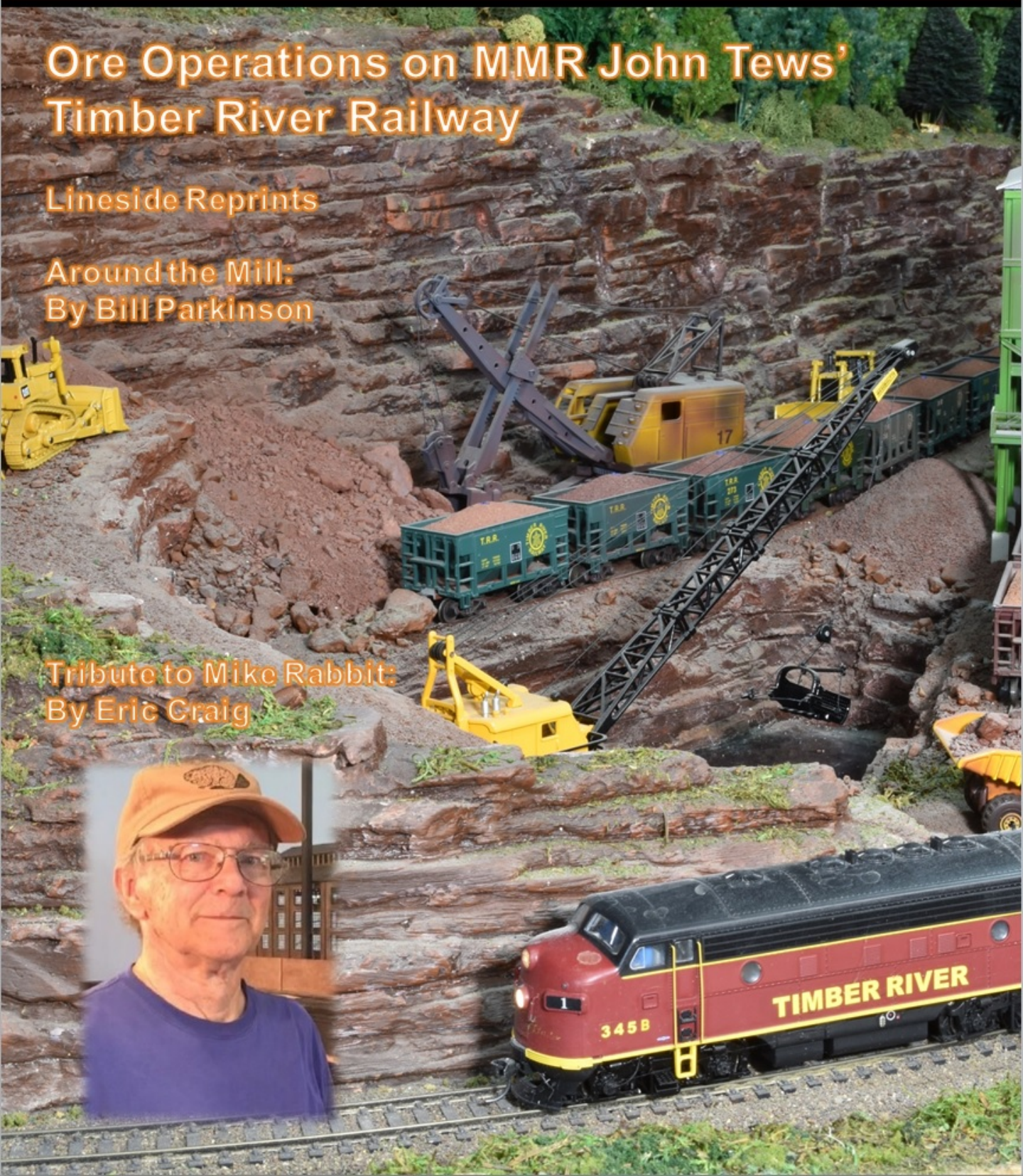
The Mill is a publication of the Steel Mill Modeling and Steel Mill Pictorial groups

THE MILL

October 2020
Vol 4 Num 4



Ore Operations on MMR John Tews' Timber River Railway

Lineside Reprints

Around the Mill: By Bill Parkinson

Tribute to Mike Rabbit: By Eric Craig

The Mill

The Mill is a publication of the Steel Mill Modeling and Steel Mill Pictorial groups and is sent out to the readers quarterly. The Mill is only available in PDF format and is free to subscribe.

History

The Steel Mill Modeling group was founded on October 21, 2014,
July 1st, 2020: 2,199 members
https://www.facebook.com/groups/708840849171343/

The Steel Mill Pictorial group was founded on July 14, 2017,
July 1st, 2020: 3,928 members
https://www.facebook.com/groups/1561038727264008/

To Sign Up

To sign up to receive the newsletter, send an email to Don Dunn at don_csx@hotmail.com.

The Purpose

This newsletter is to recognize the members of the steel mill community that would like to share their modeling ideas, on how-to builds of steel mills and equipment and the members who like to share their knowledge of the steel industry in general. This also includes industries that support the steel industry including coal, lime store, slag, coke, etc.

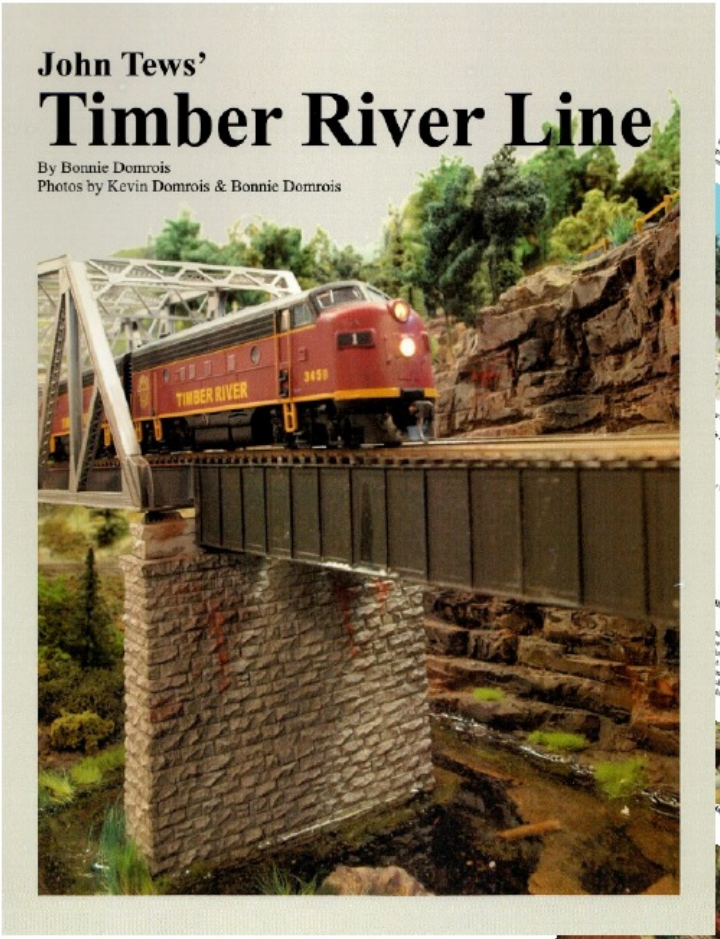
Thank You

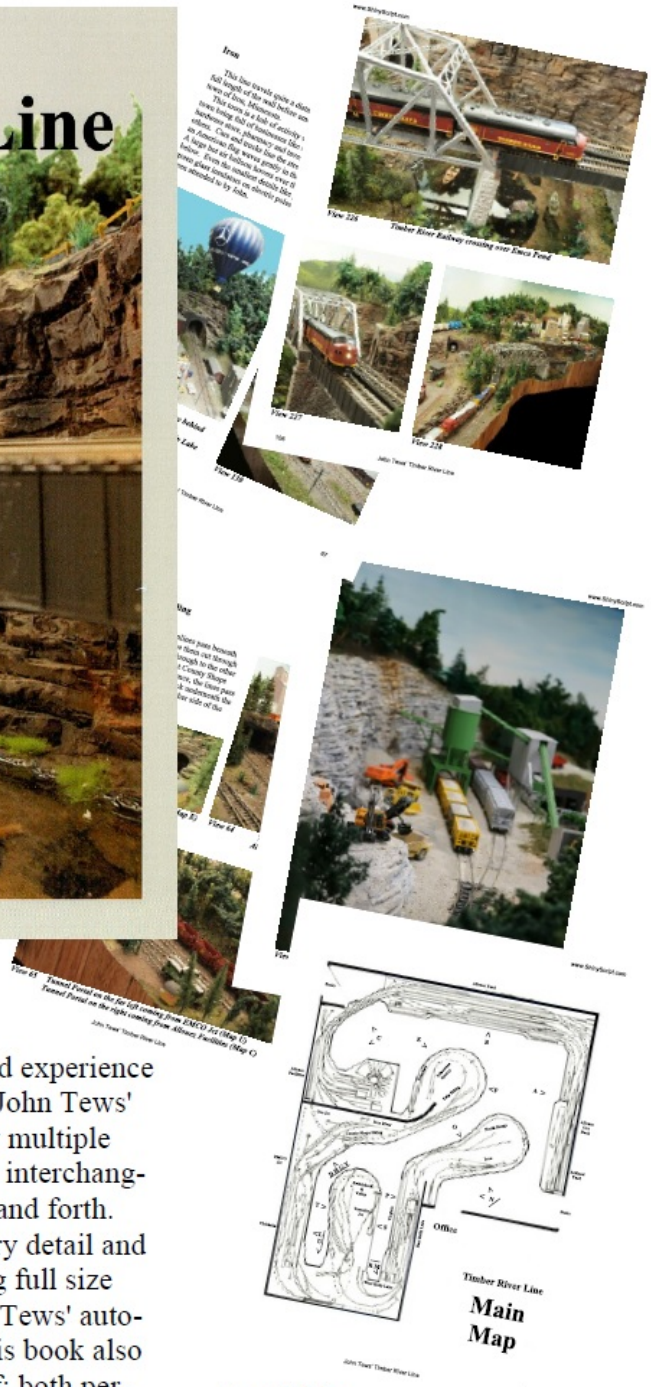
I like to thank the members of the Steel Mill Modeling Group, Steel Mill Pictorial Group and the Yahoo Steel Mill Group for what you all have done to make this newsletter possible. Thank you all who have contributed to passed and future issues of The Mill Newsletter.

As Always Take Care, Stay Safe, Happy Modeling and May God Bless you all.

Editor, Don Dunn
Assistant Editor, Brady McClelland

All Scale Rails





Take a trip on the Timber River Line and experience a visual tour of legendary Master Modeler John Tews' Timber River Line. 245 color photos show multiple industries including mines and logging and interchanges as the railroad moves the products back and forth. This being a fully operational railroad, every detail and movement is taken into account, mimicking full size railroads, along with innovations like John Tews' automatic model train hopper car unloader. This book also includes a biography on John Tews himself; both personal and his achievements within the industry, including Trainfest and how he grew it to one of the largest model railroad shows in the country. This book is destined to be a favorite and hold a permanent place in your collection.

Available:
Both in E-Book and Print
On our website in the Store

http://allscalerails.com/

Cover

Hill Mine pit at North Range, on John Tews' HO Scale Timber River Railway.

In this issue

Submission information

Anyone who would like to submit pictures, articles, club news, upcoming shows or evens to be placed in future issues of The Mill, please send an email to don_csx@hotmail.com. Pictures used have be of your own collection or used with permission. When submitting pictures the bigger the better for detail purposes.

All pictures in The Mill are used with permission. If there are any questions concerning pictures or articles used please send them to d on_csx@hotmail.com and the question will be forwarded to the contributor of the photo or article.

Tribute to Mike Rabbitt

By Eric Craig

Mike in June 2018
Photo by Eric Craig

Legendary steel mill modeler Mike Rabbitt passed away on July 4, 2020 in Franklin, Massachusetts. He was 79 years old. The son of Lawrence and Donna Holzaepfel Rabbitt, he was born in Madison, WI on August 17, 1940. Soon after that, the family moved to Sandusky OH, where Mike spent much of his childhood. He was mesmerized by the heavy industry there and it influenced him for the rest of his life. Mike graduated from the Case Institute of Technology with a bachelor's degree in Mining Engineering and from the Western Reserve University with a master's degree in Theatrical Arts.

After completing his formal studies, Mike move around, living in New York, Chicago and finally settling in the Philadelphia area. He met his wife, Patricia Buard, while working in Chicago and they were together for over 50 years until her passing in 2017. Mike and Pat were "joined at the hip" by their mutual love of the theater, the arts and science fiction. Pat was a professional costume designer and an amateur science fiction writer. Mike enjoyed reading her work, but never wrote any science fiction himself. One of his hobbies was researching his family history, and over time he created a sizable data base of relatives. His grandfather was an artist, creating porcelain figures and his father was also very artistic. Mike probably inherited his artistic talents from these two. The apple didn't fall far from the tree in the Rabbitt family.

Mike was a professor of theater and stage management at Drexel University and also owed MLR productions of King of Prussia, PA. His company made set designs for theaters plus specialty lighting for night clubs and cruise ships. One of his bigger accounts was Sesame Place, making and maintaining stage sets for them.

Mike and Pat settled in the King of Prussia area where he built his final layout, the Lake Erie and Mad River. The house was situated on a steep incline which proved problematic in their later years. They sold the house in 2016, dismantled the layout and moved close by to a more "senior" friendly home. Mike now had a large basement but never rebuilt the layout. Declining health and the Pat's passing took its toll. In 2019, Mike sold the house and moved to MA to be close to his sister-in-law Susan and her children. His nephew Saun and husband Andy, of Las Vegas, put their lives on hold, spending several months helping Mike move. In the spring of this year, Mike fell and was admitted to a medical facility, needing round the clock care. Saun and Andy again put their lives on hold and came to Massachusetts in order to care for Mike, staying with him until the end. They went far more than the extra mile for Mike, and in my opinion, that puts both of them in the awesome category.

When Mike was 16 years old, he built a blast furnace model and entered it into a science fair contest. He wrote to Koppers (or possibly McKee) Company in Pittsburgh, told them what he was doing and asked if they had any blast furnace prints and if so, could he get copies. Yes, Yes and Yes and they provided him with prints which he used to build the furnace. His project was

Dean Freytag's blast furnace, built utilizing Mike's drawings

Photo @2010 Bradley C. Bower. Image cannot be reused without permission

was featured in Model Railroaded Magazine and was seen by Dean Freytag. Dean and several of his friends visited Sandusky in order to see what the "boy wonder" was doing. As far as I know, Dean had an interest in Steel Mills at this time and the visit with Mike "rocketed" him into the steel mill modeling craze. Dean told several people that he was inspired by Mike and that he was a walking encyclopedia on Steel Mills. Mike's last steel mill layout was featured in the 2018 issue of Model Railroads.

