



Welcome to the Bessemer & Lake Erie Operations Manual. This manual will provide you with the kind of information you'll need for running trains on the route and for operating the B&LE locomotives themselves. After you get the lay of the land, you might want to write a scenario or two for the route. If so, the descriptions of the industries and other points of interest along the main should give you some great ideas. The accompanying **Project Manual** covers the B&LE's history along with a general description of what's in the DLC. On the other hand, if you're ready now, c'mon and let's run some trains!

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OPERATING RECOMMENDATIONS

General Procedures

Even though the main line speed limits are posted, there are many twists and turns on the B&LE. So it's a good idea to keep a sharp eye out for tighter than normal curves and take it easy around them. As you get to know the route this should become second nature to you.

Although the speed limit on most parts of B&LE main is 50 mph, freight trains historically ran at closer to 40 mph.

If the dispatcher directs you to take a crossover, remember that crossover speeds are much lower than the main line speed: usually 15 mph to 30 mph.

The speed limit in yards is nominally 15 mph, but slower speeds on the order of 5 mph are generally recommended.

Standard US whistle codes should be used. The most commonly used ones are **long-long-short-long** for grade crossings, with the final **long** sounding as the locomotive enters the crossing; **long-long** when releasing brakes to proceed; and **short-short-short** when backing up or when approaching a station. Be aware that in some scenarios you may be penalized for not properly using the whistle.

Locomotive Operation

HUD Layout

The primary Heads Up Display (HUD) controls—the throttle, reverser and brakes—are similar in appearance to the HUD you might already be familiar with for diesel and electric locomotives. Toggle the **F4 key** to display or hide the graphic HUD.



The control on the left is of course the throttle. Move the slider up to increase your speed. In the cab, the throttle is the big lever directly in front of you. See also the cab view illustrations in this manual for the location of the throttle. In both locomotives the throttle is item 1. Pull the throttle toward you to increase the speed.

Next to the throttle is the reverser. As you might suspect, the reverser controls your direction of travel. Just as importantly, it controls the point in the piston stroke at which the steam inlet valve is closed, or

cut off, so the reverser is more commonly known as the **cutoff** control. Adjusting the cutoff allows you to optimize the usage of steam. You'll get a better feel for the cutoff control once you've worked with it for a while. In the cab, the ratcheted lever on the right next to the engineer's window controls the cutoff. In both of the cab view illustrations the cutoff lever is item 2. When the cutoff lever is straight up it's in neutral position. Move it forward, away from you, when you want go forward, and toward you to reverse. This control lever is also known to railroaders as the "Johnson bar."

On the right side of the HUD is the brake control group. As usual, you move the control slider up to increase the braking effect. The two buttons just to the right of the slider are used to select between the train brake and the locomotive brake. Use the locomotive brake when you're running "light" (not pulling any railcars). Otherwise use the train brake. The gauge on the right side of the brakes group is the brake-pipe pressure gauge. In the cab the train brake is down in front of your "virtual knees" (item 3 in the cab view illustrations); the locomotive brake (item 4 in the cab view illustrations) is just behind and above the train brake.

The graphic HUD for a steam locomotive is a little different than that of diesel and electric locomotives in that there are some additional specialized steam controls.



The large button with the two doors is the stoker control which is used to replenish the coal in the locomotive's firebox. The next control to the right, with the U-shaped water container, replenishes the boiler's water supply. The gauge on the right displays the main boiler pressure. You'll need to keep a close eye on that one.

The small whistle, bell, headlight and sander buttons on the far right are the same as the ones you're probably already used to. The wiper control is inactive since there are usually no wipers on a steam locomotive. There's another small button in this group, the one with the upturned arrow and flames, which controls the blower. On a real-world locomotive, the blower directs a jet of steam out the exhaust stack which induces the flow of air and combustion gases through the fire side of the boiler. The blower is needed whenever the throttle is closed, particularly at startup.

Auto Fireman

If what we've described so far sounds like a lot to keep track of, you can select the Auto Fireman operating mode. In the main Menu of Train Simulator, hit the Settings button. Then hit the Gameplay button and check the Auto Fireman item. In Auto Fireman mode, the specialty steam controls on the graphic HUD are disabled and their functionality is taken over by the simulator. In the discussion that follows it is assumed you have turned off Auto Fireman and will manually operate these controls. Whether or not you choose to run in Auto Fireman mode, you are always responsible for proper operation of the primary running controls, including the throttle, cutoff and brakes.

Starting the Locomotive

When starting a locomotive, certain procedures should be observed. Procedures marked [Optional] have no effect in Train Simulator but we suggest you follow them anyway for the sake of realism.

1. Set the cutoff control to the full forward position.
2. Open the cylinder cocks [Optional]. That will purge any condensed water out of the cylinders which would otherwise damage them. There's no HUD control for cylinder cocks. You can toggle them on and off using the **C key**. Or you can operate them directly in the cab. See the cab view illustrations in this manual for the location of the cylinder cock control. In both locomotives they're item 7. Note that the cylinder cocks need only be opened during a cold startup, usually at the beginning of a scenario.
3. Turn on your headlight, then blow the whistle twice [Optional]. That's the signal to your crew and anyone else nearby that your locomotive is about to move forward.
4. Release the train brake. On the HUD, pull the handle all the way down until the legend above it reads "Release." Or in the cab you can pull the train brake handle all the way to the left.
5. Turn on the blower [Optional]. Use the blower button on the HUD or the valve in the cab. See the cab view illustrations for the location of the blower control. In both locomotives they're item 8. You can also use the **N key** shortcut to toggle the blower on and off. If you look at the exhaust stack, you'll notice there's now a small plume of white steam. That's the blower.
6. Open the throttle about half way to start the locomotive moving. As the locomotive begins to move, back the throttle off most of the way so you don't gather speed too fast. Then gradually increase the throttle again. You should close the cylinder cocks now and you can also turn off the blower.
7. If you get a wheel slip warning, back the throttle off, then increase it again but more slowly this time. Apply sand if needed. Use the sander button on the HUD or the control valve in the cab. See the cab view illustrations for the location of the sander controls. In both locomotives they're item 10. You can also use the **X key** shortcut to toggle the sander on and off.
8. When your speed has reached the 5-10 mph range, move the cutoff control slowly back toward vertical. On the HUD, a reading of 15% to 30% is a good place to be most of the time. Much higher than that and you'll waste steam. This in turn will reduce the boiler pressure and there will be less force applied to the pistons. Note that when you run the locomotive in reverse, the HUD values displayed above the reverser control will read the same as for forward, except they'll be negative.

Running the Locomotive

As a locomotive engineer, one of your most important duties is to control your speed and maintain boiler pressure. When you're operating on level track it's pretty easy to do that, but on the B&LE there are a number of gradients that will challenge your skills. It's very likely that your speed will begin to fall off when your train is climbing a grade.

You can compensate for the loss of speed by increasing the throttle and/or the cutoff. When this becomes necessary, don't overdo it! We're hauling heavy loads here, not operating to a strict timetable. You should always adjust the throttle and cutoff controls conservatively. Even so, as long as you're climbing a grade it's likely that the boiler pressure will continue to drop. A lower steam pressure means that less force will be applied to the pistons, slowing you down even more. But don't be alarmed. That's just the way it works and it's expected.

Continue making small adjustments to the throttle and cutoff until you find the "sweet spot" where the rate of your speed- and pressure loss is as little as you can make it. Watch the pressure gauge and

try to keep it “out of the red.” The grades on the B&LE aren’t *that* steep and eventually you’ll make it to a level section of track where you can restore both your pressure and your speed.

As you work your way along the route, the boiler will consume both fuel and water. Luckily, we have a tender with ample storage capacity to supply both of these. When you start a scenario, take a look at the graphic HUD and make a note of the percentage values for fuel and water. When these values drop by, let’s say, 5% you can press the button(s) on the HUD or use the stoker and injector controls in the cab or their shortcut keys to replenish the boiler’s fuel and water. If you wish to manually operate the injectors, open the steam supply valve first, then open the water valve.

