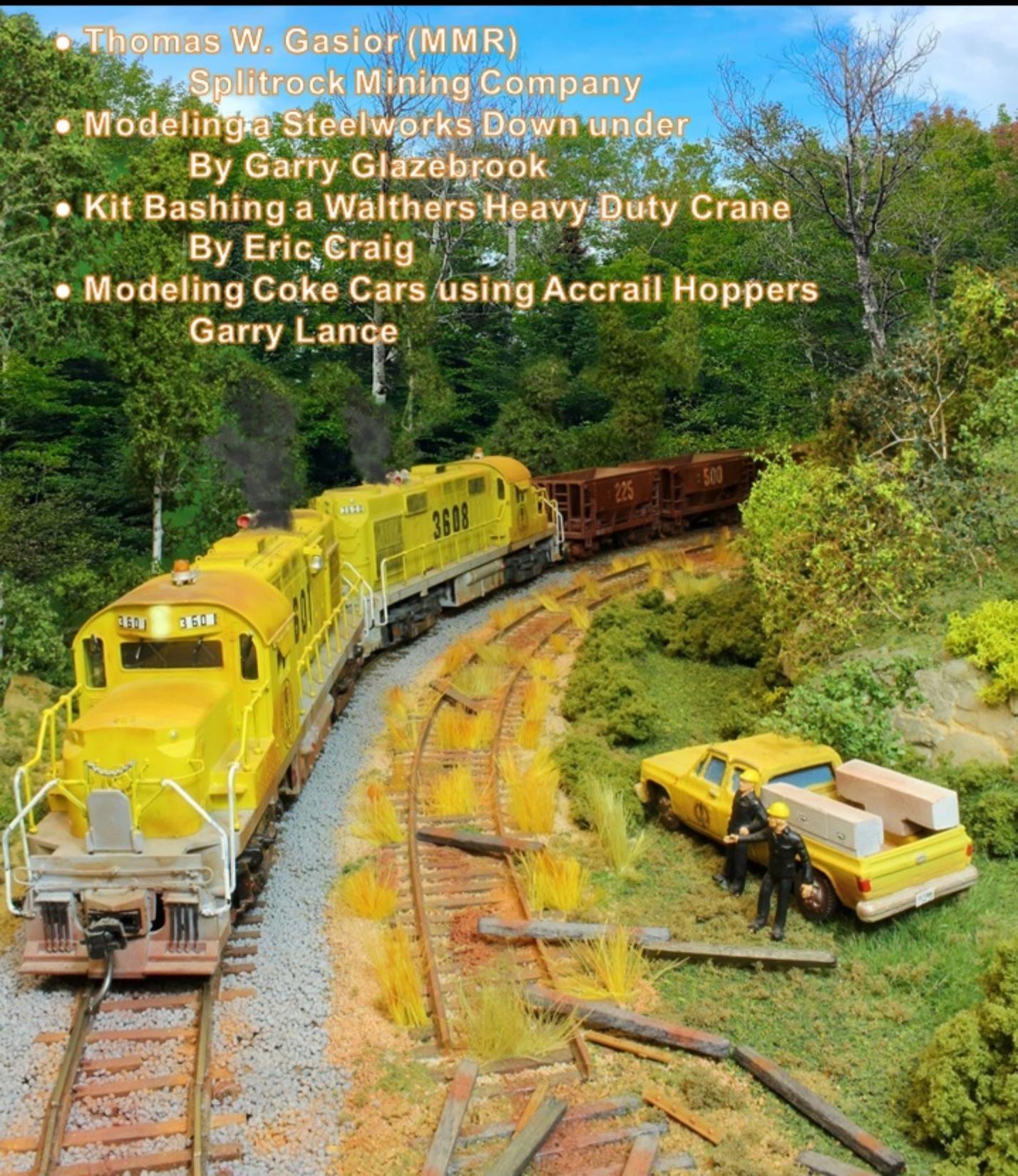


# THE MILL

Oct. 2019  
Vol.3 Num.4

- Thomas W. Gasior (MMR)  
Splitrock Mining Company
- Modeling a Steelworks Down under  
By Garry Glazebrook
- Kit Bashing a Walthers Heavy Duty Crane  
By Eric Craig
- Modeling Coke Cars using Accrail Hoppers  
Garry Lance



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## 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,  
Oct 1st, 2019: 1,716 members  
<https://www.facebook.com/groups/708840849171343/>

The Steel Mill Pictorial group was founded July 14, 2017,  
Oct 1st, 2019: 681 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](mailto: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 God Bless you all.

Don Dunn  
Editor

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### Cover

A pair of RS-36's bring a train of empty ore cars into Vermillion Yard past the abandoned switch lead on Thomas W. Gasior's (MMR) Splitrock Mining Company layout

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### Submission information

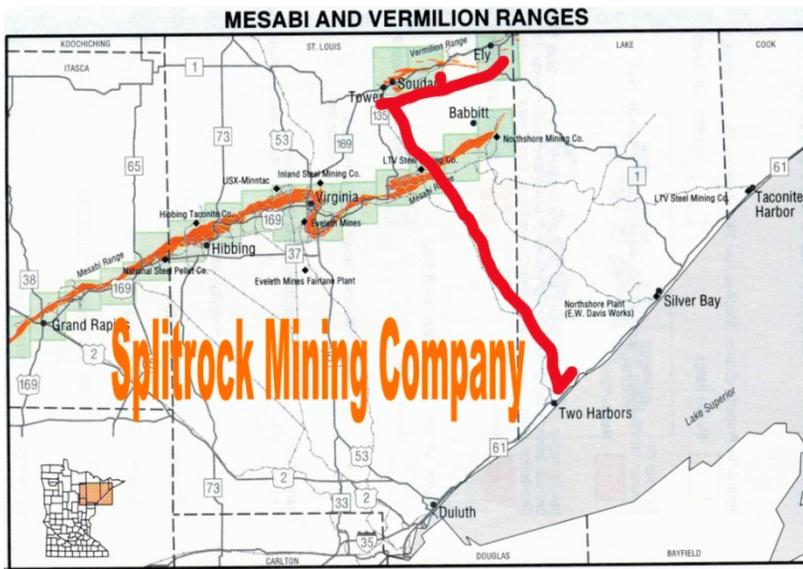
Any one who would like to submit pictures, articles, club news, upcoming shows or evens to be placed in future issues of The Mill, please send an email to [don\\_csx@hotmail.com](mailto:don_csx@hotmail.com). Pictures used have be of your own collection or used with permission. When submitting pictures the bigger the better for detail purposes.

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## Modelers Corner

Splitrock Mining Company By Thomas W. Gasior (MMR)

The Splitrock Mining company was formed in the mid 1950's by four major steel operators. These were Pickands Mathers, Cleveland-Cliffs, Bethlehem Steel and Inland Steel. Minnesota enacted the taconite tax breaks during this time to help the mines in northern Minnesota stay relevant with the depletion of the soft ores from the Mesabi Iron range. New taconite processing plants and even two new companies with their own railroads were built. Reserve Mining had a railroad from the open pit in Babbitt, MN to the processing plant on the shore of Lake Superior in Silver Bay. Erie Mining Company had an open pit and processing plant in Hoyt lakes and ran trains down to Taconite Harbor.



Red line indicates the route from the Vermillion range to the North Shore of Lake Superior.

