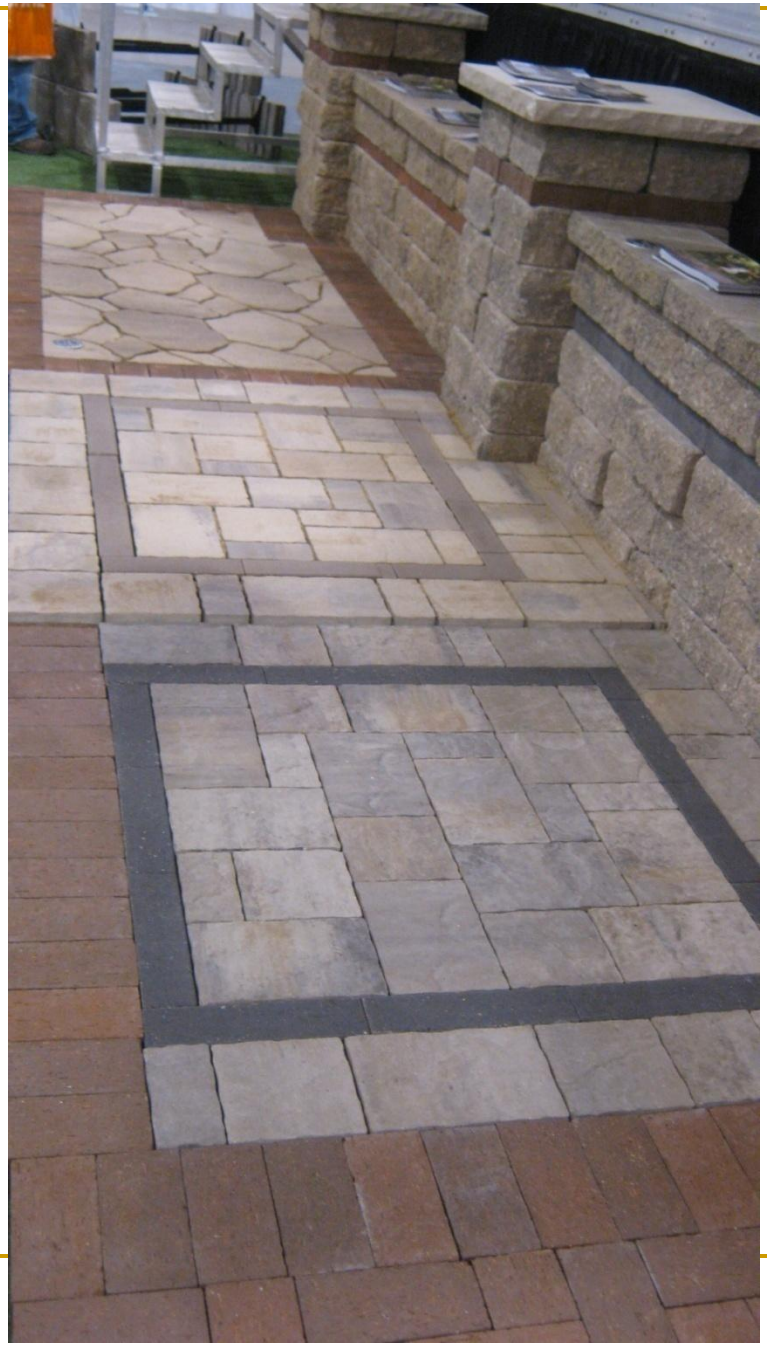


Figure 24-1 Common unit paving patterns.