Locomotive Services

Locomotives and their tenders must be periodically re-supplied with coal, water and sand, and there are several railroad yards on the B&LE that service these needs. When your locomotive or tender is properly aligned with one of these services, press the **T key** to start the material flow. In the case of coal, place the tender so its coal bunker lines up with the coal spout of either a coaling tower or a coal conveyor. For water, align the tender’s water tank hatch cover with the spout of a water column or water tank. Sand towers on the B&LE are also functional. Line the locomotive’s sand dome up with the sand tower’s spout. Both steam locomotives have two sand domes, but on the 0-6-0 only the *rear* sand dome can be filled.

Locomotive Cabs

Santa Fe Type 2-10-2 Cab Controls



1	Throttle (A D)	12	Inj. Steam (Eng. O)
2	Reverser (W S)	13	Inj. Water (Eng. L^)
3	Train Brake (; ')	14	Inj. Steam (Fire. I)
4	Loco Brake ([])	15	Inj. Water (Fire. K^)
5	Whistle (Space #)	16	Speedometer
6	Bell (B)	17	Boiler Pressure (Eng.)
7	Cylinder Cocks (C)	18	Steam Chest Pressure
8	Blower (N^)	19	Brake Press. (Note 1)
9	Firebox Door (F^)	20	Brake Press. (Note 2)
10	Sander (X)	21	Boiler Pressure (Fire.)
11	Stoker (R^)	22	Headlight Switch (H^)

Abbreviations

Eng. Engineer, Engineer's side

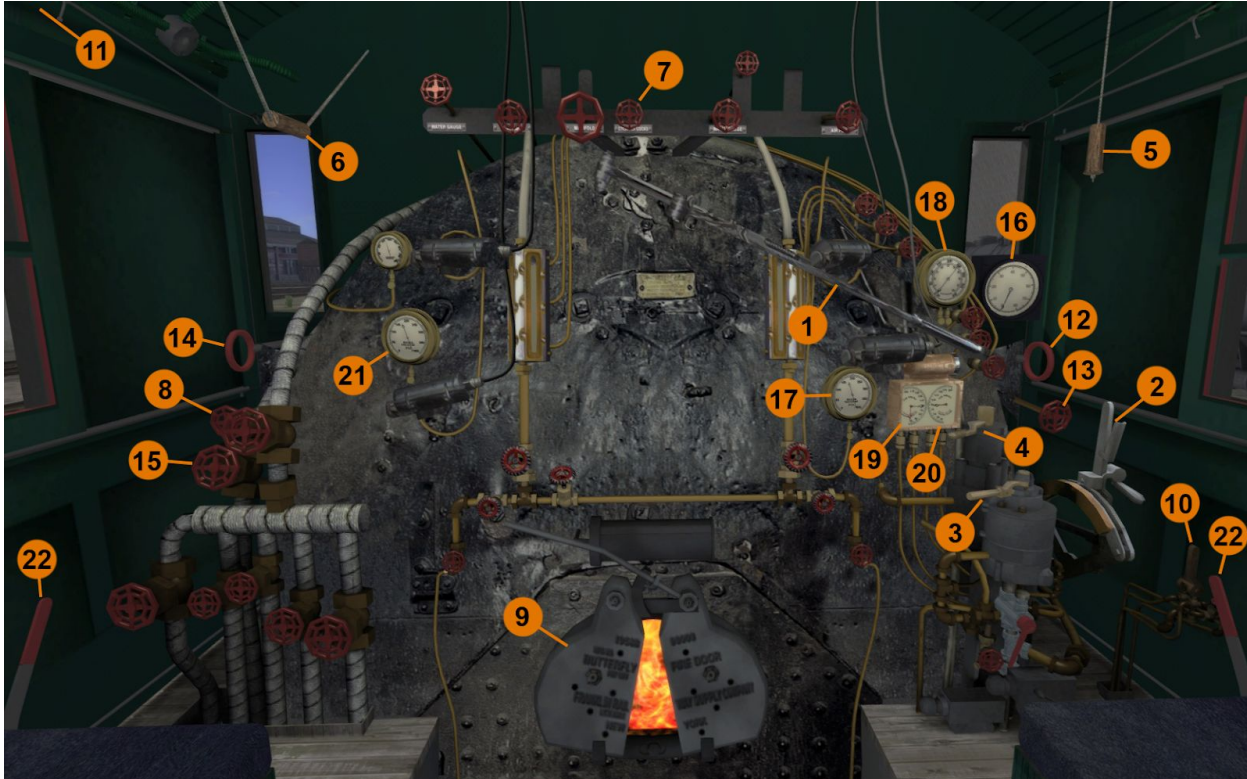
Fire. Fireman, Fireman's side

Inj. Injector

Notes

- ^ Use specified key in combination with the Shift key to reverse its action.
- # Press Space, then press Enter/Return to quill the whistle.
- 1. Red needle: Main reservoir; Black needle: Equalizing reservoir
- 2. Red needle: Brake cylinder; Black needle: Brake pipe
- 3. Cab lights (**U**) or click on lights
- 4. Gauge lights (**Y**)
- 5. Hand brake (**I**)
- 6. Drag side windows or ceiling vent with mouse to open/close.

Six-Coupled Type 0-6-0 Cab Controls



1	Throttle (A D)	12	Inj. Steam (Eng. O)
2	Reverser (W S)	13	Inj. Water (Eng. L^)
3	Train Brake (; ')	14	Inj. Steam (Fire. I)
4	Loco Brake ([])	15	Inj. Water (Fire. K^)
5	Whistle (Space)	16	Speedometer
6	Bell (B)	17	Boiler Pressure (Eng.)
7	Cylinder Cocks (C)	18	Steam Chest Pressure
8	Blower (N^)	19	Brake Press. (Note 1)
9	Firebox Door (F^)	20	Brake Press. (Note 2)
10	Sander (X)	21	Boiler Pressure (Fire.)
11	Headlight Switch (H^)	22	Blowdown (NF)

Abbreviations

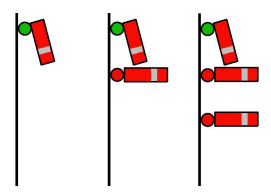
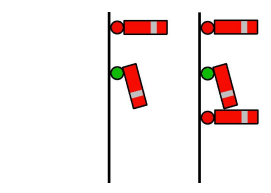
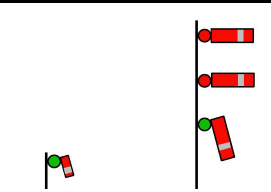
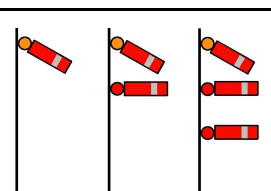
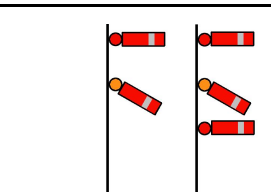
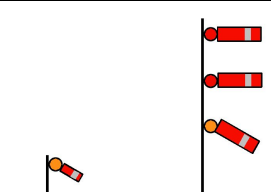
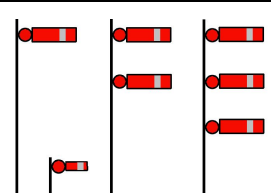
Eng. Engineer, Engineer's side
Fire. Fireman, Fireman's side
Inj. Injector
NF Non-functional