All this influx of money and joint creation was being lost on the smaller operations in the Vermillion Iron Range near the Canadian border. With some political wrangling and the help of the big steel companies, Splitrock Mining was born to start underground mining in Sudan and Ely, MN. The Splitrock Mining Company could compete with the taconite plants even if underground mining cost a bit more than the usual open pit strip mining. The ore in the Vermillion Range is so rich in iron content, that it needs no costly processing like the low quality iron found in taconite rock. It is said that you could take two pieces of ore from the Vermillion Range and weld them together. This combined with modern underground mining technology and machines, helped keep costs down and the ore flowing, along with all those payroll checks.



A mine run on the way to Ely, MN passes the job working in Soudan at the Elizabeth Mine.

I built my layout based on the Erie Mining and Reserve Mining principles. A wholly owned railroad that only exists as a conveyor of the mines product. No side business of pulpwood, lumber or other things most shortlines and class ones partake. This was not a railroad for hire. That is one of the reasons I specifically named it the Splitrock Mining Company, and not railroad. I basically model a 4' 8 1/2" wide conveyor belt.

The other contributing factors in my decision making process was modeling the Vermillion Range is unique. Plus moving iron ore instead of taconite creates switching, as the ore has different iron content in each car, instead of a unit train of 150 cars all carrying the same product. I like to operate and switch cars.

I modeled two mines for a local turn to service. I named them after my Wife and my Daughter. The mine runs bring strings of ten empty ore cars to the mine for loading, and bring back the loads to a small gathering yard in Tower, MN.



Alco's RS-32 bring a trainload of iron ore into Agate Bay as the yard job sorts a string of cars to be shoved onto the ore dock.

Operations include three jobs. The mine runs, which bring empty ore cars to the three loaders between the two mines. They also pull the loaded cars and spot the empties under the flood loaders. No switch jobs at the mines. The road train job brings long strings of empty ore cars to the yard in Tower, MN. They then double up tracks of loaded ore cars and bring them to the yard at Agate Bay, MN. This yard is located north of Duluth about 26 miles. The switch job then cuts the road train in half and weighs the cars. Then they are sorted into classification tracks based one their iron content. Then blocks of cars are put together to be shoved onto the ore dock. Each ore boat takes seventy two loads to fill. This is eight shoves of nine cars each. The grade or type of ore is specified by the colored map pins stuck in the ore loads. There are five different colors currently.



A mine run spots and pulls cars at the mine in Ely, MN.

There is no staging and operations could go on 24/7. The boats get filled and sail downbound to the mills. A new boat is docked, or the paper map placed on the cork board above the dock.

The layout fills a single car garage and is double decked. Powered by Digitrax DCC and Soundtraxx decoders. Current power is Atlas and Proto Also diesels. More models are in the shops. The Alco catalog had RS-11, 27, 32 and 36's in the mid 1950's. I model 1969 so I can have most of the Alco Centuries as well. Look for a few RSD-12's to make an appearance soon. I hope you enjoyed your visit to the Splitrock Mining Company. Please check out my Facebook Page and YouTube channel. Now, who needs some High grade Vermillion Ore for their Furnace?

Facebook Page

<https://www.facebook.com/The-Splitrock-Mining-Company-layout-326394957565987/>

YouTube Channel

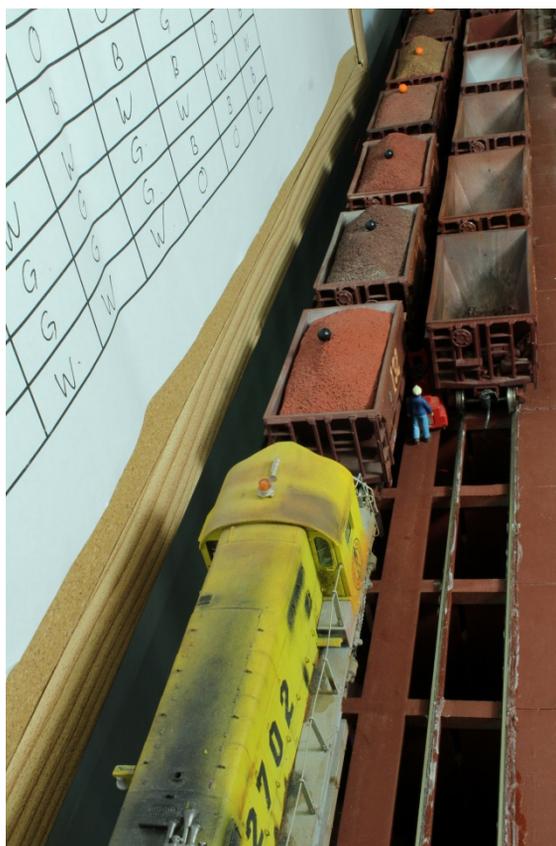
<https://www.youtube.com/channel/UCY82W8SltR64ZNaczEV22MA>



Two demonstrator C-430's cut off from a loaded train near the main drag of Agate Bay.



A long string of empty ore cars trail some new power at the scenic Dahl River Bridge. Ranger Gord watches for any signs of a fire in the Superior national Forest.



RS-32's pulling empties north as a loaded mainline train rolls south to the yard and dock in Agate Bay.

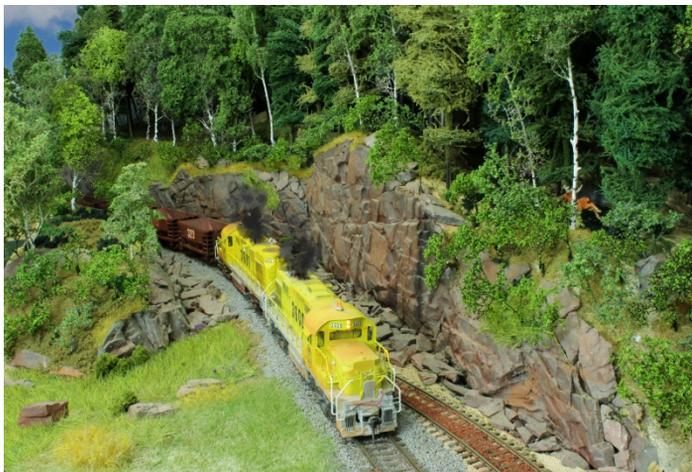
The dock job shoves another string of loads onto track 2 as a worker gets the Trapper machine ready to open the bottom doors as soon as the cars are spotted over the correct pocket and the power is cut away.



The arrival tracks in Vermillion Yard run along side some ponds and muskeg. The geese and ducks are used to the passing of ore trains.



A southbound train exits Dossa Tunnel on it's way to Agate Bay.



A great place to catch the mine runs is the rock cut just outside Soudan. Here a mine turn makes its way north with empties rolling past the Birch trees and pines of northern Minnesota.



The yard job has a cut of cars being rolled over the Fairbanks Morse track scale.



