Garden Trains
From A to Z

B is for Ballast

Better Information - Better Railroad

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GARDEN RAILROAD UNIVERSITY
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Garden Trains - A to Z

What you will find in this document.

Discussion groups are a great way to share information. One thing that is unique to LSOL.com is our Tuesday Topic. Each week, for almost six years, we have discussed a specific group topic. It could be about bridges, or maybe you like steam vs. diesel engines. Many times it is about how people solved a problem, or what they think about a current issue or product. My favorite was several years ago. "If your railroad was a candy bar, what would it be." (Good and Plenty, Milk Dud, etc.) We have fun at LSOL.com as well as help each other with serious issues on our railroads.

Now with almost 300 different weekly discussions online we wanted to make it easier for you to use this vast knowledge base of topics. We are taking the time to edit the best answers on a specific Tuesday topic into PDF documents. We have also added photos as available so you can see just what was being talked about from each of the users.

This paper is different than one written by just one author on a topic. You are getting dozens and dozens of years of combined experience from some of the smartest people running Large Scale Trains today. Save this document and start building your own personal reference library on your computer today.

What is LSOL.com? (Large Scale Online)

Large Scale Online has been providing information for Large Scale Garden Train enthusiasts for almost 15 years. We are the oldest, largest, and most professional web site on the Internet that is exclusive to Large Scale Garden Trains.

LSOL.com provides information in many different ways. We have online articles, videos for you to watch and photos for you to see how it is done. We also have organized and secure online discussion groups. We are the only site that requires people to use their real name. No hiding behind your keyboard making anonymous posts. Join Us.

Ballast

So what do you do?

What have you used and what do you use for ballast? Does ballast serve a useful purpose on your railroad or is it just decoration? What would you do differently when it comes to having ballast on your railroad?

James O'Connor - Blue Stone

I use what we locally call Va. Blue Stone +/-1/4". I sift out the 1/4+" for under layment and edge ballast and use the -1/4" for tie ballast. Works good for me, have to retouch up/re-ballast about every 8-10 mo. and that's running about 240 days a year.

Paul Roberts - chicken grit

We use #1 and #2 chicken grit and hold it down with cement bonder. Works well but we still have to send out the occasional work crew when the quail and other birds decide it is dinner.

Rudolf Jager - Pumice

Pumice that I buy in the garden center at the local OSH works great for me. Comes in small bags.

Bennie Shields - crushed stone

I have used some type of crushed stone since I began my railroad in 1996.

When the railroad was shorter, I tried chicken grit, but not only was it expensive, it was costly too. Next I tried crushed limestone from a nearby pit. The amount was small and the mine superintendent didn't charge me anything. Limestone is too soft and it doesn't lock in and stabilize the track.

There is a large stone yard nearby, so I bought a few buckets of 3/8 inch crushed granite from them. It looks good, comes in several colors, and has a good sharp bite. It holds the track well. At about 6 cents a pound, it is certainly economical. I also screen through a 1/4 inch screen occasionally to get a nicer look to the ballast. The ballast will migrate downhill during rain or irrigation, and I'll need to occasionally sweep the ballast back into place. This week I'm preparing for a two day open house on my railroad. I used only about 5 pounds of new ballast on the new section of my track. I simply brushed the old ballast into position on the rest of the layout.

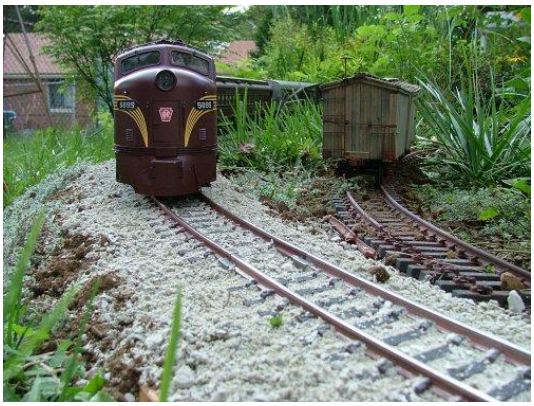
I'm not an advocate of mixing glue or cement with the ballast. The temperature here in North Texas varies too much and when the rail expands and contracts, ballast will break and look ugly.

Mike Evans - redwood track boards

I just don't do it! I also don't put my railroad directly on the ground either. My experience with ballast was that it moved a lot, washed away easily, and got really contaminated by everything falling out of the sky above, especially 1:1 leaves, acorns, twigs, etc. In addition, spring and fall with their wide swings in daily temperatures made the track dance all around and itself disturb all the neatly brushed on ballast. Instead, my entire track is laid on redwood track boards and allowed to float as needed. Just fire up a blower and it's easy to remove the entire windborne gunk that falls on it.