Stone, Brick and Concrete Paver Patterns

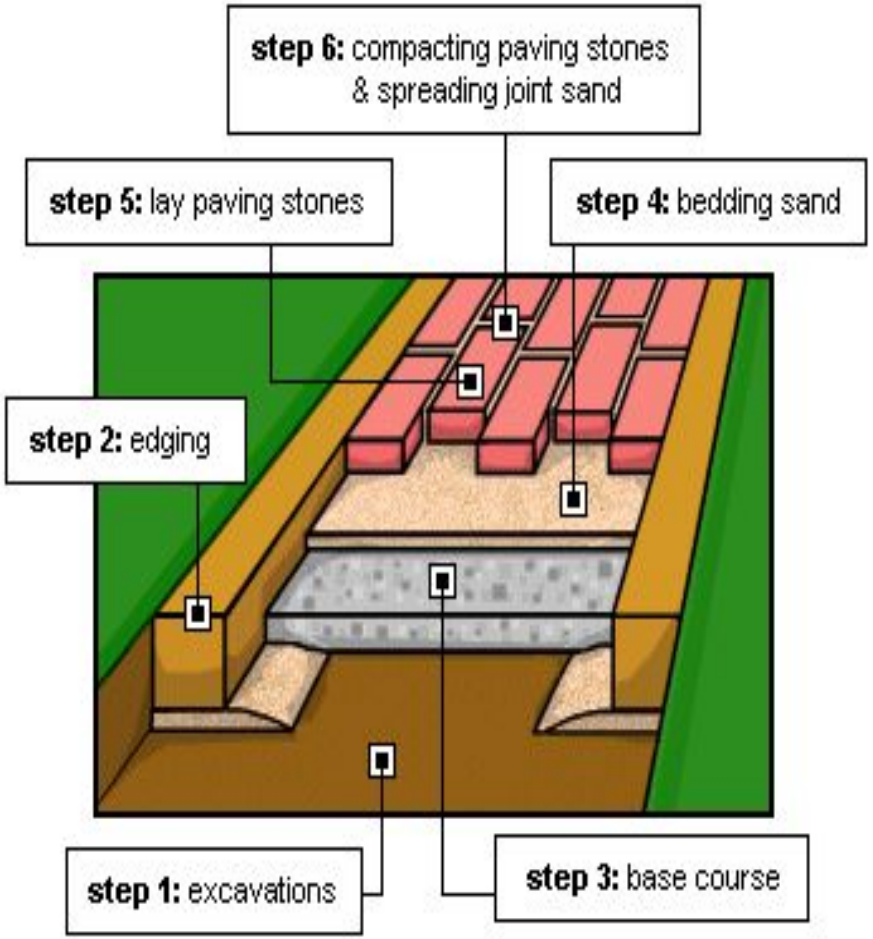


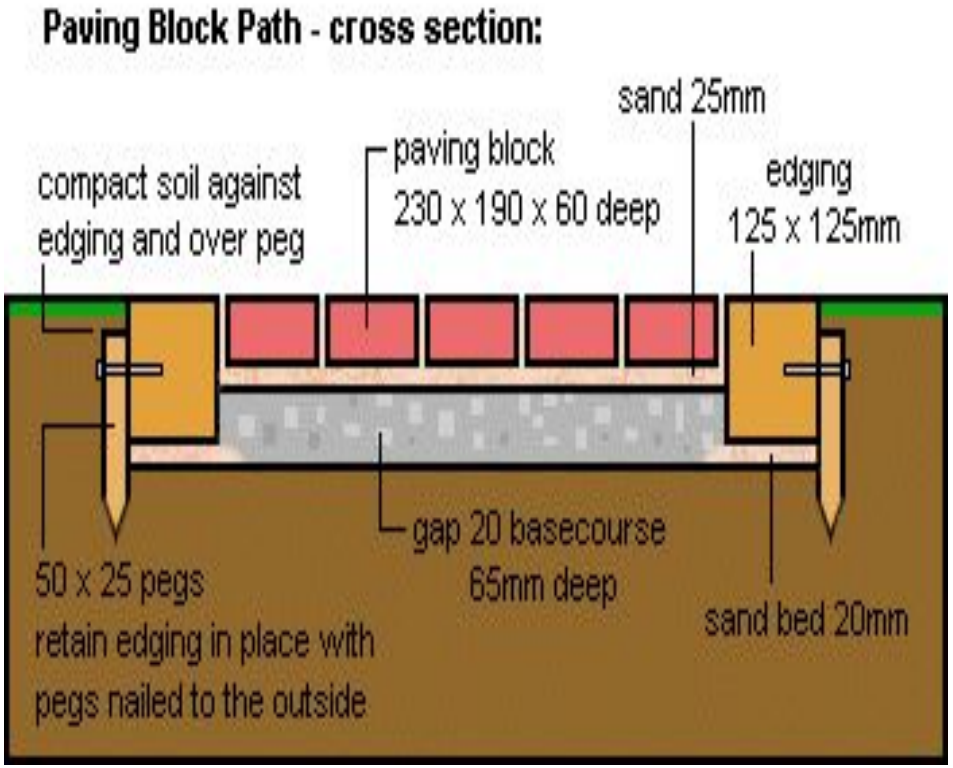
1. Paving Brick

- Standard Bricks are 2 1/4” x 3 5/8” x 7 5/8”. A standard joint is 3/8”.
- To excavate, calculate thickness of brick plus 1” of setting sand and 4” of gravel for walkways Use 8” of gravel for vehicular traffic.
- Ex. 2 ½” + 4” = 6½” deep to prepare walkways or 7” for ½” above grade. For vehicle use excavate to 12”.
- For setting brick over 4” of compacted gravel – use a compactor, then use a vibrator to settle in the brick.

Sand Compactor

Paving Brick





2. Concrete Pavers

- Can be standard brick size or other shapes including interlocking, hexagonal, Squares, rectangles etc.
- Are lighter weight than paving bricks.
- Setting same as for Paving Bricks

Setting Concrete Paving Brick

- Standard joint is 3/8”. To excavate, calculate thickness of brick plus 1” of setting sand and 4” of gravel for pedestrian use. Use 8” of gravel for vehicles.
- Ex. 3 ½” + 4” = 8 ½” deep to prepare walkway or 8” if ½” above grade and a 12” for vehicle use.

Setting Concrete Paving Brick

- Structure edge is used to hold paving brick in place
- Geo-textile fabric is used between sand and brick as a weed barrier.
- Granular herbicide may also be used

Paving Brick over Concrete

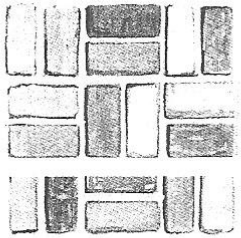
- Aggregate Base = 3” (pedestrian)
  6” (vehicles)
- Then 4” reinforced concrete.
- Mortar bed = ½” layer of mortar – spread over about 2’ to 3’ of area at a time
- Brick is set on mortar, leveled with ¼”- 3/8” joint which is then also mortared between the bricks.

Paving Brick

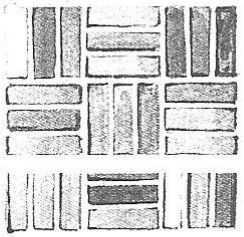
Brick Overlays

- Brick over used concrete/ Asphalt concrete pavers laid in a herringbone pattern over 1” of bedding sand and a Geotextile can regenerate new life over concrete and/or asphalt.

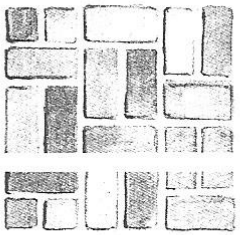
Brick Patterns



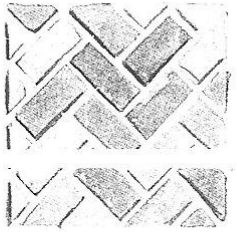
Basketweave



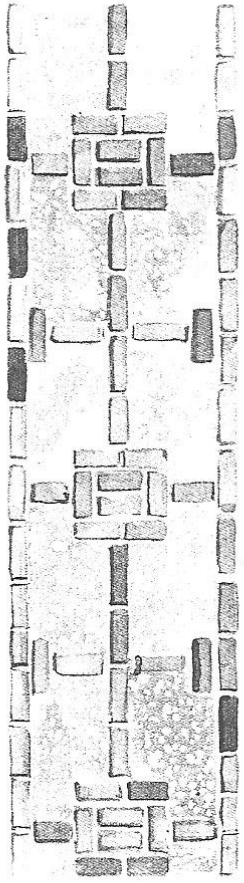
Basketweave on edge



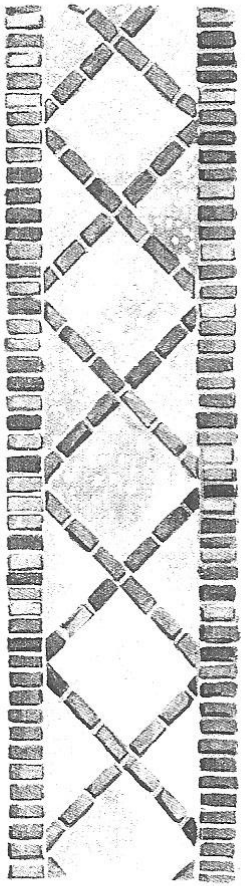
Basketweave with halves



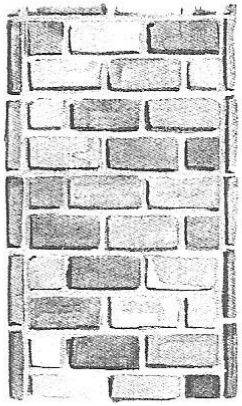
Herringbone



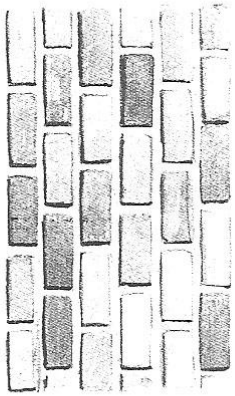
Brick and gravel



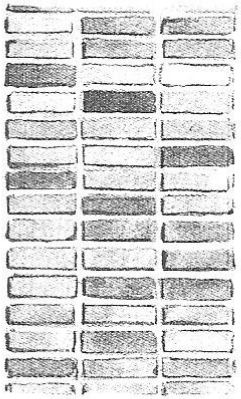
Brick and gravel



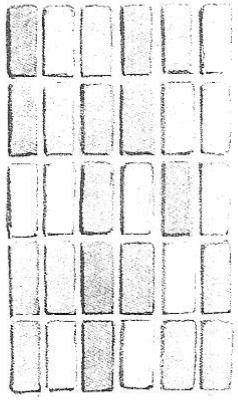
Crosswise running bond



Lengthwise running bond



Stack bond on edge



Stack bond

Brick can be used on its own or with other materials to create a vast range of patterns. Running bond and stack bond are best for curving paths. Basketweave and herringbone patterns are easy ways to create a straight path.

