



USA Volleyball

Sand Court Building Suggestions

-By John Kessel, USA Volleyball Director of Education, Grassroots, Disabled and Beach Volleyball

Thanks to Dennis Steers, C.C. Sandorfi and those quoted from *Volleyball Magazine* for the help.

This article is to give just general guidelines to provide you with an idea of what is needed for installation of a permanent sand court. Temporary courts are very easily set up using a portable outdoor grass court. A portable court will just need deadman anchors, like 2 foot long 2x4's, well buried (use a shovel) and another piece of wood to keep the poles from sinking into the sand. The information is not intended for use as architectural and/or engineering drawings or calculations. Your basic needs are:

2,600 cubic feet of #57 gravel = 10.25/ton (110 ton)

5,200 cubic feet of sand (washed) 7.85/ton (205 ton)

2 rolls of 250' perforated drainage pipe, four - 3 meter PVC sections and connectors

Ideally the court should be situated with the net running east-west, so the morning and evening sun is not facing directly into the eyes of one team. The dirt dug out of the earth should be piled up around the court in a horseshoe fashion, leaving one of the four court sides open for proper drainage. This earth pile can be made into an incline that allows for elevated spectator viewing, even piling only one or two sides.

Drainage of the court under the sand must be considered, both by grading the earth properly and even installing a surface below the sand to promote drainage. Installing leaching pipe on the standard leach slant (14 degrees), is strongly recommended for a good permanent court. Perforated drainage pipe can be laid in a serpentine fashion (see court diagram) with one end capped and the other leading to the drainage ditch/point. The drainage point should lead away from the court at the lowest point, taking care to be aware of the natural surrounding slope so you do not trap water with your inclined viewing sides.

The court should be excavated to a meter depth, plus create the afore-mentioned drainage ditch. Place a first layer of about 30 cm of #57 gravel (or similar) over the drainage pipe. Then place a porous cover such as plastic landscaping mesh or some other artificial, small-hole mesh, over the gravel to prevent the sand from washing through. Soil with good drainage and no rocks can have the sand laid down without mesh or leaching pipes.

If you're serious about making a good court, you've got to invest in good sand. Taking sand from beaches is illegal, so one group found a city street where the sand was blowing on and helped them clean up weekly until they accumulated enough. Others have found river sand of excellent court quality. A midwest program trucked in sand from a sand dune left by a prehistoric glacier. If you must buy sand, get washed masonry sand, or check the samples for beach-like feel. Do not use anything coarser or you will regret it, but also stay away from very fine grains, as they can compact into a type of mud when wet. What you want is the cleanest sand you can buy; check it out by throwing your choices and seeing how much is dirt and how much is sand. Some sand is very dirty and unsuitable for a court. (dirty sand compacts after a couple good

rains and makes for a solid jumping platform.) We suggest silica sand, regionally available by contacting Best Sand, at (800) 237-4986, FAX (216) 285-4109. The minimum recommended depth is 50 cm. The sand boundary should be a minimum of 15 meters by 24 meters, so you will have a 3 meter sand perimeter around the actual 9 x 9 meter court. The doubles court is now only 8x8 meters a side, so one brings the lines in 1 meter per corner on the sidelines and .5 meter per court on the endline to make this court size. All other games, and thus the court should be built, use the 9x9 meter (9x18 meter overall) court For professional competition, there needs to be 4 m on the sides / 5 m behind the endlines. The general area should be clear of any obstructions for 3-4 meters on all sides of the court. You should pad any item that would seem to be a hazard for hustling volleyball players who pursue the ball more often off the court, than on, given the nature of the game. The suggested boundary between the sand and surrounding surface should be soft, like rubber expansion joint material. Railroad ties and other wood containment boundaries increase the chance of injury should a diving player go all the way to the sand's edge.

