THE HENDERSON HOMEOWNER'S TURF VETTING PLAYBOOK

An Exhaustive, 50-Question Technical Standard and Screening Protocol for Odor-Free Pet Turf Systems

1. GROUNDWORK, EXCAVATION & SUB-BASE AGGREGATES

Q1: Why is the aggregate sub-base considered the foundation of any synthetic grass system?

The sub-base is the compacted foundation layer beneath artificial turf that provides essential stability, grading, and drainage. It supports everyday weight from foot traffic and furniture, ensures the lawn remains level and firm over a 15 to 20-year lifespan, and controls water movement to prevent pooling and soil erosion.

Q2: What are the primary dangers of installing artificial grass directly on top of bare dirt or native soil?

Laying synthetic grass directly on bare soil is a major installation failure. Natural soil is highly unstable, shifts over time, and compacts inconsistently. When dogs urinate on turf installed directly on dirt, the liquid cannot drain. Instead, it seeps into the bare ground, becomes trapped, and creates a highly unsanitary breeding ground for odor-causing bacteria.

Q3: What long-term visual issues occur on the turf surface if the subgrade shifts or settles?

Without a firm, well-compacted sub-base, the turf will settle unevenly with everyday use. This causes unsightly wrinkles, visible depressions, soft dips, pooling puddles, and loose edges that separate or lift. This not only ruins the lawn's aesthetic but also creates severe trip hazards.

Q4: What is the fundamental difference between open-graded and dense-graded sub-base aggregates?

Dense-graded aggregates contain a mixture of crushed rock and "fines" (microscopic dust, sand, and clay particles) that pack together tightly to form a nearly impermeable crust. Open-graded aggregates consist of clean, washed angular stones with little to no fines, allowing liquids to drain vertically straight through.

Q5: Why are dense-graded bases like Class II Road Base or Decomposed Granite (DG) referred to as "odor traps" for dog owners?

Dense-graded aggregates are packed with fine clay and sand, causing them to behave like an impermeable sponge. When a dog urinated on the turf, the liquid gets trapped in these fine particles instead of draining. Non-soluble uric acid crystals then accumulate in the base, decaying and off-gassing severe ammonia in the hot sun.

Q6: What specific stone types are recommended to create the ultimate rapid-draining pet turf sub-base?

The primary sub-base layer should be built using #57 crushed stone (3/4" down to 1/4" clean washed angular gravel) or CA7 clear gravel. The top bedding and leveling layer must use 3/8" clean chip stone (also known as ASTM #8 or High-Performance Bedding).

Q7: Why is #57 crushed stone highly favored for dog runs and pet-heavy facilities?

Because #57 crushed stone consists of 3/4" clean washed angular gravel with zero fines, it settles into a highly stable matrix with approximately 40% open void space. This creates a continuous network of miniature drainage channels, allowing water and dog urine to flush through instantly.

Q8: What is High-Performance Bedding (HPB) or 3/8" clean chip stone, and why is it used?

Because larger 3/4" stones leave a bumpy surface, installers spread a thin layer of HPB (3/8" clean chip stone) on top. HPB easily fills minor depressions and can be leveled to a smooth, uniform surface for laying the turf, without compromising the sub-base's overall permeability.

Q9: Why should rounded stones like standard pea gravel be avoided in any turf foundation?

Rounded stones like pea gravel do not compact or lock together. They continuously roll and shift under foot traffic like marbles, causing the turf above to shift, buckle, wrinkle, and sink. Always choose angular, crushed stone.

Q10: Why should sand, stone dust, or screenings never be used as a leveling layer in dog yards?

Sand and stone dust are highly absorbing materials that retain moisture and urine. When they dry, they compact into an impermeable, concrete-like crust that traps uric acid crystals, blocking drainage and locking in permanent ammonia odors.

Q11: How much void drainage space does a compacted open-graded angular stone base provide?

A properly compacted open-graded angular stone base provides approximately 40% open void space. This allows water and urine to pass vertically into the subgrade at a rate of several inches per hour, compared to standard dense-graded bases which have nearly 0% void space.

Q12: In what scenarios are dense-graded bases acceptable for artificial turf installations?

Dense-graded bases like Decomposed Granite (DG) or Class II Road Base are highly reliable and cost-effective for standard residential lawns that receive only light foot traffic and do not have dogs, or for backyard putting greens where a smooth, ultra-compacted surface is required.

2. TECHNICAL SPECIFICATIONS & INSTALLATION MECHANICS

Q13: What is the standard excavation depth for a basic residential turf installation?

For standard residential landscaping with light foot traffic and no pets, the standard excavation depth is 2 to 3 inches below the finished grade.

Q14: What is the minimum excavation depth required for a specialized pet turf installation?

Specialized pet turf installations require a minimum excavation depth of 4 inches (and up to 6 inches in heavy clay soil) to accommodate a deeper, highly permeable stone aggregate foundation that can handle high volumes of liquid.

Q15: How do regional climates and local soil conditions dictate required sub-base depths?