New Product

- Techni-seal manufactures it.
- Polymeric sand- Unilock sells it as “Structure Sand”
- Buy the sand and Sweep it between the cracks- then wet it down and it hardens like a resin – has some give for movement but stays intact – can stabilize ½” – ¾” joint for stone also:

Polymeric Sand

- Lets water through
- Prevents weed growth
- Keeps insects from mining under pavements
- Stays in joints better than other sand / fair alternative to mortar over concrete.
- Relatively new -Duration or life of product

Stone has Different Hardness's

- Limestone is soft & porous

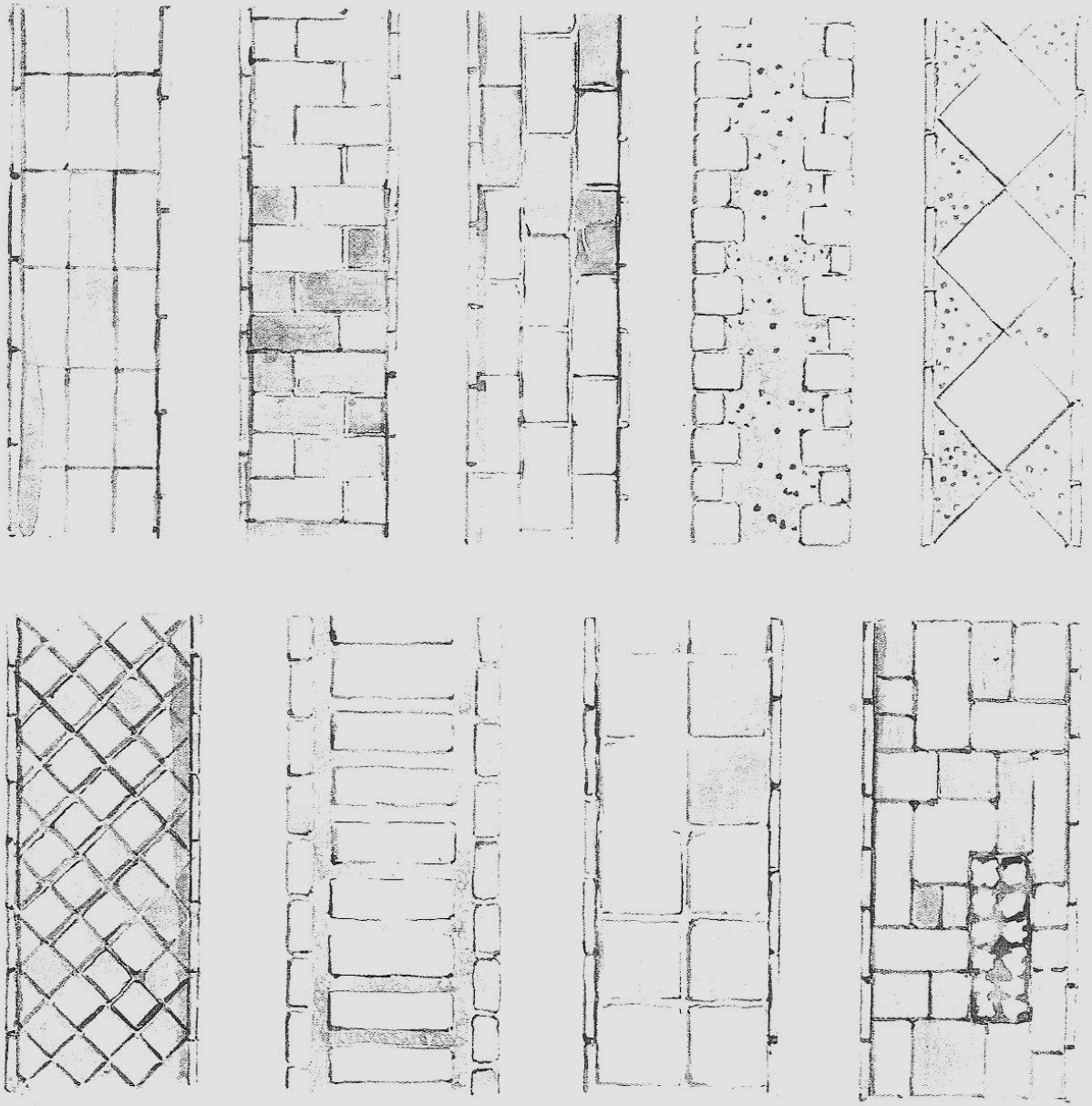
Stone has Different Hardness's

- Sand Stone Wears Faster

Stone has Different Hardness's

- Blue Stone or Slate is Harder

Cut-Stone Patterns



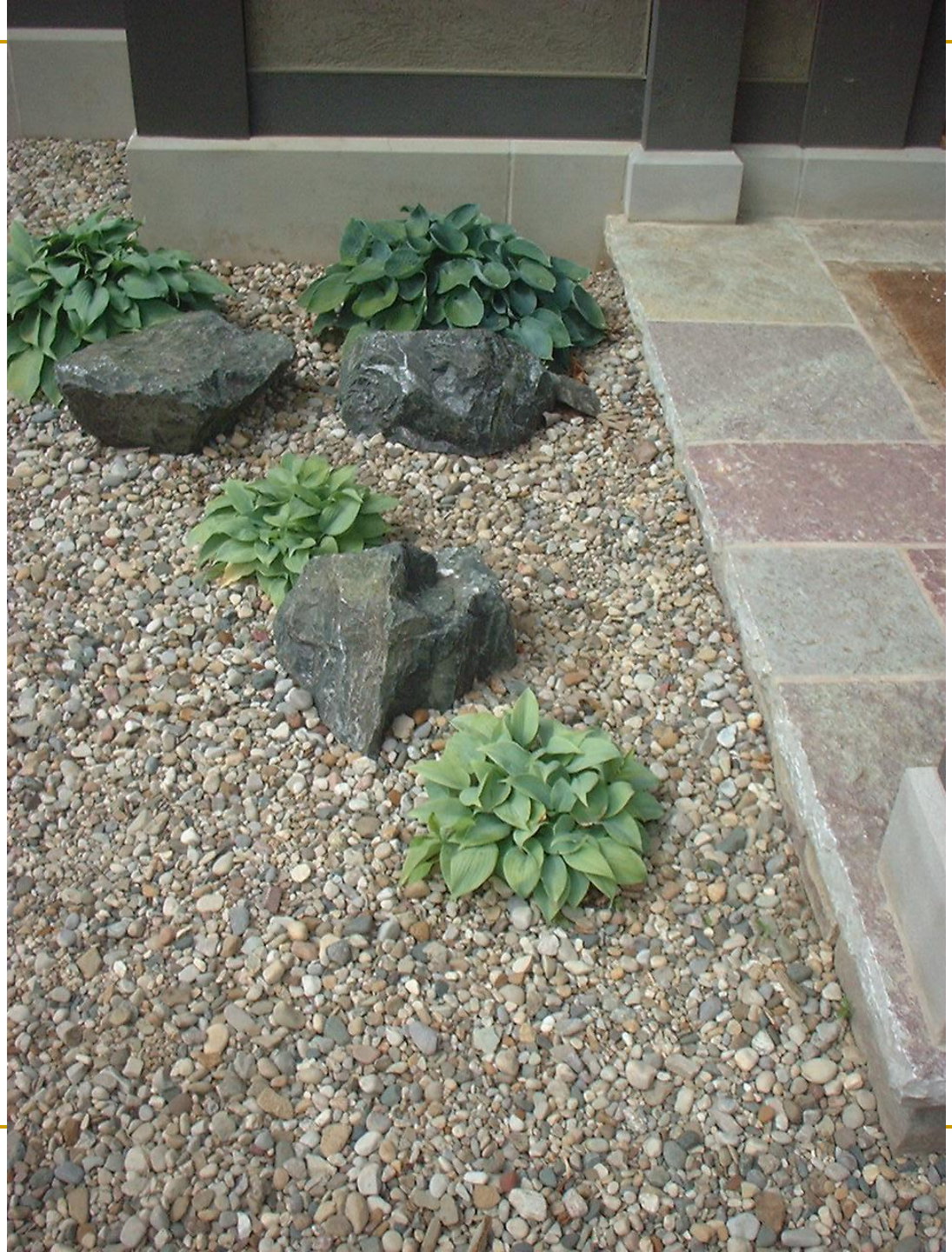
Cut stones can be used in a variety of ways to create interesting patterns on the ground. Use a simple pattern in a complex garden and vice versa for pleasing contrast. Cut stone can also be combined with other materials, such as crushed stone or gravel. Stones laid on the diagonal will require more cutting than those laid parallel to the path.