By the early 1970's, he was advertising his prints in Model Railroader. One of his early customers was Jim Kerner, and from that a friendship developed lasting a lifetime. Jim is a renowned Steel Mill Modeler and photographer, with many of his pictures appearing in Dean Freytag's The History, Making and Modeling of Steel, Nevin Yakel's Bethlehem Steel Railroading, Bob Wilt's Bethlehem Steel Co. Railroad Operations, and other publications.

John Glaab and Mike met in the mid 1990's, and their mutual Steel Mill interests have benefited all of us. Both collaborated on the inaugural Steel Mill Modeler's meet in 2004. Mike found the location and convinced a lot of steel mill modelers and venders to attend. John said that he could not have done this without him. Mike gave a clinic at this and most ensuing meets until his final, the 2017 Bethlehem meet. John formed the Steel Mill Modelers Special Interest Group in 2013 and Mike was an original board member. Mike was a "walking encyclopedia" on steel mills, sought out by all for his knowledge. He was extremely generous in sharing what he knew, and I know this firsthand. He displayed many fabulous models at these meets, with his sintering plant winning the Dean Freytag award in 2011.

Numerous modelers worldwide, including myself, built their furnaces and related steel mill structures using Mike's drawings. My first furnace was an open top, and next came a "take off" of Bethlehem's A furnace. I built several other structures, and none would have been possible without Mike's drawings. I called and visited him more times than can be counted, and he was always receptive, never tiring of "talking steel". I had the pleasure of chauffeuring Mike to the 2013 Pittsburgh meet and the 2017 Bethlehem meet, and needless to say, it was nonstop steel mill talk.

Mike produced an untold number of scale drawings including many blast furnace designs, open hearths, coke ovens, etc, I think you get the picture. Modelers worldwide are eternally grateful for his efforts. Within the last several years Mike corresponded with an individual in Australia, sharing his knowledge and supplying him with prints. More than likely, this was not the only international individual that Mike dealt with, so "worldwide" is appropriate. You can readily see this in our Facebook steel mill modelers community, with many outstanding international modelers participating. Steel mill modeling brings us all together and we are better for it.

Getting back to Dean Freytag, Mike provided him with prints that enabled him to build the Norma furnace. Dean scaled down the measurements and altered some things to fit the space

Ken McCorry's Helen and Marge blast furnaces built utilizing Mike's drawings
Photo by Eric Craig

that he had. Another beneficiary is Ken McCorry, who used Mike's prints to build his two blast furnaces, Marge and Helen. Both were built full scale. He provided the drawings and basic shapes to Glenn Sonnier, who built a magnificent super detailed blast furnace. His efforts were rewarded, winning the 2009 Freytag award. One of Mike's longtime friends, Vince Altiere is building Bethlehem A furnace by modifying a Walthers kit, using his drawings. Jim Kerner built several open-hearth furnaces for Rob Arthur using Mike's drawings. He constructed a complete open hearth building which now sits on Mike Hartlett's layout.

Open hearth furnaces built by Jim Kerner utilizing Mike's drawings
Photo by Eric Craig

Mike's "cache" wasn't limited to structures. He had many prints and photographs of steel mill rolling and was very generous in sharing. While gathering information for producing a riveted bottle car, he was very helpful, giving me several prints and photographs. Below is one of his

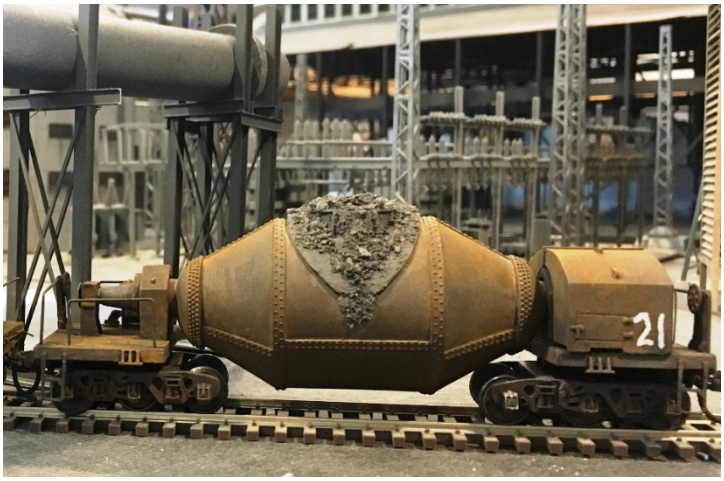
Photo of a bottle car from Mike's library. He did not take this picture and I don't know where he got it from or who took it

prototype photos and the finished model. I'll leave it up to you to decide how he did.

Mike utilized unconventional materials such as wood, cardstock, clear plastic shelf liners and floor runners. His sintering plant, main blast furnace and Bessemer building were all made of wood and card Stock. For other mill buildings his theater talents were put to good use, creating many forced perspective buildings. They are almost flats but because of the forced perspective, they look full sized. Mike built models for others, including an open hearth building with complete interior for the St. Albans Model Railroad Club.

Mike donated his models to the St. Albans Railroad Club, Newtown Square, PA. The club has both blast furnaces on the layout and, in the future, planning to construct a peninsula to display the rest of the models. His drawings were donated to the Industrial Archives in Bethlehem, PA. The intention was to catalogue the drawings and make them available to modelers but unfortunately Covid19 got in the way. The archives recently reopened and shortly his drawings will get the attention they deserve. Hopefully they will be available to us steel mill modelers before year end.

Several days before Mike's passing, I had a phone conversation with him, and he was talking Steel Mills and all the things he still wanted to do. Steel on Mike, you are sorely missed. Say hello to Dean for us and we will see you on the other side.



Riveted bottle at the Schuylkill Iron Works. Mike's photos and drawings were instrumental in producing this car
Photo by Eric Craig

A lot of people Mike touched were not mentioned in this article and for that, please accept my apologies. Perhaps we can start a Facebook thread so members can post their own personal stories. Another idea would be to do a future article and include members' remembrances of Mike.

This tribute to Mike was made possible by the collective efforts of Jim Kerner, John Glaab, Vince Altiere, Brad Bower, Saun Rabbitt and Susan Rabbitt. Thanks to all.

Timber River Railway and Iron Ore

By John H. Tews, General Manager

The Timber River Railway is my HO gauge model railroad. The modelled area is the Arrowhead of Minnesota, the Missabe Range and the Northwestern corner of Wisconsin. On the Timber River iron ore is mined at several on-line mines and is also generated from mines located in staging. The ore is hauled to an ore sorting yard at Allouez, weighed, classified and finally shoved onto the ore dock and loaded into Great Lakes ore boats for shipment to steel mills. This article will identify iron ores and the process of getting the red ore to the steel mills located on the shores of the Great Lakes. It will describe the process of prototype ore operations and how I have replicated ore operations on my Timber River Railway.

Background iron ore information

Types of iron ore - Hematite, Magnetite, Limonite, Siderite and its properties.

Hematite and **magnetite** are by far the most common types of ore. Pure magnetite contains 72.4 percent iron, **hematite** 69.9 percent, **limonite** 59.8 percent, and **siderite** 48.2 percent, but, since these minerals never occur alone, the metallic iron content of real ores is lower.

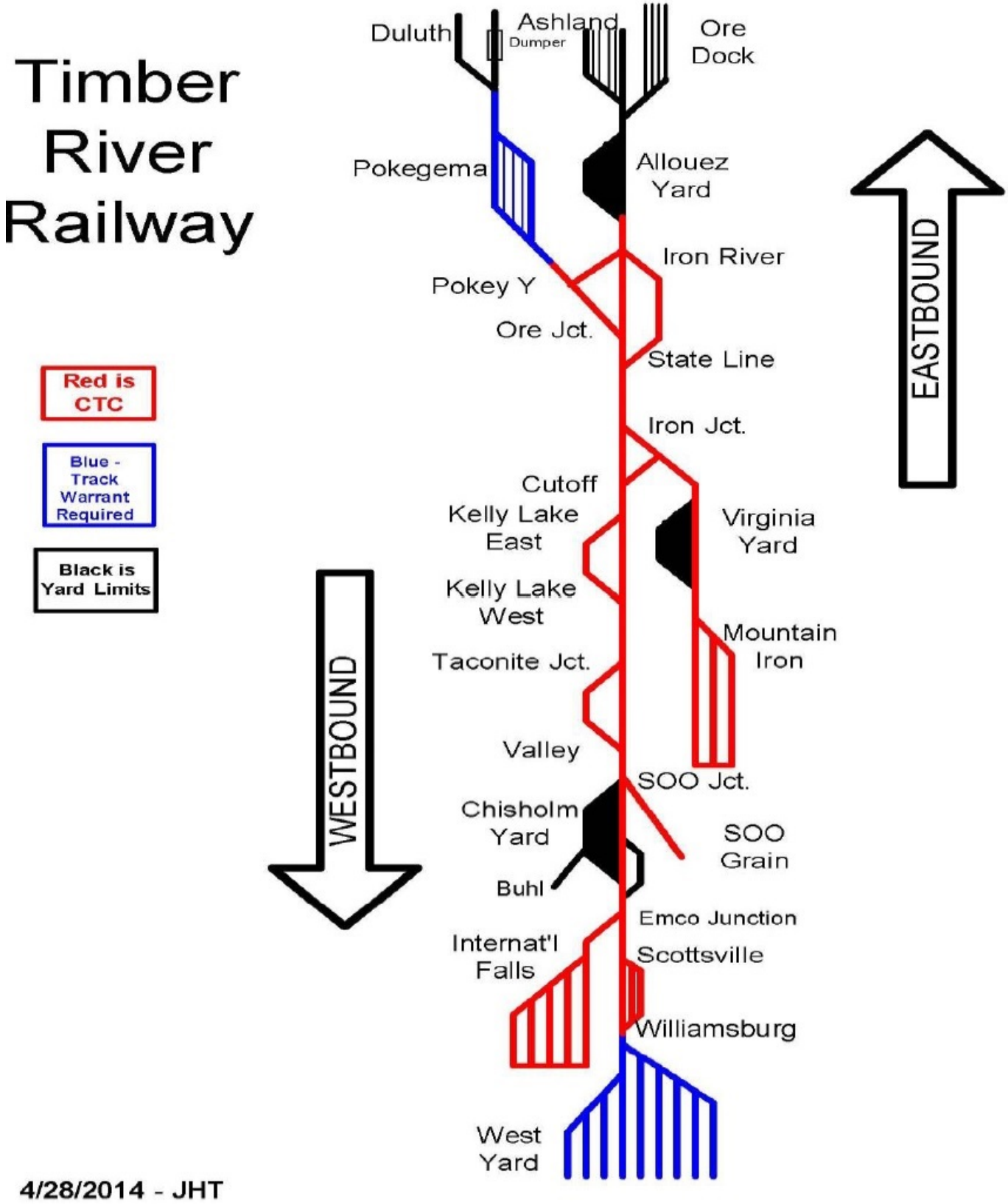
Various chemical compositions of the iron ore include silicon, chromium, manganese, aluminum and other minerals, both beneficial and detrimental to the iron ore product. The iron ores contain varying amounts of iron along with dirt, sand and gravel which is removed from the ore by crushing, screening, washing and other methods to increase the percentage of iron. A process called beneficiation increases the iron content of the ore product. Some of the various iron ores can be used directly from the mine.

In the DM&IR facilities at Two Harbors and Proctor, the railroad handled over twenty-five compositions of iron ore from various mines sorted by ore cars using colored pins on a track map of the ore yard tracks. Steel mills purchased boatloads of iron ore meeting the specific chemical composition of the iron ore accomplished by blending various ore carloads of ore, to meet the iron ore and chemical composition requirements of the steel mill.

Blending happened on the ore dock by dumping ore of required chemical compositions into specific pockets on the ore dock. In addition to the chemical composition, the physical types of ore (screened, fines, wet and sticky, granular, etc.) were considered when determining the blend of various ores to be dumped in the ore dock pockets to facilitate dumping the ore products into the boats hold. You do not want to dump sticky ore into the pocket first because it would not easily slide out of the pocket and required extensive poling labor or flushing with pressurized streams of water to move the ore from the dock pocket into the boat. You dumped granular ore into the pockets first and dumped sticky material on top to facilitate ease in emptying the dock pocket into the boat.

Once the desired chemical and physical properties were determined to meet the mills requirements, the Boat Loading Order for loading the dock was created. The specified cars are selected from the chemical composition of the ore loads in the classification yard to meet the steel mill specifications The carloads are pushed on the dock in proper Boat Loading Order and emptied into the proper ore dock pockets for eventual loading into the ore boat. As the ore cars are dumped into specific ore dock pockets a physical blending of the various occurs as the pockets were emptied into the boat. Blending of the ore also happened as the ore boat was unloaded at the steel mill.

This article does not include information about Taconite or pelletized ores.



*A sh*ort summary of the Timber River Railway and mines will help to understand ore operations. *(the number and letter after the mine name indicate the number of carloads and the iron ore grade)* The TRR is modelled after general ore handling in Northwestern Wisconsin, the Missabe Range and the Arrowhead of Minnesota.

The TRR's single track mainline runs west from the ore dock at Allouez through the Allouez Ore Yard (Superior) and continues west from Saunders to Pulp Siding, Iron River, Ore Junction, State Line and then across the Oliver Bridge through tunnels 3 and 4 to Iron Junction.

Iron Junction

Track to the left is the Virginia Division **Track to the right is the Arrowhead Division**

Rocheleau Pellet loadout (16,T) at Iron Junction

The line divides at Iron Junction with the Virginia Division servicing the beneficiation plant at East Virginia, the Virginia Yard and industries and then continues West to three staging tracks at Mountain Iron.

The **Virginia Division** heads through a tunnel to East Virginia and the beneficiation processing plant. Raw mined ore is processed by crushing, washing and screening to manufacture four different chemical contents of iron ore (20, W) , (20, R), (20, B) and (20, Y). The raw ore is dumped into the ore beneficiation plant from an upper spur at Kelly Lake East.

Virginia Concentrator (20, W, 20, R, 20, B, 20, Y) at East Virginia.

The yard at Virginia accommodates the switching for the four beneficiation load out tracks , waste loading and local industries. The opposite end of the yard connects with the three mines in staging at Mountain Iron. The mines in the Mountain iron hidden staging are Minntac- (32,R)--HullRust –(24, Y) ---National- (24, W).