In extremely dry desert climates like Henderson, NV, a light residential sub-base may be as low as 2 inches. However, in regions with heavy clay, high-water tables, or freezing winters (where the ground expands and contracts), a robust sub-base of 4 to 6 inches is required to prevent buckling.

Q16: What is the recommended compaction rating for a professional artificial turf sub-base?

The sub-base must be tightly compacted to a minimum of 95% Standard Proctor density to ensure long-term stability and prevent settling. Homeowners should never accept a base compacted to less than 85%.

Q17: What tools do professional contractors use to achieve proper soil and base compaction?

Installers use heavy plate compactors or commercial sod rollers to compact the native soil and stone layers. For tight edges and corners where large machines cannot fit, they use a hand tamper or the flat side of a trowel.

Q18: How should washed rock be compacted to prevent shifting without sealing the drainage pathways?

To compact open-graded washed rock without crushing it or blocking drainage, installers must lightly mist the aggregate with water. This lubricates the stone faces, allowing the angular edges to lock together tightly into a stable matrix while leaving the void spaces 100% open.

Q19: Why must contractors spread and compact the sub-base material in "lifts" or layers?

Spreading and compacting the aggregate in thin layers (lifts) of no more than 2 inches at a time ensures uniform density throughout the entire depth. Attempting to compact a 4-inch layer all at once leaves the bottom layers loose, leading to future sinking and soft spots.

Q20: Why is grading and sloping the sub-base critical, and what is the standard requirement?

Maintaining a minimum slope of 1% to 2% is critical to direct water runoff away from buildings and toward native drainage, French drains, or exit points. Flat installations or reverse grades can lead to standing water and stagnation.

Q21: Why should heavy machinery avoid driving over a newly prepared and leveled sub-base?

Heavy machinery will leave deep ruts, disrupt the carefully leveled grade, and over-compact local areas of the aggregate base. If you must walk on the prepared base, walk flat-footed to avoid creating depressions.

Q22: What should be the final height of the compacted sub-base relative to your yard's border?

The final, fully compacted sub-base should sit exactly 1.5 inches below the top of your perimeter border or concrete curb, leaving the perfect space for the synthetic turf backing and pile to sit level.

Q23: What distance should be left around existing trees, bushes, and shrubs during excavation?

Always leave a minimum 6-inch radius around trees, shrubs, and bushes. This protects their root systems from damage, allows natural water absorption, and prevents the growing roots from lifting or warping your turf in the future.

Q24: How does a non-woven geotextile fabric protect the aggregate sub-base over time?

Non-woven geotextile fabrics act as a high-flow soil separator. When placed between the native dirt and aggregate base, they prevent soft clay and soil from migrating upward into your clean stone base, which would clog your drainage channels and cause the ground to settle.

Q25: Where should geotextile weed fabric be placed in a pet turf system, and why?

Geotextile fabric must be placed exclusively at the very bottom of the excavation, underneath the aggregate stone. It should never be placed directly under the turf backing, as it behaves like a felt pad that absorbs and holds dog urine, creating a permanent source of foul ammonia odors.

3. THE CHEMISTRY & SCIENCE OF ODOR CONTROL

Q26: What is the chemical composition of dog urine, and why does it affect synthetic grass?

Dog urine is composed of water, yellow pigment (urochrome), urea, and uric acid. While the water and urea are easily diluted and flushed, the uric acid leaves behind non-soluble crystals that bind tightly to the turf fibers and backing.

Q27: Why doesn't rinsing the turf with a standard garden hose remove pet urine odors?

Rinsing only dilutes the water-soluble elements of urine (like urea). Because uric acid crystals are completely non-soluble in water, a garden hose cannot wash them away; they remain trapped in the fibers and sub-base.

Q28: What happens chemically when dog urine is left to dry on artificial grass?

The water content evaporates, leaving highly concentrated, non-soluble uric acid crystals tightly bound to the synthetic grass fibers, turf backing, and sub-base rocks.

Q29: Why does dog urine smell fine in the morning but reeks of ammonia by 2:00 PM?

Dog urine odor is driven by temperature-dependent bacterial decay. When the hot afternoon sun bakes the synthetic grass blades, it heats the uric acid crystals, accelerating bacterial activity and releasing sharp ammonia gas (NH_3).

Q30: What role do environmental bacteria play in generating the ammonia smell?

Uric acid crystals are a premium food source for natural environmental bacteria. As these bacteria consume and digest the crystals, they break them down, releasing offensive ammonia gas as a direct chemical byproduct.

Q31: How does temperature or heat act as a catalyst for bacterial decay in turf?

High temperatures accelerate the metabolic rate of environmental bacteria. As the heat rises, bacteria digest the uric acid crystals at an exponential rate, causing severe, sudden odor spikes during the hottest hours of the day.

Q32: What is the chemical difference between enzyme-based and live-bacteria (microbe-based) cleaners?

Enzyme cleaners are biological catalysts that temporarily break down (or "chop up") complex odor molecules, leaving the organic matter in the turf. Live-bacteria (microbe) cleaners actually ingest, digest, and destroy the organic matter completely.