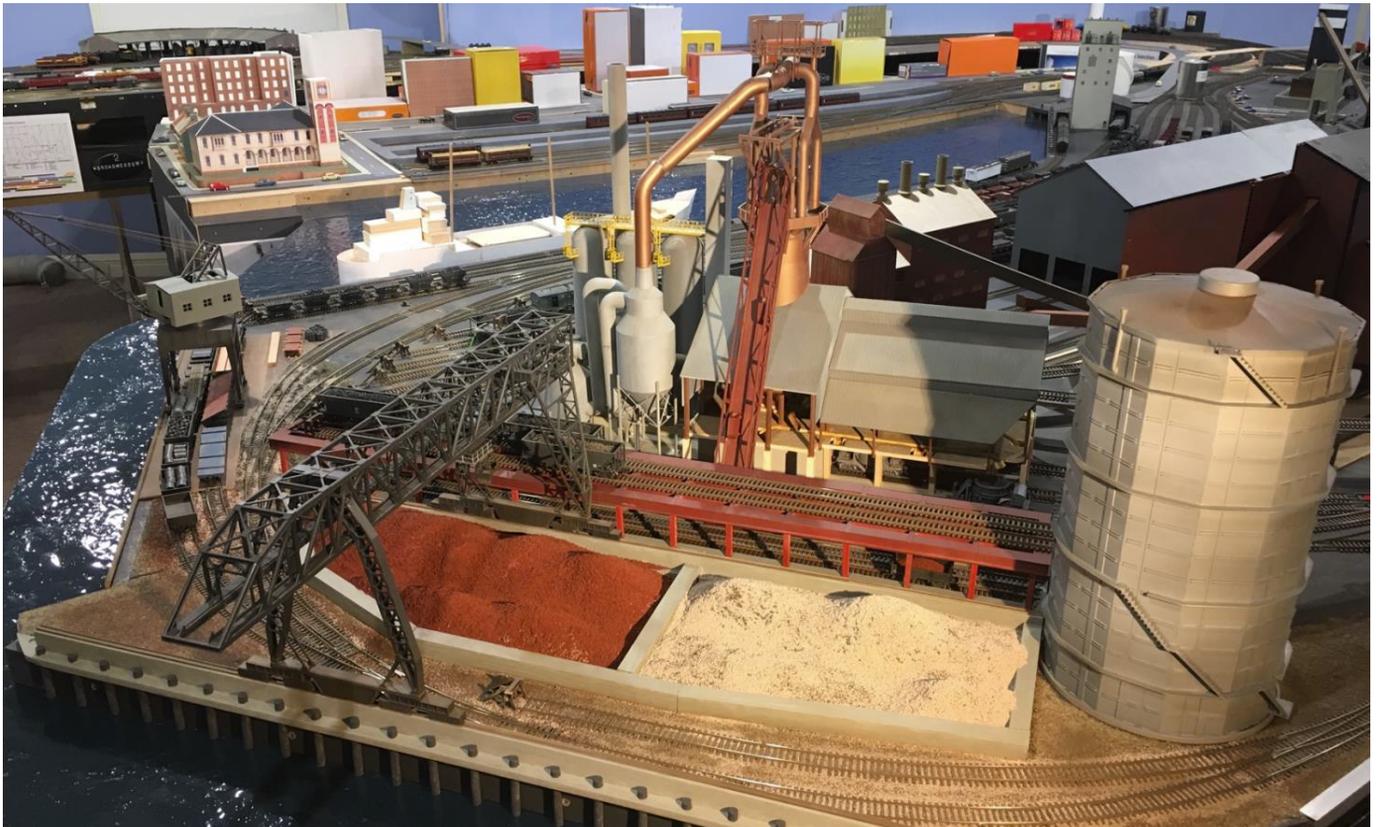
Clear skies along the North Shore are filled with brake shoe smoke several times a day. The 3210 leads two more Alcos into Agate Bay Yard with a heavy train of iron ore. The guys on the RIP track are oblivious to the scene and carry on fixing a truck on a B/O ore car. The yard power will grab these loads and sort them as soon as the caboose is cut off and put to the caboose track on the other side of the mainline.



One of the scenic highlights of the mainline is a cut along Loon Lake. The crews have dubbed this location Willow Curve. The large weeping willow tree gives the local pair of Loons swimming in the lake some shade for their fishing. Sharp eyed railfans might catch the pair of bald eagles nesting in the top of a dead tree on the far shore.



**Figure 1: BHP Steel works with Port Waratah and Newcastle in the background;**



**Figure 2: Model Version (as at September 2019).**

## Introduction

Australia is one of the world's major suppliers of both coal and iron ore, and Newcastle, which is the basis of my model railroad, is today the world's largest coal export port. Unfortunately, the BHP steel works in Newcastle (Figure 1) was closed in 1999 and much of the plant was demolished soon after.

However, as I'm modelling 1965, I had to include the steel mill, which at that time was a scene of bustling activity (Figure 2). This article will briefly cover the history of the mill, and then discuss how I attempted to represent it on my layout, both physically and operationally.

## The BHP Steelworks

Broken Hill Proprietary Limited was originally established in 1885 to exploit the fabulous silver, lead and zinc deposits in the Broken Hill area in Western New South Wales, about 1000 km west of Sydney and close to the border with South Australia. BHP went on to become the world's largest mining company, with mines and other facilities in many continents. But for over 80 years, BHP was also a significant steel producer, indeed Australia's largest.

By 1910 Australia was beginning to develop its industries, and in 1912 BHP decided to diversify its operations from mining into steel making. Newcastle was a significant coal mining district by then, and was already exporting the black gold to many countries. After an evaluation of potential sites, BHP decided to establish an integrated steel mill in Newcastle, which also had a supply of skilled labour and a large flat site on the Hunter river with rail access. Figure 3 shows construction underway in 1914, with an early ore bridge (See references for sources of photos etc).

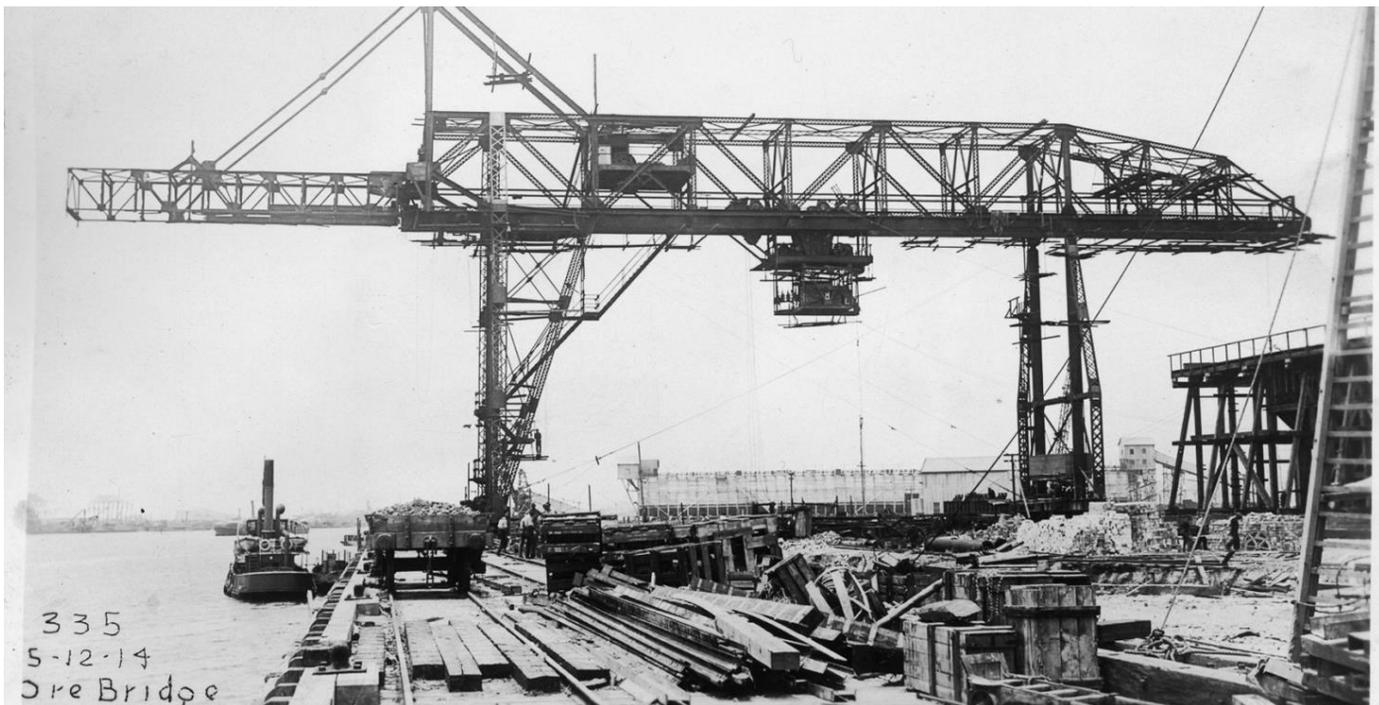


Figure 3: The Steelworks under construction in 1914, showing an Ore Bridge

BHP also established a steel mill at Whyalla in South Australia, which had an excellent supply of high-quality iron ore nearby. Iron ore was shipped from Whyalla to Newcastle in a fleet of BHP owned ocean going ships, with Newcastle coal and coke back-hauled to Whyalla. The Newcastle Steelworks developed steadily, spurred on by the need for steel in World War 1 and World War 2. By the 1960's there were four blast furnaces, steel-making facilities, rolling mills etc (Figure 4).

