The Columbia & Western

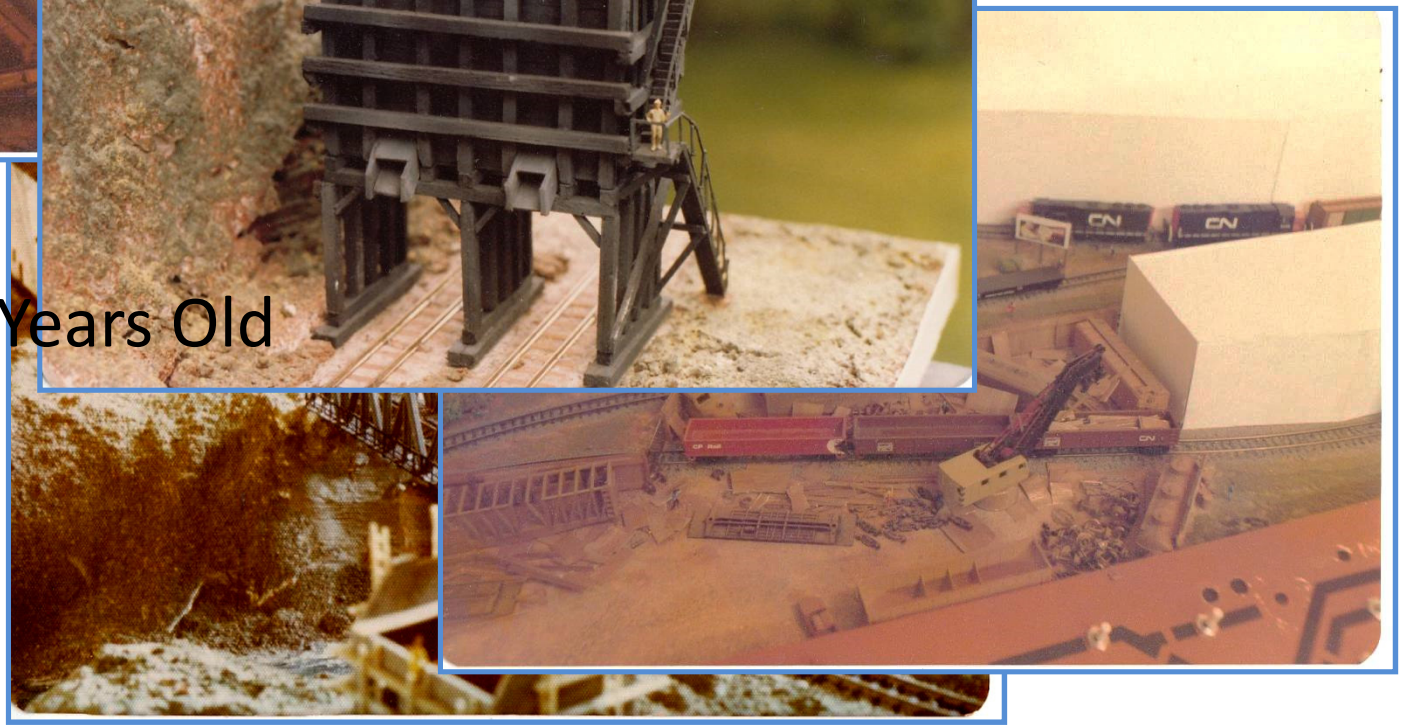
Lessons learned designing, building and operating a layout replicating the CPR in the Kootenays.

Introduction

- The bug bit early…I have been in N scale since 1971

15 Years Old

13 Years Old



9 Years Old

Fast Forward to 2001

- Opportunity to Build my Dream Layout
- Location: An insulated, 2 car garage
- What were my Interests and Objectives???


Laid back operations

Rail-Marine


Engineering Works & Stiff Grades

Snow

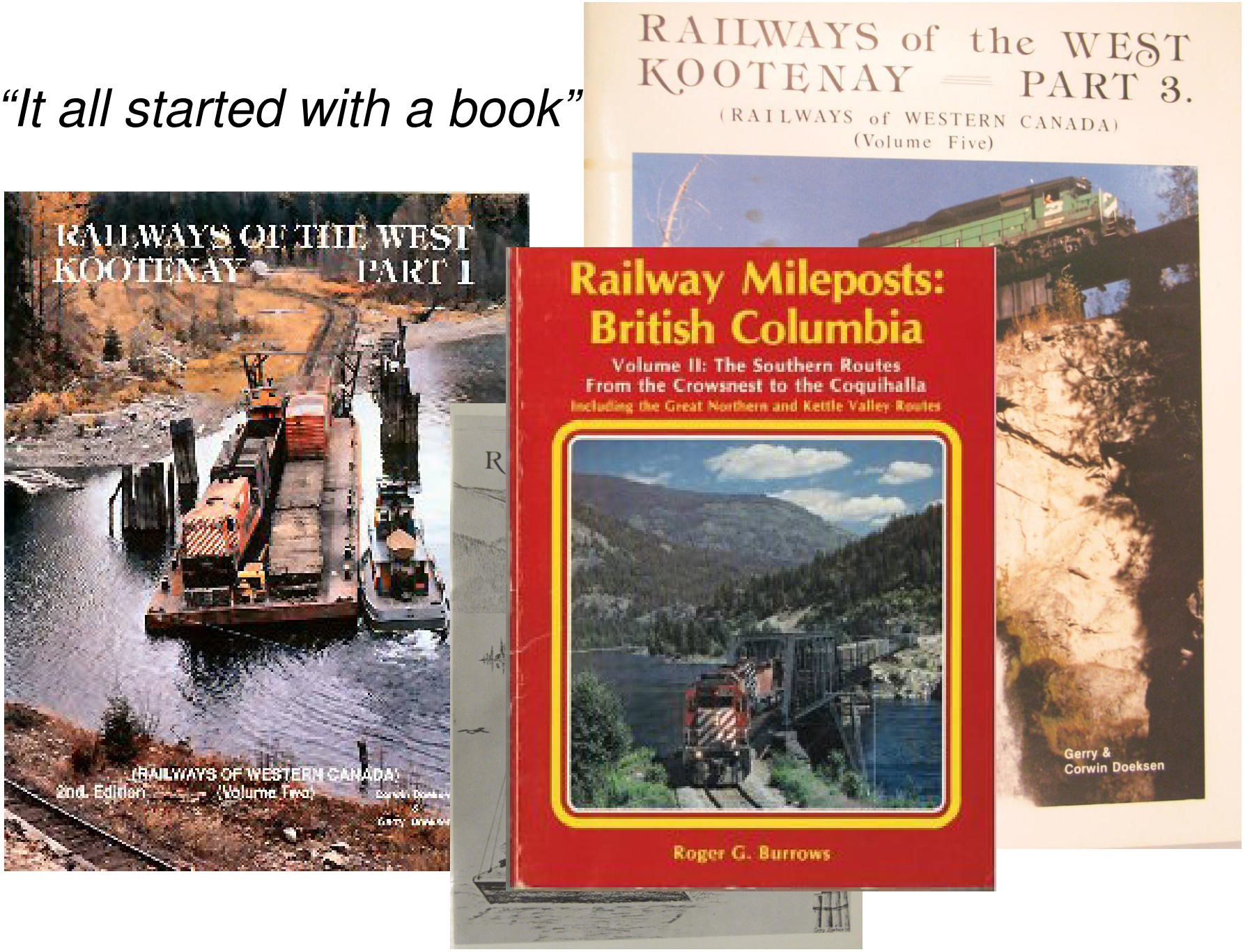
Proto photo by J. Leeming

Dramatic Scenery

Proto photo by J. Leeming

Urban Canyons

“It all started with a book”

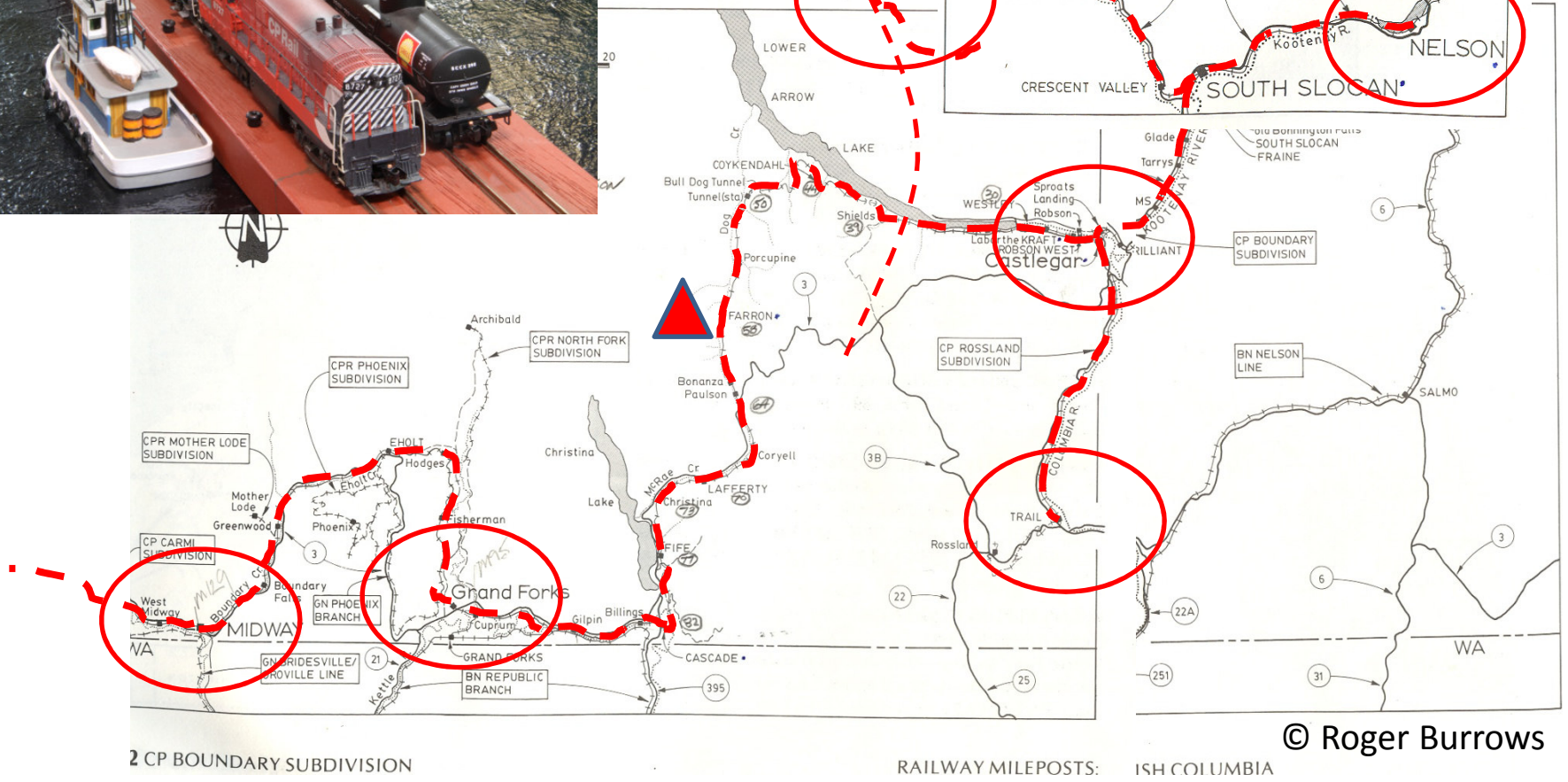


The Prototype: CPR in South East British Columbia

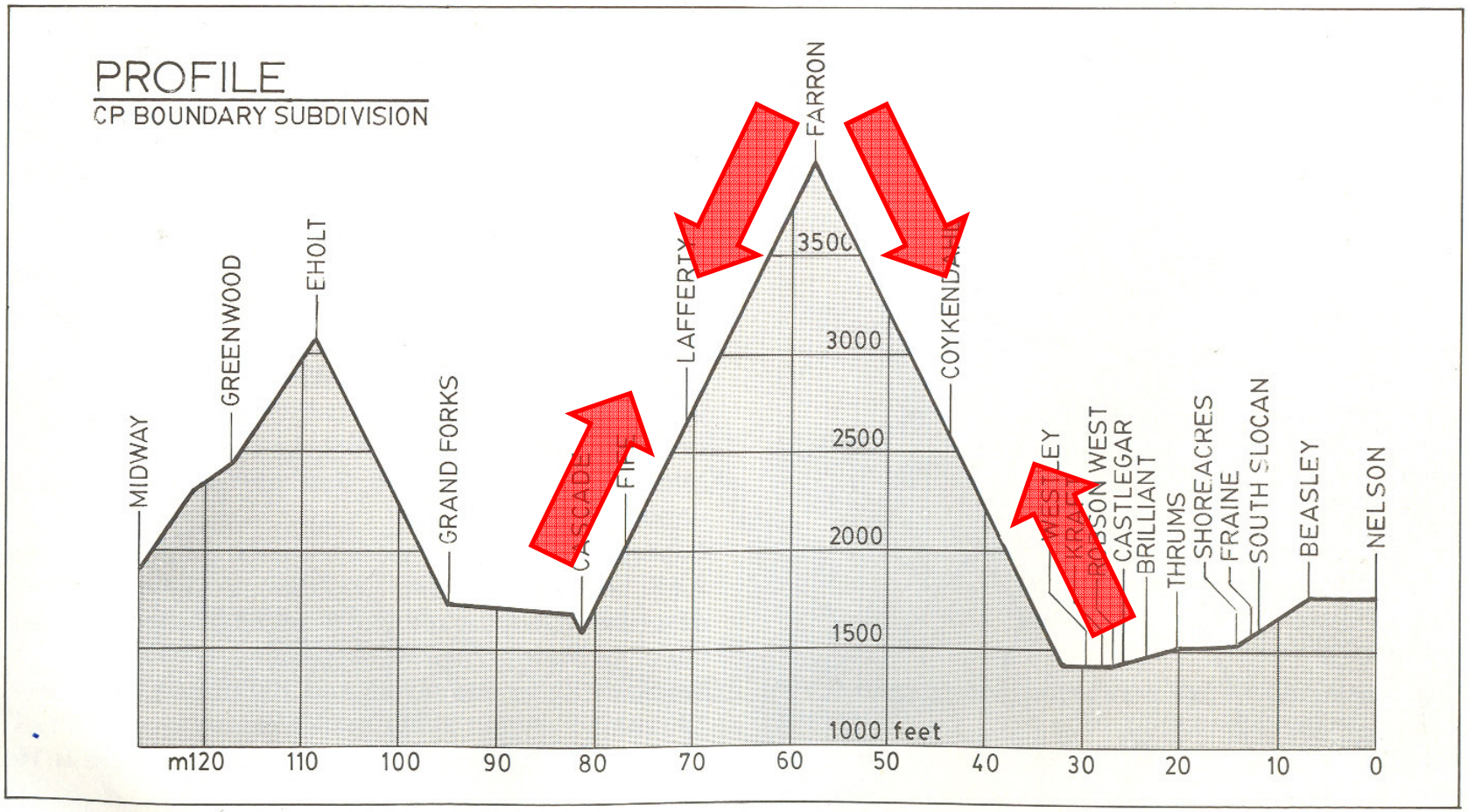
The Kootenays!