Notes

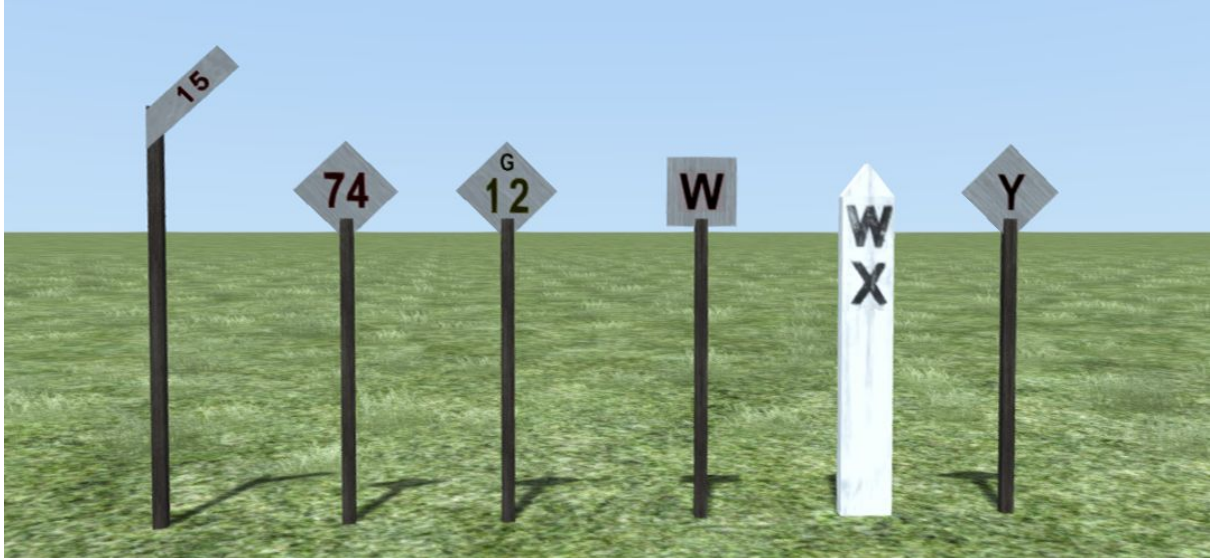
- ^ Use specified key in combination with the Shift key to reverse its action.
- # Press Space, then press Enter/Return to quill the whistle.
- 1. Red needle: Brake cylinder; Black needle: Brake pipe
- 2. Red needle: Main reservoir; Black needle: Equalizing reservoir
- 3. Cab lights (**U**)
- 4. Gauge lights (**Y**)
- 5. Hand brake (**I**)
- 6. Drag side windows, forward doors, or ceiling vents with mouse to open/close.

SIGNALS AND SIGNS

Semaphore Signals

	Aspect: CLEAR Indication: Proceed at maximum authorized speed.
	Aspect: MEDIUM CLEAR Indication: Proceed at medium speed (30 mph) through crossovers, turnouts, sidings, interlocking limits, and over power switches. Then proceed at maximum authorized speed.
	Aspect: SLOW CLEAR Indication: Proceed at slow speed (15 mph) through crossovers, turnouts, sidings, interlocking limits, and over power switches. Then proceed at maximum authorized speed.
	Aspect: APPROACH Indication: Proceed prepared to stop at next signal. Train or engine exceeding medium speed (30 mph) when indication is seen must at once reduce to medium speed or slower.
	Aspect: MEDIUM APPROACH Indication: Proceed at medium speed (30 mph) through crossovers, turnouts, sidings, interlocking limits, and over power switches. Be prepared to stop at next signal.
	Aspect: RESTRICTING Indication: Proceed at restricted speed (15 mph). Train must be able to stop within half of visible range at all times.
	Aspect: STOP Indication: Stop before any part of the train or engine has passed the signal.

Trackside Signs



Left to right:

Speed limit (miles per hour); milepost (numbered relative to N. Bessemer); milepost (Greenville branch, numbered relative to KY Junction); whistle sign, style 1; whistle sign, style 2; yard limit sign.

Note that there are not separate freight- and passenger train speed limits.

SIDING NAMING CONVENTIONS

In the event you need to add scenario-specific track markers, or if you simply wish to understand the system that we're using, all sidings on the route are named according to the following format:

CODE DESCRIPTION [NUMBER] SPOT

Example: NB Caboose 1 N

CODE — A two-letter designation for the city or town in which the track is located.

Code listing, from North to South

CH	Conneaut Harbor
AA	Albion Yard A
AB	Albion Yard B (Cranesville)
MD	Meadville Junction
CP	Conneaut Park
CK	Conneaut Lake
KO	KO Junction
GS	Greenville Shops
KY	KY Junction
GC	Grove City
KR	Keisters
HA	Hallston
CL	Claytonia
QJ	Queen Junction
JA	Jamisonville
CN	Calvin
BT	Butler Transfer
BU	Butler
SJ	Standard Junction
SS	Standard Steel Plant
OD	Odell
RV	River Valley
NB	North Bessemer

DESCRIPTION — Describes the function of the track. Examples: Caboose, Engine, Local, Yard, Arrivals.

Interchanges are labeled with the words 'To' or 'From' followed by the railroad name. Examples: BU To PRR 1 N, BU From B&O 2 S

[NUMBER] — optional numeric for multiple tracks of the same description.

SPOT — Specifies multiple locations along the track. Typically we have used the label N for north end, and S for south end. If a track requires intermediate labels, we have used O, P, Q, R between N and S. Scenario authors may wish to add spots labeled A, B, C, for example, representing doors of a building or positions along a loading dock.

COMMODITY TRANSPORT OPERATIONS

Use this information to develop scenarios that reflect prototypical commodity transport operations on the B&LE.

Coal Traffic on the B&LE

SOURCES

- Hallston Mine
- Grant Mine at Claytonia
- Various mines via Western Allegheny RR at Queen Junction
- Jamison Mine
- Buffalo Rochester & Pittsburg RR at Butler
- B&O RR at Butler
- Pennsylvania RR at Butler
- Ford Mine No 3
- Harwick mine via Cheswick and Harmer RR at River Valley
- Renton Mine at Unity Junction

DESTINATIONS

- Conneaut unloader
- Conneaut car ferry
- Shufflin Coal, retail dealer in Butler
- Standard Steel Plant
- Pittsburg via Union RR at N. Bessemer
- B&LE coal tower at N. Bessemer, Butler, Greenville, Albion, Conneaut
- via Buffalo Rochester & Pittsburg RR at Butler
- via B&O RR at Butler
- via Pennsylvania RR at Butler

Iron Ore Traffic on the B&LE

SOURCES

- Conneaut Hulett unloaders
- Conneaut storage area

DESTINATIONS

- Standard Steel in Butler
- Pittsburg via Union RR at N. Bessemer
- via Buffalo Rochester & Pittsburg RR at Butler
- via B&O RR at Butler
- via Pennsylvania RR at Butler

LOCATION NOTES

Following is a description of the features and operations at major locations along the route.

CONNEAUT HARBOR (CH)

The harbor at Conneaut is arranged around a manmade shipping channel that opens onto Lake Erie. Conneaut Creek also flows into the channel about half way along its east side. The harbor area consists of several zones, including two marshalling yards and a small service area for the 0-6-0 yard switchers. Of primary importance, though, are the coal handling area, and four distinct dock areas. Each of the dock areas has a unique function, typically related to a specific commodity.

Coal Handling

The coal handling area includes the large coal storage yard that runs along the entire east side of the yard, as well as facilities for unloading incoming coal trains. The primary offload point consists of an elevated structure and its approach ramp. This is an interactive feature which allows you to push loaded hoppers up onto the structure and empty them using the T key. The long building next to the unloading ramp is a warming shed. In the winter, loads of coal are sometimes frozen solid and warming sheds are used to thaw them out so the falling coal won't damage anything during unloading.