The **Arrowhead Division** continues to North Range, Kelly Lake, Taconite Junction, Valley and a yard at Chisholm. . At North Range, the Hill Mine has two loading tracks. Part of the mine has high content iron and the ore is loaded and shipped directly (8, Y). The lower grade ore is crushed, washed and loaded through a tipple (8,W).

Over all view of the concentrator plant at East Virginia

Hill Mine pit loading at North Range

Hill Mine loading tipple at North Range

Raw ore unloading track for the Virginia concentrator at East Kelly (8, crude)

The **Arrowhead Division** continues west to the open pit Kelly Lake mine at the west end of the Kelly Lake siding. The Kelly Lake mine produces a high-grade direct loading ore and a processing plant with a loading hopper. The line continues west from Kelly Lake to Taconite Junction where a spur from the east end of the Valley Siding services the Keewatin Taconite processing facility (20,T) and then continues to Valley. At Valley the TRR services the Soudan Mine (16, Y) and the Switchback Division.

Tail Track of the Virginia concentrator

Kelly Lake mine (8, W & 8, B)

Keewatin Taconite loadout (20, T) at Taconite Junction

The **Switchback Division is** serviced by TewsCo , an industrial subsidy of the TRR based in Chisholm. The Switchback serves TewsCo mine No. 1 ((4,G) and two truck dump loading tracks. (10, G)

TewsCo No.1 (4, G) at Switchback

Switchback Truck Dump Tracks 1 and 3 (10, G)

At Valley the TRR services the Soudan Mine loadout (16, Y) and mine service and continues to Chisholm Yard. At the Soudan Mine a new boiler and hoist house are being installed next to the Valley Depot.

Soudan Mine - (16, Y) at Valley

Below are several ore loads on the TRR's Allouez Ore Dock, showing the grade markings.

Note the painted Atlas track nails in the center of the load. Y (yellow) on track 1 and B (Blue) on track 2

Ore mine - car summary-

Taconite:

Rocheleau Loadout	-12
Keewatin Taconite	-20
West Yard 9	-32
West Yard 8	-32
West Yard 7	-32

Red Ore:

North Range –

Hill Mine Crusher	-8
Hill Mine Pit	-8

Kelly Lake -

Pit	-8
Crusher	-8

Valley

Soudan Mine	-16

Switchback

TewsCo No. 1	-4
Truck Dump	-10

East Virginia

Concentrator 1	-20
Concentrator 2	-20
Concentrator 3	-20
Concentrator 4	-20

Mountain Iron (staging)

Minntac	-32
National	-32
Hull Rust	-24

West Yard 6	**-32**
International Falls 4	**-32**
International Falls 5	**-32**
Ore Yard -	**-150 load spots**
	-104 empty spots
Ore Dock -	**-120 car capacity**

Ore Trains - Mine Runs

VC-1 Allouez to Virginia Conc. and return - 24 cars

VC-2 Allouez to Virginia Conc. and return - 24 cars

VC-3 Allouez to Virginia Conc. and return - 24 cars

AM Mine Turn – Allouez to Hill Mine 1 & Kelly Lake 2 and return – 16 cars

Soudan Mine Turn – Allouez to Valley and return – 16 cars

Rocheleau Pellet turn – Pokegema to Iron Jct and return to Duluth – 16 cars

PM Mine Turn - Allouez to Hill Mine 2 & Kelly Lake 1 and return – 16 cars

Keewatin Tac Job – Pokegema to Taconite Junction and return to Duluth – 20 cars

Switchback Ore Transfer – switchback to Allouez with loads – 14 – 20 car loads

Staged Ore Trains:

Mountain Iron 1 – 32 cars

Mountain iron 2 – 24 cars

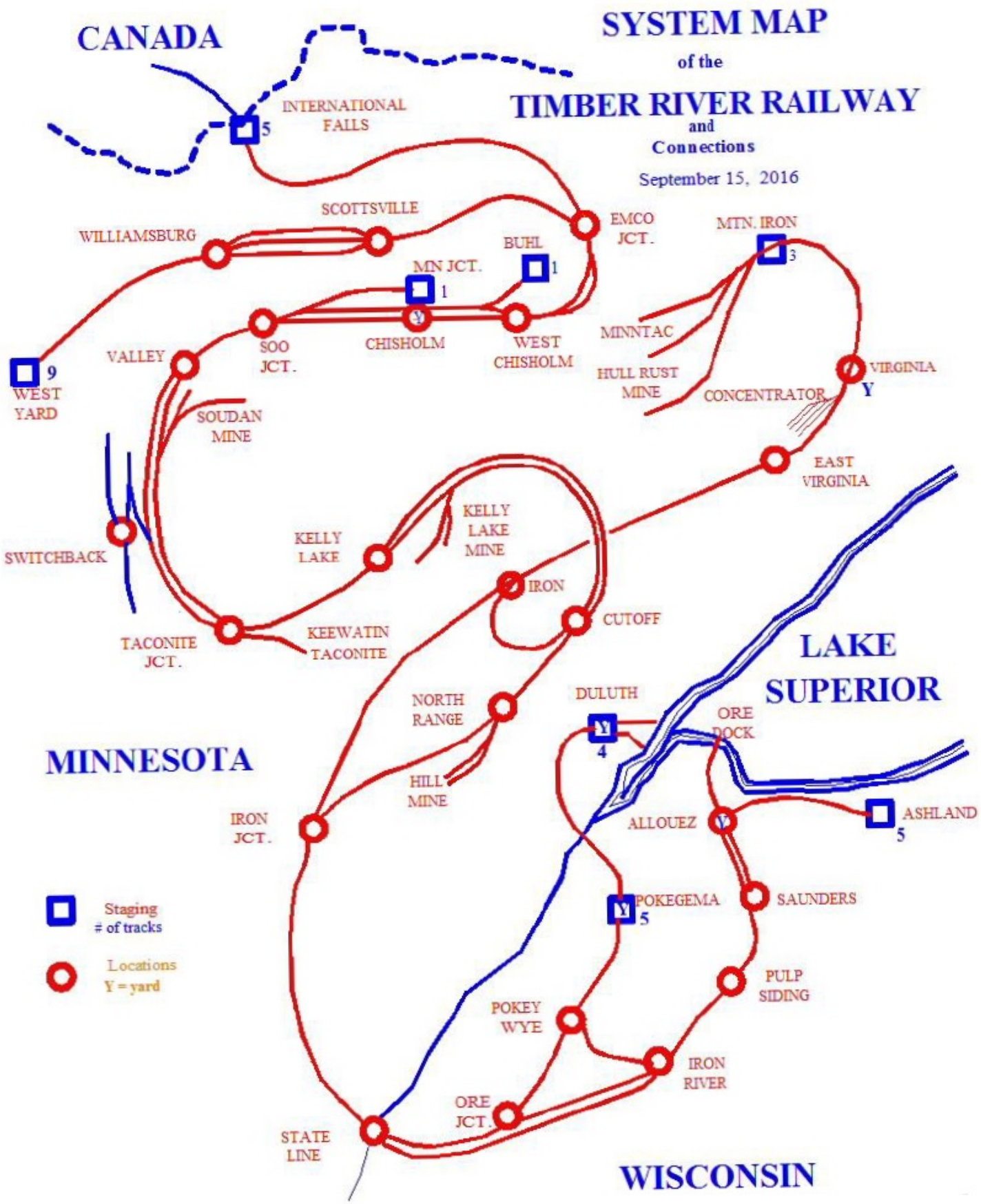
Mountain Iron 3 – 24 cars

West Yard 6 – 32 cars

I Falls 4 – 32 cars

I Falls 5 – 32 cars

TewsCo Plymouth switching at Iron River


SYSTEM MAP
of the
TIMBER RIVER RAILWAY
and
Connections
September 15, 2016
CANADA
INTERNATIONAL FALLS
5
SCOTTSVILLE
WILLIAMSBURG
EMCO JCT.
BUHL
1
MN JCT.
1
MTN. IRON
3
MINNTAC
HULL RUST MINE
CONCENTRATOR
VIRGINIA
Y
EAST VIRGINIA
9
WEST YARD
VALLEY
SOO JCT.
CHISHOLM
WEST CHISHOLM
SOUDAN MINE
SWITCHBACK
KELLY LAKE
KELLY LAKE MINE
IRON
CUTOFF
TACONITE JCT.
KEEWATIN TACONITE
LAKE SUPERIOR
NORTH RANGE
DULUTH
4
ORE DOCK
MINNESOTA
HILL MINE
IRON JCT.
ALLOUEZ
ASHLAND
5
POKEGEMA
5
SAUNDERS
Staging
# of tracks
Locations
Y = yard
PULP SIDING
POKEY WYE
IRON RIVER
ORE JCT.
STATE LINE
WISCONSIN

TRR Ore Turn Operations:

Let's follow train 81/82, VC-1 (Virginia Concentrator 1) , an ore turn from Allouez Yard with 24 empties headed for the Virginia Concentrator, at East Virginia, to pick up 24 loads of ore and deliver them to the Allouez Ore Yard. At the Ore Yard, they will be sorted by ore grade for eventual loading onto the ore dock following the Boat Loading Order, and finally into a Great Lakes ore boat for delivery to a steel mill located on the shoreline of one of the Great Lakes.

The South Allouez yard crew has set out 24 empty ore cars and a caboose on yard track 9. The crew for VC-1 has picked up their power, TRR 431 and TRR 7403, checked with the general yardmaster for permission to pick up their empties and depart. The crew picks up their train, with TRR bay window caboose 473, performs the air test and proceeds to yard limits at Saunders on track 1.

TRR 431 & TRR 7403 at Saunders

Once at the Saunders signal bridge, the start of CTC, they advise the Chief Train Dispatcher of the loco numbers, the train size, the crew members and their destination.

The dispatcher gives train 81, VC-1 permission to enter the main at Saunders and proceed on signal indication. (Note – The TRR is completely three color signaled and the dispatcher has a CTC panel to control signals and turnouts on the TRR main lines and controls hidden staging trackage). After a short time, the Saunders turnout aligns for track 1, the signal turns green and the two TRR diesels strain to get their train moving upgrade from Saunders to Pulp Siding.

Train VC-1 at Pulp Siding semaphore

The automatic block semaphore signal at Pulp Siding is clear and VC-1 continues to Iron River. Arriving at Iron River the three headed signal is Yellow over Red over Red, indicating that the train will take the main to State Line at restricted speed. After entering the main line siding at restricted speed, they stop at the west end of the State Line siding for a Red signal. In the distance they see an approaching headlight. A Burington Northern F9A-GP-9-F9A leads a loaded ore drag across the Oliver Bridge and heads into the siding at State Line, headed for the ore yard at Allouez

F9A-GP-9-F9A leads a loaded ore drag across the Oliver Bridge and heads into the siding at State Line, headed for the ore yard at Allouez.

BN / TRR meet at State Line

TRR 431 entering the Virginia Division at Iron Junction

As the BN caboose clears the west State Line siding switch, the turnout aligns and the signal for VC-1 on the cantilever signal bridge turns green. The engineer throttles up the power and the train rumbles westward across the Oliver Bridge, heading for Iron Junction and the Virginia Division. A yellow signal at Iron Junction indicates that they will take the diverging route and enter the Virginia Division at restricted speed.

TIMBER RIVER · RAILWAY ·

Emerging from Tunnel 8A, they stop at the East Virginia yard office to discuss their pickups with the Yardmaster and give him a copy of the switch list for the work at the Virginia Concentrator.

Timber River Railway
Switchlist

Train No. – 81 - 82 **Virginia Concentrator 1**

Originates – Allouez Ore Yard
Destination –Virginia
Returns to -- Allouez Ore Yard

Power: TRR Power – 2 - 6 axle units

Allouez Ore Yard

Pick Up – 24 OR empty
Maybe singles or quads

Virginia

Concentrator Track 1-- Pick up 12 OR loads
Set Out 12 OR empties

Concentrator Track 2-- Pick up 8 OR loads
Set Out 8 OR empties

Concentrator Track 3- Pick up 4 OR loads
Set Out 4 OR empties

May use local switch engine to perform switching.
Place empty cars at rear of track for loading.

Get clearance from Dispatcher for return to Allouez

Allouez Ore Yard- Weigh train on return to Allouez Ore Yard

Set out train according to GYM instructions.

Power returned to Engine Facility for service

Engineer-Sign when complete: _____

VC-1 discusses work at Virginia Concentrator with Virginia Yardmaster

VC-1 switching Virginia Concentrator

They begin pulling the required loads from the beneficiation plant (12–R from track 1, 8-W from track 2 and 4 B from track 3) and place an equal number of empties on the same track (Each track under the loading hopper holds 20 cars). Sometimes the Virginia Yard crew can assist making up the outbound train with the local switch engine.

Once the work is completed and the loaded train is made up, caboose 473 is coupled to the rear end. The power is attached to the east end and the required air test is performed. The train crew contacts the Train Dispatcher via telephone and advises they are ready to depart East Virginia with 24 loads. The Dispatcher directs the crew of VC-1, now eastbound train 82, to proceed on signal indication.

Ready to depart East Virginia

The East Virginia signal turns from red to yellow, indicating that they will have to stop at the Iron Junction Interlocking signal. The TRR 7403, now with ex B&O SD-9 in the lead, struggles upgrade to Iron Junction and the train stops for the Red Iron Junction interlocking signal, clear of the Iron Main Street highway crossing. A distant horn announces the arrival of an eastbound Detroit Edison unit coal train with TRR 890 in the lead, headed for the unloader at Duluth.

Coal train at Iron Junction

As the coal train caboose clears the block, and the Iron Junction interlocking signal turns Yellow and TRR VC-1 starts moving east, following the coal train. As the loaded iron ore turn gains speed and passes the Iron Depot, the eastbound automatic block signal for Tunnels 4 and 3 turns Green from Yellow, signifying that the unit coal train has cleared the block. The ore turn has clear signals all the way to Allouez Yard limits at Saunders.

Meeting a westbound BN empty at State Line

EB at Saunders – yellow signal

As the train clears Tunnel 2, the center head on the Eastbound Saunders Signal turns Yellow from the normal Red, permitting the VC-1 to enter Allouez yard at restricted speed. The train heads across the weigh-in-motion scale (a digital car counter) before entering the ore sorting yard. The GYM – Allouez assigns track 2 as the arrival track. The 24 ore mixed loads and caboose are spotted on the assigned track, the power is cut off and travels back to the large locomotive service facility at North Allouez for fuel, sand, a trip inspection and any required service.

Crossing the Allouez Ore Yard weigh-in-motion scale (car counter)- 10 MPH

VC-1 on Allouez Ore Yard track 2

The North switcher grabs the caboose from track 2 and shuttles it to the caboose service tracks which are behind the two-story yard office.