Laid Back Operation	✓
Rail-Marine	✓
Steep Grades	✓
Snow	✓
Dramatic Scenery	✓✓✓
Urban Canyons	**Ok…not so much**

The Prototype: CPR in South East British Columbia



Grades across the Monashees

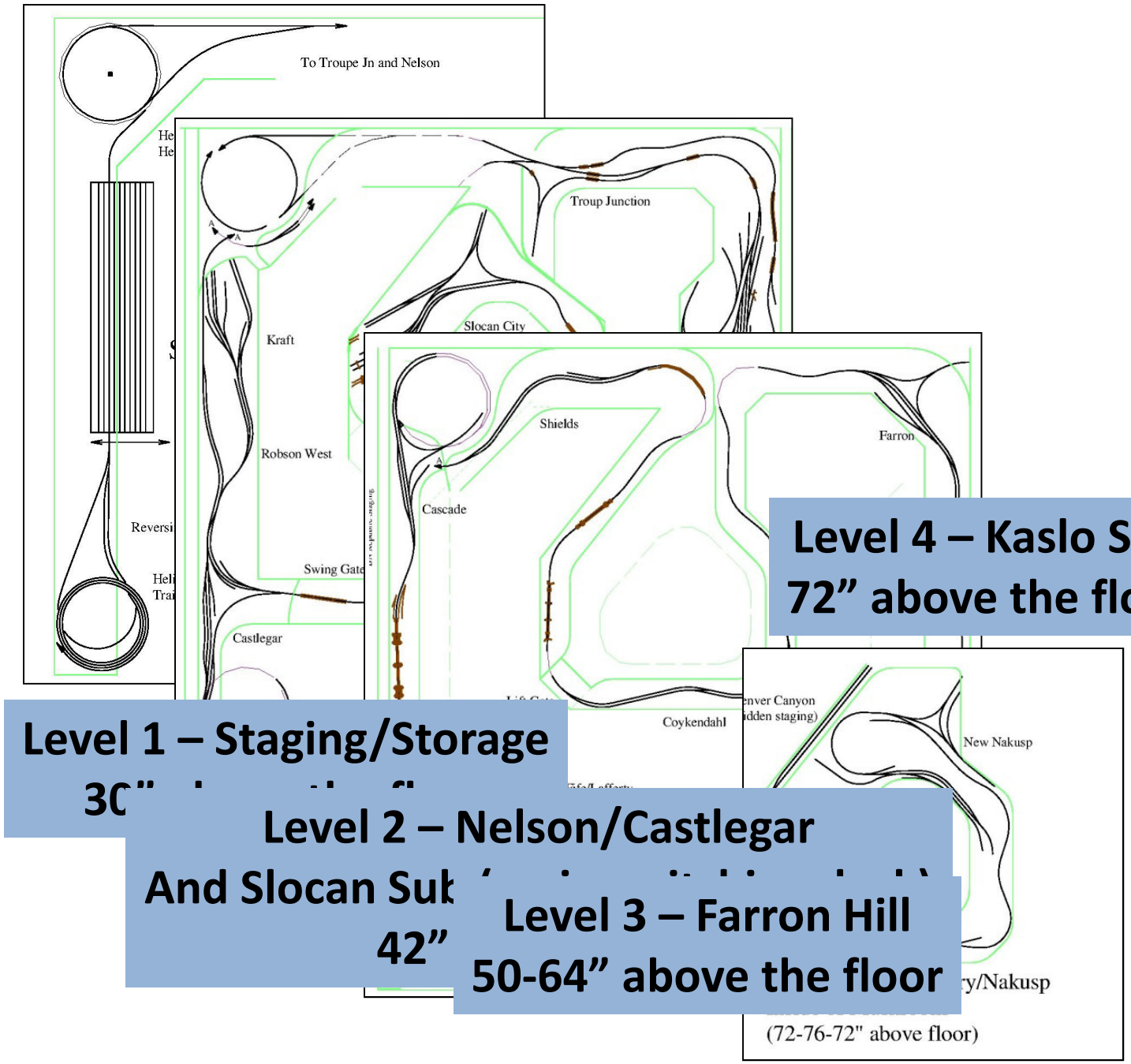


Timeframe: 1969-1974

Proto photo by David Wilkie

Design process

- Presume a two-car Garage
- Decide on single versus multiple decks
- Decide on around-the-walls versus walk-in or island
- Locate prototype information
- Consider the types, make up and frequency of prototype operations
- Consider the type, make up and frequency of layout operators! ☺



Level 4 – Kaslo Sub
72” above the floor

Level 1 – Staging/Storage
30”

Level 2 – Nelson/Castlegar
And Slocan Sub
42”

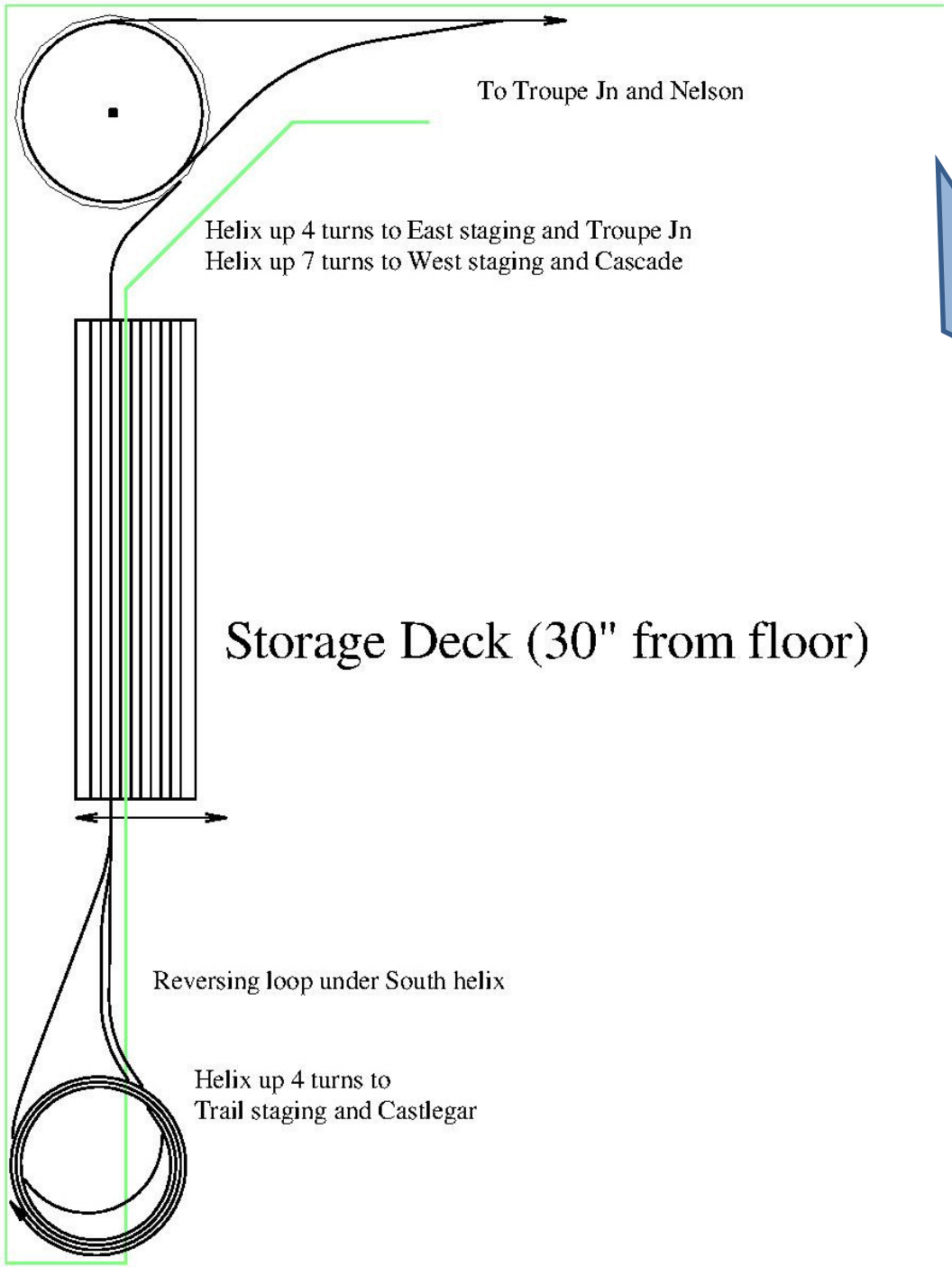
Level 3 – Farron Hill
50-64” above the floor

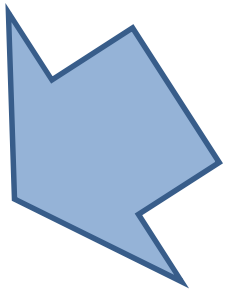
Columbia & Western "Specs"

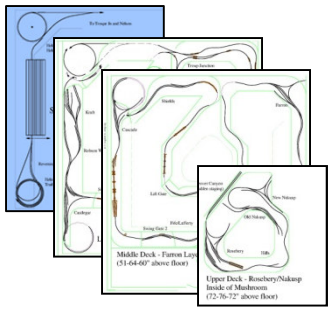
- CPR Boundary, Slocan and Kaslo Subs Circa 1970
- Converted 2 car garage of ~350 sq. ft. (~20'x17')
- N Scale
- 7 scale mile long Mainline/2 scale mile long Branch
- Around Walls with Swing Gates
- One 2.5 turn helix on mainline
- Double Mushroom Peninsula
- 4 Decks **but** of Boundary Sub…
  - only ~12% of mainline is hidden
  - ~30% of mainline is single deck
- Separated Staging and Storage

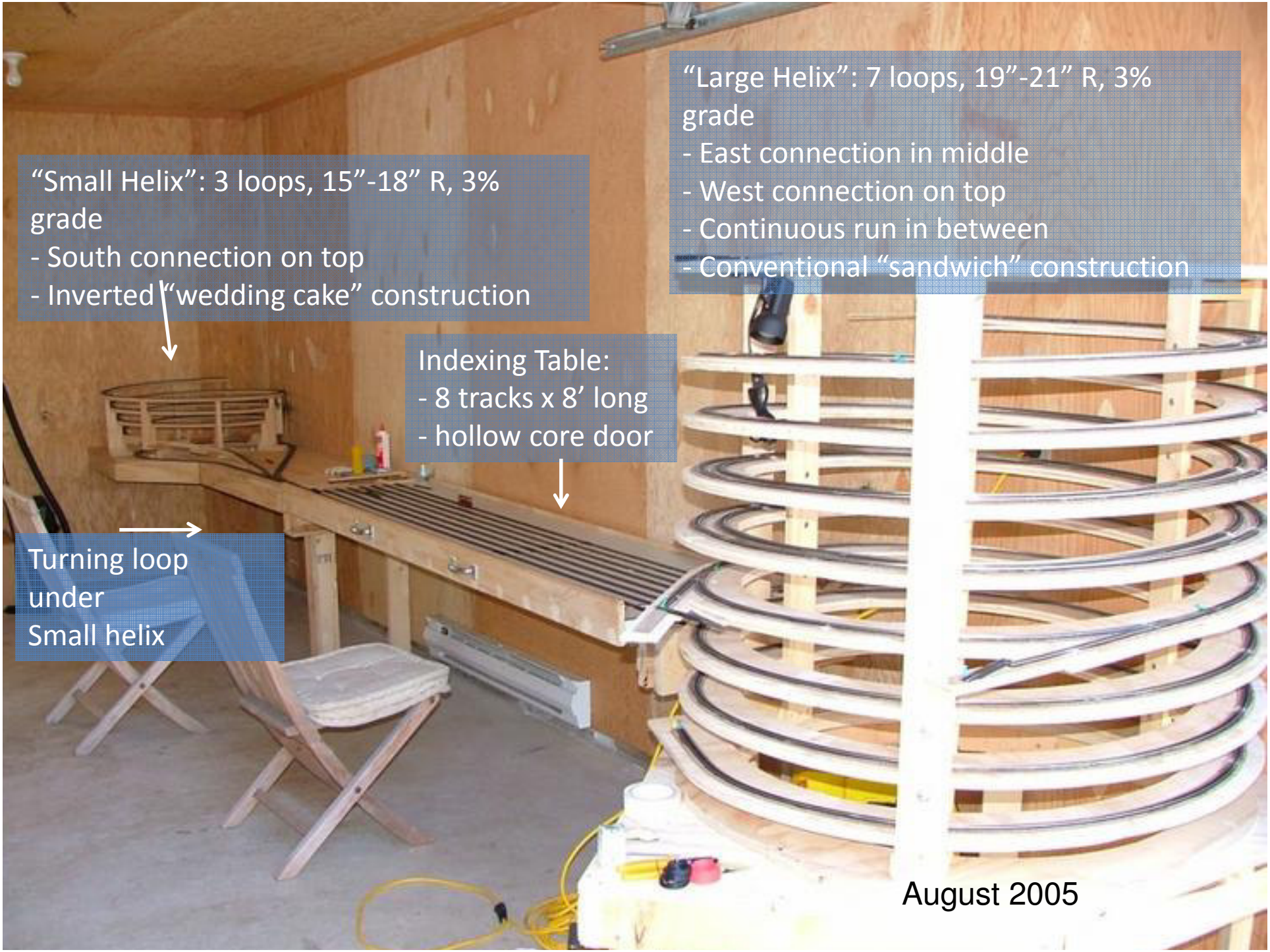
- ~200 switches, 1/3rd powered
- Digitrax DCC with Duplexing Radio throttles
- Timetable & Train Order
- 5:1 fast clock
- 6 Dispatcher-controlled Train Order stations
- >40 locos and 350 cars in use in any session
- All guest-operated trains are sound-equipped (in some manner)

- **Construction started June 2005**
- **First Ops September 2008**
- **First TT&TO January 2011**
- **Coming up on 50 ops sessions**


To Troupe Jn and Nelson
Helix up 4 turns to East staging and Troupe Jn
Helix up 7 turns to West staging and Cascade
Storage Deck (30" from floor)
Reversing loop under South helix
Helix up 4 turns to
Trail staging and Castlegar

