Southern Pacific Cascade Line
From Concept to "Buildable" Track Plan

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The HO-scale SP Cascade Line seeks to capture major features of the SP mainline in Oregon: the Cascade Hill climb, major forest products industry, and a mix of other industry in the Willamette Valley. The layout occupies about 2400 sqft of a walkout basement. It features a modest representation of Eugene, Springfield, the helper station of Oakridge, and the 1.8% climb up through McCredie Springs, Wicopee, Cruzatte and Cascade Summit, terminating in reverse loop staging at Crescent Lake. Construction began August 1, 2012.

Planning for this dream layout provides a case study in the layout design process. In the Layout Design Special Interest Group "Layout Design Journal #40," Byron Henderson identified three major elements of the design process: Concept Selection, Structural Design, and Detail Design. He illustrated their relative time, effort and importance as an inverted pyramid, with Concept Selection as the most important element.

Design of the SP Cascade Line fit the inverted pyramid image of this process, as significant effort and time went into concept selection, followed by "structural design" and more modest time spent on detailed design. Planning for this dream layout took close to a decade, with more specific design (structural and detail) involving only the last two years of that time.

A hallmark of concept selection is extensive research. Most model railroaders have been involved in concept research most of their hobby lives, whether they realized it or not. As modelers, we make choices of prototype railroad(s) to model continuously in our purchases and modeling efforts. Further, most modelers acquire a library of railroad books, some of which have specific application to layout design. Southern Pacific modelers have been blessed with a number of volumes on the significant routes and divisions of the SP. Through reading and railfanning, one can develop a list of likely layout concept candidates. What is YOUR favorite railroad, route, or scene?

Concept Selection for the SP Cascade Line began with the railroad, SP, and continued through a desire for both a mountain climb and some valley towns and industry. With significant mountain grades on all lines radiating from corporate headquarters in San Francisco, there was much to select from, but the search narrowed quickly based on my birth and growing up in Oregon. The pair of books on the SP in Oregon by Austin and Dill, and Tom Dill's separate color volume on the Shasta Route provided the research foundation for the eventual layout plan.

Layout design involves compromises and choices. It is an iterative process. The process begins with a concept, progresses through structural design where space constraints meet wishes and desires, and may slip into detail design for significant "must have" features before returning to concept choices as one realizes the space presents more limitations than first thought (or hoped for). The SP Cascade Line began as a series of design studies based on a 30x50 feet concept space. These design studies were little more than an effort aimed at determining what was possible in a large space. These studies began long before

the dream house plan was identified. Indeed, they helped define the desired space "requirements."

The layout concept went through four major iterations, beginning with a Shasta Division focus (two years), a relatively brief (one year) look at the Cascade Line, a five year excursion into proto-fiction--an SP line over the Santiam Pass, before settling back on the historic SP Cascade Line. Along the way, planning factors were developed for overall space needs, identification of wyes as space hogs, an appreciation for grade percentage impact on overall height gain for large layouts, and an increasing demand for compromise, choice and priority setting.

The **Structural Design** process listed the "givens" of the space, the "druthers" of the concept, and identified key layout design elements (LDE) desired. A schematic representation of the mainline helped trim the list of LDE's and guided the sketching of the layout into the eventual room layout. Design notebooks (design journals) helped the thought process and provided quick reference for design ideas and concepts previously explored.

Operations planning was integral to the design process. Identification of operating crew size and roles helped prioritize design features. A design goal for "satisfying operations" with a crew of six (expandable to beyond a dozen) helped constrain ever-expanding dreams for the "base yard" (Eugene) and drove a choice to install CTC (helps with small crew size).

Detail Design began with a set of geometric planning factors: mainline radius, turnout size, climb gradient, and aisle widths. Fitting the schematic concept into the actual space began with locating the most critical elements. For the SP Cascade Line, locating the turning wyes at Oakridge and Cascade Summit proved the most challenging. Aisles must be planned consciously. Model railroads are operated by full-size humans. Turn-back lobes are features of most spaces wider than the minimum diameter circle and an aisle. How those turn-backs function while maintaining a "sincere" plan (once through each scene) becomes a function of the concept and the aisle plan.

Design roadblocks can/will occur. I found looking at other model railroad plan solutions, questioning my own priorities, starting from a different spot in the room, and track schematic sketching to be useful tools in overcoming "analysis paralysis."

The current plan for the SP Cascade Line went through several detail revisions as I struggled with the base yard design at Eugene, built major towns, gathered new information on the prototype, and operated the "Valley Core." The Golden Spike for the mainline was in April, 2015. Full mainline operations began in June, after a little less than three years of solo construction effort. Initial operations experience has suggested a couple of tweaks to the operating plan and a surprising reduction in number of powered locomotives for reliable mid-train helper operation.

You may follow my efforts on my layout blog at:

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The SP's Cascade Line was completed in 1926, providing an alternative route between Oregon and California. Compared to the original Siskiyou Line, which roughly follows the route of Interstate 5, the new Cascade Line eliminated 25 miles of track, reduced total curvature by almost half, and reduced the southbound grade used by heavy lumber trains from 3.3 percent to 1.8 percent.

The Cascade Line left the original Siskiyou mainline at Springfield Junction, just geographic east of Eugene. Continuing through Springfield, the line followed the North Fork of the Willamette River up to Oakridge with a modest climb. The mountain grade began in earnest at Oakridge, continuously climbing 44 miles to the summit alongside Odell Lake. The line continued another seven miles from Cascade Summit to Crescent Lake, which served as a RR Division boundary between the Shasta and Portland Divisions until a reorganization in 1964. From Crescent Lake, the railroad continued on the east side of the Cascades down to Klamath Falls and then on to the southern junction with the old Siskiyou Line at Black Butte near Weed, north of Dunsmuir, CA.

Layout Features. Major features of the layout include the base yard complex at Eugene, the industrial area of Springfield and the helper station at Oakridge. Three mountain sidings lead to Cascade Summit. The track continues into the upper level staging at Crescent Lake. The historic 1.8 percent grade begins at Oakridge and climbs an actual 3.5 feet to Cascade Summit. A major design priority for the layout was provision for manned mid-train helpers up the mountain grade. Half of the 400 feet mainline run is on the 1.8 percent grade above Oakridge.

Construction. Much of the layout employs L-girder support. The large flat areas and mountain sidings use plywood panels. Most of the mountain grade uses spline roadbed cut from ¼ inch hardboard. The overhead benchwork for Cascade Summit and Crescent Lake uses open grid framing. Crescent Lake is suspended from the ceiling (floor joists of the house main floor) using threaded rod.

MicroEngineering flextrack is used throughout, with code 83 used on the mainline and code 70 for secondary trackage. The layout has 41 ME 6 switches with all of the remaining 167 switches using either #6 or #8 (for the mainline) switches built using FastTracks tools and jigs. Switch machines are either Tortoise ™ power or BluePoint ™ manual throw.

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SOUTHERN PACIFIC CASCADE LINE

HO SCALE

BILL DECKER

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