Dock 1

Dock 1, at the northwest quadrant of the harbor channel, was the first dock to be built and it was originally used for off-loading iron ore from lake freighters. However, in later years--that is, in the 1920s era of this route-- it became dedicated to the handling of limestone. Limestone is used to produce slag which removes impurities from the iron ore reduction process. The limestone is mined at quarries along the B&LE and either used at the regional steel mills or shipped from Conneaut to other Great Lakes industrial ports. In our representation of Dock 1 there are four cranes equipped with traveling buckets supported from long cantilevered structures that can access harbor ships, rail cars, and stockpiles of the material. The models are based on the Brownhoist "Fast Plant" design and are non-functional.

Dock 2

Dock 2, which is just south of Dock 1, is used by car ferries. The ferries transport outbound gondolas and hoppers loaded with locally mined coal or limestone, and inbound gondolas loaded with scrap iron. The cars are transported to and from other, similar ferry docks in the Great Lakes area.

You can load cars onto or off of the ferry boat, but the boat itself is a static model. When loading and unloading, always use at least two idler cars, which are normally stored on the dedicated siding. The car ferry has a capacity of 26 fifty five ton hoppers. The two outside tracks hold six each, and the two inside tracks hold seven each. To maintain balance, the ferry must be unloaded in this sequence: the two inside tracks first, then the two outside tracks. Loading is done in the reverse sequence.

The ferry switcher uses the adjacent yard for staging cars for quick turnaround of the boats. The yard has capacity for two full boat loads. The east tracks hold 14 cars each for the inner tracks on the boat, and the west tracks hold 12 car for the outer tracks. The tracks are arranged so the ferry switcher can operate in the clear of other activities in the yard

Note that in winter Lake Erie freezes over solid and the car ferries don't operate. The car ferry lays up in Conneaut harbor until spring.

Dock 3

Dock 3, on the opposite side of the channel from Dock 2, is the coal dock. Coal hoppers are offloaded either on the east side of the yard where the coal is conveyed to the large storage yard, or the hoppers are taken directly to the car dumper structure next to the dock itself. The car dumper was built by McMyler International of Bedford, OH, a suburb of Cleveland. It was installed in 1914 and it still exists, though with only its loading function. Following is a description of how it worked.

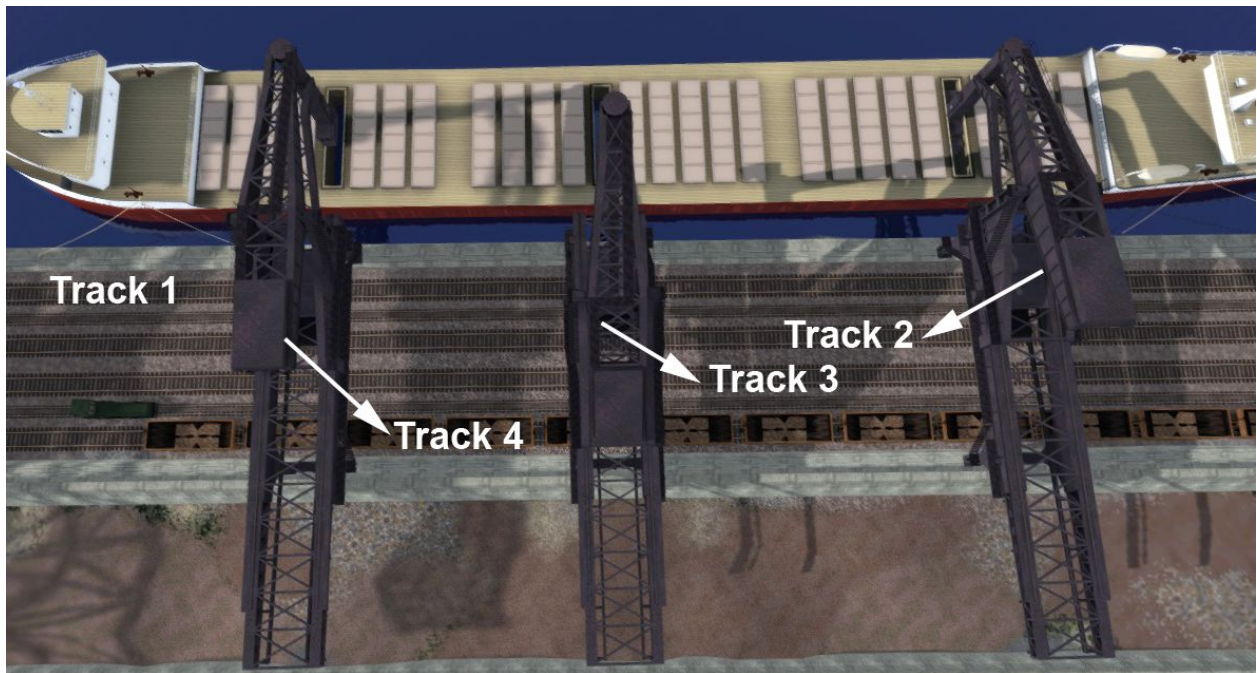
An electric "barney" pushed a string of loaded hopper cars up an incline of around 8% leading to the dumper. When the lead car was properly positioned inside the dumper structure, it was lifted, then rotated 120 degrees, spilling its contents into a large hopper. The coal then fell by gravity to a loader boom that fed the coal into the hold of a lake freighter. The now-empty car was then lowered to its original position, but not re-coupled to the car string. Instead the car string pushed the empty hopper a short distance onto a downward incline. The car would then descend the incline by gravity, like a roller coaster. At the bottom of the incline the tracks once again rose upward. The car would continue up a predictable distance and eventually stop due to gravity and friction. The car would then begin to roll backwards, and a spring-loaded switch would divert the car to another yard track where the empties were collected and assembled into a southbound empties consist.

It's fun to watch the McMyler go through its moves, but watching is all you can do. The car dumper and the wooden ramp structures that lead in and out of it are pure scenery. The "tracks" on the ramps may look inviting, but they're not real, so please don't attempt to run any trains on them. The McMyler does not operate at night after 10 pm, and it's entirely shut down the winter.

Dock 4

Dock 4, the iron ore dock, is north of Dock 3 just across Conneaut Creek. The most noticeable features of Dock 3 are the four Hulett unloaders and the immense traveling bridge crane. The unloaders were the invention of local resident George Hulett in the late 19th century and "Hulett's" could be seen at many of the Great Lakes industrial ports as recently as the 1960s. The Hulett's work by scooping iron ore out of the freighter hold and dumping it into the Hulett's internal storage hopper. A traveling "larry" then receives the ore and deposits it either into hopper cars spotted beneath the Hulett, or onto storage piles at the cantilevered rear end of the machine.

In our representation the bridge crane is a static model; however, three of the four Hulett's are animated and their combined movements are almost ballet-like. But it doesn't end there. You can actually fill hopper cars with ore. Each of the three animated Hulett's is dedicated to a single track as shown in the figure below. To fill a hopper car on a given track, set the car underneath the Hulett assigned to that track, then hit the T key. The larry will travel over to your hopper, fill the car, then return to its starting position.