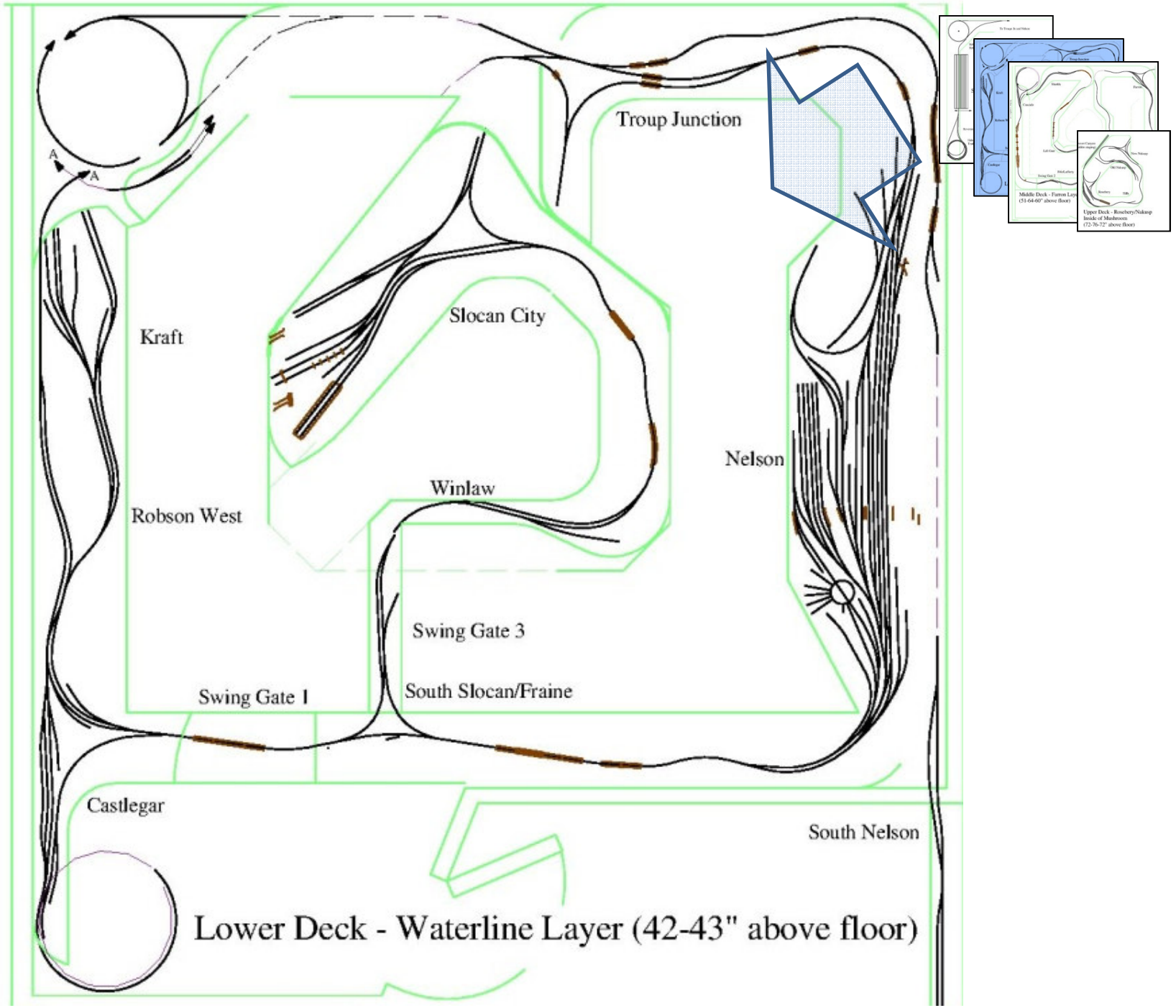





"Small Helix": 3 loops, 15"-18" R, 3% grade
- South connection on top
- Inverted "wedding cake" construction
"Large Helix": 7 loops, 19"-21" R, 3% grade
- East connection in middle
- West connection on top
- Continuous run in between
- Conventional "sandwich" construction
Indexing Table:
- 8 tracks x 8' long
- hollow core door
Turning loop under Small helix
August 2005

Storage/Staging

Indexing Storage Table


Troup Junction
A
A
Kraft
Slocan City
Nelson
Winlaw
Robson West
Swing Gate 3
Swing Gate 1
South Slocan/Fraine
Castlegar
South Nelson
Lower Deck - Waterline Layer (42-43" above floor)


NDS OF THE
FREIGHT CAR

Gates

Gate Philosophy

Starting Assumption: things will want to move!

So either

a) Resist the movement and design for the resulting stress/strain

Or

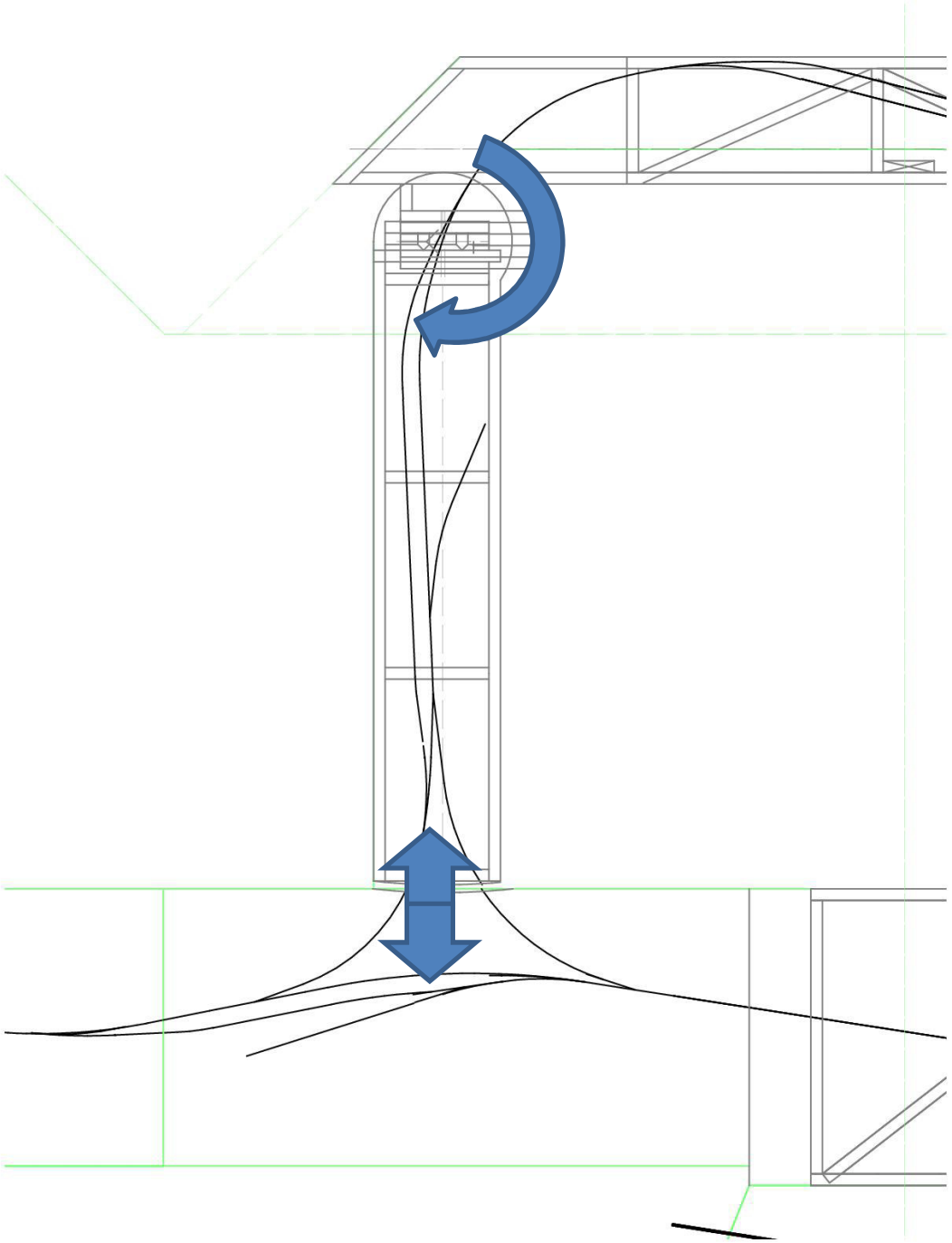
b) Accommodate the movement by allowing the benchwork to deform

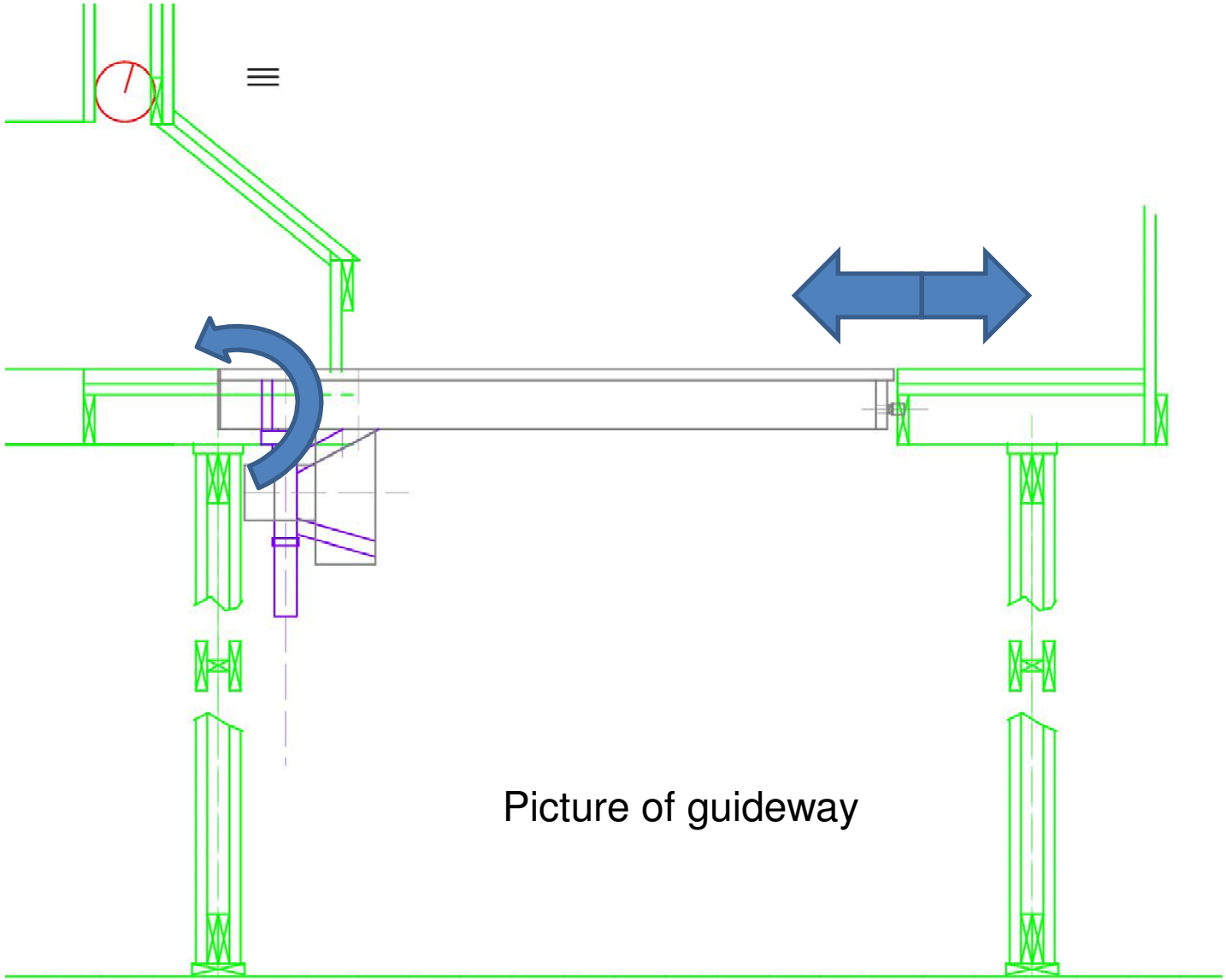
Quandary: If you allow for the movement, how do you accommodate it, or how can you close the gaps that result as part of closing the gate?

Gate Philosophy

1. Only worry about aligning the track/roadbed
2. Use “conformable” scenery to cover any misalignment away from the track/roadbed
3. One side rigid, the other deflectable. Closing the gates forces alignment:
   - Wedging action
   - Over-center latches
   - Weight of lift gate
4. Lubricated hardwood for wear surfaces
5. Also lots of Ball Spring detents