Cut Stone

- Can have 2 smooth surfaces & all sides flat or 1 side smooth 1 side textured, but still in squares or rectangles etc.
- Cut stone gives a more formal look
- Tumbled cut stone gives all world look

Stone over Concrete

- Base starts with the usual 6” gravel & 3”-4” concrete
- Needs 2” of mortar space over concrete because have irregularity in stone thickness.
- Most flagstone is 1 ½” thickness.
- Do a segment at a time
- Lay out stone besides walk patio first so can fit pieces in puzzle before you start.
- Flag will require some cutting to fit.



Cut Stone

- Stone of any kind can be cut into squares, rectangles of most any size. Is cut both horizontally and vertically.

New Product

- Effortless Cobbles- segments are attached.
- Fan Pattern, Arch pattern, Circle & Square Straight.
- Plastic grid sheet holds concrete cobblestone together – can put down same as installing bricks over sand or other concrete.

Effortless Cobbles

- Advantages
  - Saves a lot of work positioning individual cobbles to make the pattern, stone is already pre-cut.
  - Saves Labor
  - Can sweep structure sand between
  - Can trowel mortar over all the work into joints
  - Can be used in driveways if mortared, patios, walk, etc. if sand set – needs a structure edge either way.

Disadvantage

- Thinner veneer stone used – will not stand up to as much weight/traffic when installed on sand base.

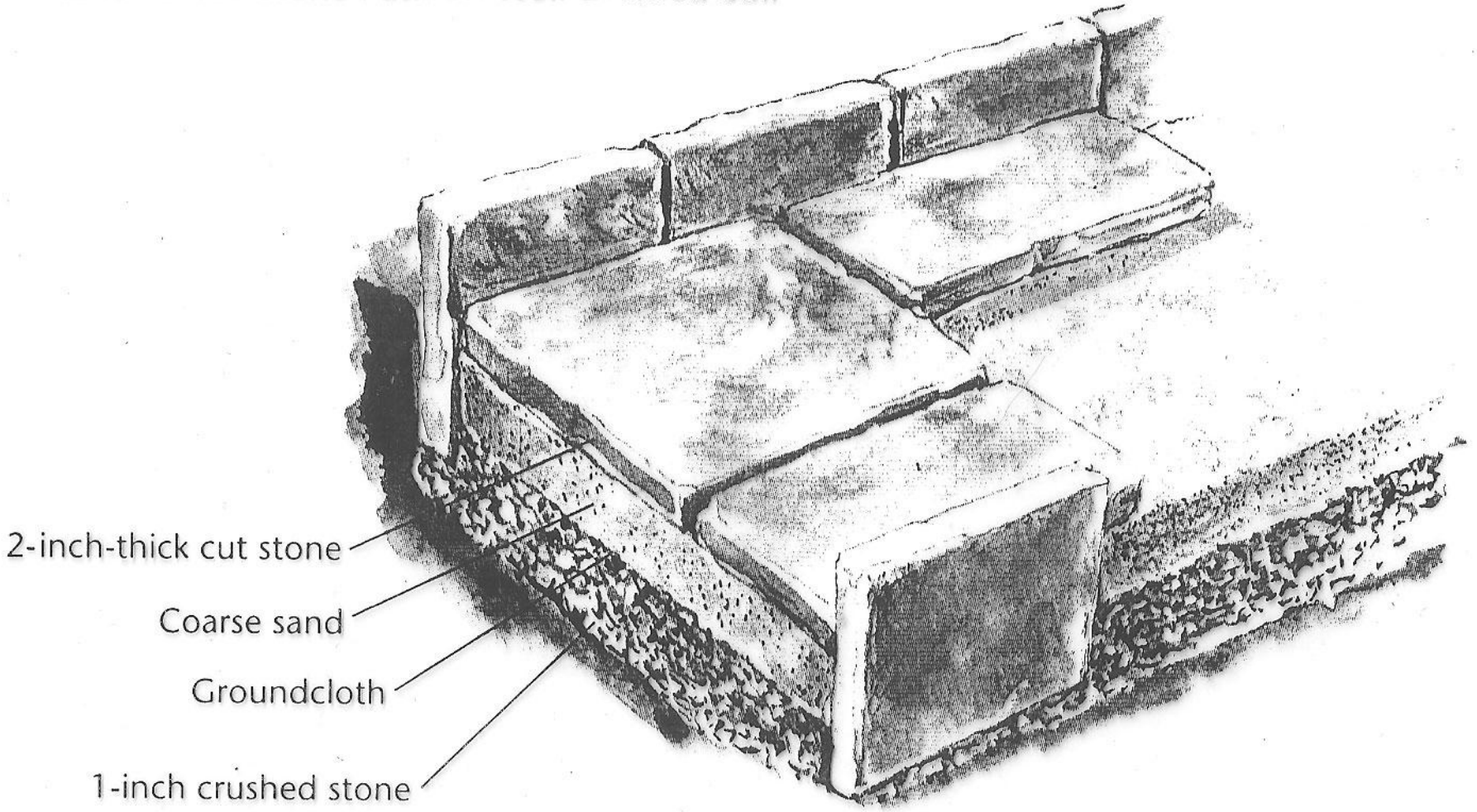
Pattern Stone

- Reversible pattern
- to create a natural
- stone look without a repeat pattern.

