

LAYOUT SPECIFICS

Here are some of the general “givens & druthers” that we established during the early design phase of the layout – not in any specific order of importance. While we didn’t use a rigorous or structured method to capture these – like John Armstrong might have done, they were all considered during the various planning concepts and charrettes.

1. **Siding/Train Length;** Because the mainline is substantially longer than the previous one, it was appropriate to increase the typical train length and corresponding siding lengths as well. We chose to set the minimum clear siding length at 9 feet, which is equivalent to 18- 40 foot car lengths. However, at all the major stations and junctions we increased this minimum to around 12 feet, with several being closer to 15 feet. Careful consideration needs to be given to train lengths – longer trains are not always the best decision in my experience.
2. **Distance Between stations;** Again, because of the longer mainline, we increased the “run” between stations to create a stronger sense of distance. We established 3 train lengths as a general rule of thumb for the distance between most of the sidings; however, due to various design – constraints, it ranges between 2 and 4 train lengths.
3. **Number of Stations;** One of the primary objectives for the layout was to create a much longer run over the summit, so we decided to elongate this part of the design significantly more than the previous layout to create more remote sidings along the way and yield a sense of isolation for the crews. This layout will have approximately 13 “stations” along the mainline. This also helps the dispatcher because it offers more physical locations for meets to be scheduled.
4. **Duckunders;** Sometimes you cannot avoid them, however, I would strongly recommend avoiding a fixed duckunder by building a gate or lift section right from the start if you decide to run across your room entrance. When I started my previous layout years ago, like all of us, I was younger and more agile. Consequently, I did not think too much about my older guests and operators, and the fact that one day I would also get “that old” and begrudge the duckunder we built! I am very fortunate to know several fellow modelers that have developed various techniques to construct swing gates, bridges and lift sections. Since the final layout design crosses the main room entry at both levels, it was essential to construct a gate at the lower level and a lift up for the upper level. As of June 2015, only the lower level is installed and a well-engineered swing gate was installed immediately. Details of how this was accomplished will be provided in the Techniques section of the web site.
5. **Deep scenes;** they are nice for effect, however, they take a lot of time to construct and create potential access challenges, therefore the new plan generally avoids them where possible. You can build a lot of scenicked linear layout for the same amount of time and energy that a large island “blob” or excessively deep benchwork consumes. This layout has been designed as a linear shelf type layout to reduce the scenery to track ratio, and produce a longer run. Most areas of narrow benchwork are only 10 to 12” deep and typically are cantilevered off the walls to reduce the number of support legs and yield a more open and aesthetic look.
6. **Industry sizes;** Avoid those one boxcar capacity buildings and plan for larger realistic size industries. Larger industries will probably generate similar traffic to a series of smaller & unrealistic industries because larger industries tend to have more than one “spot” and can justify more shipments. By employing the use of backdrop or foreground flats, or just building the spur itself without actual structures, these big industries

don't have to consume big space on the layout itself – which works well for a shelf style layout. This design philosophy is very common in current trends. There are several locations for large scale industrial operations on the layout, such as the Kootenay Forest Products (KFP) mill east of Nelson yard.

7. **Mockups;** We utilize building mockups extensively to position and help decide on whether the proposed structure needs to be scaled down and/or modified. This really helps with the visuals in the early stages of the layout when you don't have time to actually build proper structure models. It also provides an opportunity to “try” them out before constructing them, plus this approach integrates the structures & associated track into the design. You can accomplish a lot with a glue gun, foam core, and spray cans. But be careful – if you start coloring and weathering them, they are probably not temporary mock ups anymore!

We have carried the mock up strategy beyond structures, and are also using this approach to test build segments of the actual benchwork for the layout itself. Because the layout is a multi deck design with numerous grades, it is effectively a 3 dimensional puzzle, and the framing is inherently more complicated than single level layouts. Therefore, we have built various sections of framing to verify proof of concept for certain key aspects of the layout.

8. **Complicated trackwork;** try to avoid a design that has switching puzzles and switch back sidings & spurs. They may be a novelty initially; however, they are not very prototypical and often cause frustration to operators during op sessions. The prototype would strive to make track configurations simple wherever possible to save money and time.
9. **Stacking “busy” areas;** Try to avoid this as much as possible. By “busy” I mean yards, significant station areas, or major industrial switching areas. It may create conflict between the operating crews and results in congestion in the aisles. During the course of design and even the early stages of construction, we identified a couple of areas of potential concern and are working to mitigate them as the detailed plans evolve and the layout construction continues.
10. **Level track;** Try really hard to install the track level where it is intended to be level. In my opinion, areas like sidings, yards, industry spurs should not have grades, unless you want to implement some form of brake system. In fact, with metal Intermountain wheel sets, I have found that even the slightest incline will cause the cars to roll. While prototype track can be intentionally on a slight grade, a model does not have real brakes that can be set by the crew to combat this issue.
11. **Pre-plan your bridges;** Try to plan for the bridges as much as possible from the outset of construction, particularly the major ones or ones in complicated terrain. It is definitely more difficult to cut them into established scenery, add the necessary framing, align the rail and get them level after the fact. Again, we are using mock up strategies to rough out the bridges as the layout progresses. We have chosen numerous bridges to include based on space planning, visual impact, ease of construction and available data.
12. **Curved spurs;** Try to avoid a design that has curved spurs for industries where coupling/uncoupling is required. While uncoupling can be accomplished by magnets, or setting off the couplers before spotting the car, it can be somewhat difficult to couple onto cars on a curved track unless it is very broad.
13. **Trackage;** An important decision to make when building a layout is what type of track will be used? Will it be hand laid, commercial, or some combination? What code rail is best? What size and configuration of turnouts will be required?