Example:
Gate 3

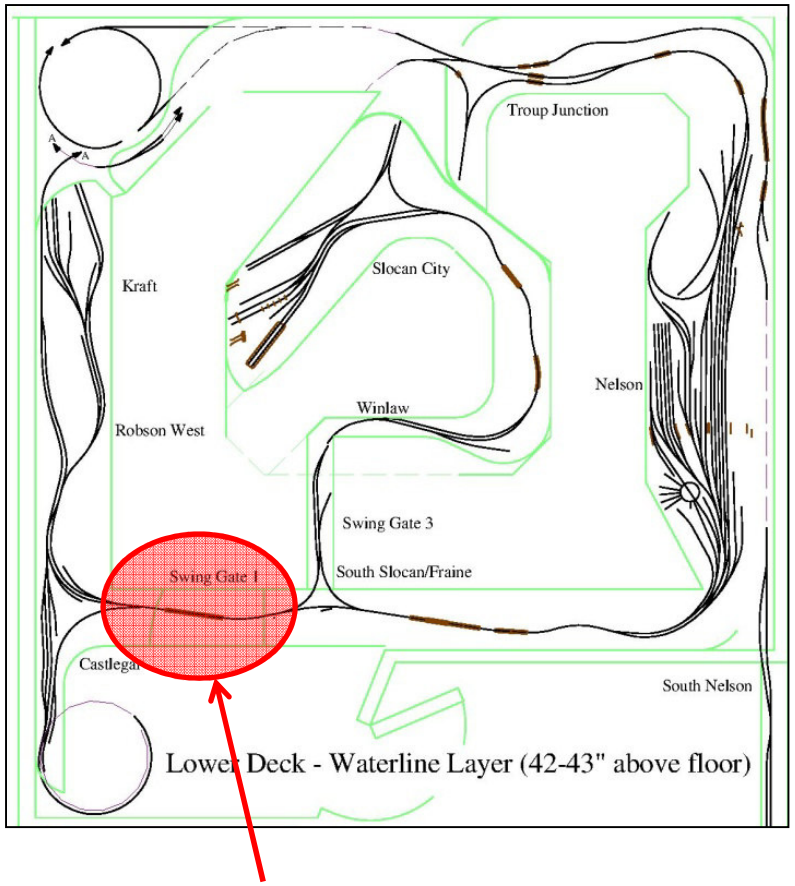




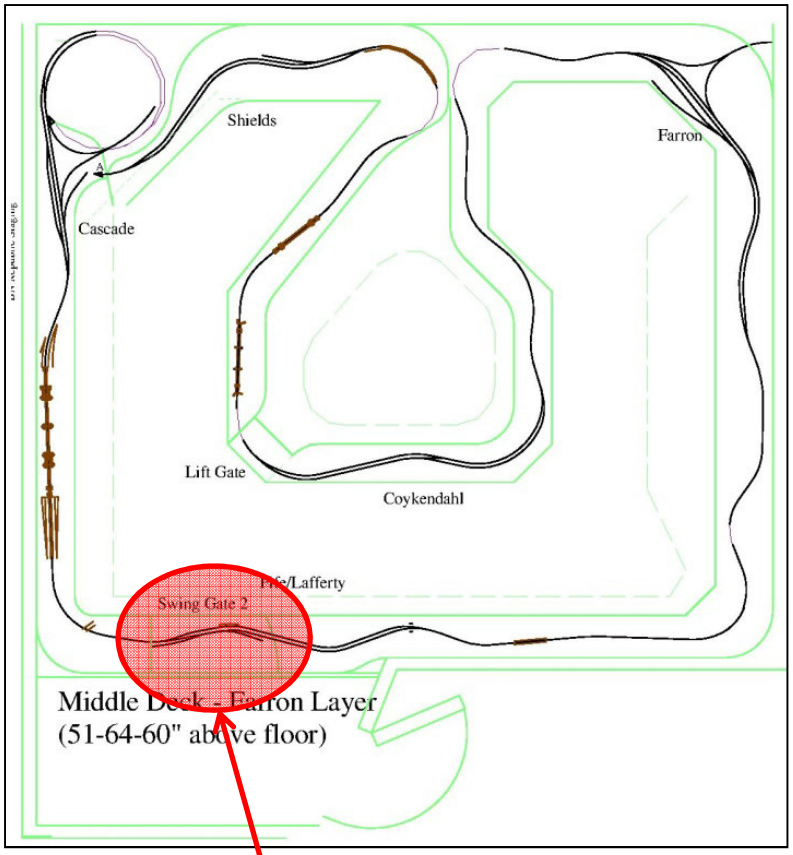
Picture of guideway

Gates

Main Entry Gates

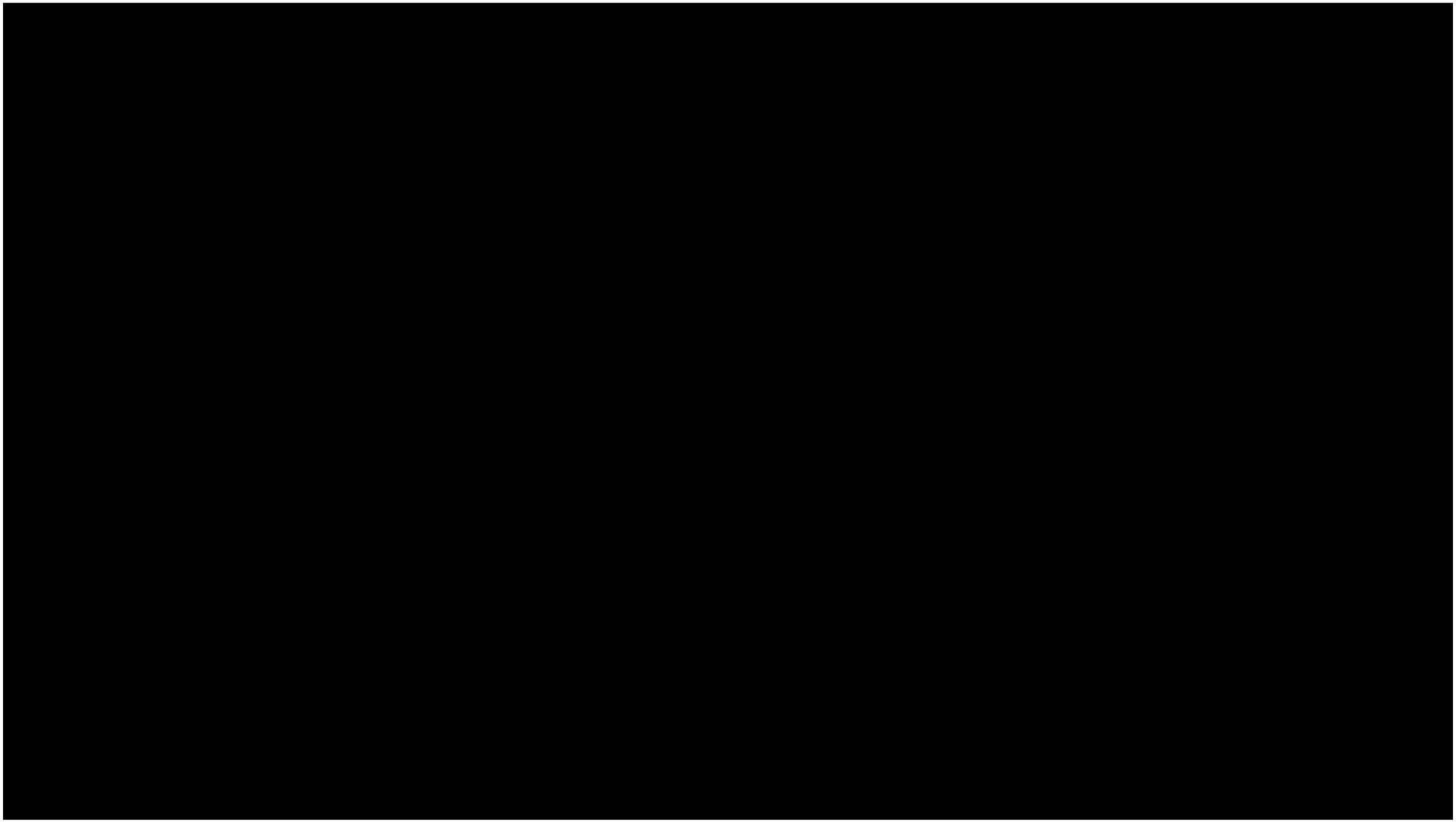


~3’ crawl under when closed



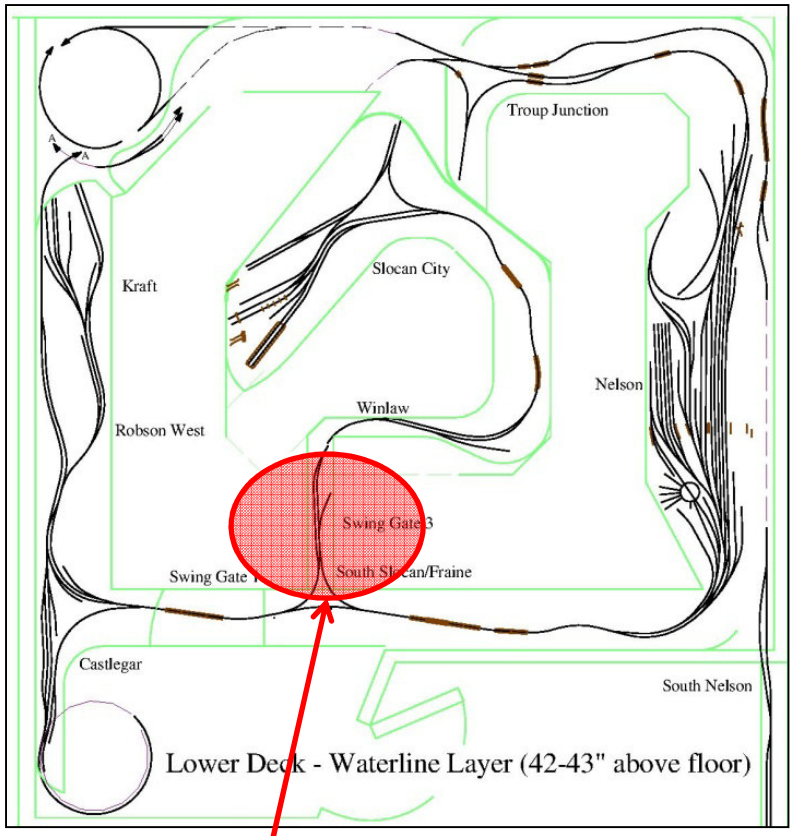
~4 ½’ duck under when closed

Swing Gate 1 – Lower Main Entrance

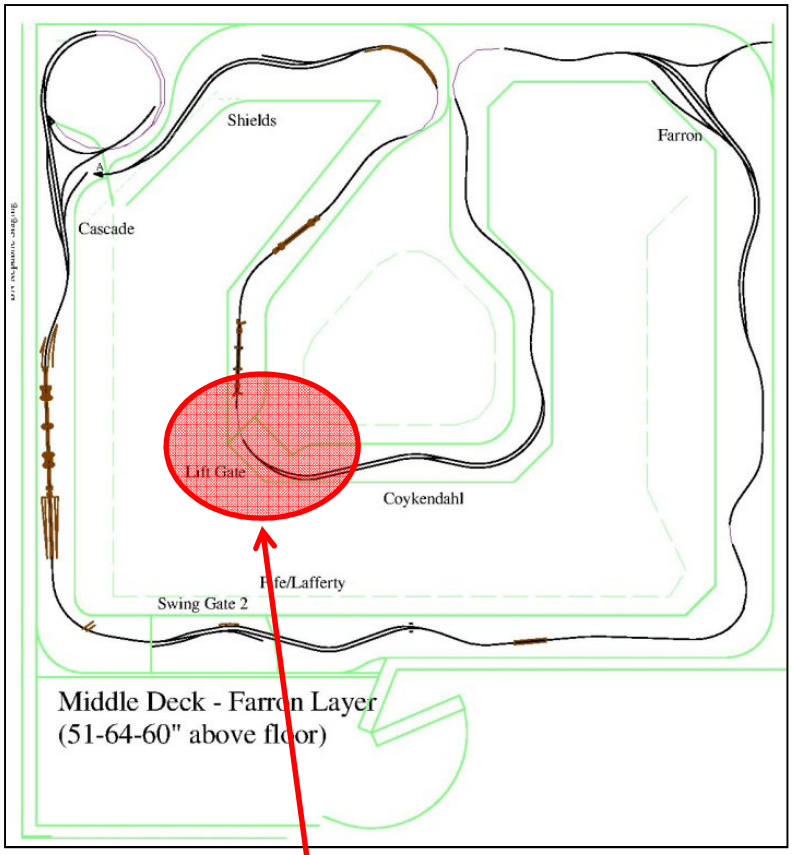


Swing Gate 2 – Upper Main Entrance

Gates

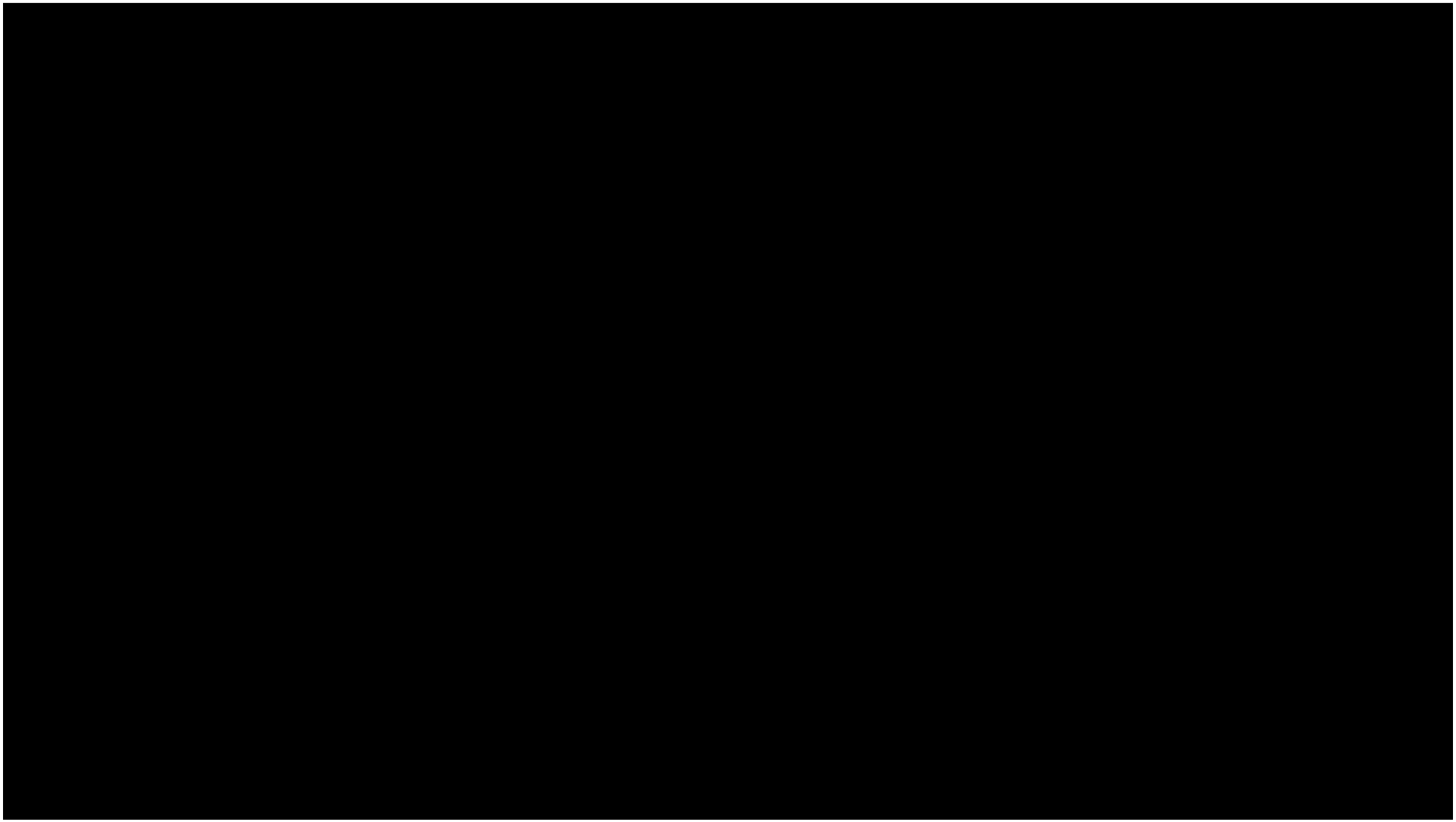


~3’ crawl under when closed

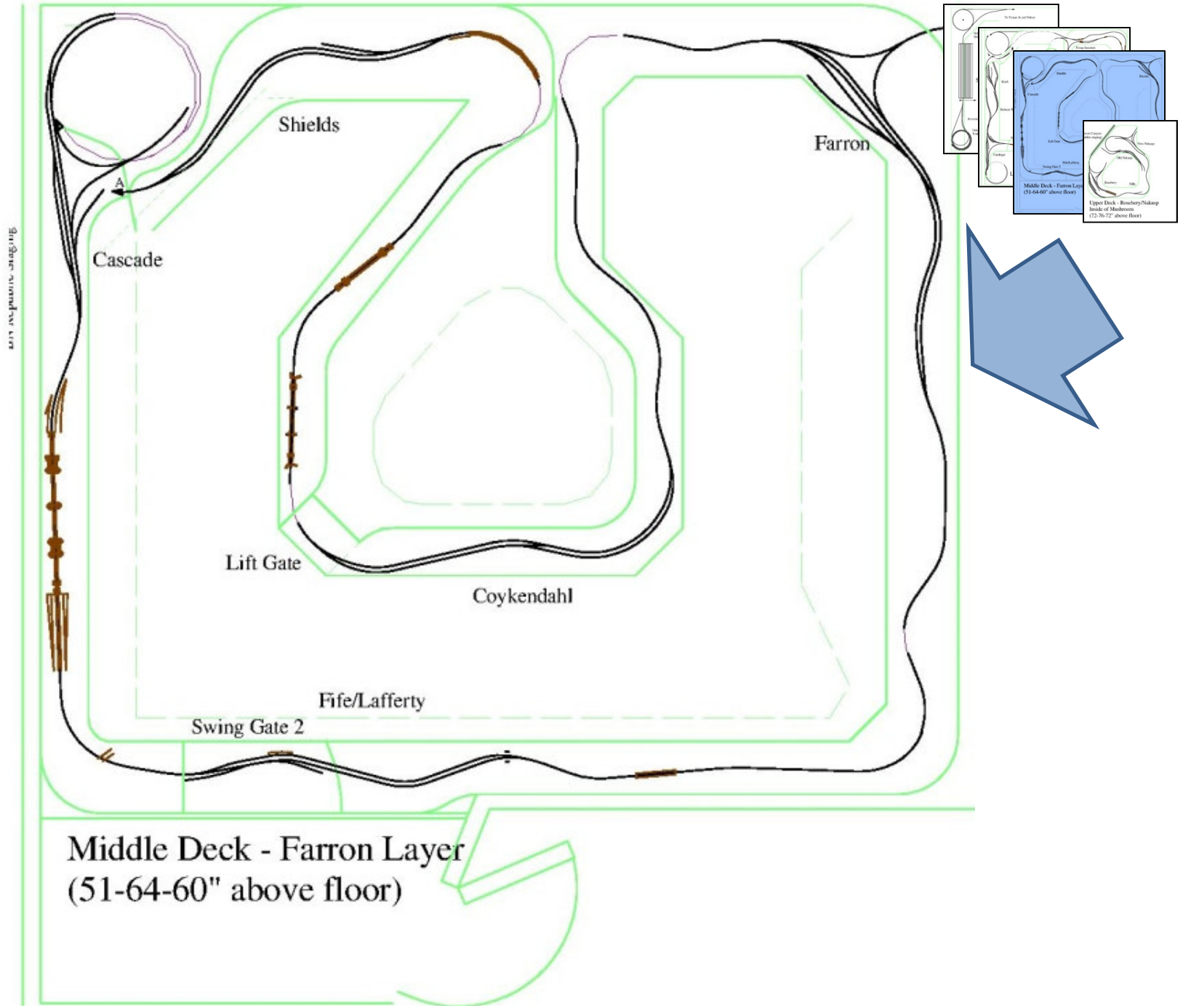


~4 ½’ duck under when closed
~5 ½’ duck under when open