The South switch engine confers with the ore dock manager and then sorts the in-bound 24 loads – 12 Red grade to track 2, 8 White grade to track 4 and 4 Yellow grade to track 5. The BN ore train had spotted the earlier train of 32 loads on track 6, waiting to be sorted.

Picture of ore sorting yard

Meanwhile the mine and steel mill engineering staff have determined the proper blend of iron ores produced by various mines ores and beneficiated ore. They create a written **Boat Loading Order** for use as the ore cars are dumped into various pockets on the ore dock for eventual loading into the Kaye Lee Barker.

The steel mill has determined the physical and chemical properties of the ore required for their blast furnace and the mine and steel mill engineering staff have determined the proper blend of iron ores produced by various mines.

The engineering staffs have considered:

1. The consistency of the ore being dumped to permit the free flow from the pocket to the boat.
2. The chemical properties of the ore needed for the furnace
3. Yard space available to sort the required carloads
4. The availability of the required quantity ore grades to efficiently load the boat
5. Communication with the 3rd Mate as to the loading sequence
6. DM&IR's Proctor Yard was very large as was necessary to sort over 30 grades of ore received from the mines serviced by the railroad.

And then create a report to place loads of specific grades of ore into the proper ore dock pockets to blend the ore to meet the steel mills specification, I.e. a Boat Loading Order. With so many grades of ore (over 30 at Proctor yard) they used colored pins placed on a yard diagram to keep track of various grades of ore.

The Timber River has created simplified **Boat Loading Order** to recreate the boat loading process as shown below, using the five grades of TRR ores. There are two BLO's created – One for tracks 1 & 2 and another for tracks 3 & 4. Pockets for tracks 1 & 2 serve the north side of the dock and pockets for tracks 3 & 4 load boats on the south side of the ore dock. (see sample BLO below – The Boat Loading Orders fit on standard letter or legal-size paper, printed using MS Excel)

Timber River Railway Ore Dock

Timber River Railway
Boat Loading Order

Loading Report for: **Kaye Lee Barker** Sailing Date ___/___/___

Pocket	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2
20	Yellow		Blue		Yellow		Blue		Red	
21		Red		White		Red		White		Red
22	Yellow		Blue		Yellow		Blue		Red	
23		Red		White		Red		White		Red
24	Yellow		Blue		Yellow		Blue		Red	
25		Red		White		Red		White		Red
26	Yellow		Blue		Yellow		Blue		Red	
27		Red		White		Red		White		Red
28	Red		White		Red		White		Yellow	
29		White		Blue		Blue		Blue		Red
30	Red		White		Red		White		Yellow	
31		White		Blue		Blue		Blue		Red
32	Red		White		Red		White		Yellow	
33		White		Blue		Blue		Blue		Red
34	Red		White		Red		White		Yellow	
35		White		Blue		Blue		Blue		Red
36	Red		Blue		Red		Blue		Red	
37		White		White		White		Yellow		Yellow
38	Red		Blue		Red		Blue		Red	
39		White		White		White		Yellow		Yellow
40	Red		Blue		Red		Blue		Red	
41		White		White		White		Yellow		Yellow
42	Red		Blue		Red		Blue		Red	
43		White		White		White		Yellow		Yellow
44	Yellow		Yellow		Yellow		White		Yellow	
45		Red		Blue		Red		Blue		Blue
46	Yellow		Yellow		Yellow		White		Yellow	
47		Red		Blue		Red		Blue		Blue
48	Yellow		Yellow		Yellow		White		Yellow	
49		Red		Blue		Red		Blue		Blue
50	Yellow		Yellow		Yellow		White		Yellow	
51		Red		Blue		Red		Blue		Blue
52	Red		Blue		Red		Yellow		Yellow	
53		Yellow		White		Red		White		Red
54	Red		Blue		Red		Yellow		Yellow	
55		Yellow		White		Red		White		Red
56	Red		Blue		Red		Yellow		Yellow	
57		Yellow		White		Red		White		Red
58	Red		Blue		Red		Yellow		Yellow	
59		Yellow		White		Red		White		Red

Red Ore	64
Blue Ore	44
White Ore	44
Yellow Ore	48
	=======
Loads =	200

Ore Dock Manager: _____

Completed Loading on :_____

The ore dock manager and the South Switcher assemble 16 car dock shoves for the boat being loaded, starting with the highest dock pocket on the report. (Note: The ore dock is capable of loading two boats at the same time, with the pockets for tracks 1 and 2 accessing the north side of the ore dock and the pockets for tracks 3 and 4 accessing the south side of the ore dock.)

Dock power ready to shove first 16 loads consisting of 8 red grade ore, 4 yellow grade ore and 4 red grade ore

The yard power on the Timber River uses three sets of MP15's for yard and dock power. Some of the power is ex-Union Railroad and still retain its blue or green paint

TRR 516 with business car Nancy L at the Allouez Yard Office

Picture partial Boat Loading Order with the dock shove circled and loads checked

Loading Report for: Kaye Lee Barker

Sailing Date __/__/__

Pocket	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2
20	Yellow		Blue		Yellow		Blue		Red	
21		Red		White		Red		White		Red
22	Yellow		Blue		Yellow		Blue		Red	
23		Red		White		Red		White		Red
24	Yellow		Blue		Yellow		Blue		Red	
25		Red		White		Red		White		Red
26	Yellow		Blue		Yellow		Blue		Red	
27		Red		White		Red		White		Red
28	Red		White		Red		White		Yellow	
29		White		Blue		Blue		Blue		Red
30	Red		White		Red		White		Yellow	
31		White		Blue		Blue		Blue		Red
32	Red		White		Red		White		Yellow	
33		White		Blue		Blue		Blue		Red
34	Red		White		Red		White		Yellow	
35		White		Blue		Blue		Blue		Red
36	Red		Blue		Red		Blue		Red	
37		White		White		White		Yellow		Yellow
38	Red		Blue		Red		Blue		Red	
39		White		White		White		Yellow		Yellow
40	Red		Blue		Red		Blue		Red	
41		White		White		White		Yellow		Yellow
42	Red		Blue		Red		Blue		Red	
43		White		White		White		Yellow		Yellow
44	Yellow		Yellow		Yellow		White		Yellow	
45		Red		Blue		Red		Blue		Blue
46	Yellow		Yellow		Yellow		White		Yellow	
47		Red		Blue		Red		Blue		Blue
48	Yellow		Yellow		Yellow		White		Yellow	
49		Red		Blue		Red		Blue		Blue
50	Yellow		Yellow		Yellow		White		Yellow	
51		Red		Blue		Red		Blue		Blue
52	Red		Blue		Red		Yellow		Yellow	
53		Yellow		White		Red		White		Red
54	Red		Blue		Red		Yellow		Yellow	
55		Yellow		White		Red		White		Red
56	Red		Blue		Red		Yellow		Yellow	
57		Yellow		White		Red		White		Red
58	Red		Blue		Red		Yellow		Yellow	
59		Yellow		White		Red		White		Red

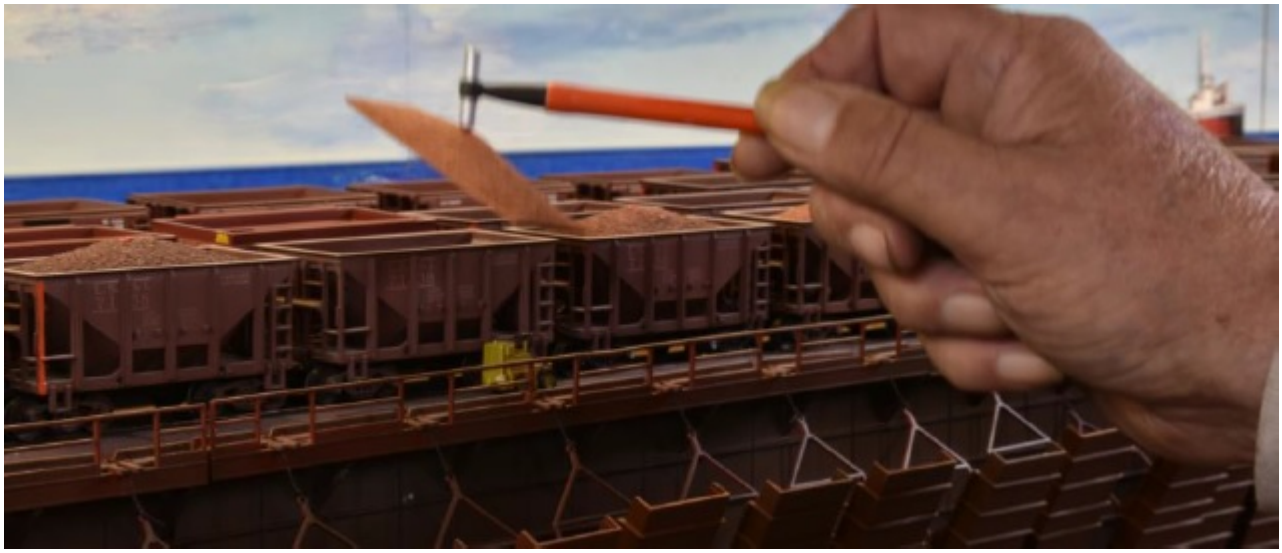
Red Ore	64
Blue Ore	44
White Ore	44
Yellow Ore	48
	=======
Loads =	200

Ore Dock Manager: _____

Completed Loading on : _____

This places the ore cars over the specified pockets as shown on the Boat Loading Order. As the loads are spotted over the correct pocket, and time is allowed for dumping, the loads are removed and checked off of the Boat Loading Order. Empty are cars removed as the cars are unloaded.

Picture unloading loads with magnet



Picture South Switch with another dock shove ready

Once the carloads are all checked off the Boat Loading Order, the boat is loaded and sails for the steel mill.

Picture of completed Boat Loading Order– signed and sailed

Loading Report for: **Louis Wilson Foy**

Sailing Date 3/22/18

Pocket	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2	Track 1	Track 2
20	Yellow		Blue		Yellow		Blue		Red	
21		Red		White		Red		White		Red
22	Yellow		Blue		Yellow		Blue		Red	
23		Red		White		Red		White		Red
24	Yellow		Blue		Yellow		Blue		Red	
25		Red		White		Red		White		Red
26	Yellow		Blue		Yellow		Blue		Red	
27		Red		White		Red		White		Red
28	Red		White		Red		White		Yellow	
29		White		Blue		Blue		Blue		Red
30	Red		White		Red		White		Yellow	
31		White		Blue		Blue		Blue		Red
32	Red		White		Red		White		Yellow	
33		White		Blue		Blue		Blue		Red
34	Red		White		Red		White		Yellow	
35		White		Blue		Blue		Blue		Red
36	Red		Blue		Red		Blue		Red	
37		White		White		White		Yellow		Yellow
38	Red		Blue		Red		Blue		Red	
39		White		White		White		Yellow		Yellow
40	Red		Blue		Red		Blue		Red	
41		White		White		White		Yellow		Yellow
42	Red		Blue		Red		Blue		Red	
43		White		White		White		Yellow		Yellow
44	Yellow		Yellow		Yellow		White		Yellow	
45		Red		Blue		Red		Blue		Blue
46	Yellow		Yellow		Yellow		White		Yellow	
47		Red		Blue		Red		Blue		Blue
48	Yellow		Yellow		Yellow		White		Yellow	
49		Red		Blue		Red		Blue		Blue
50	Yellow		Yellow		Yellow		White		Yellow	
51		Red		Blue		Red		Blue		Blue
52	Red		Blue		Red		Yellow		Yellow	
53		Yellow		White		Red		White		Red
54	Red		Blue		Red		Yellow		Yellow	
55		Yellow		White		Red		White		Red
56	Red		Blue		Red		Yellow		Yellow	
57		Yellow		White		Red		White		Red
58	Red		Blue		Red		Yellow		Yellow	
59		Yellow		White		Red		White		Red

Red Ore	64
Blue Ore	44
White Ore	44
Yellow Ore	48
	=======
Loads =	200

Ore Dock Manager: [signature]

Completed Loading on : 3/27/18

14

~~2.80~~ 2.96

A typical TRR operating session moves over 300 loads of iron ore from mines to the Allouez ore yard. The usual crew consists of a Dispatcher(1) , an Allouez General yardmaster(2), an ore dock manager(3), engine terminal manager (4), South Switcher(5), Chisholm Yardmaster(6), Virginia Yardmaster(7) and 4 to 6 road crews.

The Timber River Railway began ore operations over 50 years ago. The layout has progressed from rotary block switches to radio controlled DCC and has invited over 200 guest operators to participate in 332 TRR operating sessions. A computerized three colored signaled CTC block control system and a PBX telephone system help the train dispatcher control the traffic on the TRR. An average of 200 carloads of iron ore have been dumped at the Allouez ore dock during the operating sessions, amounting to over 66,000 carloads of iron ore loaded on Great Lakes ore boats by the Timber River. The TRR has digital counters at the scale locations, the car unloader and yard leads, to track car movements during an operating session.

In 2018 we scratch built an operating ' Car Unloader' with an ' Automated Car Mover' for handling pelletized ore (Taconite) and unit coal trains at Duluth. (More to follow)

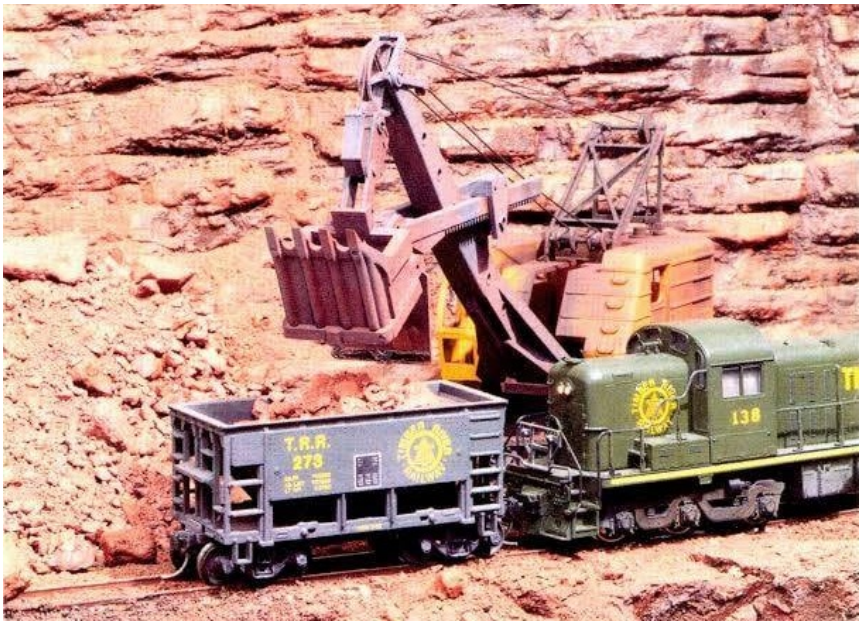
The TRR has been featured in Model Railroader magazine in January 1985, November 1992 and the 85th anniversary issue in January 2019. It was the cover feature in the Japanese “Railroad Magazine” in May of 1986 and has been a featured video on the Model Railroader Plus. Series. All Scale Rails has just published a 120 page book on the TRR titled *John Tews’ Timber River Line* by Bonnie Domrois with over 250 color pictures.