David Maynard - slag

When I started my railroad I couldn't get crushed limestone from my local dealer, so I used the 1a slag that they had. It looked perfect since the 1:1 railroads around here use slag as their ballast. Then last year my local supplier quit carrying the 1a slag and started carrying the crushed limestone. What a difference. The limestone packs better and harder, and after a good rain it sets up hard on the surface. If I need to move the track it will break up into the 1/4 minus it was with little effort. When I was using the 1a slag I would use buckets each spring to re-level and re-grade the track, but I think I used less this year. After the last hard rain I noticed that fewer of my ties were exposed and no section has washed out so bad that I need to re-ballast. I am very happy with the switch over to the crushed limestone. I will sacrifice the realistic appearance of slag for run-ability.



Kirke Fay - "fines"

The DB&H Rwy. is ballasted with "fines", a local bluestone/limestone that when becoming exposed to dampness and rain, will semi-solidify into a hard consistency. The only attachment on close to 350 feet of track is a few small wood screws holding the track on two bridges. The only shortcoming is small pieces of fines getting into the switch points and frogs, but as they are hand operated it presents no problem, though ballast is not placed under the switches it can still travel in from a heavy rain.
Refer to the picture (Thumbnail) of the track in front of the Lake George Station, and you may see the semi-solid appearance. Beneath the entire track system is a sub-base of what I would call "driveway" size bluestone....this and the use of the fines as ballast will allow as advertised, to be able to accidently step on the track without damage, as there is no rocking motion (why not to use river rock or aquarium gravel.....)

David Clapper - crushed limestone

When I started my first Garden RR back in the early 1980s, someone (can't remember who!) suggested I lay the track in 1/4-minus crushed limestone. Since the Hudson Valley of New York State is mostly limestone surrounded by clay and shale, it was easy and cheap to get the stone I needed. As others have said, it works great! It really holds the track in place. If you dig a 3" to 4" ditch where the track will go and fill it with the gravel/ballast, lay the track and then add some more ballast on top, the track will stay where you put it. It's fairly easy to level the track. Use your hands and fingers like the big yellow machines the 1 to 1 guys use to smooth and tamp the ballast into place. Every spring I would go around the layout to replace washed out ballast and level up the bad spots just like the big guys do.

I have had very few problems over the years. The new railroad will be constructed the same way. It's easy to do and the materials are cheap. Plus, it looks like the prototype.

Brian Donovan - bluestone gravel + crusher fines

I set my track on a bed of bluestone gravel (3/8" stone) then heap on the stone dust (crusher fines) and water in well. The stone dust helps lock it all into place. Each spring all gets topped with a 2:1 mix of gravel and fines. No glue, etc. as we go 'au natural' on the C&A Railway.
Working great so far.

Glenn Habrial - quarry dust

I use what is called quarry dust; it seems to be the same as quarter minus and crusher fines. The ballast plays an important role to keep the track level. It is a slow process sometimes. It is because of the MOW crew going union.

Phill Lowe - small gravel

I still favor the "look" of chicken grit but admit the maintenance is taking its toll.
I have an upper level where the track sits on a cement covered mountain. The grit has been pretty successful there with either a light sprinkling of cement or with cement binder, probably due to good water drainage. The ground level is another story suffering from constant erosion. If I use enough cement binder it will last but the look becomes artificial by filling in too much. So I have become more accepting of using small gravel.

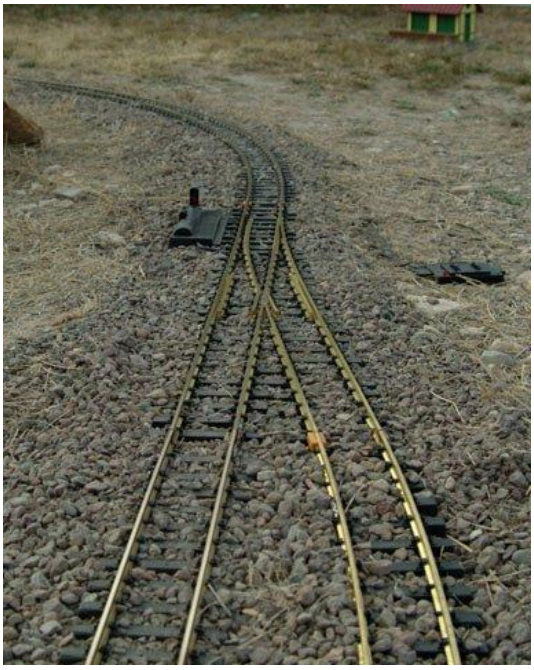
My goal isn't to hold the track, but just a nice look and to keep it confined to a narrow spread.