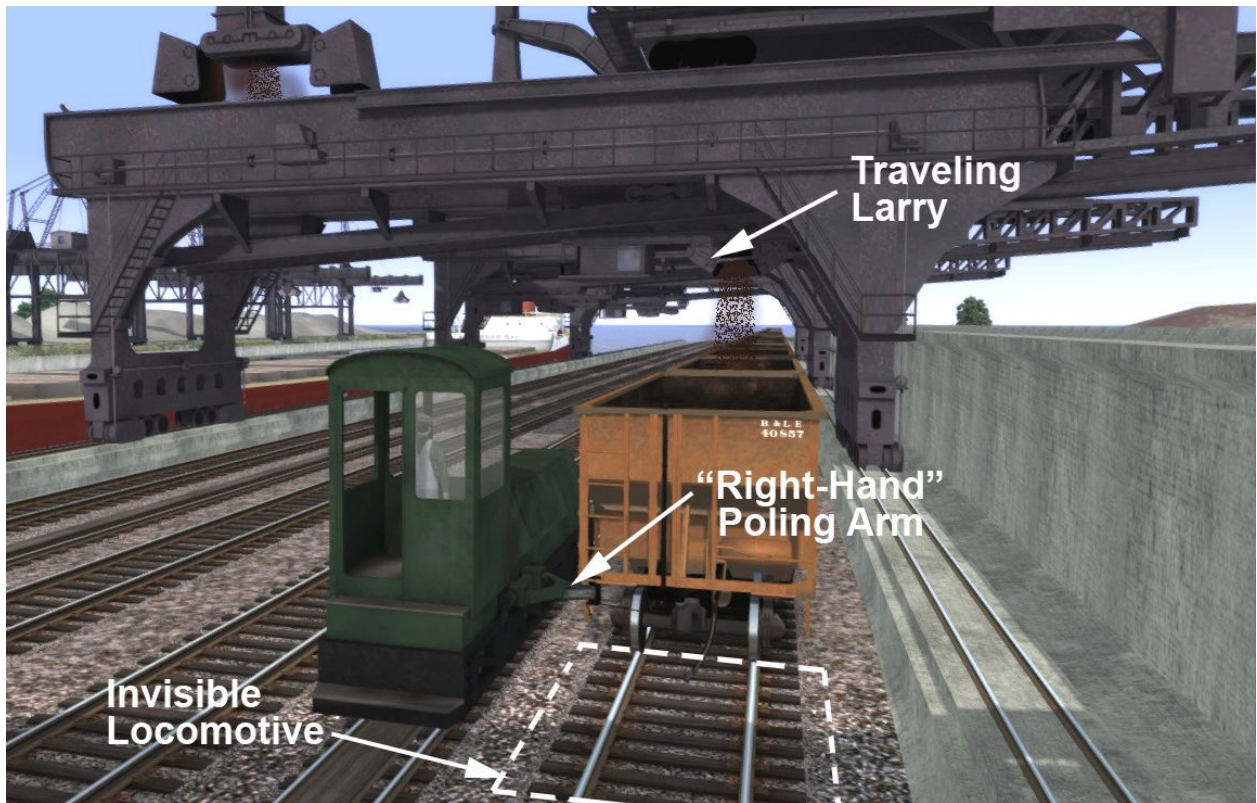
Like the McMyler, The Hulett's only operate between the hours of 7:00 am and 10:00 pm, and they are shut down during the winter. Incidentally, the track loop at Dock 4 is the only place in Conneaut where you can turn a locomotive around.

Poling Tram (AI)

You can spot strings of ore cars underneath the Hulett's using your 0-6-0 switcher, but historically an electric poling tram was used for that duty. Poling trams were small, powerful electric locomotives that ran on a separate, narrow-gauge track situated between the ore-loading tracks. Electrical power was supplied to the tram by a third-rail arrangement mounted between its running rails. The tram was equipped with two pneumatically actuated poling arms, located one on each side of the vehicle. The tram operator would lower a poling arm which would make contact with the hopper cars at their poling pockets and then push the cars into the proper position for loading.

The B&LE route includes a poling tram simulation, designed to be used primarily as AI "locomotives" in scenarios. At first you might wonder how it's possible for a locomotive operating on one track to move cars located on an adjacent track. The answer is that it isn't possible—not without a bit of illusion, that is. The actual locomotive is invisible and it rides the same track as the hopper cars. The visual "tram" is offset so it appears to ride on the tram track. The "poling arm" is part of special coupler. Once you assign a Driver to a poling tram, you can also operate it in the usual way using the standard speed, direction and brake controls. There is no separate cab view.

There are right-hand and left-hand versions of the tram. Use the right-hand tram if you want the poling arm on the right side of the visual tram to push the hoppers, and use the left-hand tram in the opposite way. Like the real trams, the simulated trams are designed for pushing, not pulling. And, being electric vehicles, they will only operate on the electrified tracks beneath the Hulett's.



ALBION (AA, AB)

Albion consists of two marshalling yards lettered A and B. The A yard, which is the southernmost, also features a complete locomotive servicing facility as well as maintenance and repair facilities for locomotives and railcars. The service yard is accessed via a third track running parallel to the double-track main line. The access track also doubles as a passenger track serving Albion depot. The depot is located at the very southern end of the A yard, which is also the location of the actual town of Albion.

At the turn of the century, the B yard also had its own locomotive service facilities. Ore trains originating in Conneaut were of relatively low tonnage, being pulled in those days by 2-8-0 Consolidations. With the arrival of the larger, more powerful 2-10-2s, full-length trains could be handled along the entire route, thus making the B yard service facilities redundant.

Otherwise, the B yard is most notable for the wye at its north end which converges as a branch line connecting to the NYC&StL (Nickel Plate) with running rights to Erie, PA. Control towers at both legs of the wye handle traffic in all three directions.

MEADVILLE JUNCTION (MD)

At Meadville junction there are storage tracks, a water stop, and a wye arrangement leading to a branch line serving Conneaut Lake Park (CP) and the town of Conneaut Lake (CK). Conneaut Lake Park is a popular amusement park and is itself accessed from either direction via a wye. Conneaut Lake is also a recreational area with access to the lake itself. A turntable is available to facilitate return trips to the Meadville Jct. and the B&LE mainline.

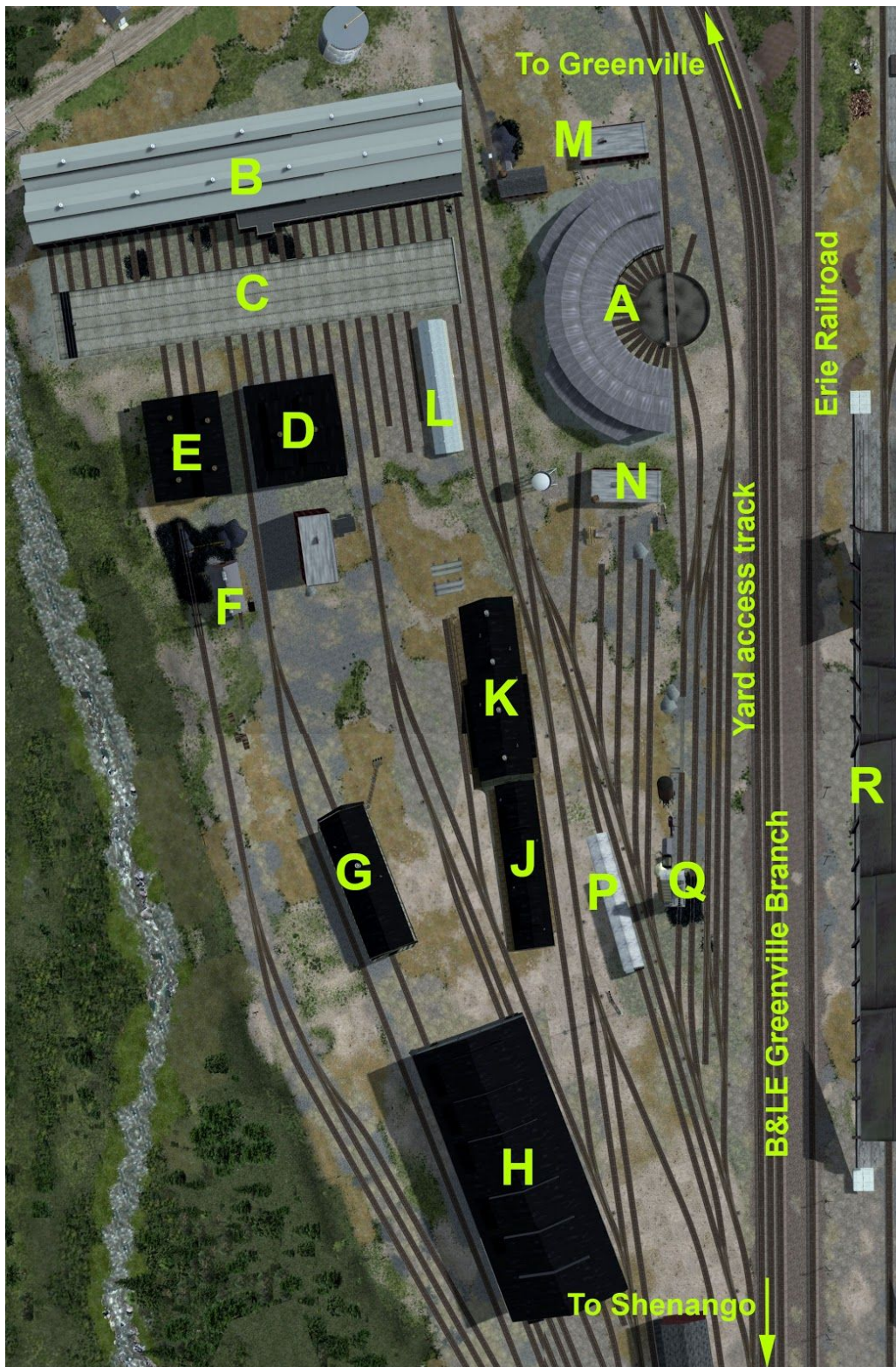
GREENVILLE SHOPS (GS)