Q33: Why do traditional enzyme cleaners fail to permanently eliminate odors outdoors?

Because enzymes only chop up the molecules without consuming them, the organic waste remains in the sub-base. As soon as the yard gets wet or hot, the bacteria resume feeding, and the ammonia odor returns.

Q34: How do live microbes (bacteria) permanently neutralize uric acid crystals?

Live microbes hunt down and consume the uric acid crystals as their food source. They digest and convert these complex organic compounds into completely odorless, harmless carbon dioxide (CO_2) and water.

Q35: What happens to the active microbes in a turf cleaner once the uric acid is completely gone?

Once the microbes run out of uric acid crystals to eat, they naturally starve and die off, leaving your turf completely clean, sanitized, and odor-free with no chemical residue.

4. TURF PRODUCT FEATURES, INFILL, AND CHEMISTRY

Q36: Why should household carpet shampoo or highly foaming soap never be used on synthetic turf?

Highly foaming soaps leave a sticky residue behind that gets trapped in the crushed stone base. This residue acts like a magnet for dirt, dust, and pet hair, clogging drainage and causing your grass to look dingy and gray.

Q37: What damage can household bleach and harsh chemicals cause to artificial turf systems?

Bleach does not break down uric acid crystals. Instead, harsh chemicals can degrade the turf's polyurethane backing, void your manufacturer warranty, and leach into the surrounding soil, harming pets, kids, and plants.

Q38: Is household vinegar an effective treatment for dog urine odors in artificial grass?

No. While vinegar is a safe, natural deodorizer, it only masks the ammonia smell temporarily. It lacks the biological agents (live microbes) required to break down and digest the uric acid crystals trapped in your base.

Q39: What is Zeolite, and why is it considered the "gold standard" infill for dog owners?

Zeolite is a natural, negatively charged mineral infill. It is non-toxic and serves as a highly effective physical and chemical filter that traps pet odors directly between the grass blades.

Q40: How does Zeolite control urine odor on an ionic or molecular level?

Because Zeolite is negatively charged, it acts like a magnet to attract and trap positively charged ammonium ions in the dog urine, preventing them from off-gassing into the air as ammonia gas.

Q41: How does Zeolite release trapped ammonia, and where does the ammonia go?

Zeolite holds onto the ammonium ions until rainwater or a hose rinse flushes the turf. The water molecules break the ionic bond, releasing the ions and carrying them safely down through the highly permeable open-graded sub-base.

Q42: How does antimicrobial infill (like Envirofill or OptiFILL) actively disrupt bacteria growth?

These premium infills feature a built-in antimicrobial coating (like silver-ion or zinc technology) that disrupts the cell walls of bacteria, mold, and mildew, preventing them from reproducing and stopping odors before they can start.

Q43: What is the difference between standard "hole-punched" and fully permeable turf backing?

Standard backing uses polyurethane with small, punched holes, allowing liquid to pool between the holes and trap odors. Fully permeable backing allows water and urine to drain instantly through every square inch of the surface.

Q44: Why is stay-cool fiber technology recommended for yards in desert climates like Henderson?

Desert heat can make synthetic grass hot. Stay-cool fiber technology uses specialized, heat-reflective polymers to deflect infrared light, lowering surface temperatures on hot summer afternoons.

5. LONG-TERM MAINTENANCE & ADVANCED CLEANING

Q45: What is the standard baseline formula used to calculate how many tons of aggregate stone to order?

The industry baseline is: 1 ton (2,000 lbs) of aggregate stone covers 100 square feet of yard at a 3-inch depth. You can adjust this based on your square footage and target base depth.

Q46: Why is it recommended to order an extra 10% of stone aggregate beyond the baseline calculation?

When aggregate stone is compacted, the particles lock together and settle, reducing the loose volume. Ordering an extra 10% ensures you have enough material to achieve your target depth and grade after compaction.

Q47: What is the step-by-step procedure for the Heavy Saturation Tarp Method?

First, saturate the turf with a concentrated microbe cleaner. Second, lay a heavy plastic tarp over the wet area and weigh down the corners. Third, let it dwell for 24 to 48 hours. Fourth, remove the tarp and rinse thoroughly.

Q48: Why is laying a heavy plastic tarp critical during a deep-cleaning microbial treatment?

Live microbes require constant moisture to survive and digest uric acid. In dry climates, the cleaner would quickly evaporate. The plastic tarp traps moisture, creating a dark, humid incubator that keeps the microbes active.

Q49: How long should the plastic tarp remain on the wet turf to ensure maximum odor digestion?

The tarp should remain in place for 24 to 48 hours to give the active bacteria enough time to multiply and completely consume the uric acid crystals embedded deep in the sub-base.

Q50: What is a professional deep-cleaning turf maintenance schedule, and what does a professional crew do?

Homes with multiple dogs should schedule a professional deep clean annually. A professional crew will use power-brooms to lift matted grass blades, deeply flush the sub-base, and top off your Zeolite infill to ensure maximum drainage and odor control.