Barbara Karkutt - 1/4 gravel + screenings

Given the nature of the terrain where I built my layout, only 1/3 of the track is at ground level. Where it is at ground level I dug a trench about 8-12" (when rock did not stop the digging🙂). I lined the trench with weed block then loaded it with (what we call) 1/4 gravel to almost track level. On top of that I put (what we call) screenings, laid the track, leveled it from side to side and added more screenings over the track using a whisk broom to brush it off the top of the ties. Then I water it down (unless of course we have had rain) as the screenings have quite a bit of 'dust' which, when wetted down and dried, sets very hard. I refresh every year to re-level where necessary...usually not a big job...as it has held up very well.

Bob Freeman - PEA GRAVEL!

PEA GRAVEL! I know, everyone I have ever read in garden railroad "how-to" books says not to use that thing called "pea gravel." However, we have two layouts in two different cities, and I go to the nearest rock supplier in each city and buy it by the pickup truck load (1/4 yard is about all a 3/4 ton pickup can handle safely) for $16 per quarter yard. It is wonderful! This is a turnout with details of the installation:



I just shovel it right onto the ground, after removing any vegetation and packing down the dirt. I lay the track onto a thin layer of pea gravel, then heap on more pea gravel to bury the track. Then, using a level, I pull the track upwards through the gravel until the ties appear; remove the excess gravel from between the rails, and it's DONE. Rain passes through the ballast without washing it away, and I have a few areas where the ballast is raised to a height of at least 6 inches to get through low areas without it settling or washing away. I love it!

Charles Griffin - crusher fines

I'm just now in the process of building my layout, but I chose to use 1/4" and under "crusher fines". Tennessee is blessed with a lot of limestone, so it is easy to come by and not too expensive.

As you can see the 1/4" and under has a good bit of very small particles as well as the 1/4" size pieces. Once laid down, a good rain causes the fine particles to sort of bond together almost like mortar. I place my ballast in my trench and walk on in to compact it. I then wait for a good rain to cause the ballast to "settle". I then add more ballast to bring any low sections up to grade and then lay my track.

Ron Brantner – PVC + crush limestone

I designed and built my RR on PVC pipe every 16 inches providing a good point to attach and level the track. This was a good, strong and quick method to build and start operating the RR without preparing the ground to lay track. I later came back and back filled with dirt and crush limestone.

The ballast does serve a means by providing strength between the PVC points. I couldn't find chicken grit in my area and decided to go with crush limestone for ballast. It's cheap, but it's not very prototypical in appearance. The stone is about 1/4 inch in size and it nicely packs down to secure the track in place. One of the advances of using a little larger stone is that it doesn't prohibit the operation of the turnouts as much.

Donald Urquhart - Small Pea Gravel

My outdoor railroad in Connecticut, read first, build twice.

I started by screwing down the track to 1X4 pressure treated wood and added "fines" for appearance. Spring rains washed away the fines ballast while frost heaves lifted the wood base. I decided to rebuild my line the way a real railroad would, float the track on ballast heavy enough to hold the ties. Remove all the wood and re-ballast with "Small Pea Gravel" in 50 pound bags from Home Depot. Spring maintenance is now done with a rake, cleaning up any stray ballast.

Charlie Millspaugh - My yard is all rock

My yard is all rock and the railroad lays on it. The yard is mostly 1" rock and the railroad lays on 1/2" rock. I press and shake it down into the rock and it lays there. I have crushed limestone in places and river rock in others. The limestone sets up hard and holds pretty good, but the river rock moves a lot. I have to add rock on both fairly often. The train hitting the curves causes a lot of rock movement and the track will dip. Have to get it back in line then.

Paul Deis - Ice Sand

We are just starting track laying. We built up 6" of 3/8" crushed granite contained by 1x6 engineered wood. I am then using what is locally called Ice Sand (its 1/4 and smaller crushed rock) as a top layer.

John Caughey - All ballast all the time.

The trick is to use rough broken rock. River and beach rocks are too smooth and won't hold together. They are migratory... I use gravel from my land, sifted through 1/4 hardware cloth, poured on and pushed into place with a 3" paint brush. I can lift the track where necessary or wiggle it down.