Greenville is a mid-sized city on a separate branch from the B&LE main between KY and KO control towers. The branch also includes a marshalling yard just south of Greenville at Shenango which serves as an interchange with the Erie Railroad.

Greenville is home to the BL&E's main locomotive and car shops. The Erie runs roughly parallel to the B&LE and serves the Chicago Bridge & Iron Works, opposite the B&LE shops, and the Greenville Steel Car Company complex just to the northeast.

The Greenville Shops complex consists of many buildings. You can drive through or into many of them and the large barn doors will automatically open for you. The layout of the Greenville Shops is illustrated on the next page. The letter-key identifiers are as follows.

A	Roundhouse and turntable	J	Old storehouse
B	Erecting Shop	K	New storehouse
C	Transfer table	L	Tin shop/Iron house
D	Coach Shop	M	Boiler shop
E	Paint Shop	N	Roundhouse annex
F	Power house	P	Private car shed
G	Mill building	Q	Service facilities
H	Car repair shop	R	Chicago Bridge & Iron



The B&LE Greenville Branch is double-tracked from the Shenango interchange and into Greenville proper. Beyond those points the railroad runs on single track to the KY and KO junctions. The B&LE

main line runs double tracked between KY and KO junctions along a shorter route known as the Greenville Bypass, saving three miles and with no reduction in speed.

GROVE CITY (GC)

Grove City is a small industrial center. It is home to the Bessemer Gas Engine Company, which later became Cooper-Bessemer, and later still became GE. Today the facility is used to manufacture diesel engines for GE locomotives. In the 1920s, Grove City was the location of an early automobile and truck manufacturing plant.

KEISTERS (KR)

Keisters is a passenger flag stop on the B&LE. A short spur serves a sand and gravel retail dealership.

HALLSTON (HA)

Hallston is named for the one-mile spur that serves the Hallston Mine.

Northbound trains back into the spur to reach the mine. The train is routed around the tipple on the east track. The train crew drops the caboose on the team track, then drops empty coal hoppers on the empty track. The mine crew use gravity to roll cars under the tipple and out onto the load tracks.

The B&LE crew gathers hoppers from the load track and reassembles them into a train ready for departure.

The crew must contact the dispatcher to obtain clearance before entering the main at the Hallston switch.

CLAYTONIA (CL)

Claytonia is a single, named spur serving the Grant Mine.

Empties are stored uphill beyond the mine tipple. Mine workers use gravity to roll the empties under the tipple. When loaded, the hoppers are rolled down past the highway crossing to await pickup.

QUEEN JUNCTION (QJ)

Queen Junction is the interchange point with the Western Allegheny Railroad (WA), a 25-mile short line serving the area coal mines. The QJ interchange with the B&LE is the WA's main route to market.

The B&LE sets out empty coal hoppers on the 'To WARR' interchange track and picks up loaded hoppers from the 'From WARR' track. A passing siding allows the road crews to work in the clear, off the main line.

Dispatch also uses the siding to allow faster trains to overtake the slow freights. Crossover tracks allow the interchange to be worked by both northbound and southbound trains, and allow the passing siding to be used in either direction.

BUTLER

Butler is the largest city on the B&LE. The railroad is double-tracked through the city, with right-hand running on the main. There are several distinct industrial and railroad-related zones in the area.

Calvin Yard (CV)

Calvin Yard is used primarily for the breakdown and assembly of mixed and local freight trains. The yard is designed so any yard track can be used for departures. A drill track allows switching without blocking arrivals, although a switcher must clear the drill track for northbound departures. Southbound departures can leave without interfering with switching.

The yard has a Repair-In-Place ("rip") track for small repairs, a loco-ready track (hostlers move locomotives to Butler for service), and a caboose track.

Butler Transfer Yard (BT)

The Butler Transfer Yard is used primarily for staging and handling the unit ore and coal trains. The yard is designed so any yard track can be used for departures. A drill track allows switching without blocking arrivals, although a switcher must clear the drill track for southbound departures. Northbound departures can leave without interfering with switching.

The yard includes a full service locomotive terminal. It also has facilities for light car repair, and it handles cabooses.

BT yard interchanges with Buffalo Rochester and Pittsburgh Railroad.

Butler Interchange Yard (BU)

Butler Interchange Yard is at Kittanning Street, a major east-west thoroughfare that runs through the city. The yard primarily serves the B&LE freight shed and team track and there are interchanges with both the Baltimore & Ohio Railroad and the Pennsylvania Railroad.

Standard Junction (SJ)

Standard Junction has many functions.

- Serves several local industries.
- Interchanges with Standard Steel (which has its own plant switching locomotives).
- Serves Standard Auto plant.
- Serves Butler Substation.
- Provides a wye for turning locals.