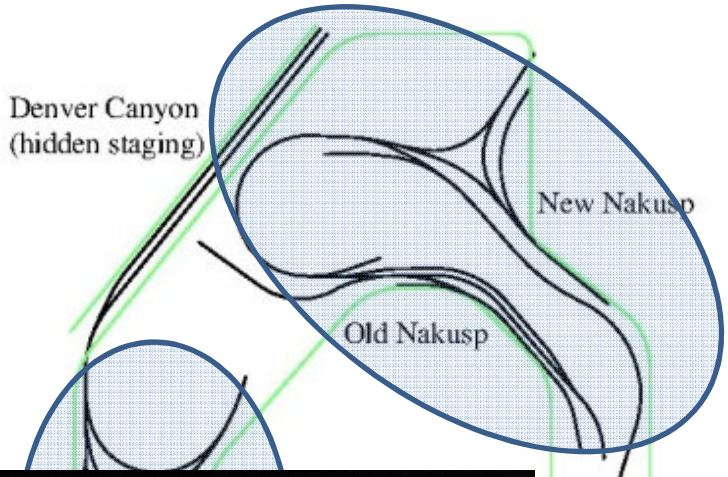
Swing Gate 3 – Branch Across Main Aisle

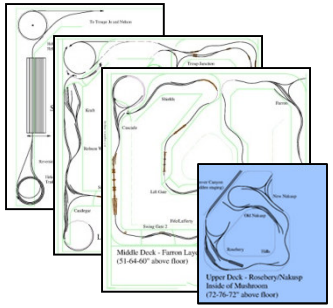


Lift Gate into Mushroom


Shields
Farron
A
Cascade
Lift Gate
Coykendahl
Fife/Lafferty
Swing Gate 2
Middle Deck - Farron Layer
(51-64-60" above floor)


Cascade
Farron
Lift Gate
Coykendahl
Fife/Lafferty
Swing Gate 2


Denver Canyon
(hidden staging)
New Nakusp
Old Nakusp

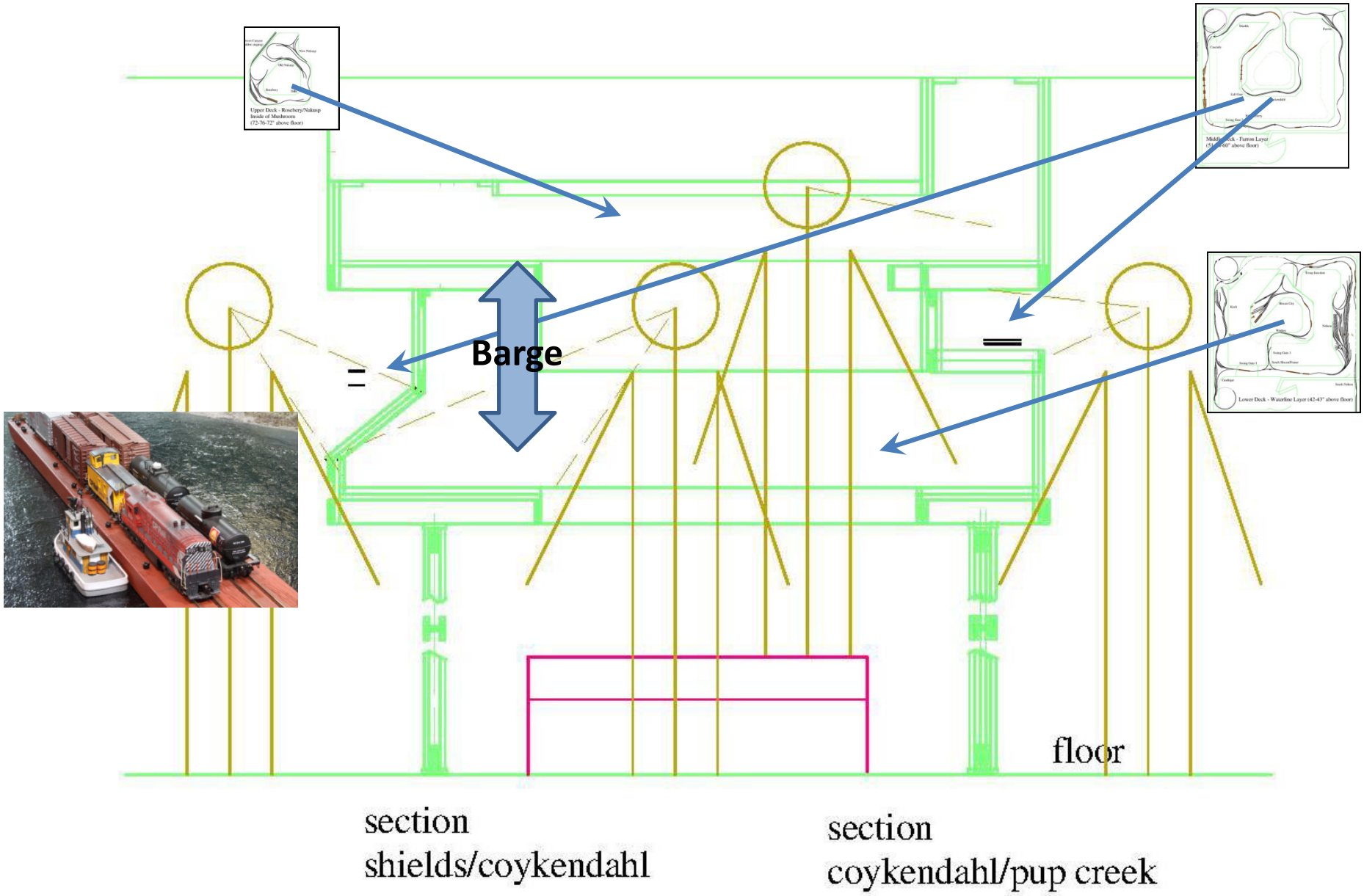

Middle Deck - Farron Loop
(51-64-60" above floor)
Upper Deck - Rosebery/Nakusp
Inside of Mushroom
(72-76-72" above floor)