No weed barriers as I encourage the weeds for some greenery! Well when you live in a desert, you" takes" what you get. I am not going to plant anything that the critters will eat, another reason I don't have wet water features and instead model dry washes. Don't want to encourage them onto the layout. Spring maintenance is just like the big boys, replace wash outs and re-level any areas that need it. Run the track cleaning car a couple of times and good to go...

Dave Marecek - ¼" crusher fines

The Lone Firr uses 1/4' crusher fines for ballast. A trench 3" deep by 6" wide is created in the ground. Landscape fiber lines the trench so ballast doesn't disappear into the ground. Trench is filled and leveled, tamped and watered down, refilled and leveled. Track is then added and ballasted to hold track in place. No adhesive or bonding agent is used.

This requires touch ups once a year after the winter rains. This is due to sinkage and rarely washout. Also in heavy rain, there is no water pooling visible. Also as there is no adhesive, touch up for cross leveling can be done at any time if there are rough spots identified through operations during the year

KC Marshall - ¼" crusher fines

We did the same as Dave Marecek, been down for years, holds fine. Don’t get monsoons here but a lot of hot sun lets the track float as it expands and contracts

Terry Haas

I use very fine cinders as the ballast. I pour them over the track and brush gently to smooth it out. Then I use water from a sprinkling can or sprinkler system to keep it in place. You can get these cinders at a cement company or stone quarry. I get a lot of compliments from people who see my layout during our open house.

Rick Hamilton - thinking about using decomposed granite

I have been out of the railroad business for a while. Divorce, lost house etc., but managed to hold onto all locomotives and rolling stock. Am now planning to build outside in Long Beach, California. I will use the down spout method to secure track, and need ballast for appearance. I haven't seen any limestone or crusher fine, but was thinking about using decomposed granite.

Richard Friedman - 1/4 sea foam green

Ballast is a big issue with me. Not only does it make the railroad looked finished, it supports the track. When the ballast washes away, I've got conductivity problems caused by the track flexing at the joints. Getting the right ballast is tough for a couple of reasons: 1) the stuff is heavy, and 2) it is cheap. Thus there's no market for shipping it very far. It's like the real railroads -- we use what we have locally.

I've tried "grit." Here its stone mixed with oyster shell, which blows away in the first wind. Then I found something called 1/4 sea foam green, a multicolored stone. It came in sizes from 1/4 to 2 inches. The quarry doesn't make the 1/4 any longer, so I hoard it carefully.

I've found "crusher fines" which is used locally as highway road base. It's too uniformly green in color for me, but it's available. I've also used decomposed granite. It works well, locks up and holds the track. But it's too brown for my taste. When last in Palm Springs I bought some "Palm Springs Gold", a fine 1/4 or so rock with a lot of fines. When I'm ready to re-ballast this year, I'll try that out.

Sure wish I could find "1/4 inch sea foam green."

John Dexter - crushed rock

Like many of the others, I use crushed rock for my roadbed. It's not prototypical in size but the irregular shape holds it in place even in Maine's hard winters so I can usually run trains without having to do any roadbed work in the spring. The color is good, too. My track just floats in it.

I had terrible luck with chicken grit. I am very happy with the crushed rock.

Kenneth Allen - crush fines

When I first laid my track I put them on 1x8 pressure treated boards that were a fence around an above ground pool. They had been out in the weather for 4 years or better, so I had no idea that they would wrap within 2 years. They did help me get my railroad up and running petty quick though. I backfill dirt up to the boards and I figured that touching the ground they got too much moisture and that caused them to warp.

I took the boards out and put the track on crush fines and the track has been that way for 8 years now. I did mix cement with the fines for a while but now I redo after every big rain fall, which is usually 3 or 4 times a year, a lot of work and rock. Cannot not figure where the fines go for the layout is not getting bigger.

Ron Hill - 1/4 down limestone

I build a trench 16" X 6" for the sub grade. After filling in the trench and shaping the roadbed, I glue down the top of the ballast. Once glue has dried and the track is in place, I ballast the track with 1/4 down limestone.

Dave Clarke - 7mm bluestone + cement

I first used 7mm bluestone gravel in the loose form. The birds came along and scratched it away so much that it continually caused derailments. I would have to re-ballast every time I would run the trains. I have since added a small amount of cement to the ballast prior to re-ballasting. This works really well and lasts a lot longer and only requires an annual touchup.

Arthur Raynolds - crusher fines

I cannot believe Idaho doesn't have any rock quarries out there. Check out your local quarry and ask for crusher fines (rock dust). Here in NC we sit on rock and our local darn near gives the stuff away. It cost $16.25 per ton. Believe me a ton will last you many seasons.