Poles for standards can be either wood or pipe. The minimum metal pole thickness is 4" diameter schedule 40 galvanized steel pipe while 8 inch diameter round treated wood poles are also recommended. USA Volleyball does NOT recommend square poles, due to the corners. In all cases, padding the poles is strongly encouraged. Should the standard not have equal sides, the narrower side should be the net anchor side (facing the court). Standards should be 3 meters above the court's sand surface and imbedded a meter into the ground using a concrete footing, unless the soil is solid, in which case packing in and washing in the soil and letting it dry should suffice. These should be placed 1 meter from the boundary of the court; any less and there will not be room for the full net (which is 10 meters wide) and adjusting cables.

Installing a water spigot near the court is encouraged, as the sand can become very hot, as can the players...both may need to be cooled off. Building a seat for the referee to sit in near the top of one standard is a nice touch, but outdoor play can be refereed just as well from below the net, on the sand.

Boundary lines are made of 1/4" rope or 1-1.5 inch webbing and tied to the four corners with buried deadman anchors. No centerline is needed, but 4 meters extra beyond the 54 meters of total court lines will be needed for anchoring the corners. A small wood board buried at a 45 degree angle to the corner is fine, and can be installed just for play, if vandalism is a problem. The net should also be easily removed and stored in case of theft. Players would only need their own net to borrow the court as approximate lines can also just be dug into the sand by dragging a foot.

Net heights are 2.43 m (7' 11 5/8") for Men's and Coed play, and 2.24m (7' 4 1/4") for Women's and Reverse Coed. A 10 meter net with a cable top is preferred, but strong ropes, especially the Kevlar types that are as strong as steel, can also work fine. A winch (padded) and hardware, such as eyebolts, is needed to mount the net both top and bottom. The bottom need only be anchored by rope to the standard.

The 2006 USA Official Outdoor Rules are the basically same rules used in the 1996,2000, 2004 and 2008 Olympics as beach volleyball is now a medal sport. The rulebook also includes the indoor, coed, and reverse coed rules, plus 2-3 and 4 person differences. A casebook is also available, valuable for tournament directors and facility owners. All books can be obtained by calling 1-800-275-USVB (8782)

The Basics

The playing area consists of the court and a space around it measuring approximately 10 feet in each direction (more if possible). The space above the playing area should be free of obstructions (branches, power lines, etc.). The playing area should be level. It's important to use good quality sand, thick enough to prevent players from contacting any underlying hard surface.

Dimensions of a standard court are 18 meters (59-0 feet) by nine meters (29-6) and are measured from the outer edge of the boundary lines. The boundary lines should be made of brightly colored rope, webbing or material having similar characteristics but shouldn't unreasonably impede play. The court lines are snugged up .5 meters on the endline and 1 meter on the sideline at each corner for 8x16 meter DOUBLES play as needed. You need to make the court larger to accommodate the game for triples up to six person.

Net supports should be made of wood, metal, PVC or other material that will withstand tension and not bend or break. Supports should be about 14 feet long and buried five feet deep (cement is optional). Make sure they're free of hazardous protrusions. If you use guy wires, they should be made of bright colors or marked with flags so they're visible. All anchors for guy wires and court lines should be level or below the playing surface and free of sharp edges.

For areas comfortably above sea level, the court area should be excavated two to three feet deep, depending on the depth of the sand and gravel base you intend to use. For low-lying areas, the court area should be excavated only about six to eight inches; you should end up building an elevated court rather than one that is flush with the ground.

To keep dirt or grass from mixing in with the court sand, you may want to build a barrier around the court, either with wooden beams (such as railroad ties) or some type of low, solid fencing. This can be especially important for a court that is built slightly above ground, or of course temporarily on a parking lot.

You should have a drainage system under the court. A drainage ditch should lead away from the lowest point of the court, and perforated drainage pipe should be laid in a zig-zag pattern over the base of the area with one end capped and the other open to the drainage ditch. Drainage is very important. You don't want to be playing in a swamp.

Step by Step

1. Excavate the court area to your desired depth using a Bobcat or front-end loader. Our experts all advise against using a bulldozer or backhoe (the bulldozer won't be able to pick up and replace the dirt, and the backhoe won't dig a level surface). If you're in a low sea-level area (for example, shoreline areas in Florida), the court should be built slightly above ground. Use the dirt you excavate to create a slight slope up to the court.

