



Site Preparation for Flatwork

By Jon Hirsch – Krugel Cobbles, Inc.



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February 23, 2017
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Before You Dig




- ALWAYS call JULIE
- Be aware that many potential hazards will NOT be marked such as:
 - Electric to garage or street light poles
 - Landscape lighting
 - Irrigation
 - Septic
 - Well
 - Old oil tanks & grease traps
 - Existing Drainage



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Before You Dig



- Be aware that there may be unexpected surprises once you start digging.



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Access to Area

- Equipment selection that can get in & out of the site
- Travel time between parked truck & site
- Parking situation (especially in the city)
- Fences or other obstructions that can or cannot be removed

**** ALWAYS make a site visit to familiarize yourself with the site conditions – you are leaving yourself open to a lot of surprises if you do not and just bid a project off of a plan ****




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Removals

- Type of removals? (thickness & conditions)
 - Dirt / Clay
 - Concrete
 - Asphalt
 - Existing pavers / stone
 - Vegetative Debris



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Removals

- Type of equipment needed?
 - Air hammer with breaker





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Removals

- Type of equipment needed?
 - Skid steer or bobcat
 - Wheelbarrow & hand tools



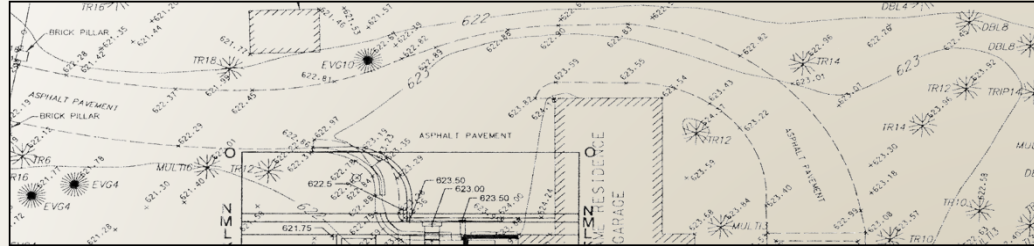




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Grading / Drainage & Sleeves



- Civil plan or Grading plan is always useful
 - Community requirements vary.
 - Grading plan and/or compensatory storage may be requested.
 - Following a civil or grading plan means meeting up with the adjacent elevations.
 - Always check with the architect, general contractor or homeowner for civil or grading plan availability before creating your own.

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Grading / Drainage & Sleeves

- If you create your own grading plan, remember this:
 - Anything less than 1% pitch (1" of pitch over 8' of run) is probably too flat for a pedestrian application and it will be difficult to sheet water off of your installation.
 - Use a bubble level, a line level or preferably a laser level to set up your grades on stakes around your job site before you dig, so that your tractor operator can run string lines to see exactly how deep he needs to dig at each point and how much gravel is needed.
 - ALWAYS try to envision where you are sending your water to – if you are sending it to a low spot that will flood, or sending water to plants that will not tolerate it.



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Grading / Drainage & Sleeves

- According to the ADA, pitching something 12" over 20' of run or less requires a hand rail and anything with more than 12" of pitch over 12' is NOT allowed (even w/ a hand rail)
- Drive applications, especially with asphalt, need at least 2% pitch (2' of pitch over 8').
- If too flat, consider adding drainage in the right location – realize drain could clog.
- Consider burying downspouts. We typically use SDR26 or SCH35 4" PVC plus attachments.
- ALWAYS remember to install PVC sleeves 2-4" (2 side by side) to all planter beds.

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Grading / Drainage & Sleeves

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Spoils / Debris

- Calculate the amount of spoils that will be coming out.
 - How many loads will you have and how much trucking time will it take?
 - Do you have the proper size truck or does it make sense to sub out the trucking?
 - Where are you planning to take the debris
 - Certain places allow you to dump for free, while certain places will take some debris, but not others. Do you research beforehand.
 - Be aware of the State of Illinois regulations in terms of disposing spoils.
 - Cost of disposing spoils
 - ALWAYS remember to factor in your dumping expenses.



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Basing: Sub-Soil Conditions



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Basing: Sub-Soil Conditions

- Soils are generally categorized as 4 types:
 - Sand
 - Silt
 - Clay
 - Gravel

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Basing: Sub-Soil Conditions

- Compact your sub-grade with skidsteer or bobcat before laying the base down.
- Determine if deflection is present (movement when the skidsteer passes over it) in sub-soil – avoid deflection at all costs, as these are the areas that will settle.
 - If deflection is present, dig out these areas.
 - Use #3 rock to stabilize areas that are soft and are deflecting.
 - Use Mirafi Filter Fabric or the equivalent to stabilize these areas.

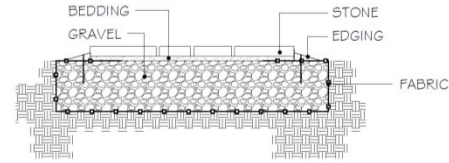


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Basing: Fabric

- Things we want a fabric to do in a base application:
 - Separation
 - Reinforcement
 - Confinement
 - Filtration
 - Drainage
 - Sometimes wicking
- The best fabric for this application is a high strength woven and alternate would be a non-woven needle punched.