This year I am cheating a little. I am mixing concrete into the base layer of the crusher fines to help stabilize the embankments from erosion. In April I collected 13.12" of rain, the second wettest month in 5 years of recording our rainfall. Generally the crusher fines measure under 3/16" and compact together very nicely.

Roy Towne

Ballast has been a problem for a couple of reasons. If you are using track power, you have to make sure the ballast is not full of iron. It will short any signal sent down the track. Use a magnet to stick into the ballast material before you buy it and if it comes out all fuzzy, don't. I use a 3/8 minus (1/4 had too much iron in it) and use a 1 to 3 mix of Quik Crete. It sets up enough to hold the track and can be broken up easily if changes are needed. I place the track and pour the mix over it. Then when it is the right height and level, I wet it down with a fine spray to set it. Culverts are good for drainage and when placed under switches, helps keep them clear. I use stainless track to minimize shifting. It has been very stable over the last three years.

Todd Brody - No.5 granite crusher fines

We use No.5 granite crusher fines used as roofing material and available at roofing supply houses @ $3.50/80# bag.

Dennis Cherry - Polymer Sand

Just started using something new, learned about a couple of years ago. It's called Polymer Sand, comes in colors. I am using Gray. Apply it dry and level it with a stiff wire brush. Use your garden hose on a fine mist and wet the Sand per instructions on the bag. This stuff stays slightly flexible so hopefully will prevent the problem when using Titebond II or III of eventually breaking off.

This polymer sand is used to fill in the areas between stone in walkways and patios. Maximum spacing is 2".

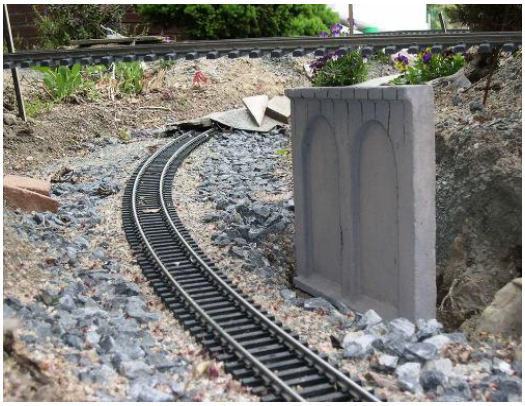
Glenn Habrial – ballast vs. rain

My problems have been a hard rain directly on the ballast will simply splash it away over time, even with all the fancy engineering for diverting the water. When I put in a cut a few years back it just filled up with water on each rain.


So I put a drain pipe with 3/4 inch holes drilled every 3 inches to drain off the water then I mostly backfilled with driveway stone and topped it off with quarry dust. When it rained again all the quarry dust washed into the driveway stone and became mostly water tight.

I wound up digging out the quarry dust and driveway stone and sieved out the bigger stones and put them back and then I put a concrete base in.I plan to glue quarry dust on top to give it that prototypical look. Gluing it in place will prevent it from washing back into the driveway stones. But I had some erosion from the surrounding clay into the stone base. It isn't as bad as the quarry dust as it isn't a big quantity.

That little fiasco added a year to the project.



MEMBERS ONLINE STORIES ON ROADBED, TRACK AND BALLAST

Here is a small sample of the articles that are online for members of LSOL.com

Track & Bridges

Almost Instant Roadbed, Revisited

Since the first article, I have learned more and newer tricks on this process, as I am sure that Jon has with his.

Track & Bridges

EXCLUSIVE: A NEW ROADBED ALTERNATIVE

For several months I have experimented with this idea and have tried numerous ideas on cutting, joining, and drilling this plastic down spout and have reached a point where I can share my ideas with you. I do not think you will find an easier, faster, cheaper way to get your track on the ground, or up in the air using one product.

(TTT) Tuesday Topic

(TTT) Do Over: To Ballast or Not to Ballast. What would you do Different?

I don't know about you, but I have tried and have heard about all kinds of ballast you can use for Large Scale Trains. When we first got started we had an indoor layout and went looking for the ever allusive "crusher fines" we kept reading about. I came to find out that no one in Idaho knew what they were. What have you used and what do you use for ballast?

(TTT) Tuesday Topic

(TTT) A Common Mistake To Avoid When Laying Track

So if your one Do-Over was in the area of track what would it be? It does not matter what was then and what is now. Just Do-Over and tell us what you would be doing? Give us the details that might help us from making the same mistake.