May you have “Clear Signals Always”,

John

Website
https://www.timberriver.net/

Facebook Page
https://www.facebook.com/groups/1591376621172524



Shovel loading ore at the Hill Mine at North Range on the TRR.

Lineside was a quarterly newsletter focused on many different industries not just steel mills. The articles that were about steel mills helped many modelers and help people to understand how the steel making process worked.

After receiving permission from Stan Knotts and John Teichmoeller, a few of these steel mill related article will be featured in issues of The Mill. Some of these articles maybe obsolete from the technology that we have today but there are great article none the less. These articles are photo copied from past issues. Thanks John and Stan for allowing these to be shared. Original article by Phil Baggley.

Lineside

The Iron and Steel Industry. Part 2

By Phil Baggley.

We have previously studied a plan of the Replogle Steel Company of Wharton, NJ, using it as an example of a blast furnace plant in service around the 1930's. Though rebuilt in the 1920's it is never-the-less quite representative of plant layouts dating from much later.

Before we take a close look at another site in greater detail, let us take a brief moment to consider some alternate plant arrangements. These arrangements can be broadly categorized into 3 types; straight line, echelon, and crosswise. In all these drawings the layout of the ore storage yard, the ore bridge and ore delivery tracks, and the blast furnace stock bins are the same.

This simplification allows us to concentrate on the the key elements of the blast furnace layout. Whilst the blast furnace stock bins would usually be adjacent to the furnaces, the area set aside for ore storage could commonly be some distance away. As modellers, this is an important point to keep in mind. Pikes built with typically narrow baseboards can capitalize on the siting of ore grounds in line with the furnaces instead of parallel. Such an arrangement will promote an increased volume of rail borne traffic between ore ground and blast furnace bunker, thus adding to the realism and operating potential.

Straight Line and Echelon Arrangement (Figs 1&2).

Whilst there are good reasons for choosing one or the other arrangement for a given set of circumstances, they do not strictly concern us here. More importantly, it is the way in which we plan to operate rail traffic around the blast furnace model which will influence the choice of best arrangement to adopt.

Arguably the straight line arrangement would suit a center aisle location very well. Iron and cinder traffic is handled from opposing sides of the blast furnace structure, which itself would form an effective view block. In this case the ore ground would benefit from being relocated to an area in line with the furnaces. The rail tracks serving the iron and cinder traffic would be adjacent to the baseboard edges.

The echelon arrangement (Fig. 2) lends itself to a narrow shelf layout where both the iron and cinder tracks are accessed from the "front". As before, the ore ground could be shifted to the side in line with the furnaces, or alternately depicted as a "flat" modeled in low relief against the backscene.

In this instance note that the iron ladles receive their charge of molten iron from below the cast house, not to one side. This is a useful feature that the astute modeler can take advantage of. Extend the tracks below the cast house through to hidden storage tracks and it would be very easy to set up an empty ladles in - full ladles out sequence. Anyone interested in expanding this theme might check out the superb track plan drawn up by Rick Mugele in the November 1973 Bulletin.

Crosswise Cast House Arrangement (Fig 3)

This third arrangement was favored when it was deemed important to have through rail tracks to avoid congestions, compact cast house, economy of size and offered relative ease of working with large capacity hot metal and cinder ladles. An open foundation was built around the base of each furnace with the cast house floor extending on columns and beams out over the tracks.

This arrangement offers much to the modeler who plans intensive operations, and may suit a club layout particularly well. The multiple tracks would make for interesting traffic movements. I have suggested the placement of a large mirror at XX where this arrangement might be built with stub end tracks. The illusion of depth that this would offer needs no further elaboration.

In all these cases note how tracks run below each dustcatcher - another facility requiring car movements. There are also tracks, independent of those dedicated to iron and cinder traffic, serving the cast house. Production and engineering sections need to have access for materials and equipment without interfering with the flow of iron and cinders. This is a 24 hour process and when ladles have been filled we wouldn't want any interruptions would we?

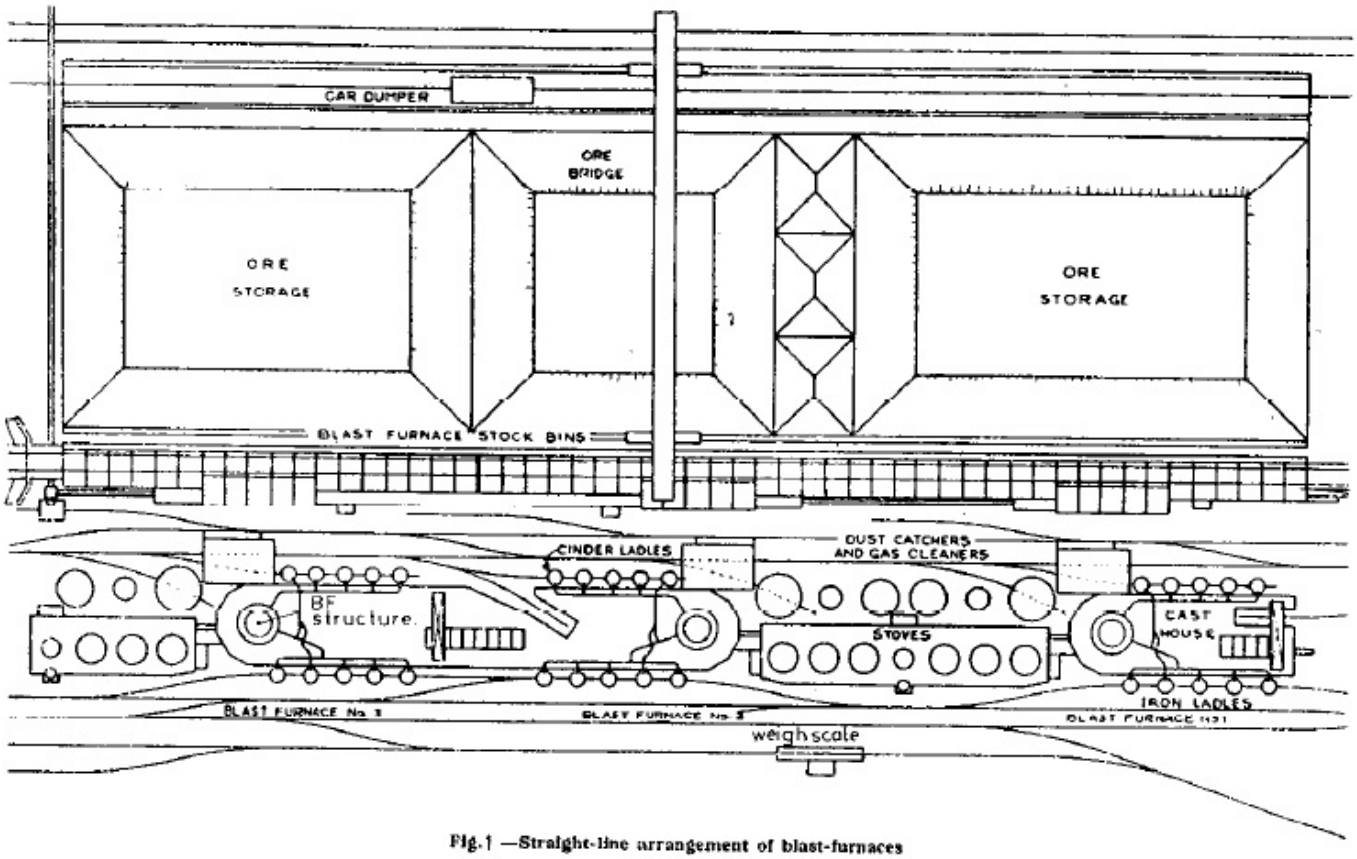


Fig. 1 —Straight-line arrangement of blast-furnaces

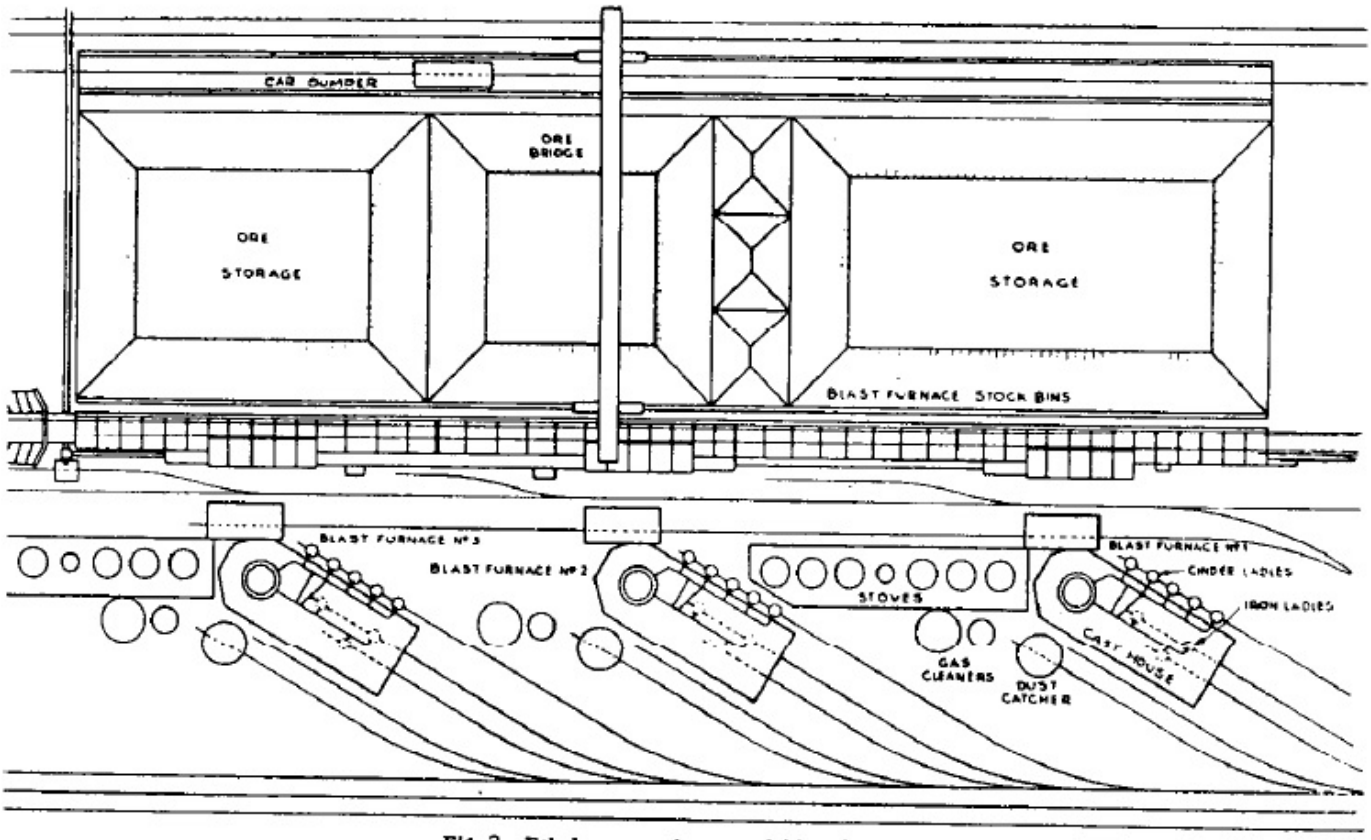


Fig. 2—Echelon arrangement of blast-furnaces

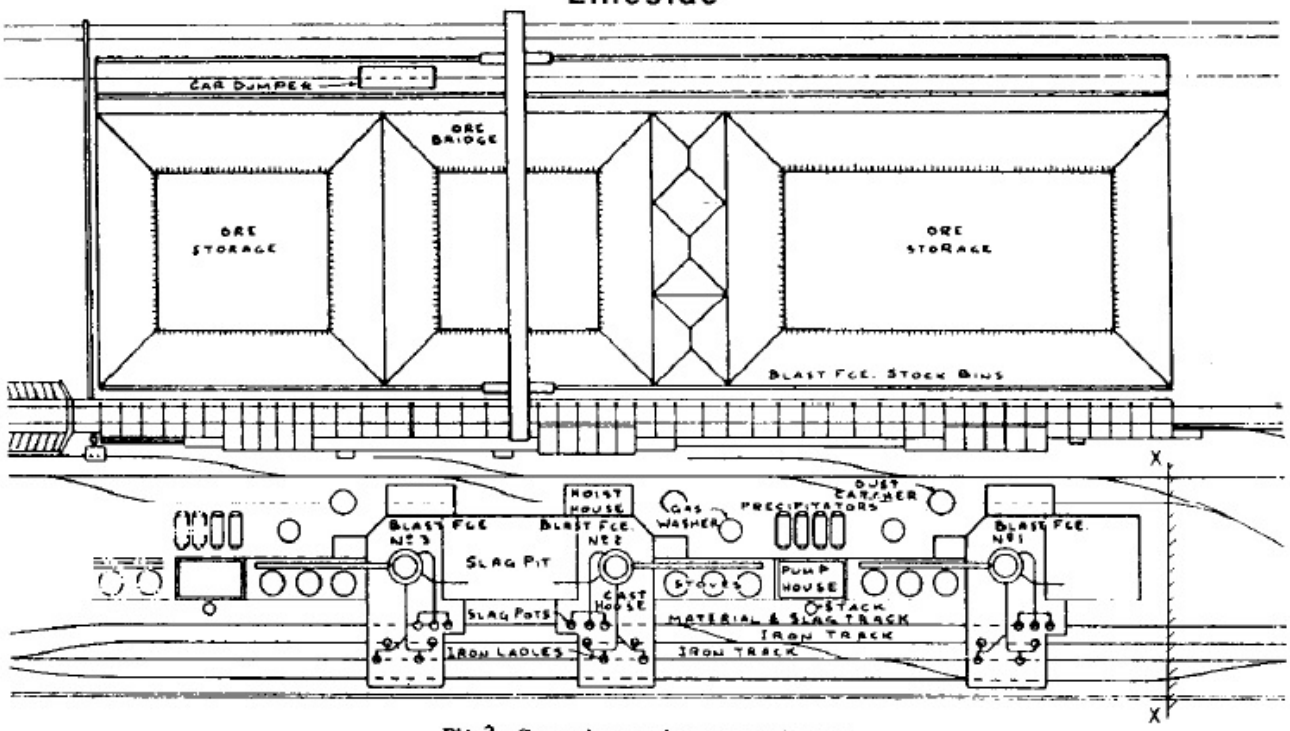


Fig. 3—Crosswise cast-house arrangement

Before we leave this part of the discussion, let us turn back to the flow of materials through the ore ground. The ore ground is nothing more than a large flat expanse usually covered with a selection of iron ores, and depending on circumstances, limestone and/or coke. It should be noted that one wouldn't normally expect to see coke stockpiled on the ore ground. There may or may not be a coke works near by but in either case one would expect to find bunkers dedicated purely for coke storage near the furnaces and additional coke supplies stored at some other nearby place.