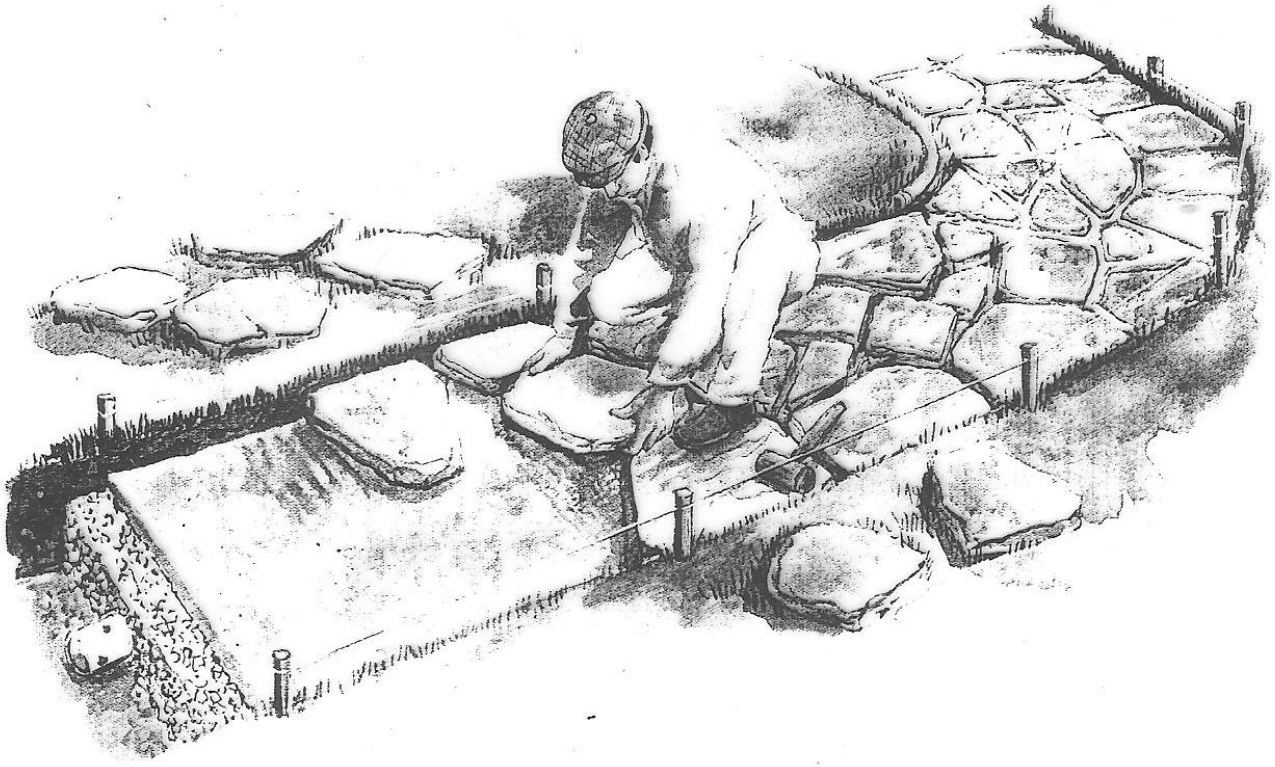
Recycled Countertop Granite

Granite Countertop – pieces recycled

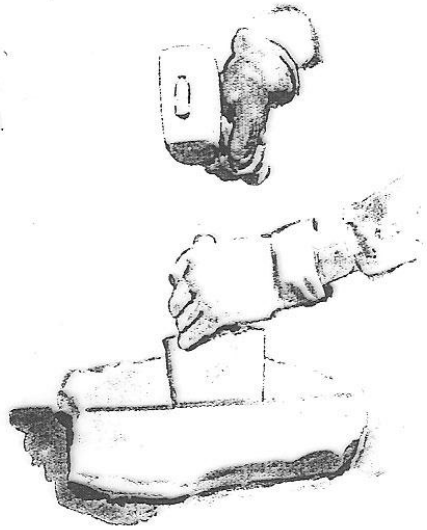
Base for a Cut-Stone Path on Well-Drained Soil



Cut stone can be laid on a few inches of finely crushed gravel. To increase the drainage underneath, you may need to lay two or three inches of 1½-inch crushed stone and then woven black plastic cloth beneath the gravel. The bottom of the edging stones should sit on crushed stone for good drainage.

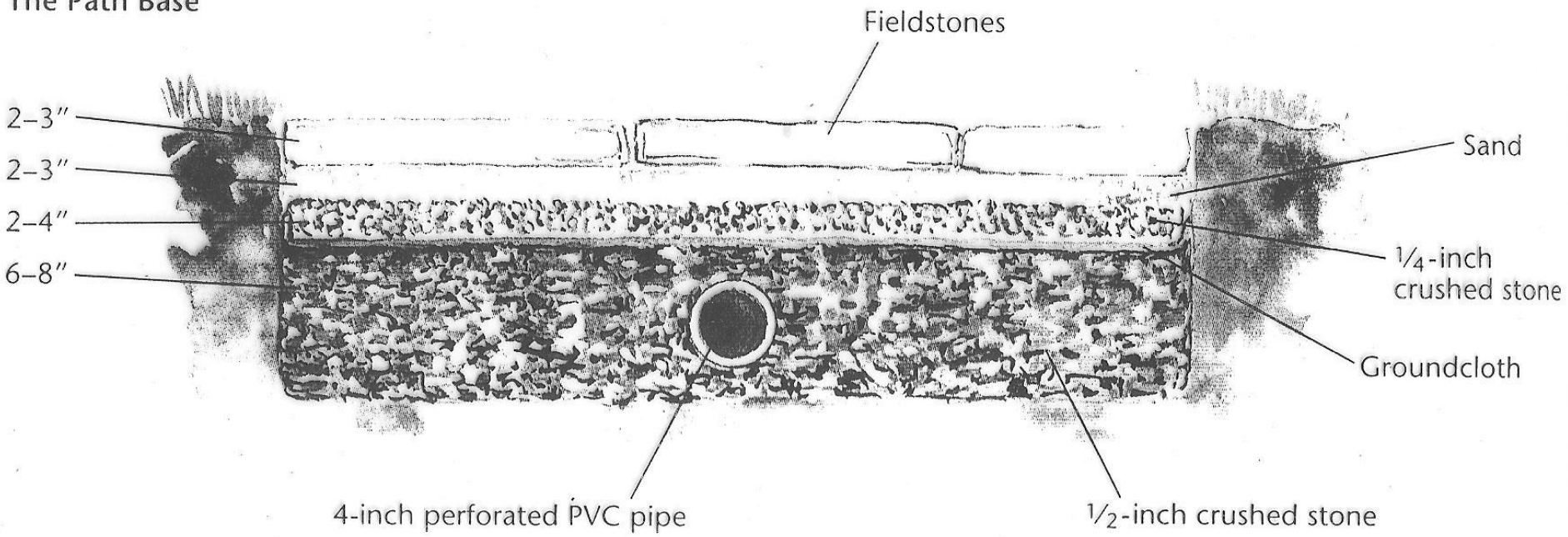


Making a fieldstone walkway is like doing a jigsaw puzzle. Enjoy the challenge of fitting and shaping pieces to get just the look you want: tightly laid and formal, or loosely laid and informal.



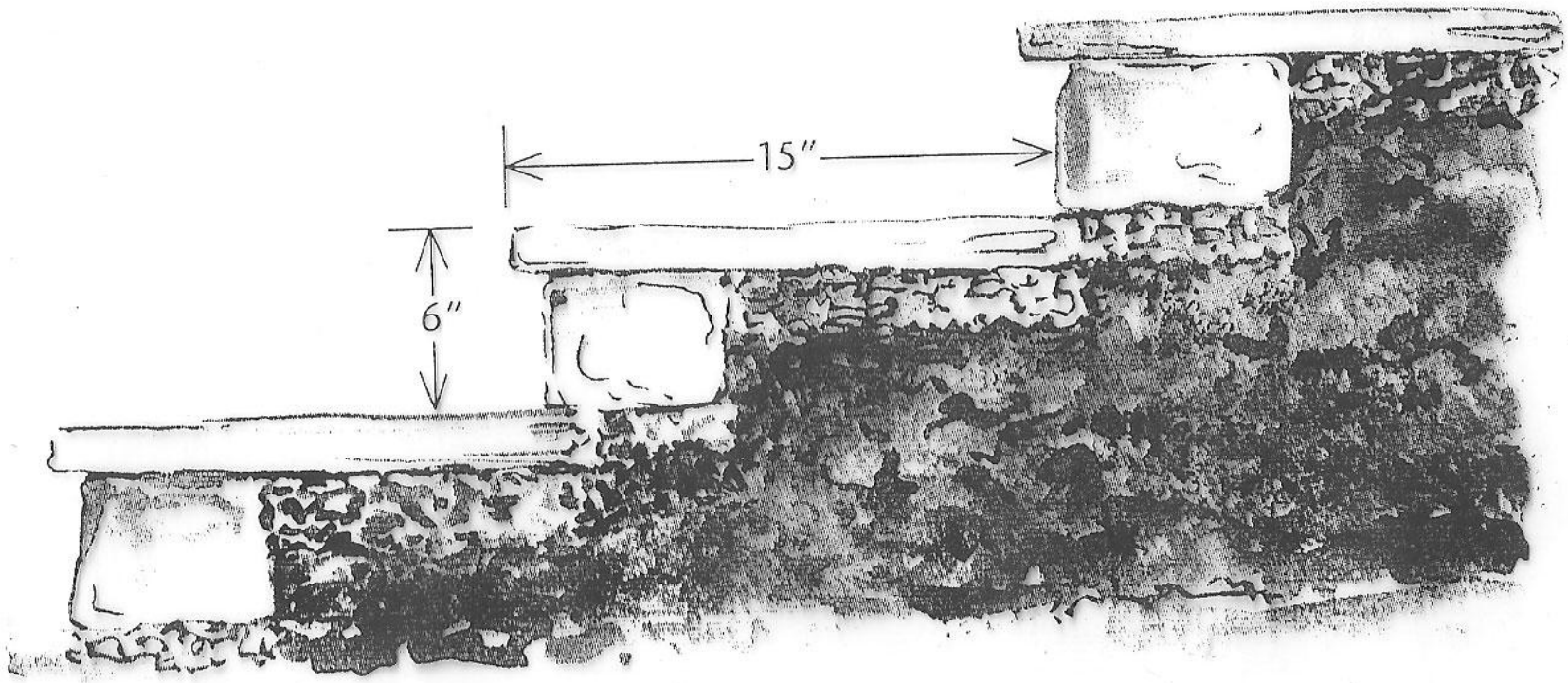
A four-pound hand sledge hammer and a mason's chisel will suffice when it comes to shaping fieldstone. Don't use a power saw to make your cuts, as they will look too perfect and stand out from adjacent stones.