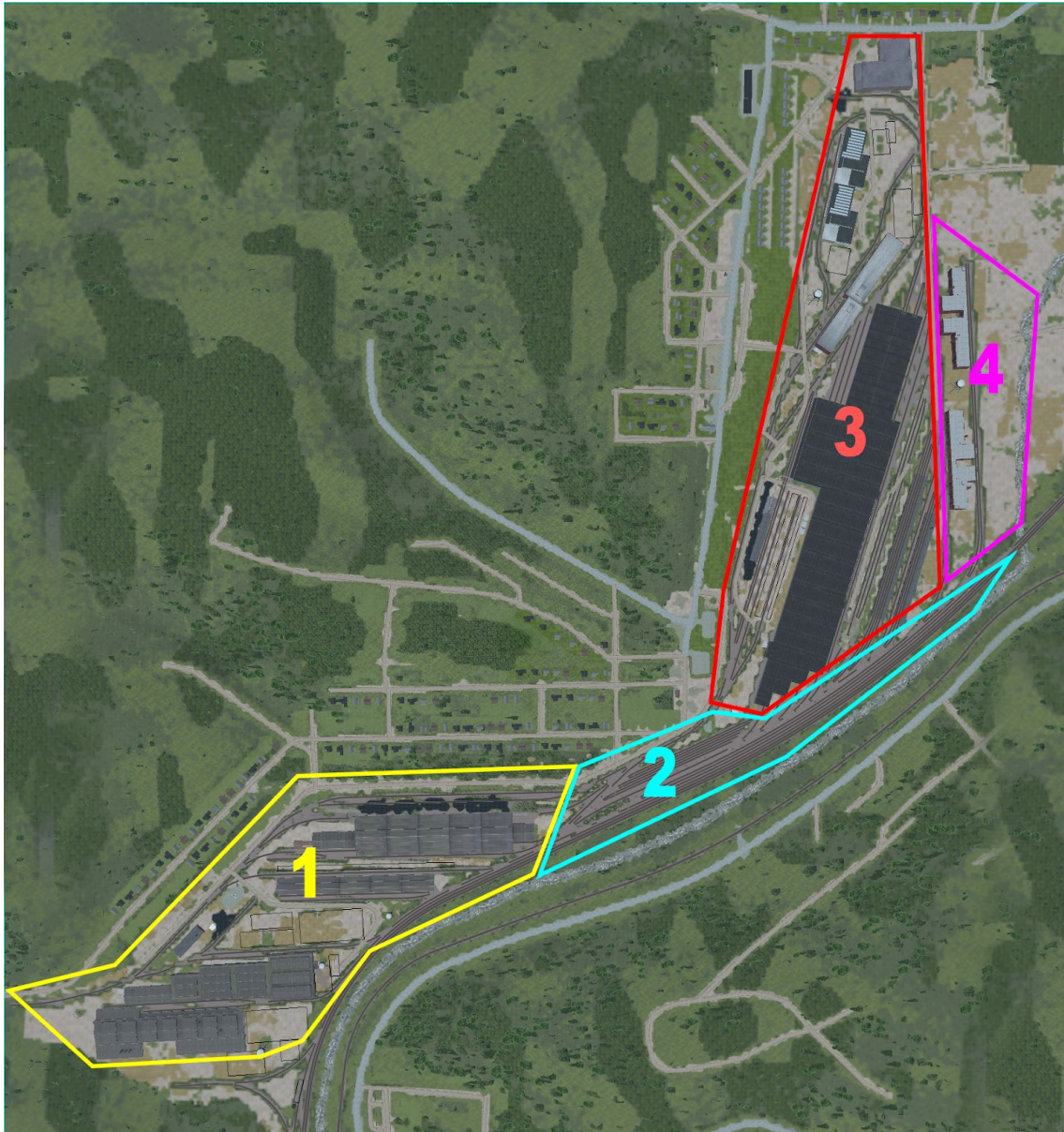
The foregoing industrial zones are connected by what we'll call the Local Track. The Local Track runs parallel to the main line, providing a thoroughfare for switching jobs to work in the Butler complex without interfering with the main. The Local Track starts at Calvin, taking a route along the east side of Butler Transfer Yard past the engine terminal. In addition to switching, this track is used for engine movements between the yards and the locomotive terminal.

The Local Track continues southward to the small Butler Interchange Yard. To reach Standard Junction, switching jobs must join the main, through a signalling interlock, to reach the point where the Local Track continues again. Here the Local Track parallels the west side of the main providing

protection for switching Standard Steel and the other industries on this side of Butler. The Local Track ends at a wye and runaround to allow the crew to turn its train for the return trip.

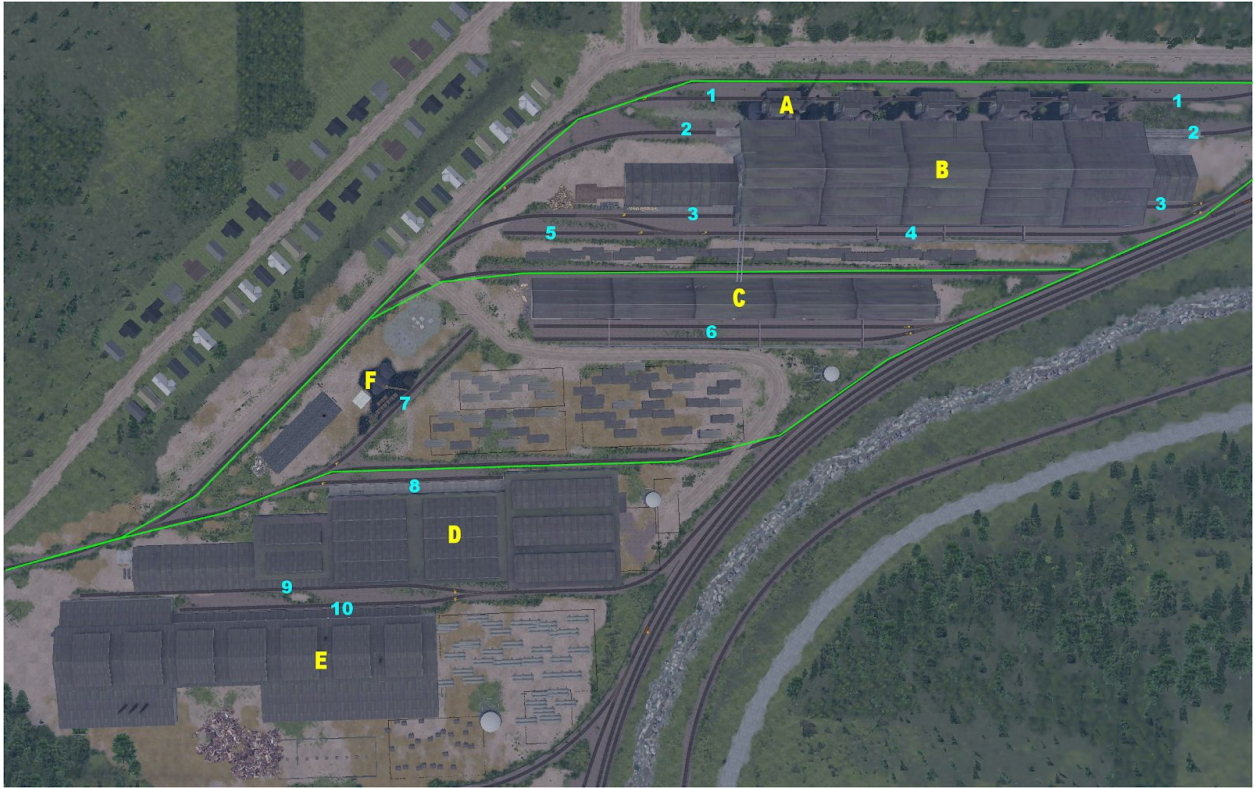
Standard Steel Car Plant

Standard Steel is an integrated manufacturing facility with four main areas.



- (1) Steel production and steel product manufacture
- (2) Transfer Yard
- (3) Railroad car production and railroad car parts
- (4) Automobile production

Steel Production

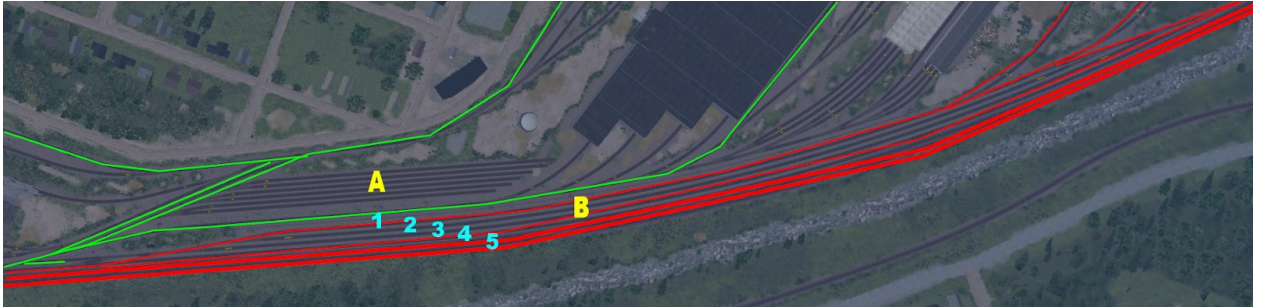


Note - the plant switcher's main track is shown in green.