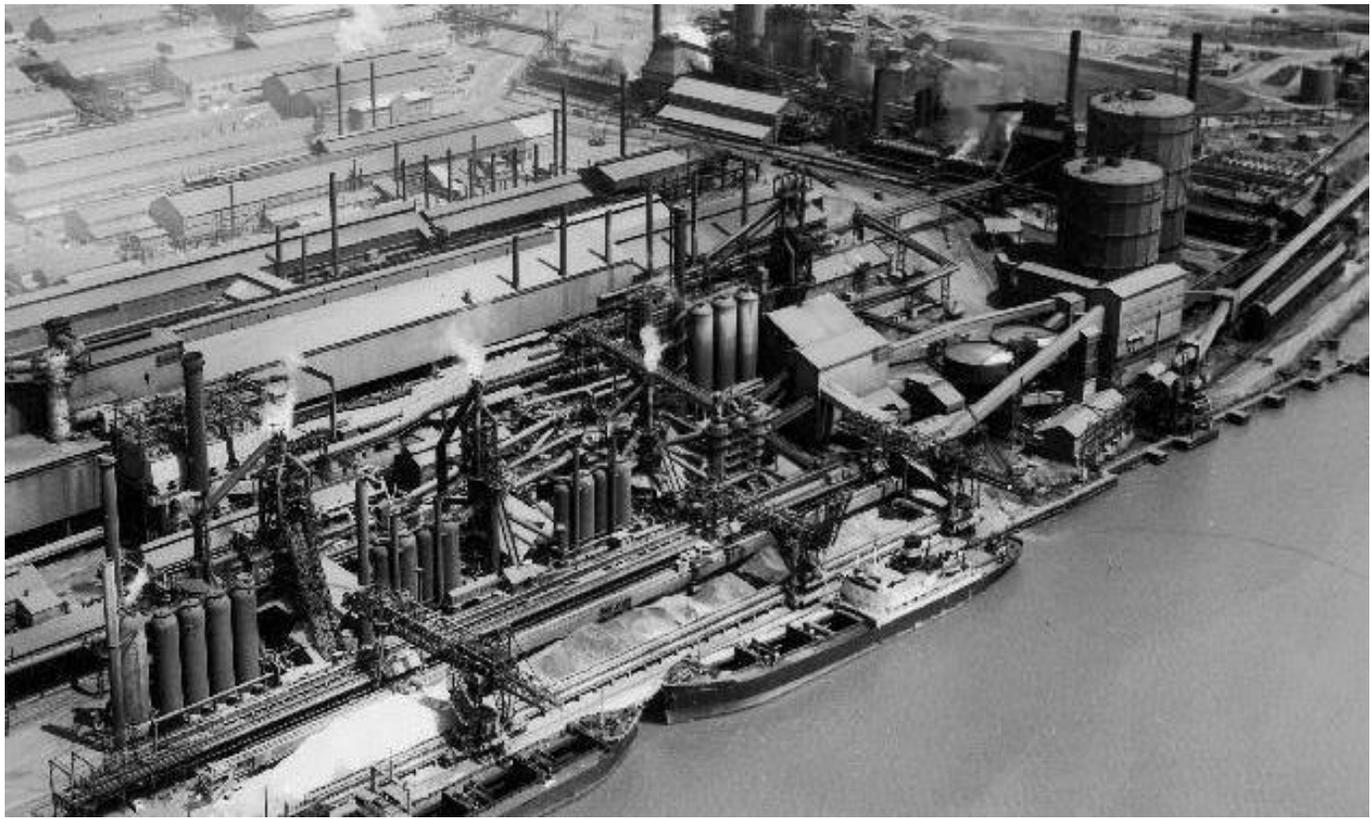


Figure 4: BHP Newcastle Steelworks in the mid 1960's

In 1961, BHP management examined overseas developments, where the Basic Oxygen Smelter was revolutionizing steel production, and beginning to replace Open- Hearth Furnaces. Accordingly, BHP decided to install two 200-ton capacity BOS furnaces in 1961, which at the time were among the world's largest. These increased capacity and reduced costs – indeed the Newcastle Steel Mill was for some decades one of the lowest cost steel producers in the world.

However, from the 1980's Newcastle faced increasing competition from newer steelworks, particularly in Japan and Korea, which had much larger and more modern blast furnaces. The Newcastle works continued to invest in bloom and billet mills but management decided not to build a fifth blast furnace, and steel production gradually became a loss-making part of the BHP empire. Eventually it was decided to close the “front end” (blast furnaces, coke making and basic oxygen furnaces) in 1999, although the rolling and finishing mills continue to produce “long products” (rods and bars) from steel produced at Whyalla, Port Kembla and mini mills.

### ***Internal Rail Network***

As with many integrated steel mills, the BHP steel mill was served by a large internal private rail network, both standard gauge and narrow gauge, with the latter serving the movement of ingot cars between the iron making and steel making divisions. Other internal rail movements were handled on the standard gauge network. Steam had been replaced by a fleet of 25 end-cab and centre-cab diesels by the 1960's, as shown in Figures 5 and 6.

These were closely based on the GE designs used in the United States, but with some modifications. For example, some of the centre-cab locomotives operated on narrow gauge (3 feet) bogies and had narrow bodies to fit inside a restricted loading gauge. Figure 7 shows the rail network in 1995, by which time the narrow-gauge system had been replaced by continuous casters, blast furnaces 1 and 2 had been demolished, and BOS furnaces had replaced the open hearth furnaces. Note there are over 300 sidings in the steelworks complex.



## ***External Rail Movements***

The combination of the steelworks and Port Waratah's export coal and grain terminals made for a busy place. There were over 200 sidings in a series of "nests" at Port Kembla for holding loaded and empty trains, and more than 60 coal and freight trains arrived daily (Figures 8 and 9).



**Figure 8:** Port Waratah with coal "nests" in foreground, steelworks in the background, in 1970.



**Figure 9:** Model version. Port Waratah can accommodate up to a dozen coal, grain, steel and other trains.

As late as 1970, there were still numerous trains of 4-wheel coal hoppers hauled by 70-year old steam engines arriving at the Port, as well as some more modern trains of bogie hoppers hauled by 260-tonne Beyer-Garratts. Coking coal arrived by rail from mines in the local Newcastle area over both New South Wales Government and

privately-owned rail networks, and there were direct rail shipments from coke ovens about 250km south of Newcastle. Much of the steel product from the mill was exported by rail to Sydney and other destinations. However, most ore and limestone arrived by sea, and some steel was also exported by sea via the steel wharf (Figures 10 and 11).