North South
Slocan & Nakusp
Wayfreights
New Nakusp
Old Nakusp

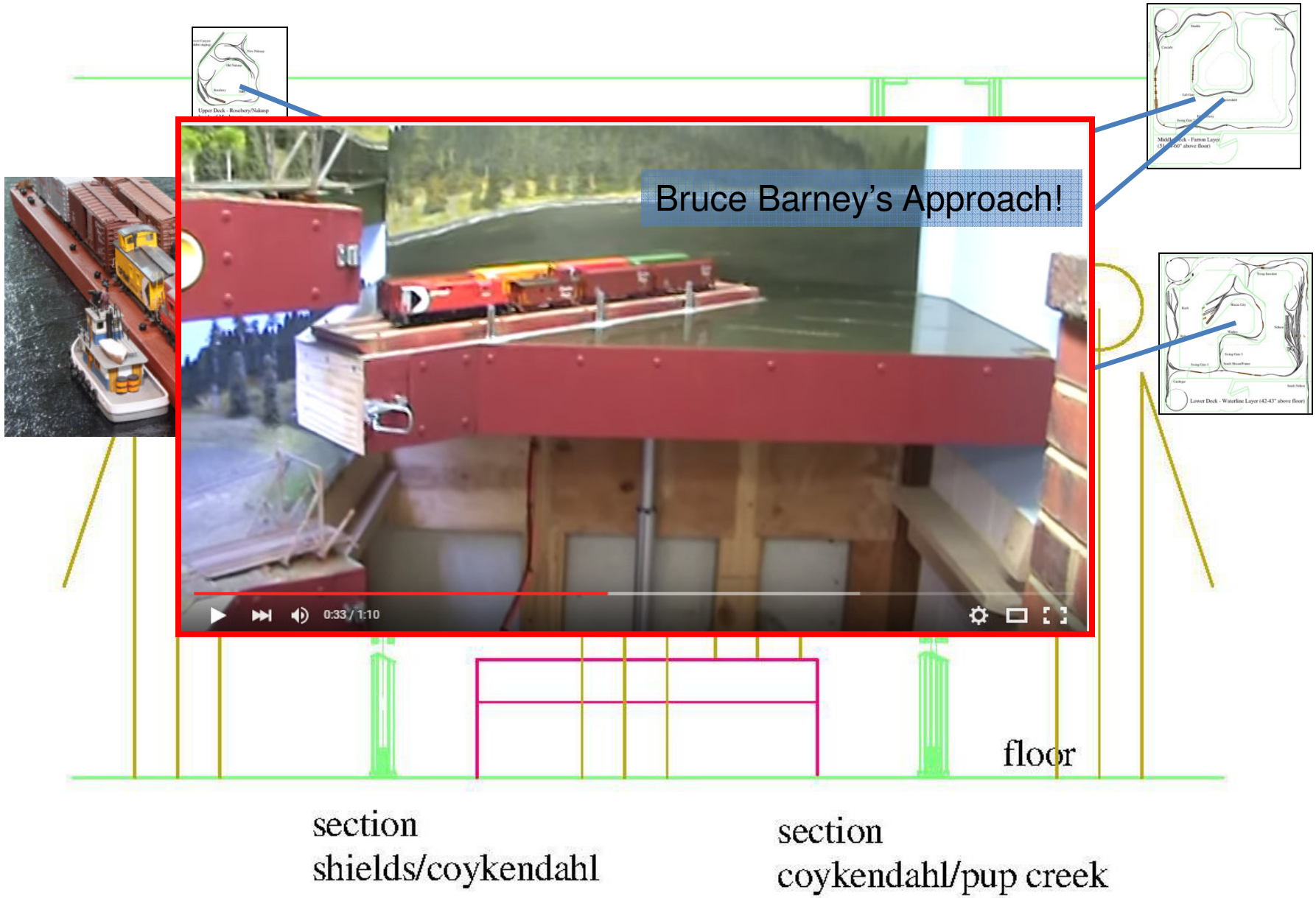
Double Mushroom


09:20
SLOCAN FOREST
PRODUCTS

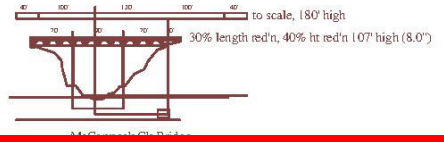
Double Mushroom



Double Mushroom



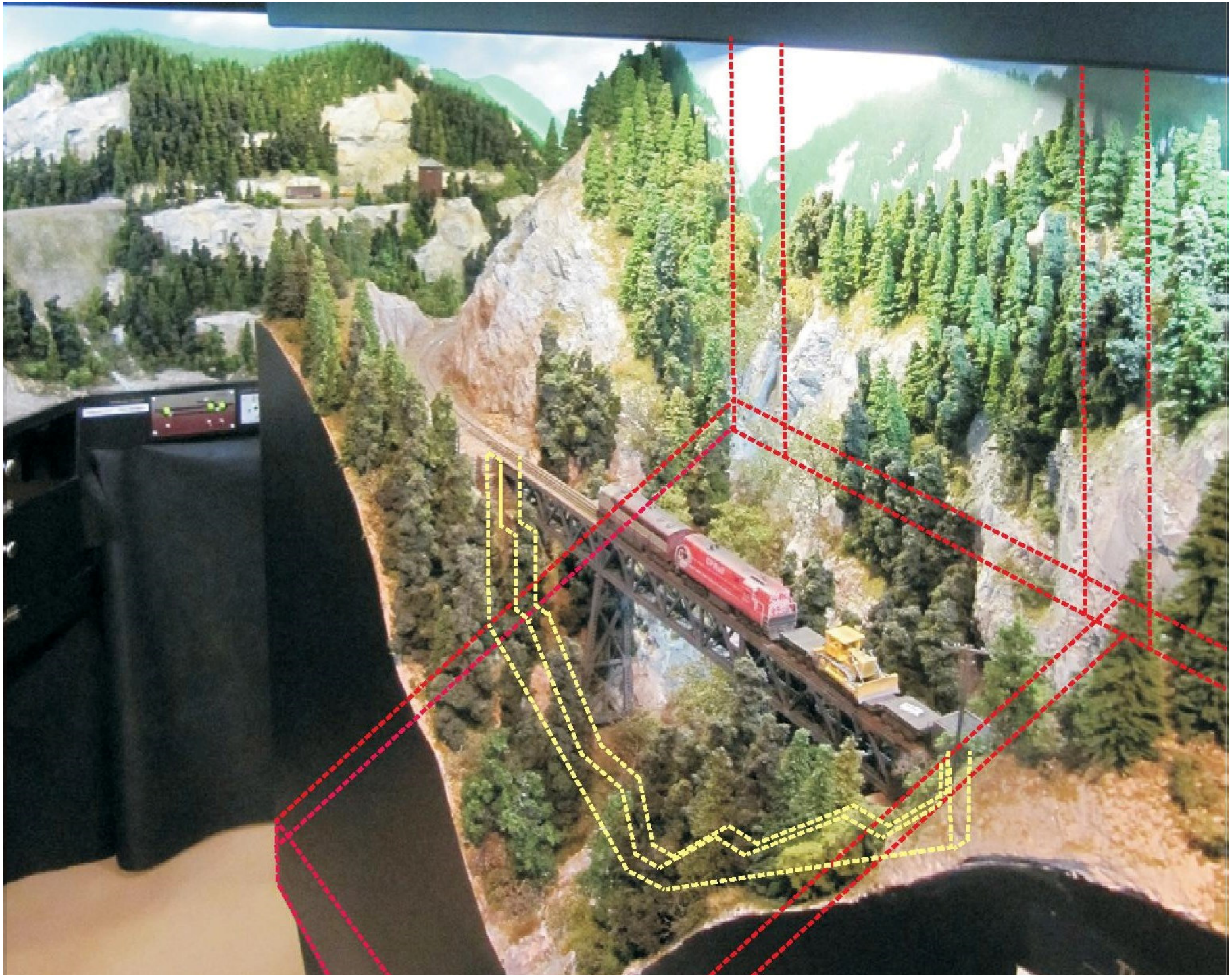
Pull Out Step
For Level 4



s to Continuous run at Troup JN
Storage

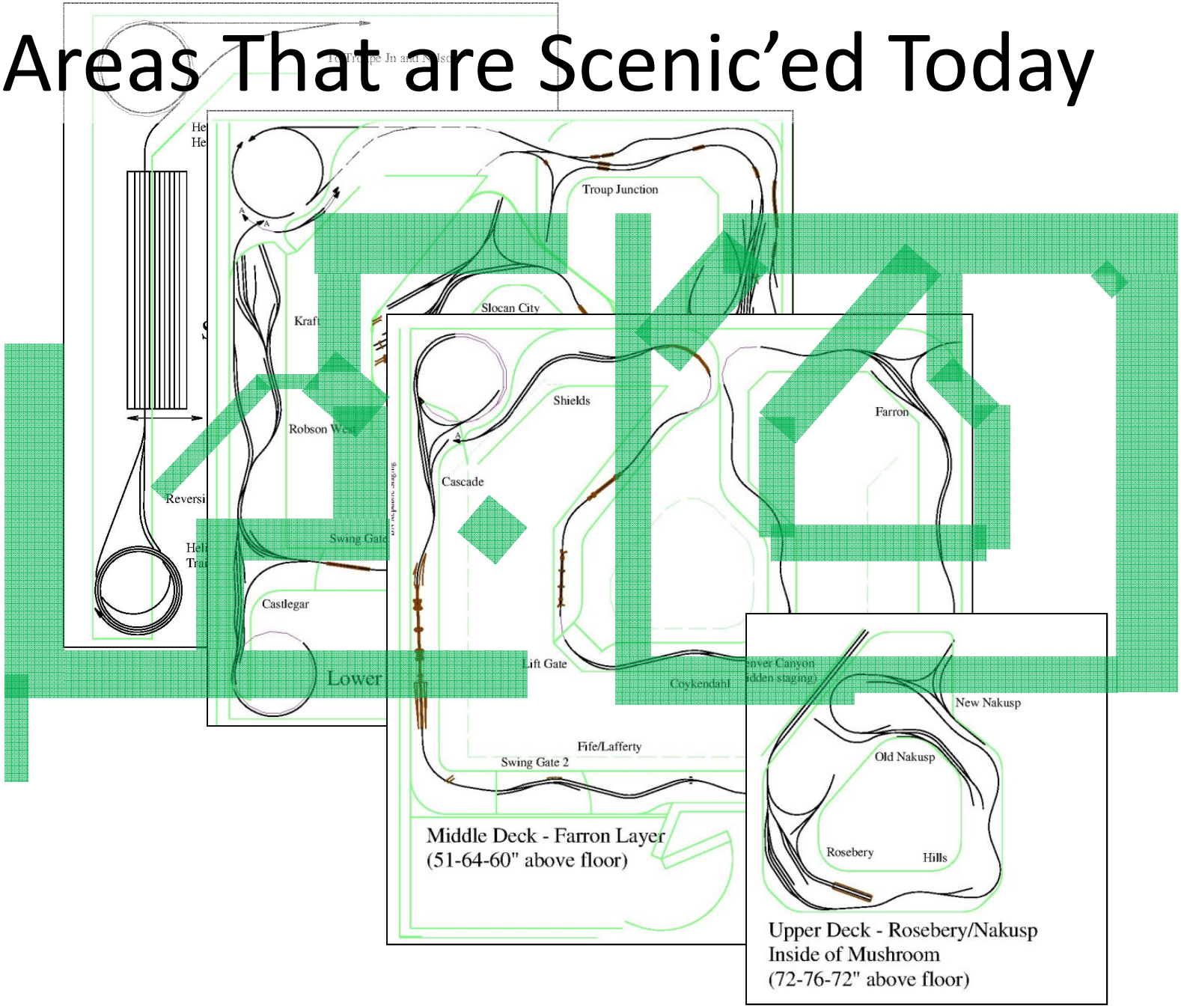
Grass Creek

Coykendahl



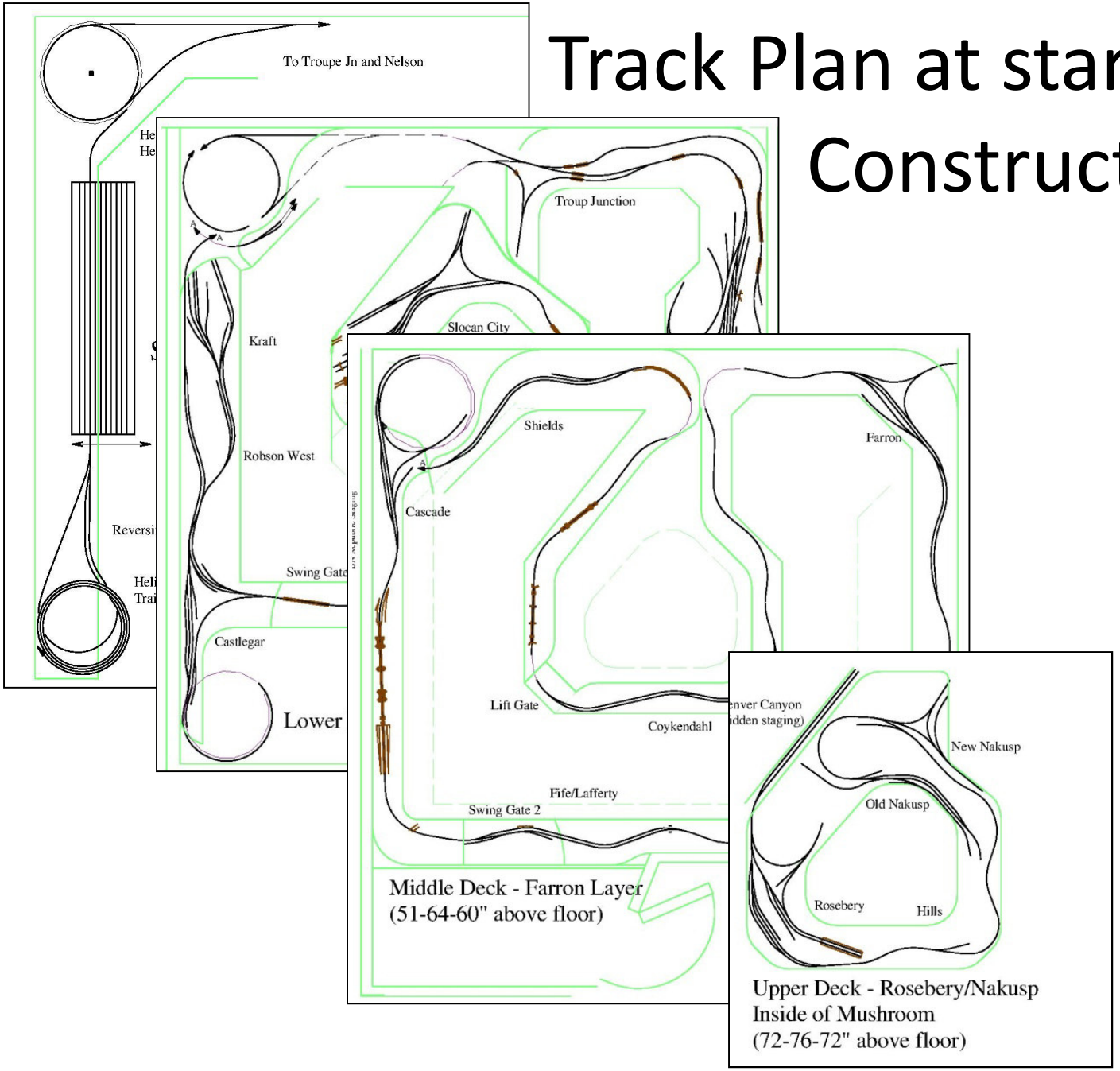
Double Mushroom

Areas That are Scenic'ed Today

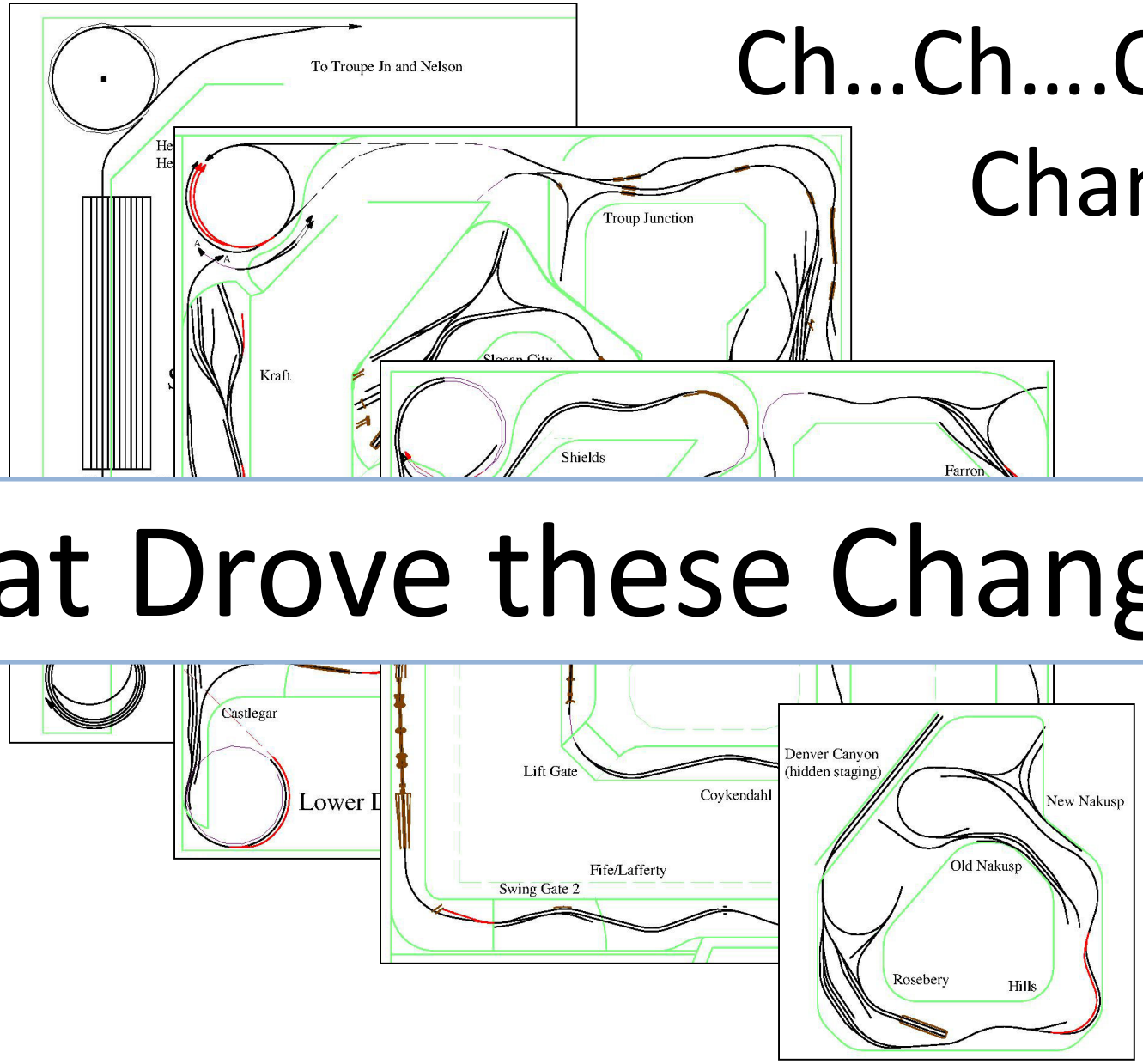


What Changed in the Design?