- A - Coal Gasifiers** The steel is made in gas fired open hearth furnaces. The first step is the production of gas from coal. There are five gasifiers, one for each furnace. At the beginning of each shift, coal is delivered (1) and empties removed.
- B - Open Hearth Furnaces** Produces steel from iron. Raw materials are delivered to the Charging Floor (2) where they are measured, mixed and prepared for the furnaces. Deliveries include iron ore in hoppers and gondolas of pig iron, scrap iron, and limestone. Additional Receiving Tracks (3) provide for unloading boxcars of material including machinery, alloys and chemicals in bags and barrels. The finished steel ingots and billets are stored in the adjacent yard or loaded (4) onto flatcars and gondolas for movement to the Slab mill, or for shipment out of the plant. An additional Storage Track (5) is used by the switching crew to stage cars for loading.
- C - Slab Mill** Rolls ingots and billets into sheets and various shapes. The Mill Tracks (6) are used for unloading incoming billets and for loading finished sheets and shapes. Finished material is moved to other buildings in the plant or shipped out of the plant.
- D - Pressing Mill** Produces railroad car wheels and other pressed steel products. One track (8) is used mainly for loading finished car wheels and other larger products. A second track (9) is used for loading finished products into boxcars, and receiving boxcars of material for the plant.
- E - Merchant Mill** Manufactures an assortment of finished steel products such as pipe, I-beams, and rails. The Mill Track (10) is used for loading finished product and receiving raw material.

F - Engine Shops The plant has two 0-6-0 switchers that are fueled and serviced here at (7).

Transfer Yard



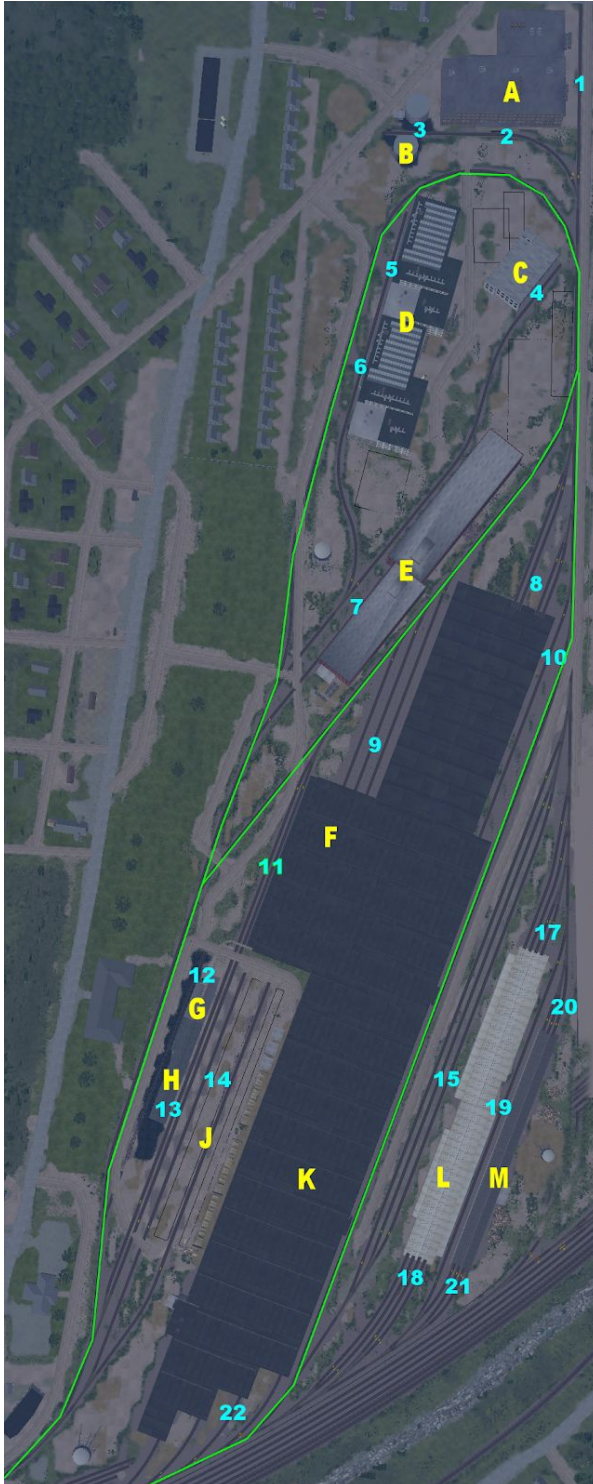
Note - the plant switcher's main track is shown in green. B&LE track in red.

A - Standard Steel Yard Used by the plant switch crews to sort incoming cars by type and for various destinations in the plant. Material is staged here until needed in the plant.

B - Standard Junction B&LE tracks used for transfer of material to and from the plant.

- (1) Runaround track and access to automobile plant.
- (2) Plant outbound - the plant switchers place cars here for pickup by the B&LE.
- (3) Plant inbound - B&LE places cars here for pickup by the plant switch crews.
- (4) Local track - used by the B&LE local crews to operate off the main.
- (5) Double-track B&LE main.

Railroad Car Production



A - Machine Cutting Manufactures nuts, bolts and other machined components. Raw material, such as steel bar is unloaded from flatcars and boxcars at (1). Finished product ships in boxcars from loading dock (2).

B - Oil Storage Receives machine oils and cutting oils at (3).

C - Wheel Shop Does assembly and final machining of wheel sets. (4) Receives pressed wheels and axles, ships finished wheelsets.

D - Foundry Produces cast components such as truck frames and couplers. (5) Receives steel ingots. (6) Ships finished products.

E - Wood Shop Manufactures components for wooden rail cars. Material is shipped and received from track (7).

F - Wood Car Assembly Finished cars are shipped from tracks (9). Raw materials are received off the two tracks (11). The outside track is reached with pass-through deck plates.

G - Power House Coal is received at (12) and used to produce steam for the entire plant.

H - Machine Shop Does repair of plant machinery. Occasionally receives machines and parts in boxcars and flatcars at (13).

J - Lumber Yard Stockpile used by all wood car departments. Lumber is unloaded from flatcars and boxcars on three tracks (14).

K - Steel Car Assembly Production area for steel freight cars. Material is received through the four-track loading dock (8). Track (10) holds material until it is needed. Finished cars ship from the tracks at (22).

L - Paint Shop Cars awaiting painting are staged at (15). They are moved in and out through both ends of the shop at (17) and (18).

M - Stencil Shop Applies final lettering to the cars. Cars are staged on track (19) and moved in and out of the shop from both ends (20) and (21).

Automobile Production



Standard Steel, which began operation in 1913, produced the powerful Standard Eight model. The factory was purchased by American Bantam in 1929, and eventually became famous for production of the World War II Jeep.

The factory was separate from the steel plant and was serviced directly by the B&LE rather than using the plant switching locomotives.

A - Production Building Raw materials arrive at (1) and finished vehicles are loaded into special double-doored automobile boxcars (2)

RIVER VALLEY (RV)

River Valley is the interchange point with the Cheswick and Harmar Railroad, a 4-mile short line that serves the Harwick Mine. In 1904, the mine was the site of a major explosion in which 180 miners lost their lives.

NORTH BESSEMER (NB)

North Bessemer is the southern terminus of the B&LE. The large yard at North Bessemer serves as an interchange with the Union Railroad, another US Steel property. The yard is divided into two halves consisting of northbound and southbound interchange tracks, with an “expressway” track running in between.

The B&LE ends where the yard tracks converge to a single track at the south end. At that point and southward, the tracks belong to the Union Railroad. The Union Railroad enters a tunnel and continues “off route” to serve several steelmaking installations in the Pittsburgh area.

The flow of goods is mostly one way, with the B&LE supplying the raw materials—ore and coal—used in the steel mills. It’s likely that an occasional manifest train would depart northward out of North Bessemer to serve customers along the line, or to interchange with other railroads. Otherwise, northbound traffic would largely consist of long trains of empties headed for Conneaut or to the coal mines.

North Bessemer also includes facilities for the servicing and maintenance of locomotives as well as other functions such as caboose storage.

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