Figure 10: Steel Export Wharf



Figure 11: model version.

## Modelling the Steel Works and Port Waratah

Despite having a large space (40 feet \* 25 feet) for my layout, of which about 25% was available for the steelworks and Port Waratah, I had to be very selective as to which facilities to model, and then further compress those facilities. Table 1 shows those selected and why they were chosen. Nevertheless, the resulting facility is extensive, and includes sixty-five tracks and industrial spurs, which can be divided into four zones (Figure 12).

Table 1: Selected Facilities.

Facility	Features	Why Selected
Blast Furnaces	Only one of four modelled; Walthers Kit, to be detailed.	Visual impact and rail operations
Ore Bridge and wharf	One of three modelled; Walthers Kit	Visual impact
High Line	Currently being scratch-built.	Visual Impact and rail operations
Basic Oxygen Furnace	Currently a mock-up. Scratch-building opportunity	Visual impact and rail operations
Engine/Blower House	Characteristic Facility - Walthers Kit	Visual Impact
Gas Holder	One of two modelled - scratch-built	Visual Impact
Coke Ovens	54 Oven Battery (three Walthers kits). Details to add.	Visual impact and automation
Rolling Mill	Currently a mock-up; will be scratch built	Visual impact and rail operations
Refinery	Small facility modelled - will be scratch built.	Visual impact and rail operations
Comsteel Plant	Rolling Mill, Electric Arc Furnace. Walthers Kits	Visual impact and rail operations
Slag Dump		Visual impact and rail operations
Lime Kilns	Will be scratch-built	Visual impact and rail operations
Harbour	5 wharves, with up to 5 ships to be scratch-built	Visual impact and rail operations

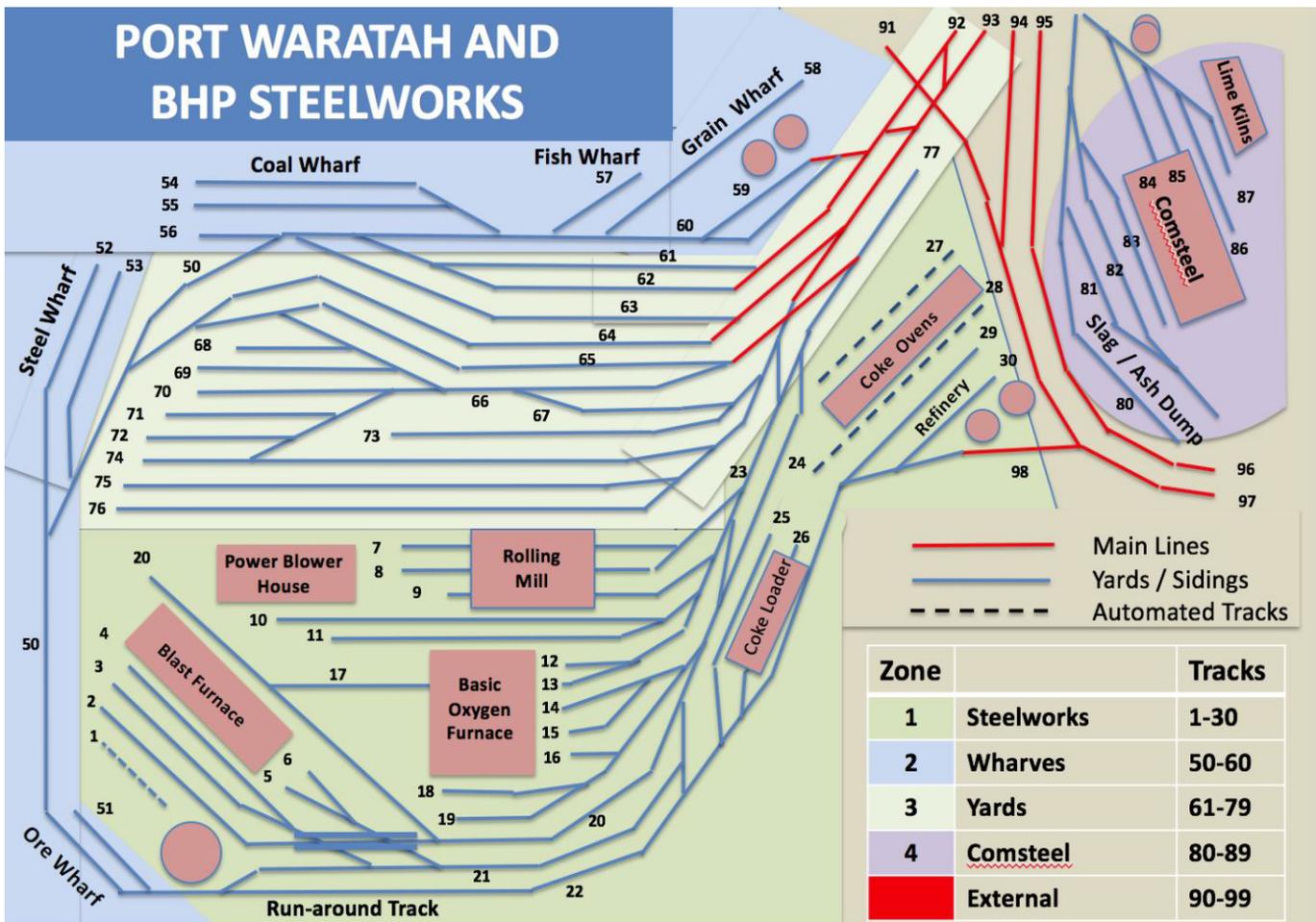


Figure 12: Track Plan of Port Waratah and Steelworks.

# Operations

Operating sessions on the layout have up to 16 crew all up, including six or seven fixed location operators (despatcher, signal box operators, yard and locomotive facility foremen, and yard shunters) and eight or nine train crew. Single man crews are used, so up to eight trains can be operating at one time.

I use a 2:1 fast clock, with two-hour operating sessions representing a four-hour slice of the 1965 working timetable. For example, Figure 16 below shows the midday to 4 pm timetable, which was operated most recently in the June and September 2019 operating sessions.

This is based on a selection of the actual trains in the 1965 Working Timetable, and includes 28 freight, coal and passenger trains, plus around 15 light engine movements. However, this is less than half the actual number of trains which ran on the prototype timetable for this four-hour period – the Newcastle area was a very busy place, with over 300 train movements during a typical weekday!