The ore ground is serviced by a huge electric overhead traveling crane (the ore bridge) which may run on elevated rails supported by substantial concrete walls. The concrete walls also to contain the ore, etc. Figures 1 and 3 illustrate an arrangement where the ore ground is adjacent to to the furnaces and the ore bridge can recover ore etc. from the stock and fill the blast furnace stock bins (bunkers) direct.

Should the ore ground be some distance from the furnaces, then hopper cars or quite commonly a self propelled electric ore car (larry car) would deliver ore to the stock bins. There are tracks over the blast furnace stock bins for direct delivery of all raw materials.

<u>A closer look at blast furnace plant layout - the Trumbull Cliffs Furnace Co., Warren, Ohio.</u>

So far, we have looked at blast furnace plant layouts from a modelers perspective in fairly broad terms. The Trumbull Cliffs plant serves as a particularly good example of a single blast furnace site which will lead us to a closer examination of the facilities which surround the actual furnace. Once again this material is taken from a source published circa 1930 but it is still relevant for much later plants. At the time, this plant was state of the art in the U.S. Designed for a 600 ton daily capacity, over 100 tons per day had been produced. The installation consisted of a single furnace with provision for future extensions as well as for the addition of by-products coking plant. Ore and coke were brought in by the Pennsylvania and Erie railroads but a connection was later planned for the B&O. The plant was laid out primarily for the delivery of hot metal to the mixer (note 1. see appendix) at the open hearth furnace building of the Trumbull Steel Co.

The following were the approximate weights of materials dealt with each week:

Iron	5215 tons	Dolomite	605 tons
Ore	8917 tons	Coke	4475 tons
Cinder	2608 tons	Dust	335 tons
Auxiliaries	619 tons		
Limestone	1816 tons		

The ores and flux (limestone) arrived in 60 ton capacity cars, were unloaded by a dumper into an ore trough running parallel with the stock pile from which it was picked up by the ore grab (note 2). The car dumper was capable of handling up to 30 wagons per hour, or 1800 tons, the average service requiring 22 cars per hour. The ore and flux were delivered to the stock pile, or into the blast furnace stock bins direct by means of the ore bridge capable of handling 600 tons per hour and the larry car of equal capacity. The ore bridge span was 390 feet (54 inches in HO). The ore ground was 270' x 505' (37" x 70") with a storage capacity for 250,000 tons of ore and 80,000 tons of limestone.

The blast furnace stock bins comprised nine ore pockets, four limestone pockets and five coke pockets. In addition there was one central double compartment coke pocket, each delivering coke through a chute to the skip bucket over a rotary grizzly screen (note 3).

The scale cars were of the double compartment type equipped with air brakes, air operating doors and dial indicating and recording scales (note 4).

Figure 5 is a cross section through the plant. The furnace top was of the Freyer-Brassert standard double-bell design equipped with a McKee distributor. Access to the furnace top was by stairs up the skip incline and also by a bridge to an Otis elevator which served both the stoves and the furnace. The furnace was 92' high , 18'6" diameter in the hearth, 22'6" diameter in the bosh, 17' diameter in the throat, and had a capacity of 25,500 cubic feet. There were ten cast iron columns and ten tuyeres, arranged centrally between the columns. Three standard Freyer-Brassert design hot blast stoves service the furnace. The stack is 8' diameter and 225' high.

The blast furnace gas was taken off by four off-takes from an annular space around the large bell hopper. The uptakes led to four down-takes, each pair combining into one downcomer which entered the dust-catcher. The gas cleaning system was arranged between the boiler house and the blast furnace and consisted of one 22' diameter by 40' high dust catcher for primary cleaning. The gas then passed to a 12'6" diameter Brassert whirler where further flue dust was removed.

The hot metal was carried in 75 ton capacity Pollock ladles. Whilst the greater proportion of metal was taken direct to the steel works, a double strand Heyl and Pattison 120 ton per hour pig casting machine dealt with the surplus.

Now if the latter part of this description has left you somewhat breathless, relax. It has been necessary to record this here so that later we can refer back to it and put things into context. As we start to examine blast furnace construction piece by piece, the plan and sections illustrated in figures 4 & 5 will greatly assist in understanding how all of the parts fit together.

Finally, I want to draw attention to one important difference between the Trumbull Cliffs furnace described here and the Replogle Steel furnace featured earlier. The Trumbull Cliffs plan shows the cinder trough on the cast house floor running to a granulating pit, not into ladles standing on an adjacent road. Granulated cinders, made in spectacular fashion when water is added, are a salable commodity and clearly this furnace is set up to maximize revenue from what would otherwise be waste. I would however expect to see some facility for the removal of slag by ladle as an alternative to granulation. There are sound operational reasons for this, notwithstanding the fact that demand for granulated slag was/is subject to market forces.

Anyway, it is your model and you can dispose of slag any way you like.

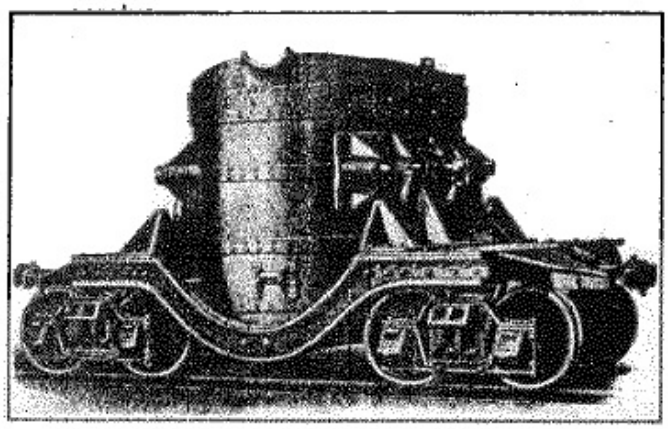
Appendix

Note 1: The mixer was a large capacity refractory lined vessel usually installed close to processes using molten iron as the raw material for subsequent work, eg open hearth and Bessemer steel making. It might typically be of 200 ton capacity and by nature of the fact that molten iron from the blast furnace was stored and "mixed" therein, any variation in metalurgical analysis would be smoothed out and countered by process adjustments.

Note 2: From the tonnage tables it is a straight forward task to calculate typical car loadings, useful in the preparation of a sequence timetable. It is possible to gauge the proportions between coke, ore, and limestone etc. delivered to the furnace so the modeler can make up his traffic pattern to suit. One quick conclusion is that there are two ladles of iron for every ladle of cinder.

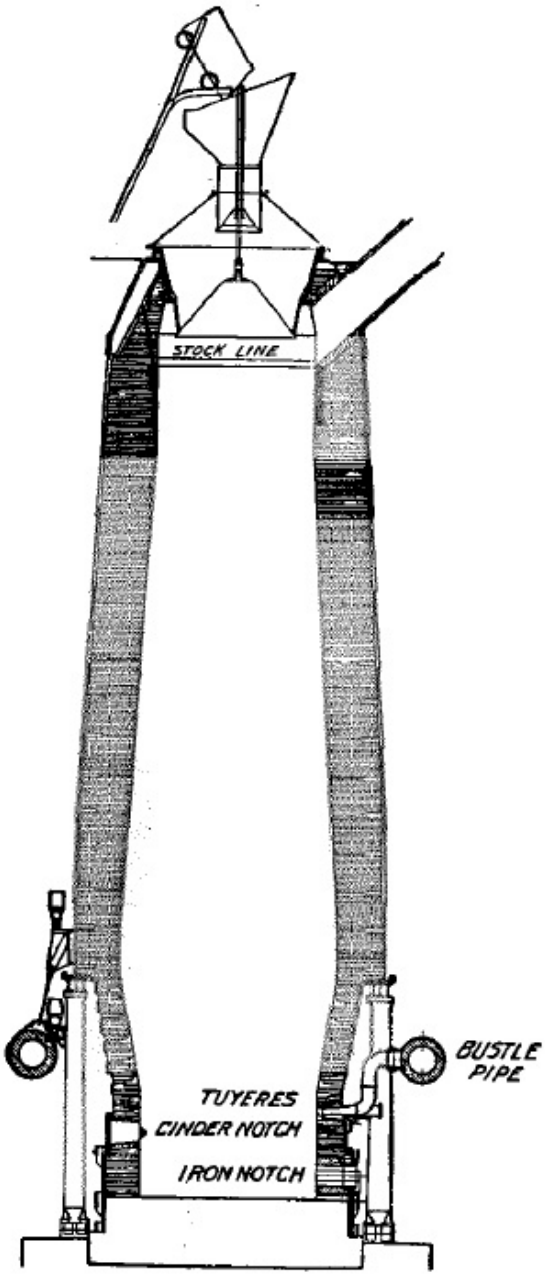
Note 3: It was of prime importance to ensure that only coke of a suitable size and strength was charged into the furnace. For this reason, the coke was screened as late as possible in the materials handling route to the furnace, ie underneath the stock bins and prior to the skip bucket. The screened fines (coke breeze) was recovered and recycled eg. at the sinter plant. More rail traffic!!

Note 4: The function of the scale car beneath the bunker was to receive from the stock bins the predetermined mixture of raw materials, weigh them, and release them to the skip bucket. They were fundamentally just an electric, self propelled shuttle incorporating a receiving hopper with bottom doors suspended on weighing



Treadwell hot-metal car.

THE BLAST FURNACE



VERTICAL SECTION OF A BLAST FURNACE.

Legend for Fig. 5

1. Pump house
2. Power house
3. Boiler house
4. Dust catcher and whirler
5. Downcomer
6. Cast house floor
7. Bleed valves
8. Bell operating levers
9. Skip hoist framework
10. Iron ladle
11. Coke breeze car
12. Larry car
13. Ore grab
14. Ore bridge
15. Stock bins (bunkers)
16. Blast furnace skip (1 of 2)
17. Scale car
18. Ore ground

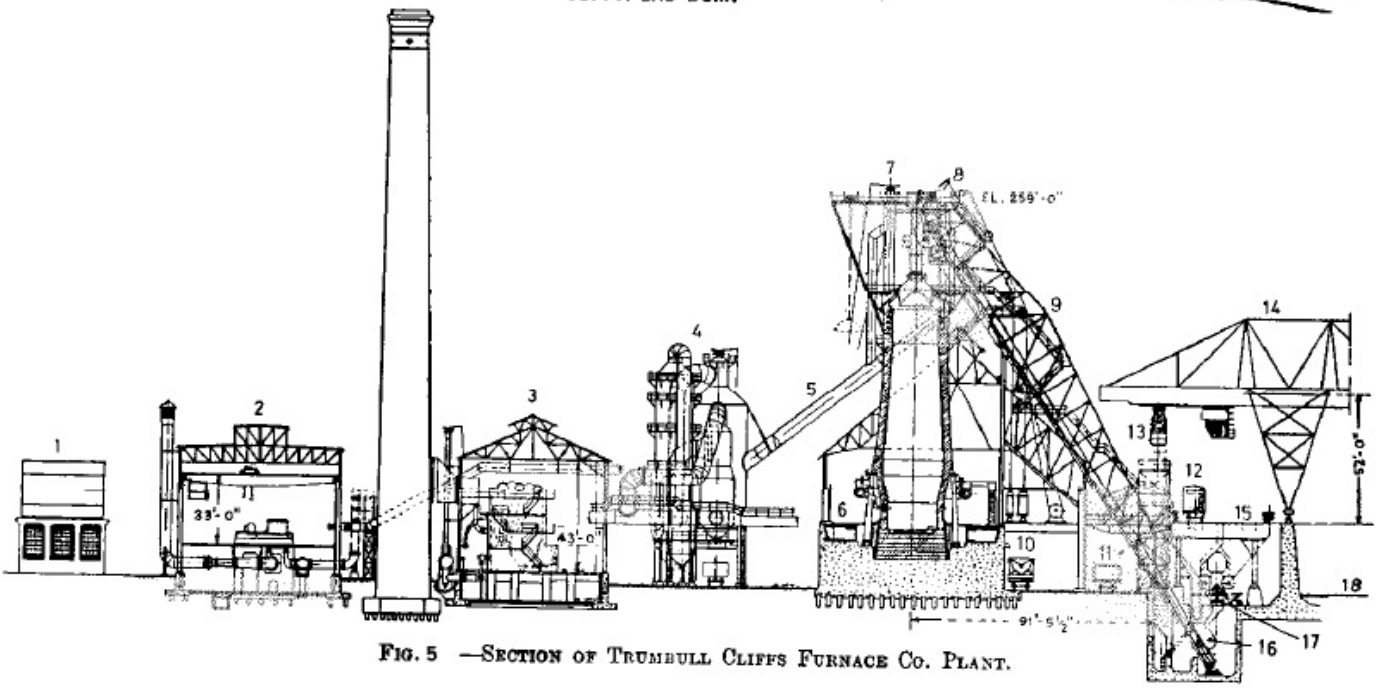


FIG. 5 —SECTION OF TRUMBULL CLIFFS FURNACE CO. PLANT.

Around the Mill

By Bill Parkinson

A freshly painted AIS / BHP D19 shunts a pollock ladle near No.5 blast furnace back in the late 1990's.

D43, on it's way from the builders, the English Electric Co. of Australia, situated in the Brisbane suburb of Rocklea Queensland to the Port Kembla steelworks of AIS in New South Wales, a distance of 650 miles. Photographed at Grafton in Northern NSW in 1973.

As BHP was a supporter of the year 2,000 Sydney Olympics. Before the start of the games a coal hopper was given a special paint job to help promote the Sydney games. BHP also supported local sporting clubs & painted coal hoppers in special schemes to promote them as the coal trains were the only company owned trains to run outside the works & could be seen by the general public. Surprisingly the hoppers remained reasonably clean considering the material they transported.