Track Plan at start of Construction



Ch…Ch….Ch….
Changes

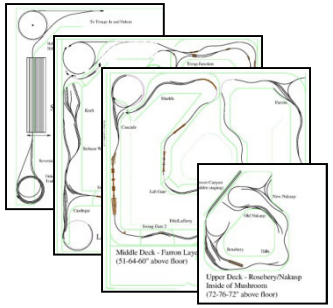


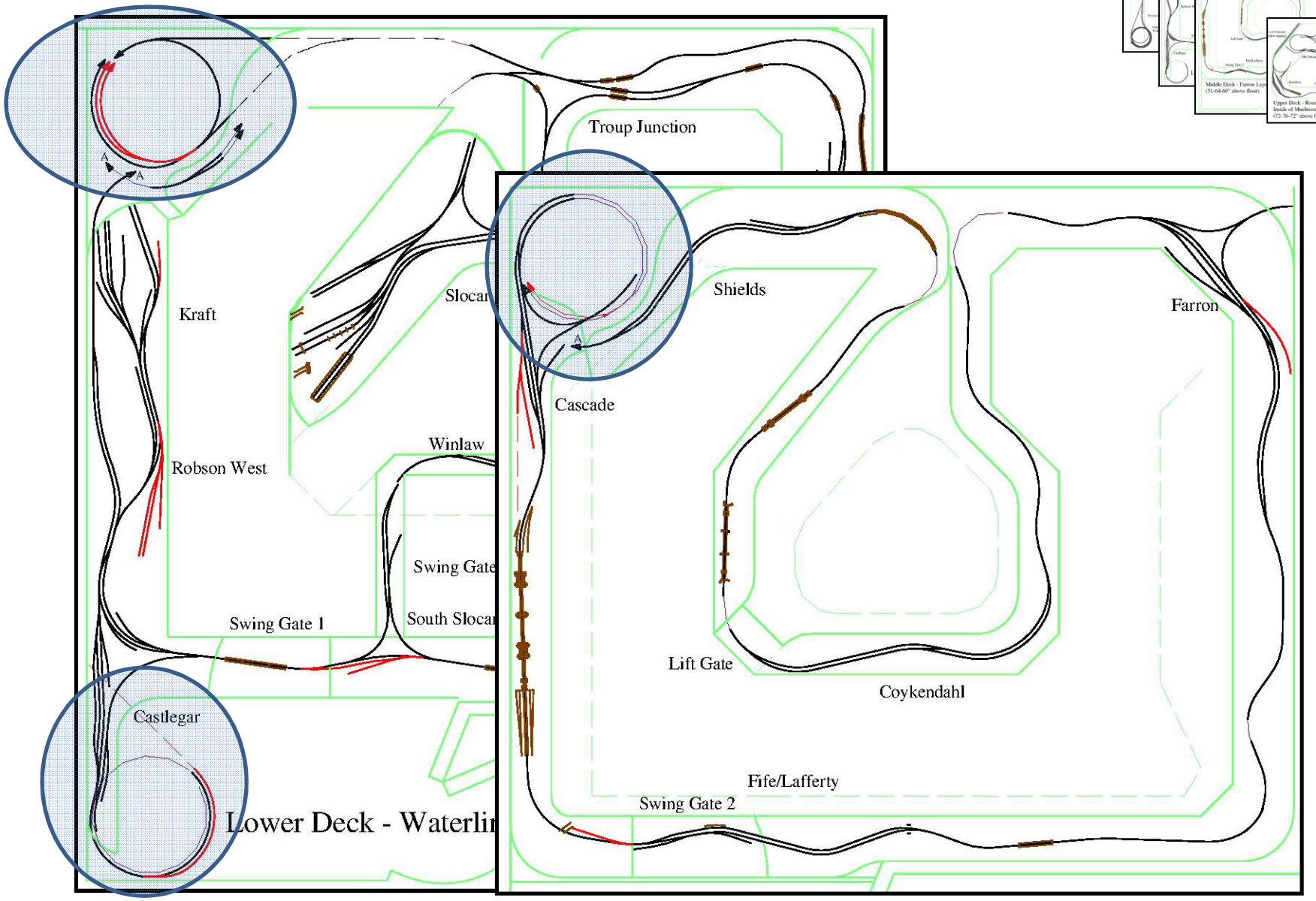
What Drove these Changes?

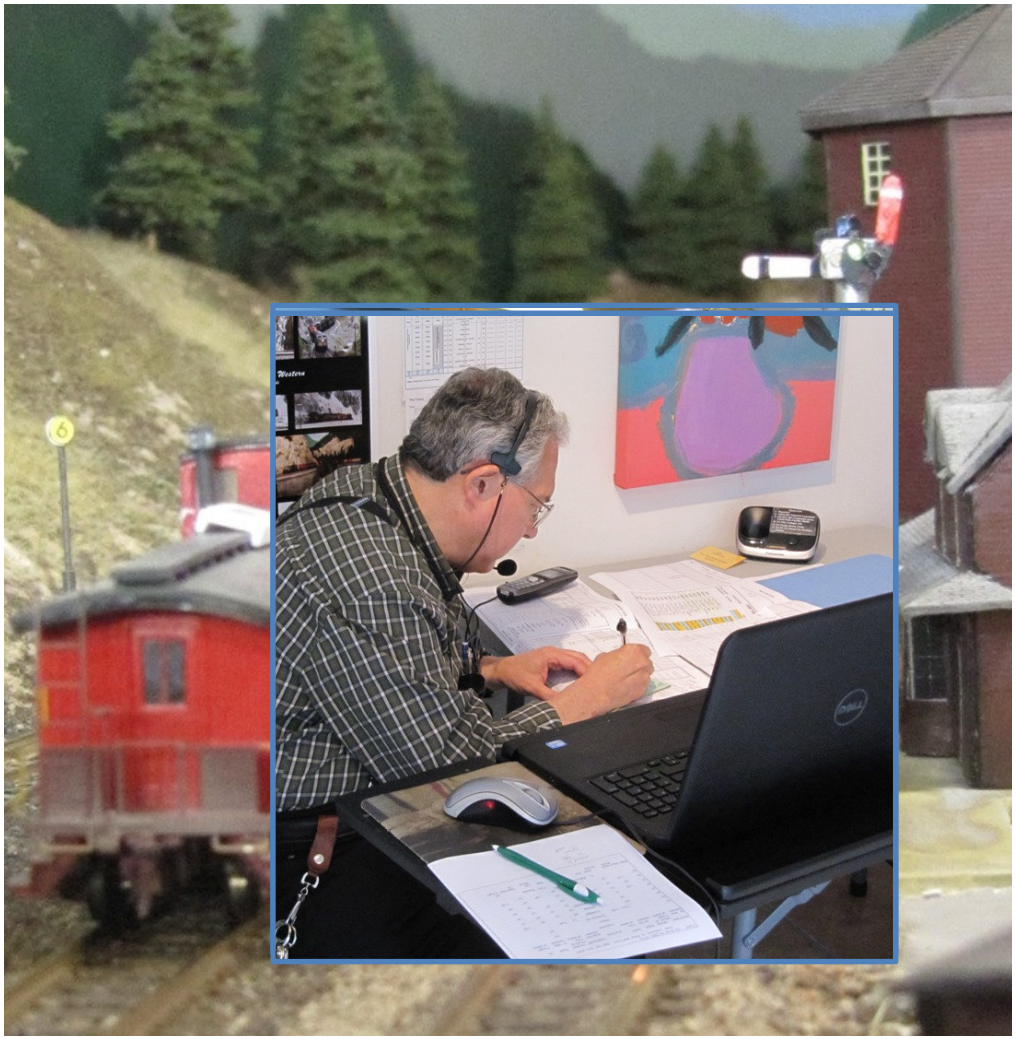
1. *Staging* Versus *Storage*

Added Staging Tracks just beyond end of visible run:

- 2 South staging, 2 West staging, 4 East staging
- Using Mainlines as staging tracks provided 4 of these





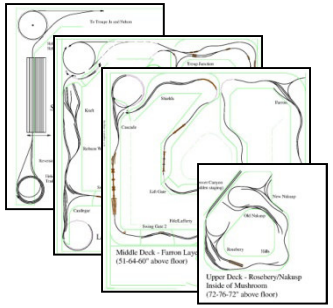


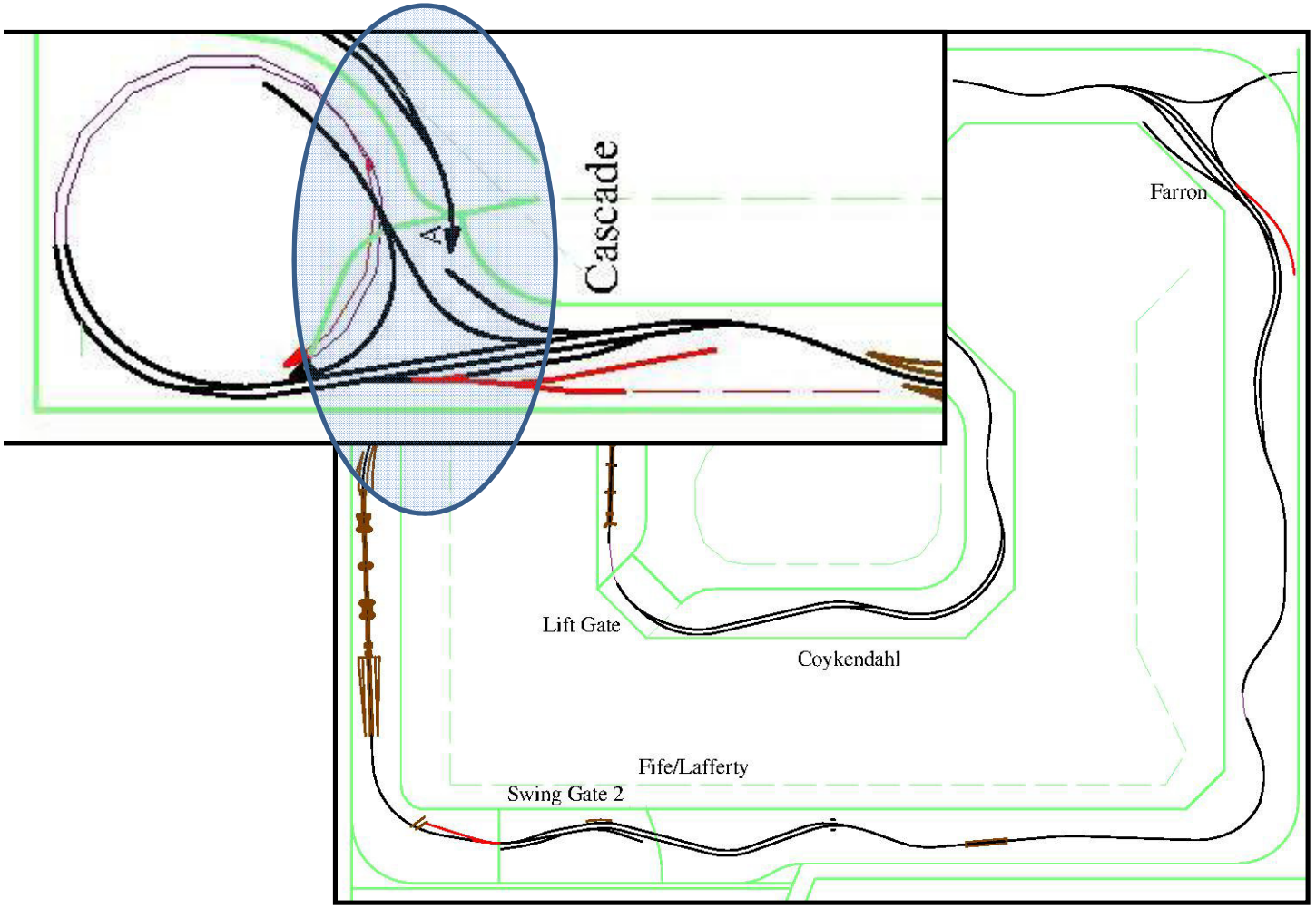
2. TT&TO… but After-the-Fact

- Operator-less
- Dispatcher sets semaphores through JMRI
- Crews Clear and Protect (Rule 91a)
- Orders passed using Pigeon Holes
- Chordless phones to OS

3. Work Across Farron Summit

3. Work across Farron Summit





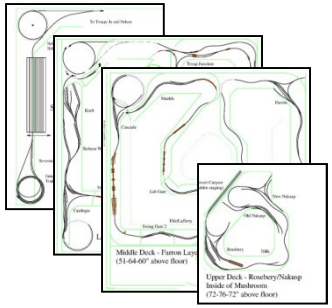
Reinstitute Ore Trains from Phoenix
But route them to Tadanac