I addressed all of these based on this reality check; the layout is large and I have limited time to work on it. So I chose to use commercial flex track and turnouts – as I had done on the previous layout to speed things up and to ensure a consistent level of quality. Although the selection of code 70 products is not as extensive as code 83, I elected to use code 70 for these reasons; I had a substantial amount of it in stock already, and I like the lower profile of the code 70 rail as it is closer to the prototype rail for the area I model. The flex track is primarily Micro Engineering, and the turnouts are primarily Shinohara (Walthers).

We wanted to increase the performance of the Shinohara turnouts for DCC, so Ken C developed a series of modifications to improve their performance and reliability. Properly performing turnouts is critical to an enjoyable op session. The Techniques section of the web site will have an item covering how we did this. Several non-modified turnouts have been installed temporarily and these can easily be removed and modified when time permits.

Another thing we wanted to achieve was a visual vertical separation between adjacent tracks. Generally on the prototype, the mainline is higher than adjacent tracks, and the sidings are higher than yard and industrial tracks. We are achieving this objective by installing various thicknesses of roadbed and cork under the track. In addition, generally the tie spacing is larger for secondary tracks, so we spread the ties out on the secondary tracks and spurs. Both these initiatives add to the visual effect and will be done throughout the layout .

14. **Single or Multi deck;** My previous layout was originally designed with a single deck, however, the experience of operating on several double deck layouts at ops events such as **BayRails** and **ProRail** showed me the advantages of employing more than one deck. Because one of the primary goals for the new layout was a long and isolated feeling mainline, opting for a double deck was essential and has resulted in a roughly 500 ft plus mainline - 2 ½ times longer than the previous layout had.

Again, this is a personal choice, and multi deck layouts do present a completely different set of challenges since they are essentially a 3 dimensional puzzle which often requires creative and complicated solutions. To mitigate some of these issues, a lot of the layout is based on a narrow shelf design and is cantilevered off the walls. This is particularly helpful for the upper decks.

15. **Continuous Run;** My previous layout had a cut off track that actually connects each end of the layout and allowed for continuous running. This was contemplated from the outset because I wanted this ability for open houses, shows and to run in and test equipment. It proved to be a good decision and a continuous run connection on the lower level was considered essential and is included in this layout for these same benefits.
16. **Hidden Track;** My personal preference is to avoid as much hidden track as possible. In my experience, there is a psychological anxiety with many operators when their train disappears from view for protracted lengths of time. The longest stretch of hidden track on my previous layout was only about 20 feet, however, it still seemed too long. The new layout is designed to minimize hidden track and most of it only occurs at prototype tunnel locations. Most staging yards are not covered and are easily accessible.
17. **Helix or Nolix;** this is a fundamental factor to consider for the design of a multi deck layout. I freely admit I am not a fan of helix'. They are complicated to build and typically place the train out of sight for long periods of time, although, sometimes they are the best decision to satisfy the needs of the owner. I was able to capitalize on the fact that my CPR prototype has 2.2% grades which were to get from deck to deck without a significant helix. I have a 1.5 turn helix at the location of the longest tunnel on my line.

18. **Track to layout edge distances;** A couple of places on my previous layout had track that I feel was too close to the edge of the layout fascia. While this did not cause any equipment to hit the floor, there were some close calls. This issue is even more important for multi deck layouts in my opinion. I would suggest that 4" be used as a minimum standard. The new layout has been designed to have roughly 4" to 6" from the track centreline to the fascia wherever possible. In areas where this standard cannot be maintained, we will be installing Lucite panels to protect the layout and equipment from errant elbows, and clothing.
19. **Tunnel Locations;** Because this is a mountain prototype, there are numerous tunnels along the line – more than can be included. However, tunnels are helpful features to visually interrupt the continuity of the mainline, separate scenes, or disguise penetrations through backdrops. They are also useful in disconnecting the visual connectivity between decks. The design currently includes numerous tunnels, including the longest; the 2900+ foot Bulldog Tunnel.
20. **Layout Design Elements (LDE's);** Because this layout is intended to be very prototypically based, use of LDE's is an effective tool to create the connection between model and prototype. In reality, most prototype based layouts are really a series of LDE's connected by generic or interpretive scenes. By focusing energy and creativity on LDE's, a layout can appear more detailed and prototypical than it actually is. In my experience, they are also fun to research, design and create. These can be individual structures, small scenes, or entire sections of the layout, and are attempting to employ this technique to its fullest. See the LDSig website for more info on this topic; www.ldsig.org/
21. **Standards;** A layout this size will consume significant time and resources. In order to diminish the chances of it becoming a maintenance headache in the future, we have established a set of fairly rigorous standards to follow – effectively like a lot of group or club layouts do. These can include everything from ensuring the benchwork is completely level, to making sure that all individual sections of track have their own feeders, to consistently programming loco decoders.

Some standards are technical – such as feeder sizes and locations, while others may be more aesthetic or visual. I am personally quite specific about how the track gets installed, making sure it is straight, level, not kinked, and flows smoothly. We are also quite particular about the quality of the benchwork, and are using ¾" plywood instead of dimensional 1x4 lumber. Standards also include labeling things and keeping a record of everything for reference.