At the Port Kembla steelworks, coal that has been mined at the company pits is washed to remove impurities such as stone etc. before going to the coke ovens. This coal wash is then transported to a coal wash dump near one of the coal loading bins. the photo shows a trainload of wash being dumped before the train is shunted under the loading bins to transport coal back to the works. At the dump the wash is progressively buried under earth & vegetation planted to regenerate the land as can be seen in the distance.

An aerial view of the No.2 works of AIS Port Kembla taken in February 1960. In the foreground is the newly commisioned flat products area where plate, strip, coils & tinplate were manufactured

Back in the 1980's the State owned railway system was undergoing a modernization program resulting in mass scrapping of older rolling stock. Here are views of lines of 4 wheel general purpose open wagons awaiting their fate at the old No.1 scrap yard which itself was out of use & eventually went the way of the wagons.

A newly overhauled D8 hauling a rake of ingot buggies, the leading buggy is a B.O.S. unit. the remainder of the train is composed of No.2 open hearth buggies.

One weekend back in 1985 one of the loco crews marshalled some of the specially painted hoppers into a train & took them to one of the loading bins for a photo session. This is one of the shots.

D20 on loan to Lysaghts hauls a train of coils North on the Port Kembla main line. No.1 works is in the background with the No.1 open hearth building prominent. Behind is No.2 blast furnace.

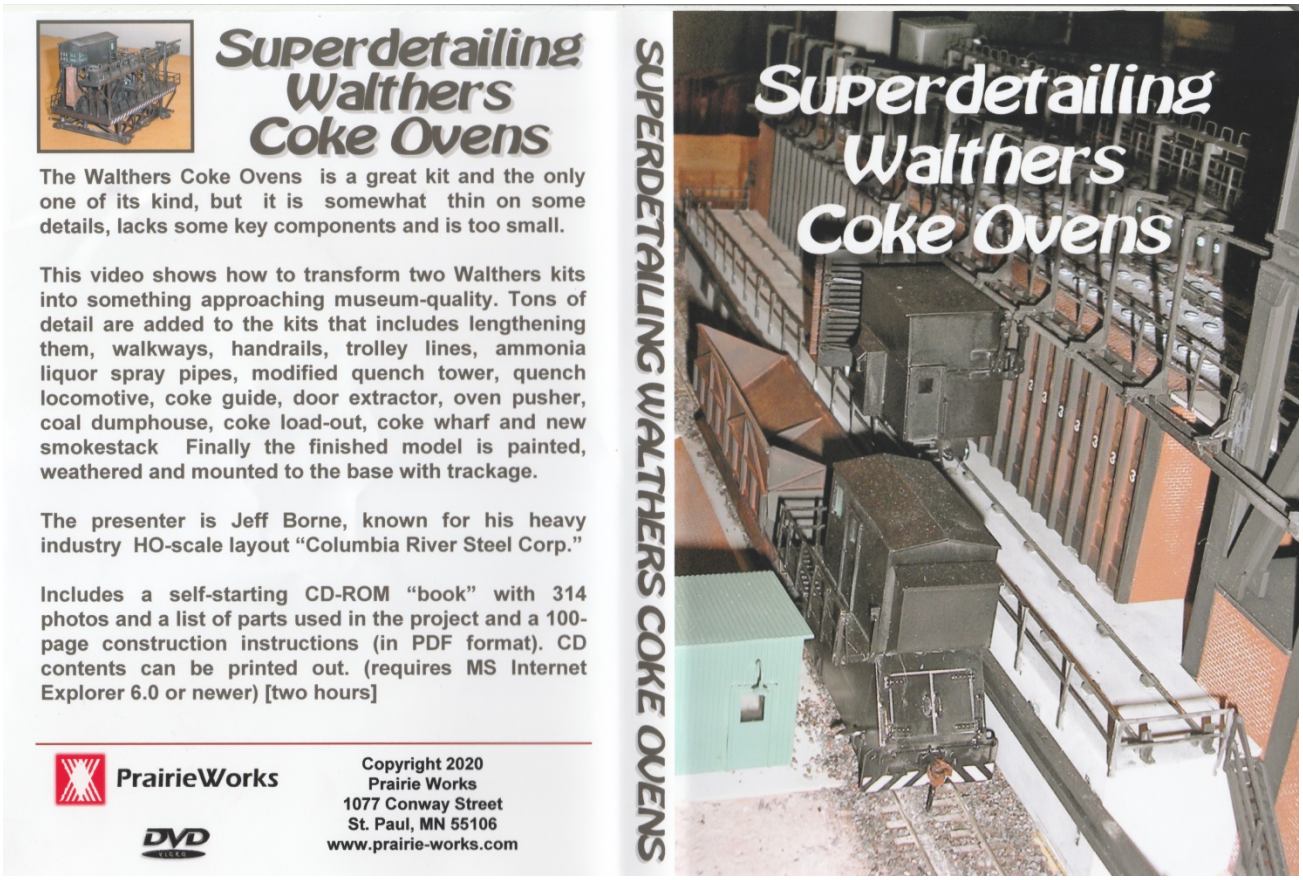
Some ingot action at the No.1 open hearth back in the 1970's AIS works Port Kembla.

All safe working movements at AIS Port Kembla are controlled by 2 way radio which most times works well however there are times when things do not go as planned. Back in the late 1960's D17 & D2 had an unexpected meeting on a blind corner inside the old No.1 works. Even though both locos have industrial strength underframes something had to give & in this case they both did. Both locos were repaired & served the works for many years after the incident.

D17 shunts the No.2 scrap yard with the now vanished No.2 open hearth building in the background back in the 1970's

D28 shunts a rake of ingot buggies near the No.2 open hearth scrap yard back in the 1980's. AIS works Port Kembla.

Review: Jeff Borne's Super Detailing Walthers Coke Oven.



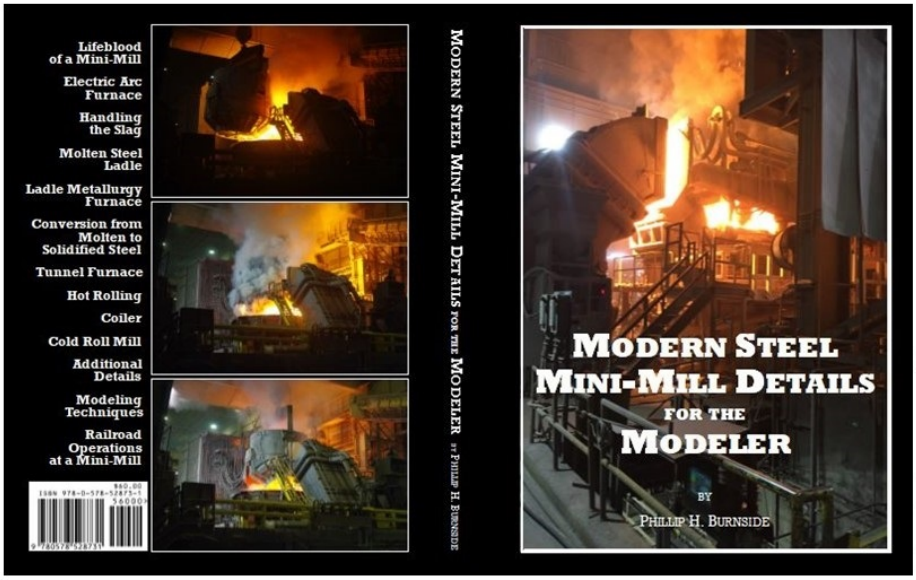
It has been 16 years since the last super detailing video by long time steel mill modeler Jeff Borne. In this new video, Jeff gives step by step instructions on super detailing the HO scale Walthers Coke Overs. Included with the video is a CD-ROM "book" with over 300 photos, a parts list and, 100-page instructions on the construction of this super detailed coke oven.

This video is a much need and welcomed video for steel mill modelers. Some of the instructions on the video may be hard to understand for a beginner but using the included instructions, photos, and parts list as guides anyone could make a nice model just like Jeff's coke oven. Even though the instructions are for HO scale, N scale modelers could adapt these techniques to N scale coke ovens too using the Walthers N scale coke oven.

Overall I say this video is a welcome video to the steel mill modeling community and, for $24.95 plus free shipping, I highly recommend this video. The video can be ordered from Jeff through his website. http://www.prairie-works.com/steel-mill-modeling.html

Happy Modeling

Modern Steel Mini-Mill Details for the Modeler order form.



Modern Steel Mini-Mill Details for the Modeler

by
Phillip H. Burnside
phillipsfoundry@yahoo.com

What started as a chance encounter with a Nucor company executive led to an incredible opportunity for private tours to photograph the interior of a modern steel mill. Knowing that most visitors are not allowed to take photographs inside these mills, and with the assistance of Nucor, the author is sharing his experiences and newly-found knowledge by writing this book. With over 300 photographs, drawings and diagrams, this book explains the various steps and describes the equipment used in a modern steel mini-mill. It also illustrates the techniques used to build a model of the Nucor facility in Crawfordsville, Indiana.

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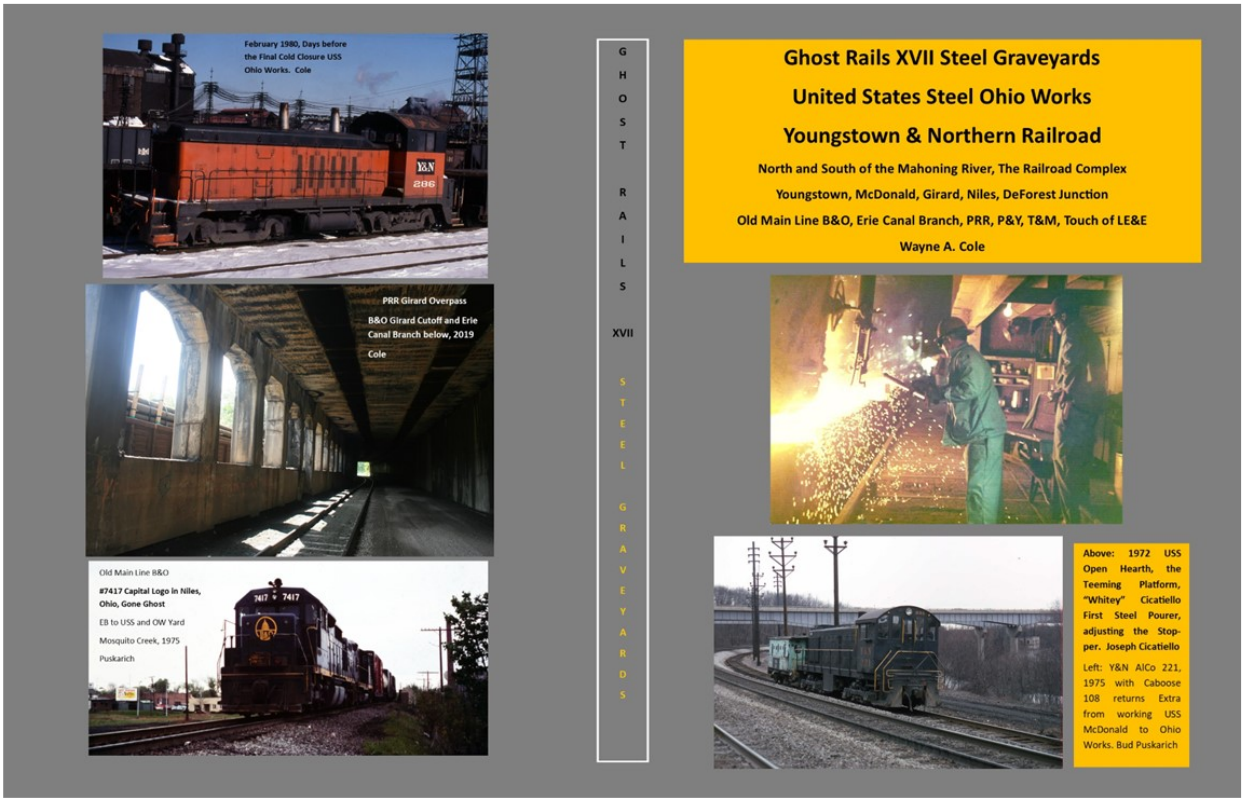
Ghost Rails XVII Steel Graveyards



Volume 17 Steel Graveyards is an intense United States Steel Ohio Works history and its railroad the Youngstown and Northern. About 200 pages of the 292 page, 44 color pages, hardback, details the massive plant and its entire history. Emphasis is on the open hearth, Bessemer converter, and blast furnaces. The open hearth in particular is manifested with unique 1970 employee photos. Numerous maps and charts manifest layouts and production flow. The 5 mile Y&N linked the USS Ohio Works and the USS finishing mill at McDonald. Volume 17 has well over 500 first time photos and outstanding timelines!

About 1/3rd of the book covers the very complex railroad layout on the north and south side of the Mahoning River. I did not intend to cover in Volume 17, but the Y&N was built upon the Painesville and Youngstown narrow gauge; thus, one history led to another and I had to have a good geographical end and beginning. I could not have **ghost rail loose ends** so to speak. Consequently, old main line B&O is detailed, P&Y (the unknown T&M) from Youngstown to DeForest, Erie Railroad from near Girard to DeForest, the Canal Branch, connection to Ohio Works, PY&A near Niles, Mineral Ridge RR, Ohio Central, LE&E, streetcar lines in Niles area. All this lead me to cover briefly AM Byers, Republic Niles, and a handful of smaller blast furnaces in Girard Niles area. Volume 17 is complex and an exceptional first time history. DeForest operation OML B&O, P&Y and Erie covered in depth.

There are a handful of other Ghost Rails 9, 12, 13, 15, 16 plus some coil bounds as Y&A or Y&S Special Edition available; email if interested. Prefer: **Books can be paid via PayPal Family and Friend to wacole@hotmail.com. Or send a $65 check for Volume 17 to: Colebooks, 1402 Seminole Circle, Beaver Falls, Pa. 15010 Add $10 for priority. Price listed includes shipping**

Because of the virus only a small number were printed, and I may be a little slower on shipping.

Name_____

Address_____

City_____ State_____Zip_____

Brief note:

Armco book in the works

Frank Sabo is currently writing a book on Armco Steel -AK Steel. He is looking for images of Armco locomotives both roster and action, rolling stock, and also photos of any of Armco's structures. These photos can be from any year or any plant. If you would like to make a photo contribution, please contact Frank by email. The book will be published by Morning Sun Books with a release date sometime in 2020. Frank Sabo can be contacted through his email SP_Lives@rocketmail.com or Facebook page. https://www.facebook.com/frankie.sabo

Photos by Brad McClelland

STEEL MILL MODELERS

A SPECIAL INTEREST GROUP (SIG) OF THE NATIONAL MODEL RAILROAD ASSOCIATION

MEMBER BENEFITS

●Priority registration for events.