2. Arrange your court perimeter (if desired) around the edges of the excavated site. This keeps dirt and grass from leaking into the court and vice-versa. Use Lawn edgin material. We do not suggest using railroad ties or similar materials, but we do suggest covering the exposed top edges with some sort of padding to minimize injury potential. One expert says he's had great

luck buying used rubber escalator handrail material from escalator companies and seating it atop his 2 x 6-inch wooden boundaries.

3. Lay out your drainage pipe, perforated side down, with the open end at the low point of the court. You may wish to wrap each section of pipe with some type of filter to keep sand from filling up the pipe: burlap is one choice although eventually it will rot. Our experts suggest using flex wrap or "handicap wrap," which can be bought at plumbing supply houses.

4. Prepare your net standards by attaching hooks, hook-and-eye hardware and any winch-type hardware. Sink your poles at least three feet deep since they'll need to be sunk five feet overall when you're finished. For longevity, if you're using wooden poles you should pre-treat them with a weather-resistant stain. If you're not using guy wires as supports, set your poles in the ground at a slight angle outward from the court to allow for any "bend" caused by eventual net tension.

5. Cover the pipe and the remaining court area with a one-foot thickness of small gravel. Various sizes seem to work, but the overall consensus is to use a small, pea-sized gravel known around the country as #56 gravel, #2 or #3 size gravel. Explain to your gravel supplier that it will be used for drainage, and he can recommend the size for your needs.

6. Cover the gravel with a screen-type filter to keep gravel and dirt from working its way up to the sand level. Again, burlap will work, but it will eventually rot, especially if you get a lot of rain. The best material is ground stabilization filter fabric, which is a woven poly-blend that won't deteriorate. You can find a supplier by calling a landscaping or excavating company for a referral.

7. Deposit your sand - one to two feet deep - and rake so it's level. With a good gravel base, one foot of sand is usually enough.

8. Attach your net, put down your boundary lines and you're ready to play. Now for the big question: How much?

Your Basic Costs

They fall into three categories:

Sand and gravel

Excavation equipment rental

Court equipment.

Tips from *Volleyball Magazine's* experts

JOHN DALOISE, president of Standard Building Systems and local promoter for the Bud Light Pro Beach 4s and WPVA, Dallas:

- It's best to hire a contractor if you're unfamiliar with the excavating equipment. It'll save you time and headaches in the long run.
- One foot of sand is usually enough; if you put down more, you won't be able to reach the lower levels with a rototiller or rake.
- Don't use sugar sand it sticks too much and is too fine to be a good playing surface.

RICHARD ANDERSON, vice-chair of 1996 Olympic Committee for Clayton County, Jonesboro, Georgia:

- Try using used escalator handrail material for padding on the court borders.
- Rake your court frequently with a three-foot garden rake.
- Use a net with steel cable or Kevlar both on top and bottom for maximum tightness.

J.B. SHARES, owner, Hot Shots beach volleyball clubs, Rochester, New York:

- Pay special attention to the plans and follow them line by line. Don't cut corners or it'll cost you in the long run.
- If you use steel poles for net standards, seat them in steel sleeves so you can easily remove the poles for maintenance or replacement
- If your net has steel cables, use pulleys on each side to hold it tight.

ROBERT "La Jolla Bob" ROEMER, owner, La Jolla Beach Volleyball Club, Toledo, Ohio:

- Go with round poles whenever possible to reduce injury risks; try used utility poles (you can get them for free in many communities by contacting the utility companies).
- Allow plenty of space for a sand perimeter around the court don't let grass or dirt serve as your perimeter.
- Watch out for freebies. Sometimes free sand can be more expensive than purchased sand because removing or sifting debris from the sand will be more expensive in the long run.

DALE HOFFMAN, president, California Beach Volleyball Association, Ventura, California:

- Always put in proper drainage.
- Use the simplest net attachment system possible. In Brazil, they cut a notch in the top of the pole and drill a hole in the middle, string the net cable and rope over the top of the pole and knot it off at the hole.
- Choose your site carefully. Putting a court near a busy road or a swimming pool isn't a great idea.