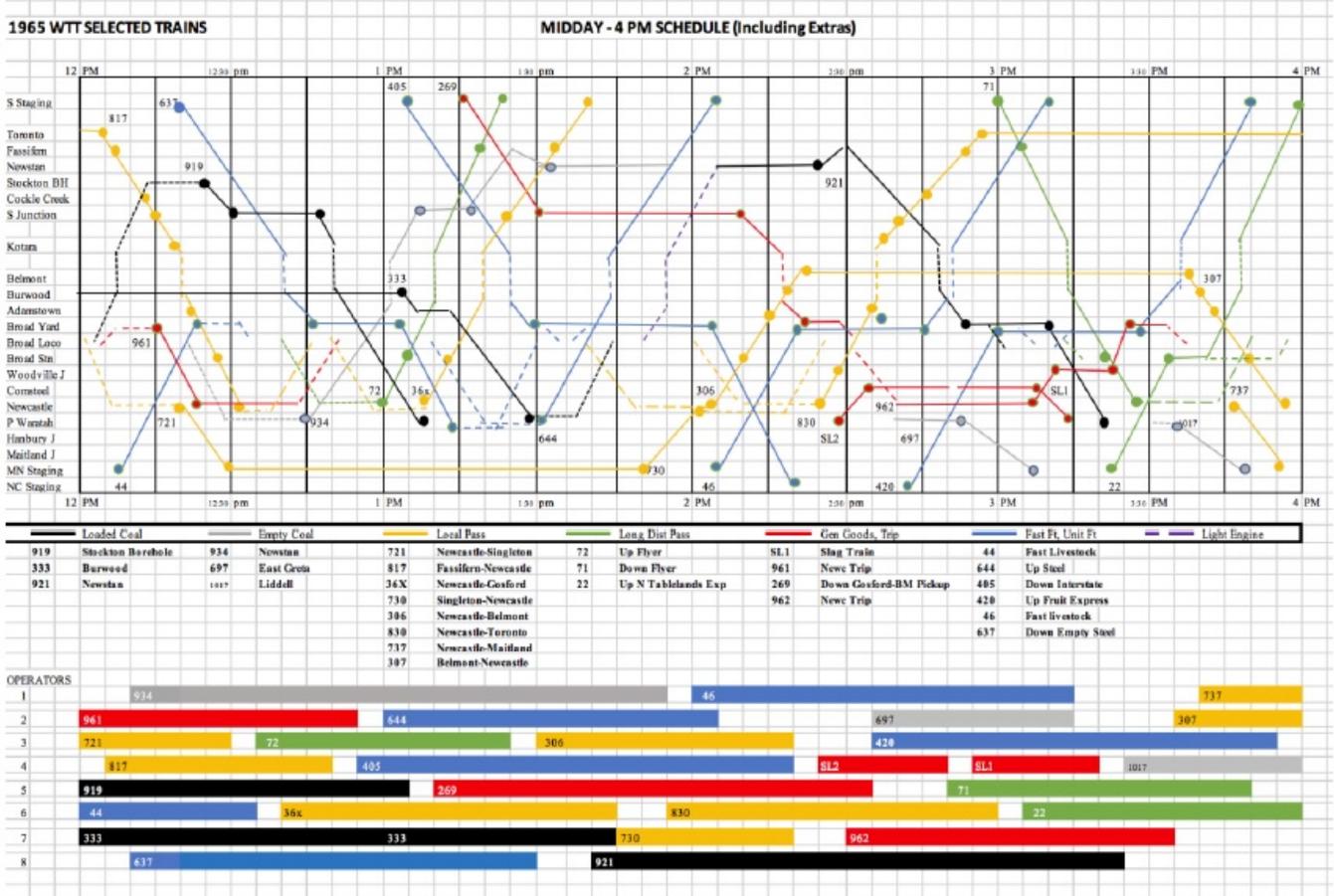


Figure 16: Timetable for June 2019 Operating Session

Altogether I have now had over 35 operating sessions, open days and work sessions in the last three years attended by over 500 people, including more than 80 different individuals (Figure 17). Some have been to nearly every session, while others have been only a couple of times. For many of them, an operating steel plant is quite a novelty, as layouts with steel plants are relatively rare in Australia (but for an O-scale layout with operating steel mill in Western Australia, see <https://ogrforum.ogaugerr.com/topic/action-at-the-steel-mill-friday-21-12-1972?reply=98710576486039464#987105764860394>)



Gary Warton (left) was in charge of Port Waratah



The author (red sweater) at the Steelworks



The Customs House at Newcastle is adjacent to Newcastle station. The clock tower has yet to be completed.



Roger Tuck (left) in charge of Broadmeadow loco depot while Keiran Ryan (2nd from right) handled the yard.

**Figure 17: Operating Session, June 2019. Note the Fast Clocks in the Background. Photos by Seth Neumann**



**Figure 18: Beyer-Garratt (right) shunts coal cars while a "Standard Goods" (left) shunts the grain wharf. Note the strings of government (black) and private owner (red and grey) 4-wheel hoppers. Comsteel plant in the far distance.**



Fig 19: Export Coal awaits loading onto ships. Power/Blower House in background.

### ***External Steelworks Assignments***

Ten of the 28 trains operated in the midday – 4 pm timetable either originate from or terminate at Port Waratah/ Steelworks, including six coal trains, two steel trains and two “Trip” trains, The latter are the “Slag” trains which take slag, ash, limestone and hot metal to the Comsteel complex, returning with lime and empty cars (Figure 20). In addition, there are four light engine movements between the Port and Broadmeadow locomotive depot during the session.

The Steelworks /Port Waratah complex is thus one of the major traffic generators on the layout, along with Newcastle Station (for passenger trains) and the three staging yards. While the Port Waratah shunter handles most coal, coke and grain trains (Figures 18 and 19), the Steelworks shunter(s) handle “Trip” trains, Steel Trains and also internal shunting moves inside the steelworks..

Table 2 below shows details of external steelworks assignments for the midday-4pm session. The first priority assignment for the steel works shunter for this particular 4-hour “trick” (2 hours of actual time) is to assemble the loaded steel train by 12:30pm, with this train due to depart by 1:30pm. Note that this involves a number of moves.

The second and third priorities are internal tasks (see Table 3 below), while the fourth priority is to assemble the slag train by 13:50pm. Breaking up the incoming empty steel train is the eighth priority, while the last priority for the shift is to break up the returning empty slag train, if time permits, with these tasks interspersed by internal shunting moves.

Table 2: External Steelworks Assignments

ORDER	BY	ASSIGNMENT	ACTION	NO	CARS	FROM	TO	SPECIAL INSTRUCTIONS	MINS (Actual)
4	13:10	W ASSEMBLE SLAG TRAIN	Move	1	BHP Brakevan	Yard siding 19	Far end of Tk 22		4
4	13:25		Add	1	Loaded Slag & Ash cars	BF 4 and BOS 13	TK 22		6
4	13:40		Add	2	Hot Metal cars	BF 6 and BOS 15	TK 22		6
4	13:50		Add	4	Loaded Limestone Hoppers	Limestone Siding 51	TK 22		4
			Add	0	Empty Lime Hoppers	Lime Unload Tk 11	TK 22		5
11	if time	X BREAK UP SLAG TRAIN	Shunt		Empty Slag and Ash Car(s)	Arrival Track 74	BF 4, BOS 13		6
11	if time		Shunt		Loaded Lime Hoppers	Arrival Track 74	Lime Unload Tk 11		4
11	if time		Shunt		Limestone Hoppers	Arrival Track 74	Limestone Tk 51		5
11	if time		Shunt		Empty Hot Metal Cars	Arrival Track 74	BF 5		4
11	if time		Shunt		Empty Hot Metal Cars	Arrival Track 74	BOS 15		4
11	if time		Shunt		BHP Brakevan	Arrival Track 74	Yard Siding 19		4
1	12:10	Y ASSEMBLE STEEL TRAIN	Move	1	NSW GR Brakevan	P Waratah Siding 67	Far end of Tk 75		5
1	12:20		Add	8	Cars loaded with Steel Coil	Morandoo Sidings 73, 76	Morandoo Tk 75		5
1	12:30		Add	7	Cars loaded with Steel Plate	Morandoo Sidings 73, 76	Morandoo Tk 75		5
8	14:50	Z BREAK UP STEEL TRAIN	Shunt	5	Empty Steel Plate cars	Morandoo Arr Tk 74	Rolling Mill 8		4
8	14:58		Shunt	6	Empty Steel Coil Cars	Morandoo Arr Tk 74	Rolling Mill 7		4
8	15:06		Shunt	2	Loaded Scrap Cars	Morandoo Arr Tk 74	Scrap Track 18		4
8	15:26		Shunt	1	Empty Tank Cars	Morandoo Arr Tk 74	Refinery 29,30	Use runaround track 22,21	10
8	15:34		Shunt	1	Brakevan	Morandoo Arr Tk 74	BV Siding 67		4



Figure 20: The Comsteel “Trip” Train headed by a 48-class departs the Steelworks, carrying hot metal, slag, limestone, and steel products. In the background a 41-class diesel shunts ingot cars into the rolling mill.