●Annual Steel Mill Modelers Meet – The annual meet is held some time from mid-August through Labor Day weekend from Thursday evening through Sunday morning and features steel mill modeling clinics, layout tours and where possible prototype tours.

●Quarterly "Steel Mill Modelers Journal" – The journal serves as the official newsletter to members and contains articles and data that pertains' to steel mill design, operations and modeling. Also featured are product releases and how to find information.

●Clinic Slides and Presentation Material – Presentations from the annual meet are available.

●Plant Directory – Have your layout listed in the steel mill plant directory. Use this directory to contact other modelers who have steel mill operations on their layout.

●Reference Exchange – Share blue prints, photos, reference materials, member designed and constructed unique steel mill features and details.

●Dean Freytag award – Be judged by your peers and earn this prestigious award at the annual meet for excellence in steel mill modeling.

DUES

●$60.00 per year for US members

●$75.00 per year for International members (the additional dues for international members barely covers the cost of postage to send out the Journal).

For more information on dues, member benefits, membership, and the annual meet please contact the SMMSIG

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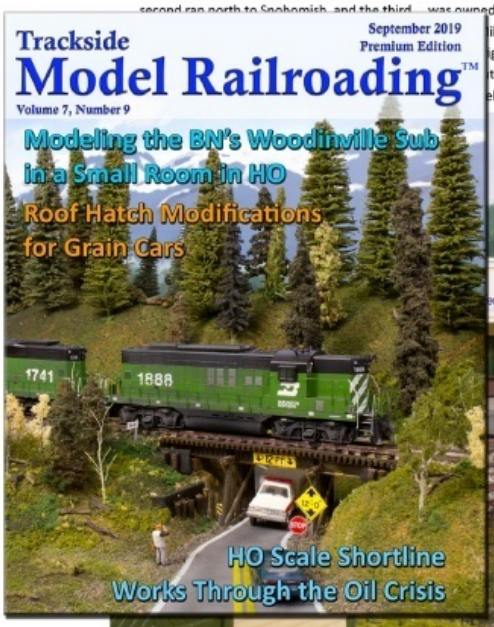
From Woodinville, one leg of the wye headed west to Bothell, Kenmore, and Seattle, the second ran north to Snohomish, and the third

CB&Q formed the Burlington Northern, the route known locally as the "Eastside Beltline" was owned by the BN. As a concession of the ilwaukee Road was granted ghts over the former Northern te and used it to access its remote ellingham, and Sumas operations to

the north. Unlike the BN, which operated mostly shorter locals on the line, Milwaukee ran long trains with six-axle GEs on a line that was never intended for such heavy service. Brian shared, "There are many reports that BN operators were shocked when they first

learned that Milwaukee was running 80-plus car trains over the line. After Milwaukee abandoned its 'Lines West' in 1980, the line reverted to its branch line status." The Woodinville Subdivision passed to the BNSF after the BN/AT&SF merger in 1996.



The Kirkland Turn travels through Redmond. The city is the southern terminus of Brian's Woodinville Sub layout. It sits east of Seattle on the other side of Lake Washington and at the north end of Lake Sammamish. It began as a logging town, first incorporating in 1912. It grew significantly in the 60s and 70s, partially thanks to a number of high-tech industries that made the town their home.

Resources

Steel Mill Related Videos

Green Frog Productions
*Styrene The Ideals, Tips and Techniques of Dean Freytag.

PCN Tours
*Joy Mining Machinery
*ArcelorMittal Steel

Pentrex
*Eastern Kentucky Coal

Pelts Express
*C&NWs Iron Ore Route
*Duluth, Missabe & Iron Range Vol 1
*Duluth, Missabe & Iron Range Vol 2
*Lake Superior & Ishpeming Vol 1
*Lake Superior & Ishpeming Vol 2
*Bessemer & Lake Erie
*LTV Ore Lines
*Missabe T-Birds
*Missabe Rails
*Missabe Winter Vol 1
*Missabe Winter Vol 2
*North Shore Mining Railroad
*Ohio Rails and the Wheeling & Lake Erie
*Railroads & Ships of U.S. Steel
*Taconite Trains of Minnesota Vol 1
*Taconite Trains of Minnesota Vol 2
*Birmingham Southern
*Elgin Joliet & Eastern
*Tribute to the Erie Mining Ore Lines
*Twin Ports Trackside Vol 1 Duluth Minnesota
*Twin Ports Trackside Vol 2 Superior Wisconsin

Prairie Works
*Hot Metal
* Union Railroad
* On the Great Lakes
* Lake Superior Iron
* Missabe Retrospective
* Duluth, Missabe & Iron Range Steam Power
* Duluth, Missabe & Iron Range Depots & Structures
* Taconite Haulers
*USS Duluth Works - Photo Video
*Super detailing a Walthers Blast Furnace Part 1
*Super detailing a Walthers Blast Furnace Part 2

Model Railroader's Dream - Plan - Build
* Railroads and Steel

Videotrain
*The Union Railroad

Steel Mill Related Books

*Morning Sun Books
By Stephen Timko
Steel Mill Railroads in Color Vol #1
Steel Mill Railroads in Color Vol #2
Steel Mill Railroads in Color Vol #3
Steel Mill Railroads in Color Vol #4
Steel Mill Railroads in Color Vol #5
Steel Mill Railroads in Color Vol #6
Steel Mill Railroads in Color Vol #7
Appalachian Coal Mines and Railroad Vol#1
Appalachian Coal Mines and Railroad Vol#2
Appalachian Coal Mines and Railroad Vol#3
Industrial Railroading Vol#1
Industrial Railroading Vol#1
Union Railroad Power In Color

Steel Mill Railroad Facilities and Equipment (eBook)

By Robert Wilt
Bethlehem Steel Company Vol #1, Obtaining – Transporting Raw Material, and Making Iron
Bethlehem Steel Company Vol #2 Making Steel, Finished Product Handling, and the Final Years

By David C. Schauer
LS&I Vol #1
LS&I Vol #2

By Richard C. Borkowski Jr.
Union Railroad In Color

By Kurt Reisweber & Brad Esposito
Pittsburg & Shawmut

*Model Railroader
By Bernard Kempinski
The Model Railroader's Guild to Steel Mill

*The Railroad Press
By Nevin Sterling Yeakel
Bethlehem Steel

*Plastruct
By Dean Freytag
The Cyclopedia of Industrial Modeling

*Walthers
By Dean Freytag
The History of Making and Modeling of Steel

Phillip H. Burnside
Modeler Steel Mini-Mill Details for the Modeler

All Scale Rails
John Tews Timber River Railway

*Wayne Cole
Rails of Dream
Y&S New Galilee to Youngstown Lisbon and Ohio River at Smith Ferry, steam, electric, diesel,

Beaver Valley RR coil company
5th Street RR in Beaver

Ghost Rails I
10 RR local histories Ellwood City, New Castle, Leetonia, Sharon, Erie Niles Lisbon RR, E&P RR

Ghost Rails II Western Allegheny RR,
Rt 422 Lake Arthur to Bradys Bend popular bk Lots of West Pittsburgh, Cascade Park, Kaylor, Queen Junction, Route 422 to East Brady

Ghost Rails III Electrics
East Liverpool, Calcutta, Beaver, Salem, Rock Springs Park Chester, Steubenville, Leetonia

Ghost Rails IV Industrial Short Lines
5 local rr histories, Wampum, Koppel, Beaver Falls, New Castle, Sandy Lake Note This book has the Beaver Valley RR from steel mill perspective quite different from the other Beaver Valley RR book listed above. Covers early German Koppel Car Company.

Ghost Rails V PRR Butler,
Allegheny River to Butler USS Sintering Plant and steel mill sintering process

Ghost Rails VI Harmony Route
(Beaver Valley Traction included) Tons of very local history, popular bk Lots of Ellwood, New Castle, Koppel, Beaver Falls, Butler, Pittsburgh

Ghost Rails VII Short Line
Pittsburgh to Butler, other half of Harmony line history.

Ghost Rails VIII B&O Northern Sub
Butler, Foxburg, Marienville , Mt Jewett, K&K RR, Kinzua Bridge, a little Tionesta Valley, Kane

Ghost Rails IX State Line Legend
New Castle dynamite. Bessemer, P&LE Gateway yards, Sharon Steel Lowellville plant, critters, Narrow gauge, industrial limestone operations, Mt Jackson, Lowellville,

Ghost Rails X Iron Phantoms
Aliquippa and Southern J&L Very popular steel mill book. Just had a very limited reprint March 2018

Ghost Rails XI Shenango Valley Steel
New Castle to Sharon Sharon— tons of New Castle, history of Sharon Steel, Youngstown, Center Street, NS to Hubbard and Sharon. Good complex history!!

Ghost Rails XII Seamless B&W History
Beaver Falls, Ambridge, Koppel touch of National Electric, Armco, AM Byers, PRR Economy Branch. Good steel mill history Beaver Valley

Ghost Rails XIII Hilliards Branch
Butler County, and North Bessemer, Unity RR, Pa. Turnpike, PRR Plum Creek in Verona

Ghost Rails XIV Hallowed Ground
Conneaut Lake, Linesville, Meadville, Mercer, Cheswick and Harmar RR, B&LE history, Harwick Coal Mine and Pa. greatest coal mining disaster

Ghost Rails XV Monongahela
Connection RR, Pittsburgh J&L, extensive Pittsburgh history, Allegheny and South Side, PRR Whitehall Branch, B&O in Glenwood, sister book of Volume 10

Ghost Rails XVI Republic Steel Youngstown
Detailed history of Republics Steel Youngstown from 1850 to its demise in 1980s and the aftermath.

Keystone Driller history
industry in Beaver Falls, early well drilling, steam, diesel, electric

Youngstown and Southern / Pittsburgh Lisbon and Western
Special Edition to Dick Mumma last Y&S Superintendent, Coil bound, 75 pages / 26 color, new photo collection covers Ohio Central Y&S operation and Y&SE to 2018

Steel Mill Related Websites

Groups
*Steel Mill Modelers Special Interest Group
http://www.smmsig.org/

Facebook:
*Bessemer Subdivision
https://www.facebook.com/groups/787429424621662/?fref=nf
*Bessemer and Lake Erie Railroad Sightings Page
https://www.facebook.com/groups/1029716723816394/
*Birmingham Southern-Fairfield Southern
https://www.facebook.com/groups/337021349697833/
*BSRR/FSRR
https://www.facebook.com/groups/471524686212350/
*Coal Critter of Kentucky
https://www.facebook.com/groups/446906699000395/
*Harrisburg Terminal Railroad
https://www.facebook.com/Harrisburg-Terminal-Railroad-271356453384157/
*Chicago Area Steel Mills
https://www.facebook.com/groups/1679894998965838/
*Hot Metal Trains
https://www.facebook.com/groups/1143908999010704/
*Iron Ore Modeling
https://www.facebook.com/groups/559496990829520/
*J&L Narrow Gauge Railroad
https://www.facebook.com/groups/rolling.ingot/
*Munhall, Bessemer and Port Perry
https://www.facebook.com/munhallbessemerandportperry/
*New Boston Steel Mill and Coke Plant
https://www.facebook.com/groups/349284928484151/
*Timber River Railway
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*The Splitrock Mining Company layout
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*Steel Mill Modelers
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*Steel Mill Modeling
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Facebook: Continued

*Steel Mill Pictorial
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*U.S. Steel Duluth Works
https://www.facebook.com/groups/101591233225098/
*Youngstown Steel Heritage
https://www.facebook.com/SteelHeritage/

Photographs
*2007 Steel Mill Modelers meet
http://www.pbase.com/jtunnel/2007_steel_modelers_meet&page=1
*Arthur's Albums and Images
http://www.rmweb.co.uk/community/index.php?/gallery/member/6861-arthur/
*Birmingham Rails
http://www.bhamrails.info/
*Rick Rowlands
https://www.flickr.com/photos/33523379@N03/sets/
*The Rust Jungle
http://www.therustjungle.com/

Layouts:
*Acme Steel Riverdale BOF & Chicago BF Modeled in HO scale(1/87**)**
http://www.trainweb.org/chicagosteel/index.htm
*Bethlehem Steel Layout
http://www.brokenbushandroundtop.com/bethlehemsteel/
*Columbia River Steel Corporation
http://www.prairie-works.com/crsc.html
*Dave Scale Modeling
http://daveayers.com/Modeling/Steel.htm
*DK Recycling
http://www.frankshuette.de/
*Forsten Online
http://www.stahlbahn.de/index.php
*Harrisburg Terminal Railroad
https://www.facebook.com/Harrisburg-Terminal-Railroad-271356453384157/
*Pittsburgh and Western Railroad - Paul Lapointe
http://www.coaldivision.org/pittsburgh_and_western.html
*Pittsburgh, Youngstown & Ashtabula RR
http://www.pyamodelrailroad.com/
*Stahlbahn
http://www.stahlbahn.de/index.php
*Republic of Train World
http://trainworldcity.webs.com/apps/blog/show/43914314-the-trainworld-city-steel-works-and-duluth-works-

Blogs
*KV&O and D&D Mining & Steel
http://doncsx.blogspot.com/
*Musser Steel Mill
http://mussersteelmill.blogspot.com/
*The Mill
https://steelindustray.blogspot.com/

Hobby Shops
*Industrial Model Shop
http://industrialmodelshop.com/
*Joswood
http://lasercut-shop.de/Joswood-Ltd
*KenRay Models
https://kenraymodels.com/
*State Tool & Die
http://www.statetoolanddie.com/

Yahoo Groups
*Harrisburg Terminal Railroad
https://groups.yahoo.com/neo/groups/htrrco/info
*Steel
https://groups.yahoo.com/neo/groups/steel/info

Podcast
*A Modelers Life
https://www.amodelerslife.com/
*Model Railroad Hobbyist podcast
http://model-railroad-hobbyist.com/podcast/episodes
*The Roundhouse
http://theroundhousepodcast.com/

Manufactures
*Adair Shops
http://adairshops.net/index.php
*FireCat Designs
http://www.firecatdesigns.com/home.html
*Plastruct
https://plastruct.com/
*State Tool & Die
http://www.statetoolanddie.com/
*Steel Mill Modelers Supply
https://www.facebook.com/steelmodelerssupply/

Museums
*Youngstown Steel Heritage
http://www.todengine.org/

Steel Mill Related Picture CDs

Prairie Works
http://www.prairie-works.com/
* Minnesota Iron & Steel
* Heavy Industry Postcards
* Coper & Nickel
* Tod Engine Project

Any steel mill related videos, books or website that should be included on this list please send information to don_csx@hotmail.com