BASE SECTION



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Basing: Types of Gravel

- Use a gravel that is 3/4" aggregate to fines for most hardscape installations.
 - Non-limestone grade 9: does not change the pH of the soil.
 - Limestone grade 8: can be damaging to oak trees and some other plants.



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Basing: Types of Gravel

- CA-6 (recycled concrete): may have contaminants – ‘Green’ option
- 3” stone for laying down under really poor sub-soil conditions.
- Clean CA-7 for permeable applications.



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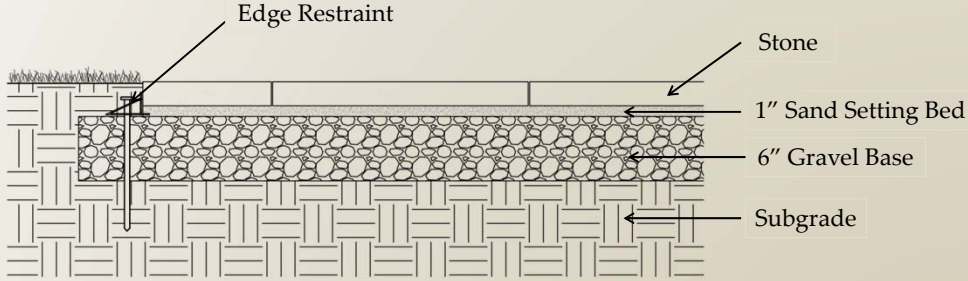
Basing: Gravel Installation

- Determine freight for the gravel.
 - *Maybe have it trucked directly from the quarry.*
- Install the gravel in no more than 3” lifts.
 - *Very important or else you will have air voids in the base and compaction will not be consistent, giving you the potential for waviness and depressions in the future.*
- Grade out gravel with skidsteer and then fine tune by hand with rakes.
 - *To ensure consistently smooth grades before compaction*



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Basing: Gravel Installation

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Edge Restraint

Stone

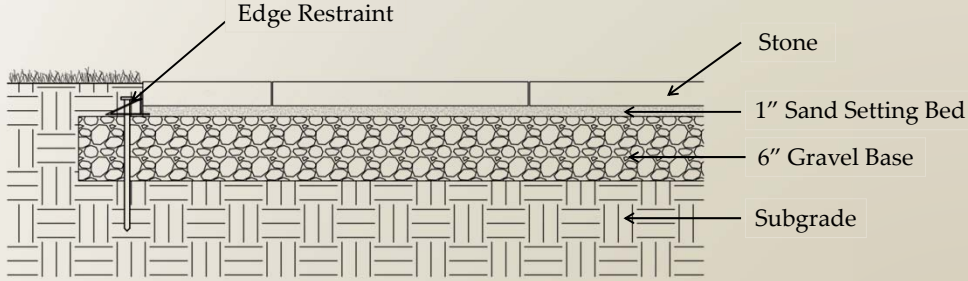
1" Sand Setting Bed

6" Gravel Base

Subgrade

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Basing: Permeable

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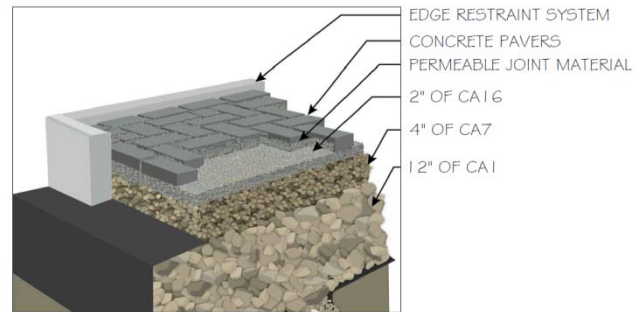
- Different type of base than your traditional.
 - 2 types of applications:
 - Vehicular
 - 12" of CA1 (3" aggregate)
 - 4" of CA7 (3/4" aggregate)
 - 2" CA16 (3/8" aggregate)
 - Residential
 - 6-8" of CA7 (3/4" aggregate)
 - 2" of CA16 (3/8" aggregate)
- Helps reduce stormwater runoff volume from paved surfaces.
 - During heavy rainfall municipalities sewer systems can get overwhelmed. By using permeable materials the ground can capture water runoff, absorb it and clean it during the process.
- Some municipalities will not have it count towards the impervious surface allotment giving you more area to work with.



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Basing: Permeable Installation

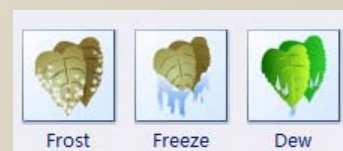


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Weather Consideration

- Be aware of how the weather can affect your finished base product:
 - Even when it is warm on a particular day, but has been cold previously, there is probably still frost in the ground and you will be unable to dig.
 - Gravel freezes and clumps when it is cold and it will not be workable.
 - If the base is saturated by rain, make sure to drain it first, as compacting it becomes difficult. If you install over it, you are asking for a call back.



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Clean up & Safe Driving

- Clean up site and trucks after removals and basing.
 - Mud on truck tires can really anger the neighbors, as well as the municipalities and can lead to problems.
 - Make sure to NOT leave gravel or mud in the street.
 - Sweep tailgates and make sure to have gravel screens on truck to avoid complaints from motorists driving behind.
- Always make sure to not be overweight and to follow the proper truck routes when going to a job site.



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