The Path Base



The base for a path set into poorly drained soil might need all the elements shown here. However, if your soil is sandy or gravelly, you can dispense with the PVC pipe and use considerably less crushed stone under the path.

The Formula for Step and Tread Measurement



To design steps, use the standard formula: two times the height of the step (the vertical measurement) plus the length of the tread (the horizontal measurement) should equal 27 inches. In this case, 2 x 6 inches + 15 inches = 27 inches. Follow this formula rigidly and no one will trip on your steps.

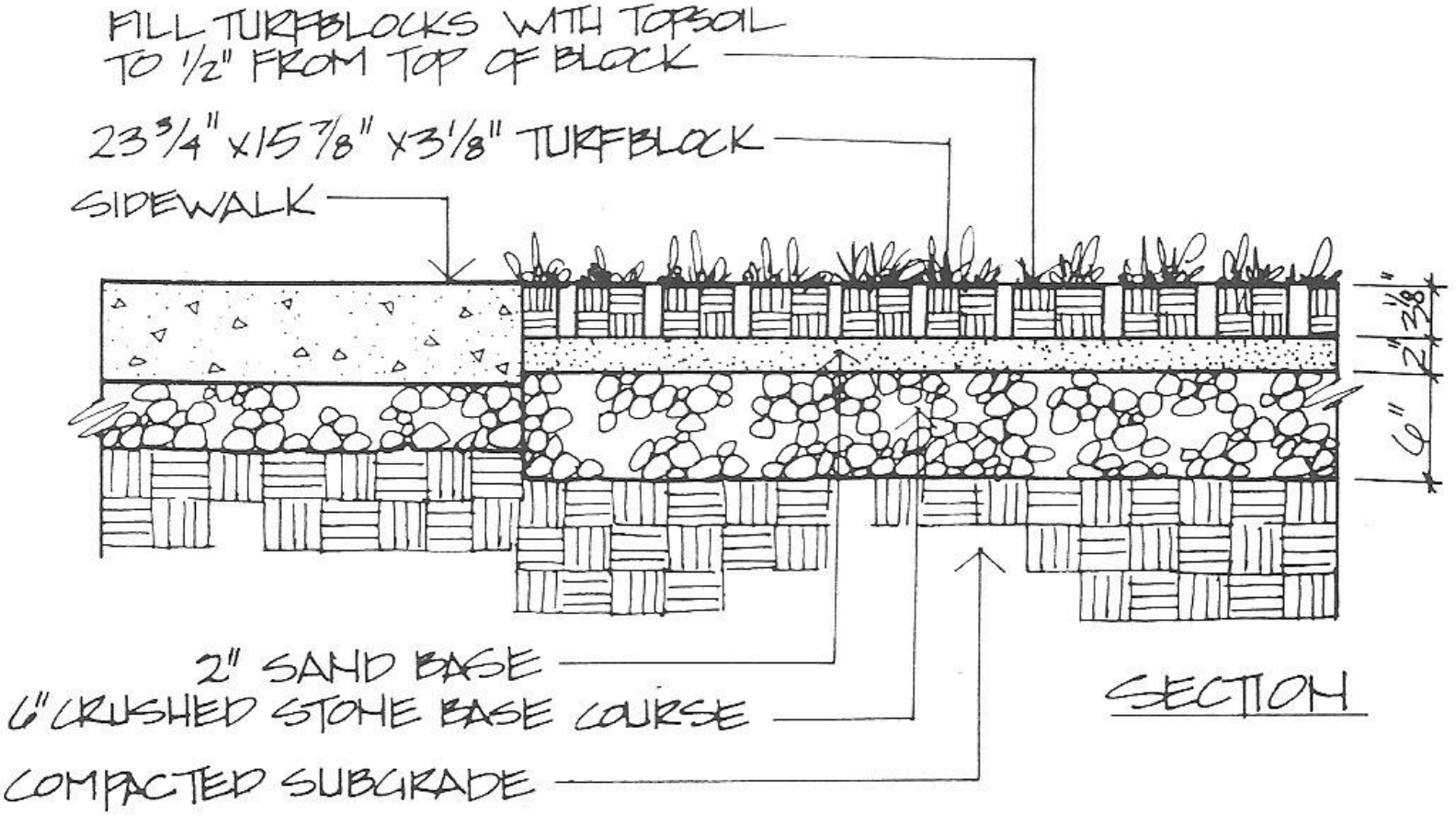
Stone Pavings

1. Flag stone
2. cut stone

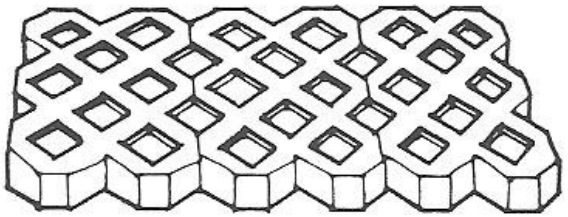
- Random irregular pieces, as they broke when taken out of a quarry or put onto pallets of wire bins.
- Flagstone is a term to any kind of stone i.e. Limestone flag, Bluestone flag, Sandstone flag

Flagstone

- Flagstone will have differer faces & thickness 11/2” is standard width.
- Faces include “weather edge”
- “Rock Face” edge
- “Snapped Edge”