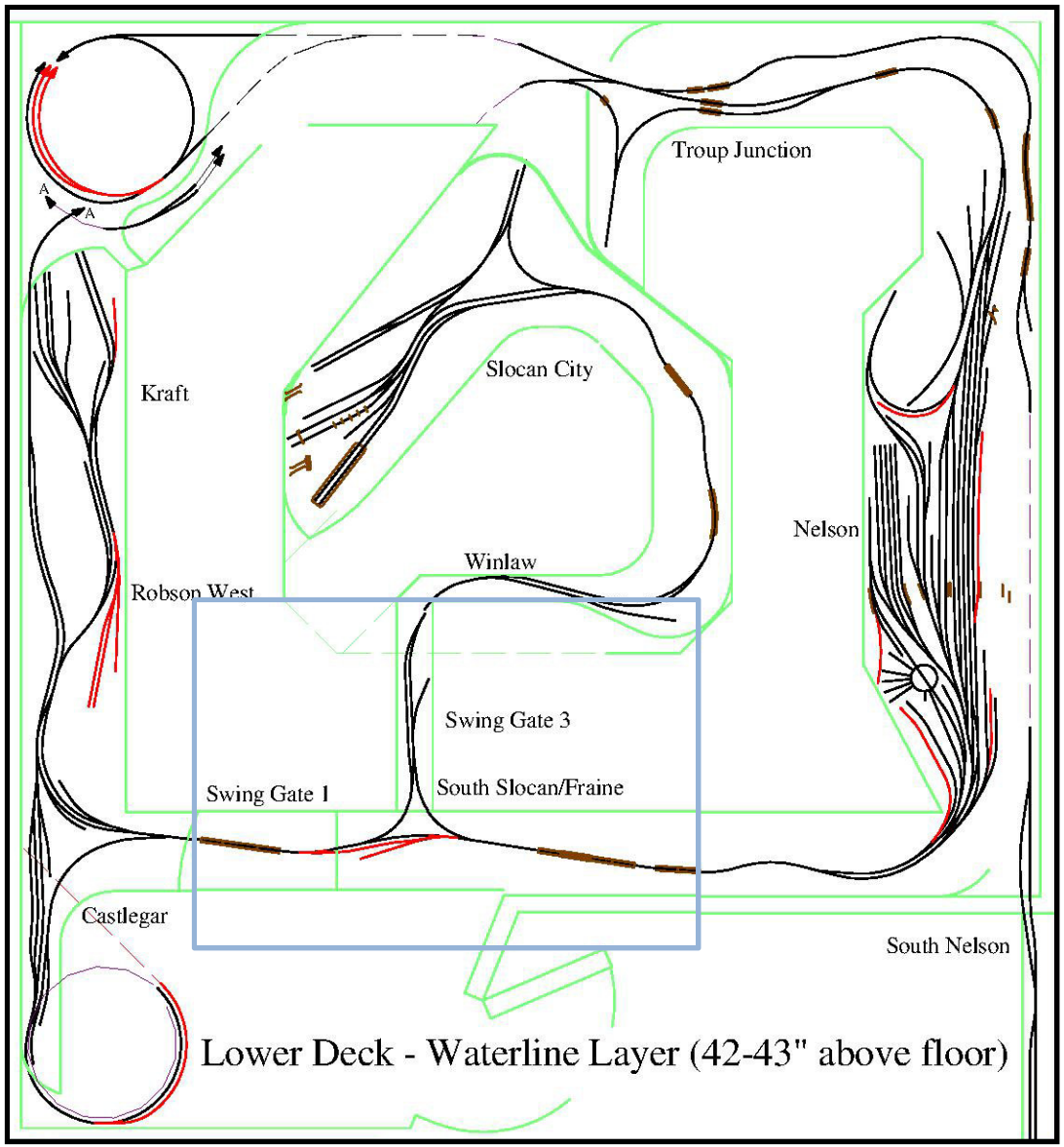
Through Freights and the Cascade Turn

4. Putting Prototype Tracks Back In!

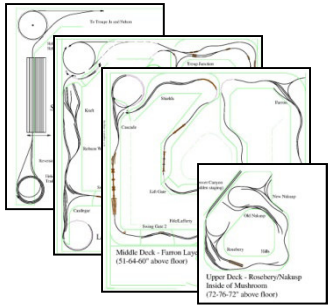
South Slocan Junction

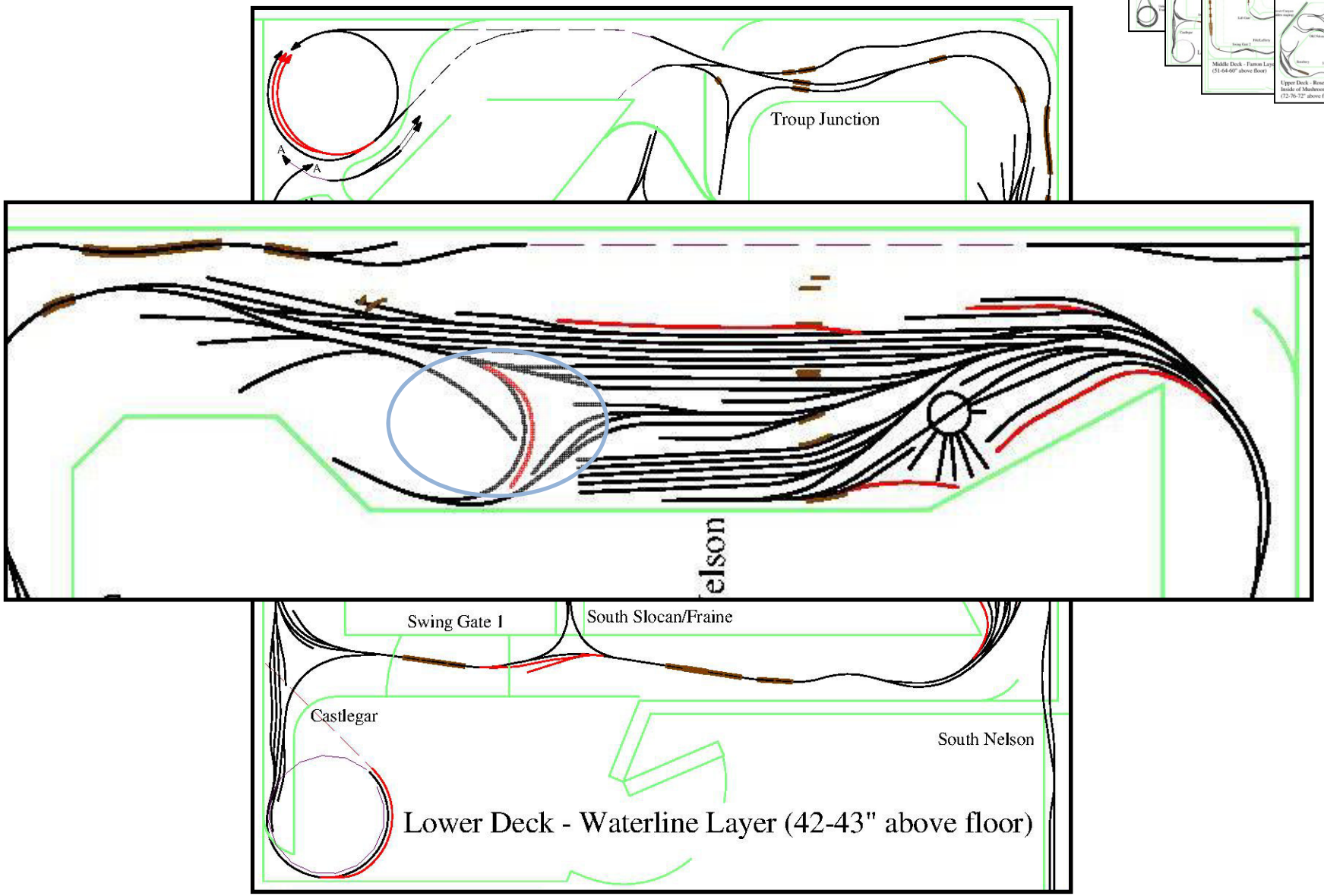
South Slocan Junction





Nelson Yard trackage

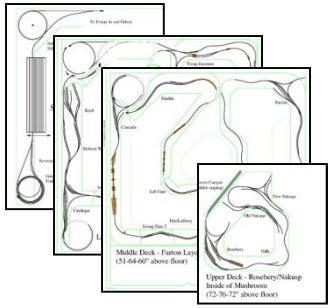


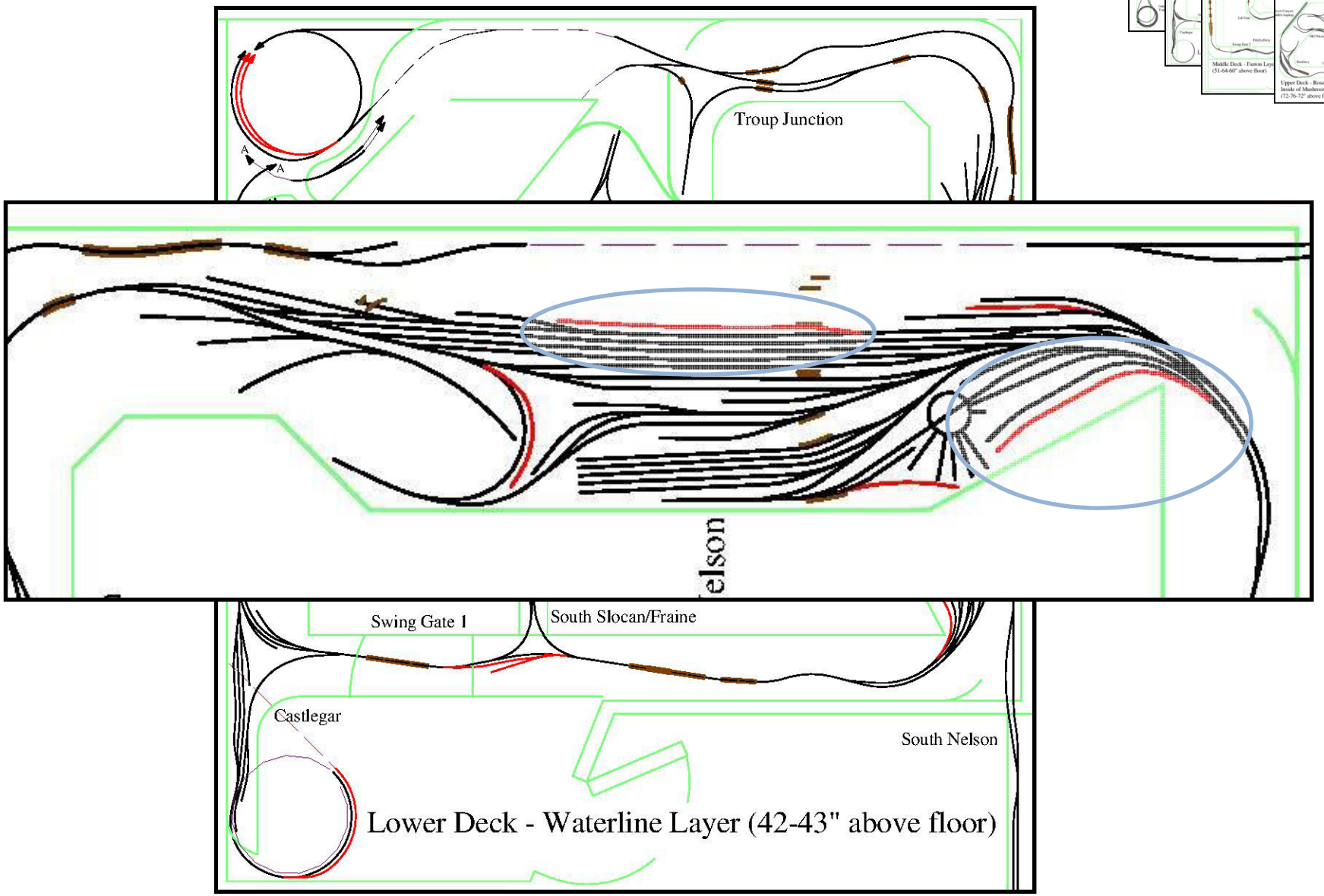


Nelson Diesel layover

Nelson clean out tracks and BN trackage

Nelson Yard trackage





Pope & Talbot Mill at West Robson

5. Sound

So, What Have I Learned?

Lessons learned

- Design the jobs and layout at the same time
- Design jobs so crews pick up and terminate their roles prototypically (if you can)
- **Both** of these I would have known if I had operated more


Lessons learned
Don’t fear gates

Lessons Learned

- The prototype has track for a reason
- When in doubt, do like the prototype
- Don’t hesitate to reinstate tracks and operations that exist outside your time frame if it makes things more “fun”


Lessons Learned
• Thinking things through speeds things up
• CAD speeds things up
• So does completing things in batches

Lessons Learned

- Mushrooms are complicated
- *If* Double Deck = 3xwork of single level, then Mushroom = 4-5xwork, and Double Mushroom = 6-8xwork

Some of the Issues:

- Upper deck height.. movable floor and limited operators in space
- Framing complexity, Lighting, and Viewing Angles
- Oh yeah, and Photography!

Lessons Learned

- Crews pay attention only to the small area around their equipment. If you wish scenes any more than a few inches deep, don't do it for operations.

Lessons Learned

- More staging is better (2n+1)

Lessons Learned

- Mountain ops are fun …grades, pushers, etc.

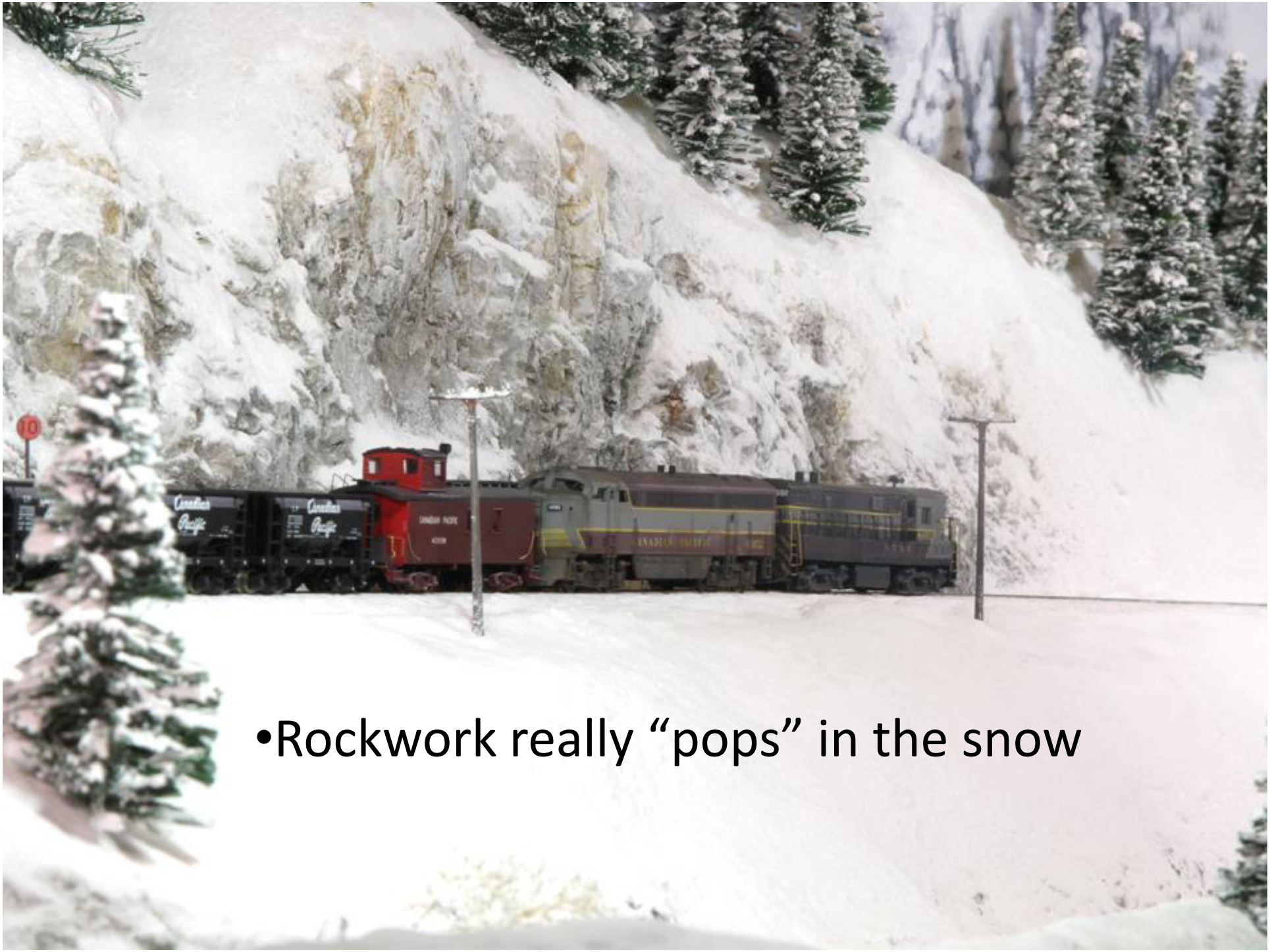
Lessons learned

- TT&TO is a lot of fun (and a hobby unto itself)
- Design TT&TO in from the beginning
- Keeping paperwork consistent is a lot of work

Lessons Learned

- Snow is fun!

…but “Snowing” track is a hassle



- Rockwork really “pops” in the snow


•Trees are more work but ground cover less
CP Rail
CP Rail

Lessons Learned

- Understand your objectives & stay true to them … but build a solid “platform” you can expand from

In Summary


A large layout takes a
lot of time…

…and a

lot of energy…

…but is very satisfying and fun to share!

Video Tour!!


Thanks for Coming!
Any Questions?
8604
8604
Photos by the Presenter and Timothy J. Horton
Email: mark.dance@gmail.com
FLIKR Page http://flic.kr/s/aHsjqN8fVQ
YOUtube http://www.youtube.com/user/markdance63

- For the videos from this presentation, please see the Columbia & Western's Youtube page and markdance63