## Internal Steelworks Assignments

There are over 20 internal steelworks assignments. These would take even an experienced operator at least two and a half actual hours (five timetable hours) to complete. See Table 3 for details.

Table 3: Internal Steelworks Assignments

ORDER	FINISH BY	ASSIGNMENT	ACTION	NO	CARS	FROM	TO	SPECIAL INSTRUCTIONS	MINS (actual)
2	12:40	A TORP LADEL (LOADED)	Move	1	Loaded Torp Car(s)	BF 5	BOS 12	Max 5mph when moving loaded torpedo cars	5
		B TORP LADEL (EMPTY)	Move		Empty Torp Car(s)	BOS 12	BF 6		5
10	15:54	C DE-KISHING (IN)	Move	1	Empty Torp Car(s)	BOS 12	BF 2		5
9	15:44	D DE_KISHING (OUT)	Move	1	Empty Torp Car(s)	BF2	BF 6		5
		E HOT METAL (LOADED)	Move		Loaded Hot Metal Car(s)	BF 6	BOS 12	Max 5 mph when moving loaded hot metal cars	5
		F HOT METAL (EMPTIES)	Move		Empty Hot Metal Car(s)	BOS 12	BF 6		5
5	14:05	G STEEL INGOTS (LOADED)	Move	5	Ingot Cars	BOS 16	RM 9	Max 3mph for moving Ingot cars	5
		H STEEL INGOTS (EMPTY)	Move	5	Ingot Cars	RM 9	BOS 16	Max 3mph for moving Ingot cars	5
6	14:20	J SCRAP (LOADS IN)	Move	3	Scrap cars	Scrapyard 18	BOS 17	Use runaround tracks 23,24, then pull up high line 20	7.5
		K SCRAP (EMPTIES OUT)	Move		Scrap cars	BOS 17	Scrapyard 18	Use high line 20, then runaround tracks 23,24	10
		L COKE OVENS (LOADS OUT)	Move	5	Coke hoppers	Coke 26	BF 4	Use runaround tracks 21,22, then high line 50	7.5
		M COKE (EMPTIES OUT)	Move	7	Empty Coke hoppers	BF4	P Waratah 64-72	Use high line 20, then push via track 50	7.5
		N COKING COAL (LOADS IN)	Move		Loaded Coking Coal Hoppers	P Waratah 64-72	Coke 25	Use track 50, then runaround tracks 21,22	10
3	12:55	O COKE OVENS (LOADS IN)	Move	7	Loaded Coking Coal Hoppers	Coke 25	Coke 26	Max 3mph while under coke oven unloader/loader	5
		P DIRECT COKE (LOADS IN)	Move		Loaded Coke hoppers	P Waratah 64-72	BF 4	Use track 50, then high line 20	10
		Q STEEL EXPORT RAIL	Move		Steel Wagons (loaded)	RM 7,8	Morandoo 73,76	Coll steel cars on track 7, plate and bar steel on track 8	5
		R STEEL EXPORT SHIP	Move		Steel Wagons (loaded)	RM 7,8	Wharf 52,53	Coll steel cars on track 7, plate and bar steel on track 8	7.5
		S EMPTY STEEL CARS (WHARF)	Move		Steel Wagons (unloaded)	Wharf 52,53	Rolling Mill 7,8	Coll steel cars on track 7, plate and bar steel on track 8	7.5
		T REFINERY (LOADS OUT)	Move		Tank cars	Ref 29,30	Morandoo 73,76	Use runaround tracks 23,24	10
7	14:40	U REFINERY (EMPTIES IN)	Move	3	Tank Cars	Morandoo 73,76	Ref 29,30	Use runaround tracks 23,24	10
		V POWER HOUSE (LOAD IN)	Move		Loaded Steam Coal Hoppers	P Waratah 61-63	Powerhouse 12	Use track 50. 4-wheel hoppers only	7.5

Hence the schedule only includes a selection of assignments in any given operating session. For this particular shift, only assignments A, C, D, G, J, O and U are scheduled to be completed. Different combinations of assignments will be scheduled for different shifts. Hence an operator would need to work the steelworks several times to become familiar with all the assignments.

## Conclusion

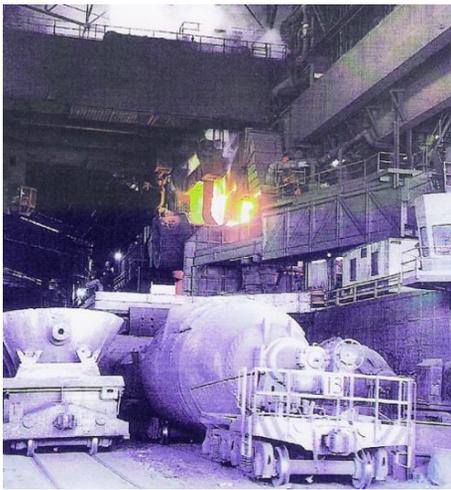
My original goal of simulating the complex operations and structures of a steel mill is well on the way to being achieved. Now the really fun part can start – detailing the structures and making the whole scene realistic. Fortunately, I now have access to hundreds of detailed photos of the steelworks from a website which includes official BHP photos as well as photos by people who worked there (see Figures 21 and 22 for examples). I also have long-term ambitions of adding lighting and animation, and possibly working Larry Cars, Pusher machines and the like (Figure 23).



Figure 21: Older Blast Furnace.



Figure 22: Blast Furnace No 4 and Basic Oxygen Smelters.



Slag and Torpedo Cars at the BOS



Slag Cars at the Slag Dump



Teeming Steel into Ingot Cars



Bloom and Billet Mill



Coke being pushed into Larry Car



Steelworks at Night

**Figure 23: Steelworks provide opportunities for lighting and animation; these photographs were all taken at the Newcastle Steelworks.**

However already the decision to model a steel mill has been vindicated, and given operators a taste of what the real prototype must have been like. Some of my operators have in fact worked in either the BHP steelworks, or its close cousin, the Australian Iron and Steel Mill at Port Kembla (which has one of only two blast furnaces still operating in Australia).

They have a wealth of colourful stories of the skills required, risks present and accidents which unfortunately made these quite dangerous places to work some fifty years ago. A couple of examples are shown in Figure 24. However, whilst derailments occur on the model just as on the real thing, I don't intend to destroy my ore bridge, or simulate an earthquake!



Derailed Torpedo Car



Oops – Accident with Ore Bridge



Coke Ovens being vented after the 1998 earthquake as a precaution. The media (wrongly) reported that the Steelworks were on fire!

**Figure 24: Mishaps and Incidents at the Newcastle Steelworks**

## ***Acknowledgements***

I would like to express thanks to a number of people who have inspired me in this endeavour. In the United States:

- Bernie Kempinski's wonderful book on a Model Railroader's Guide to Modelling Steel Mills was particularly significant in providing both inspiration and detailed modelling ideas. I managed to visit Bernie in Washington in 2017 and was able to see his beautiful Civil War layout, as well as his Port of Los Angeles diorama.
- I was also lucky to meet Mike Rabbitt in 2017 and see his fantastic steel mill model, which had been re-installed after he moved house. I also bought some of his amazing 1:87 scale plans of coke ovens, blast furnaces and basic oxygen smelters. These will be invaluable for the next phase of my modelling when I move into detailing and scratch-building.
- I was also fortunate to visit both Bill Kachel's and Ken McCorry's wonderful layouts in 2017. These should be on any modeler's bucket list, and both include substantial super-detailed steel mills, though these are only a small component of these amazing empires.