SECTION



PERSPECTIVE

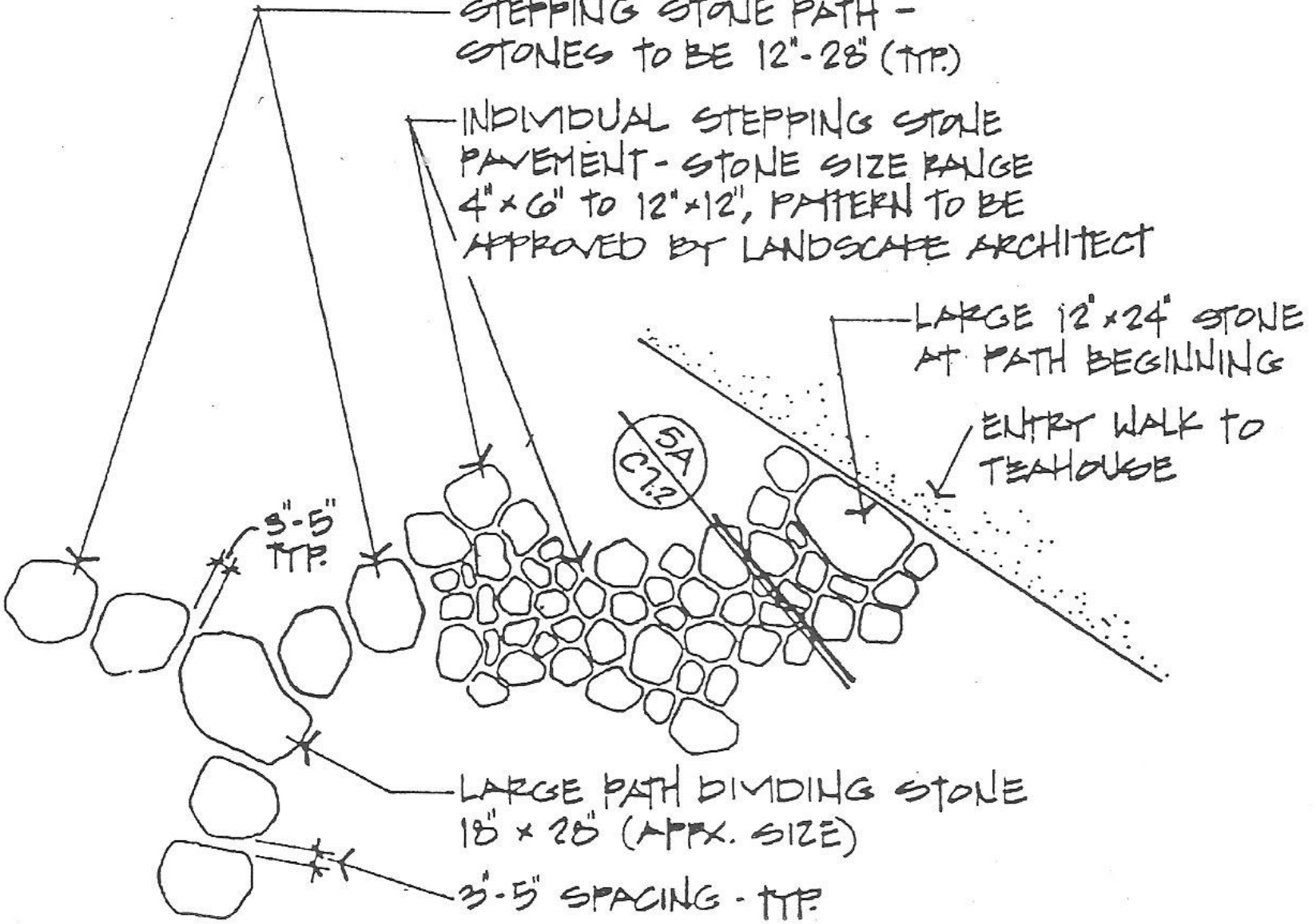
TURFBLOCK

Turf Block or Geo Grid Materials

- Used primarily for providing support under heavy pedestrian traffic areas
- Especially good for car parking or overflow parking where lawn and the weight of the car are compatible.
- Permits green space instead of paved space

Stepping Stones- Using Natural Stone

- Flag or cut can be laid 1’ to 1 ½’ apart cut out turf the size of the stone & so that no more than 1” is above grade.



5 STEPPING STONE PATTERN at ROJI

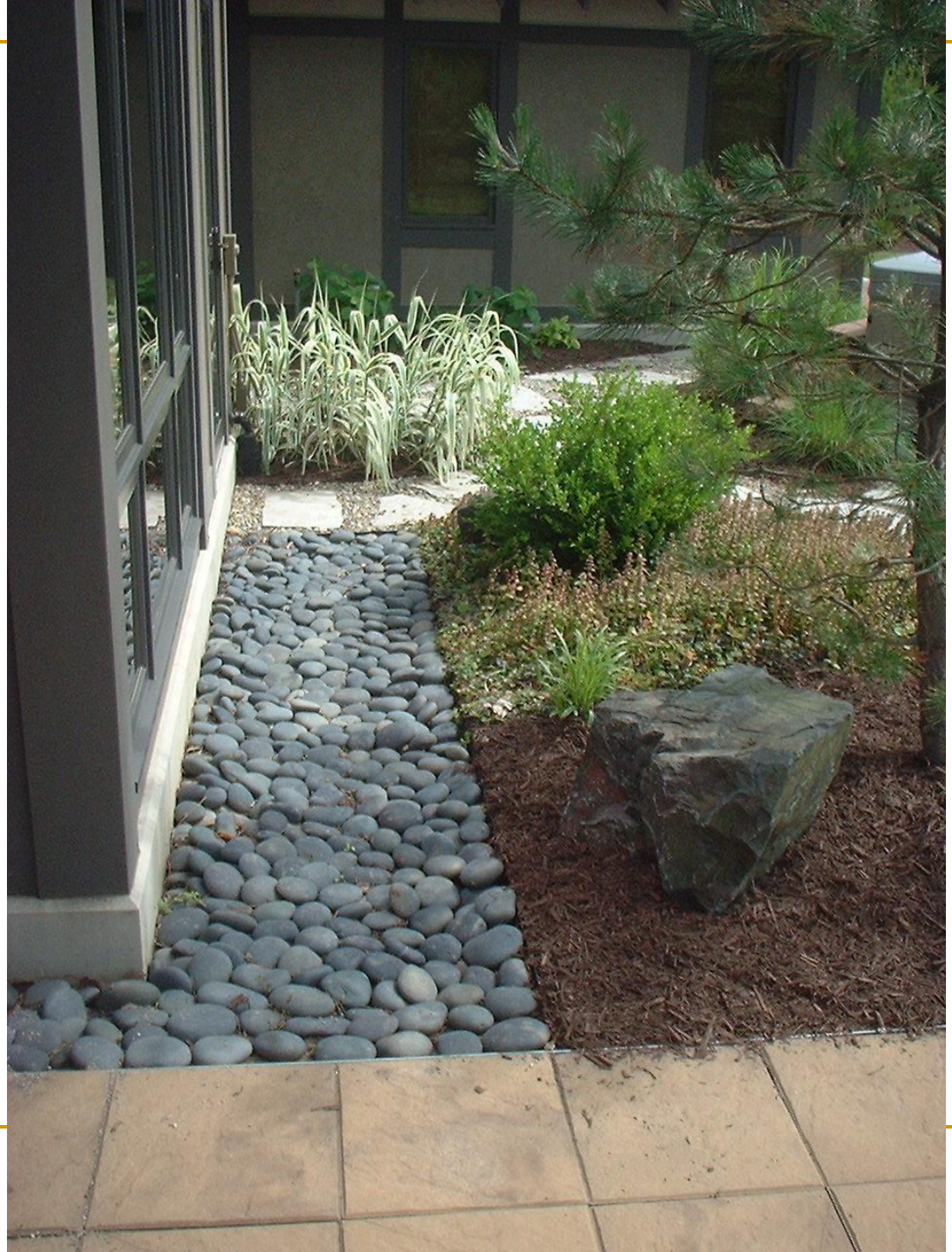
Formed & Molded Concrete Stepping Stones

Flag Path

- 4” of gravel base compacted 1”-2” of sand and an edge restraint.
- Sand swept between and can use structure sand or polymeric sand wet in for up to 1 ½” joints.

Flag Path

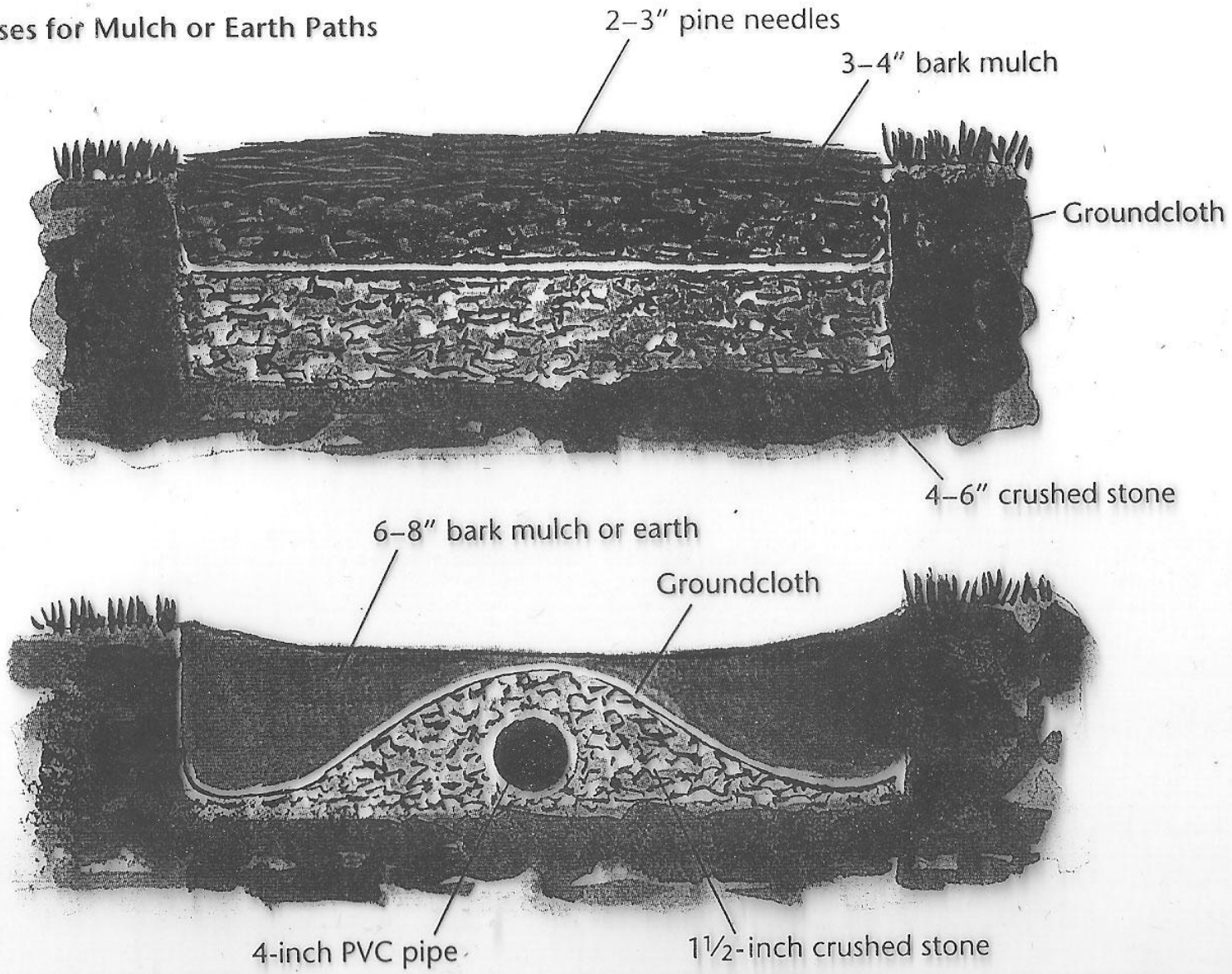

Navistone Concrete Squares/Rectangles



Bark Chip Paths

- Hardwood Bark
- Cedar Bark
- Pine Bark
- Eucalyptus Bark

Bases for Mulch or Earth Paths



Bark-mulch and earth paths require a prepared base if they run through wet or low areas that are slow to drain. If your soil drains freely, you can make an earth path simply by raking leaves and other detritus from its surface. The key to a bark-mulch path is to lay down just enough mulch to cover the forest floor and achieve the springiness you associate with natural woodland.

Advantages to Bark Chip Paths

- Least expensive cost wise of all options
- Easy to put down and top-dress as needed
- Grays out and blends into the landscape in a few months
- Great for natural areas
- Attractive aesthetically
- Best for limited traffic pattern

Disadvantages of Bark Paths

- Cannot shovel snow off of it.
- Hard to keep leaves out of it and blowing them off sometimes take the bark with it.
- On slopes, it tends to wash to the bottom
- Best if it has an edging to hold in place
- Needs to be reapplied about every second year because it continues to break down/decompose
- Can be slippery if used on slopes

Granular Paving – Gravel Paths

- Putting granular material over a soil base is generally not recommended
- Granular materials should not be put over pavements such as concrete and asphalt, create a safety (Slippery) hazard.
- Excavate Soil 5” to get ready for gravel path installation

Granular Paving – Gravel Paths

- Base material of 3-4” of compacted road gravel or 1” = 1 ½” crushed stone or tamp or roll down to compact it thoroughly
- Place the Geotextile weed barrier fabric down next

Granular Paving – Gravel Paths

- On top of this the finish granular material can go – particles should be ¼” or less of a gate stone, Agate, Maramac pebbles preferably local materials or stone composites in pea gravel in a light mixed color can be rolled. Slag “fines” is something used for a gray look. Etc.

½” gravel edged with stone

Gravel on steps not recommended, steps poorly designed

Granular Paving – Gravel Paths

- Can figure the amount of cu. yds needed by measuring length and width of path, then multiplying L x W x Depth of each material and dividing by 27 (cu. Ft. in a yd.)
- For Depth use .4 for 3”, .5 for 6” as the multiplier, etc.
- Example: Gravel Path = 4’ wide x 60’ long

  4’W x 60’L / 27 cu.ft. = 8.9 x .4 (3” deep)

  = 3.5 cu. yds. of gravel

Granular Paving – Gravel Paths

- On slope used a 4” perforated drain pipe under the length of the path to keep the path dry during wet weather.
- On well drained soils can get by with less material


Dry Stream

Advantages to Using Gravel in Paths

- Inexpensive to buy and install
- Generally good traction under foot if installed properly
- Aesthetically attractive if natural colors chosen
- Serviceable for many years if leaf debris and litter is kept blown off
- Some people like the sound of the “crunch” under foot.
- Best used in a natural setting with limited foot traffic.

Disadvantages to Gravel Paths

- Installing an Edging is a must to keep the gravel from migrating off the path
- If too deep, it is hard to walk in
- Difficult to navigate in women's heels or pushing a baby carriage, wheel barrow or pull a wagon through etc.
- Can't shovel snow off of it.
- Must have a blower to keep leaves & debris off

Fines

- Term used to described compacted stone dust.
- The product of cutting stone – esp. granite fines are excellent – available from landscape supply companies.
- Compact it 1”-2” deep for a serviceable path
- Screened slag has been used this way also.

Compacted Granite Fines

Compacted Granite Fines

Slag

- By-product of Steel making
- Limestone heated to a high temperature
- Clinker size to small granular fines
  - clinker size used as an under layment for driveways and roads
  - granular fines used to compact for walks and parking lot surfaces

Composites

- Plastics and sawdust combos

  - Used for steps, stairs and decks

  - Used for walkways around boat launches etc.

Trex, Tec Dec, Monarch -Composite

Epoxy/Bonded Surfaces

- Resin and catalyst mixed which when combined create a solidifying glue
- Mixed with small pea gravel which then hardens with the epoxy.
- Lets water through it but isn't generally winter proof.

Epoxy Aggegate


22


BASS

Porous Pave

Porous Pave

- Recycled rubber tires.
- Flexible, withstands cracking or heaving due to ground freezing and thawing.
- Resistant to oil, chlorine, UV, acids, gas & petrol products
- Put down 2” deep - cures in 24 hrs.
- Comes in colors
- Great traction underfoot

Porous Pave – Recycled Rubber Tires

WOOD PATHS/WALKWAYS

Railroad Ties

2” x 10”, 2” x 12” American Hardwood

Pressure Treated Timbers

Cedar, Redwood, or Ipae, or other Brazilian Hardwoods

Composite – wood and plastic blends such as Trex