In Australia:

- John Briggs very kindly and expertly built my coke ovens and ore bridge from Walthers kits, and also scratch-built the gas holder. He is also keen to work on the Basic Oxygen Furnace which will be scratch-built (the current structure is merely a mock-up).
- Denis Gilmore has also been particularly helpful. He worked for many years at the Port Kembla steel mill and developed a very clever fully automated layout (called "DIRT") based on a steel mill and its operations, exhibiting it many times at model railway exhibitions. The layout operated on DC, using relays to run seven different locomotives carrying out different shunting movements in a complex sequence.
- I have also had much help from Leon Oberg and more recently Aubrey Brooks, the BHP Newcastle History Researcher, in obtaining photographs of the BHP Newcastle steel mill.

## ***References***

"A Future More Prosperous: The History of Newcastle Steelworks 1912-1999". Christopher Jay. Broken Hill Proprietary Company Limited, 1999. ISBN 1 876634065.

Figures 1, 3, 4, 7, 10, 14, 21, 22, 23 and 24 are courtesy of Aubrey Brook's compilation of photographs from many sources including official BHP photographs and those made by some of those who worked at the Steel mill over its more than 80 - year life. See <https://www.facebook.com/muster.point.31/>.

Figures 5 and 6 are courtesy of Leon Oberg; Figure 8 is courtesy of David Shield (1), and Figure 11 is courtesy of Seth Neumann. All other Figures and Tables are by the author. More information on the layout can be found at the website [www.newcastle-modelrail.com](http://www.newcastle-modelrail.com), which includes plans and photographs of the layout and the prototype, and a series of articles for the Layout Design and Operations Special Interest Groups of NMRA. The author can be contacted on [g.glazebrook@bigpond.com](mailto:g.glazebrook@bigpond.com).

(1) Published in "Northern Exposures, The Last Years of Steam in the North of New South Wales". Malcolm Holdsworth. ISBN 9780957732483.



This was taken on my old workbench which has since been replaced, I was weathering my ladles.



A view of the old storage yards connected to the workbench, I was in the middle of building railcars, locos & ladles for clients. Note two ladle vessels on the flats behind the blue railcar.



First stage of weathering, I mixed sand & casting resin & applied it to the spout, this was followed by ballast fines then a mix of grey & brown to get the right shade of metal crust.



A close up of the finished weathering.



Hot metal & slag, the steam loco is an old diecast 0-4-0 from a deceased friend converted from 3 to 2 rail, painted & named the WOMBAT. All of the AIS steam locos were named after Australian birds & wildlife. D32 was an English Electric 850hp diesel electric loco used on metal transfer.



Another view showing parts of the railcars under construction on the flatcars & the SD wagons.



A bowser ALCO C636 painted in the colors of The Mt. Newman Mining Co. a subsidiary of BHP in Western Australia the supplies AIS with iron ore.



A view of the incline to the furnace gantry with a train of coke & ore wagons with D4 in charge.



The works loco shop with a couple of EE locos & 103, an export ALCO DL541 1800hp loco modified & painted in the later blue colors of BHP on lease from another company that was in the loco leasing business.



General view of the works area with company & Government railway wagons in the foreground.



The other end of the sidings with an Australian version of a GM F7 co-co locomotive in the foreground.



Slag cars in front of the blast furnace loaded with slag.

## What's on the bench!

### Kit Bashing a Walthers Heavy Duty Crane to fit into a Walthers Rolling Mill Building Article and Photos by Eric Craig

The Walthers Heavy Duty Crane kit replicates a 250 ton crane found in many manufacturing facilities. It was designed for the Electric Furnace and Back shop buildings, which are the same width. Unfortunately it is too wide for the Rolling Mill building, but don't despair, with a little kit bashing it can be adapted to fit nicely into it. Follow along as we reengineer this model to fit inside a rolling mill building.

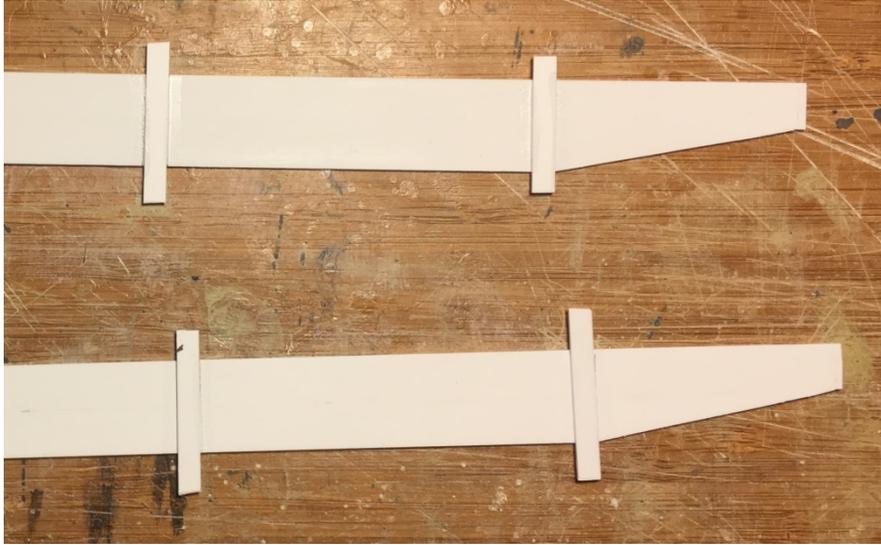
**Step 1.** The trolley support beams included in the Walthers kit are too long and therefore are not used for this project. Save them or discard them, your choice. The first thing we have to do is get the exact measurement between the Rolling Mill building crane rails, which turns out to be 65 HO scale feet. Cut 4 pieces of 312 x 30 Evergreen styrene strip, two 65 HO scale feet long and two 64 HO scale feet long. These will make two trolley support beams. Each beam consists of a top piece 65 feet long and a bottom piece 64 feet long.



**Step 2.** Next, we want to shape the bottom piece. Draw a vertical line in the center of the beam. Make a mark 20 feet on each side of the center line and draw vertical lines. From the bottom of the outside lines, draw a line to the top end of the beam and cut that piece off. Now glue the top piece to the bottom piece. The top piece will be slightly longer on both ends than the bottom piece. This allows the finished beam to be inserted into the slot on the crane rail trolleys.



Cut 12 pieces of 30 x 156 styrene strip, each approximately  $\frac{3}{4}$  inch long. These will be used for the vertical supports. Using the vertical lines previously drawn, center a piece of 30 x 156 strip on the center of each line and cement in place. The ends should overlap the support beam. Let them set for a minute or so and then using a spruce cutter, cut the strips flush with the support beam. Turn the support beam over and repeat the process on the other side. I didn't mark this side, just lined the strips up with those on the other side.



We now want to put flanges on the tops and bottoms of the trolley support beams. Cut 2 pieces of 30 x 156 styrene strip 64 HO scale feet long, center one on the top of each beam and glue in place. Cut 3 pieces of 30 x 156 strip fit on the bottom of each beam and glue in place. The ones I built had gaps that were easily filled in with putty and sanded smooth. Make sure the flange doesn't extend to the ends of the top pieces, this is where they slide into the grooves on the crane rail trollies.



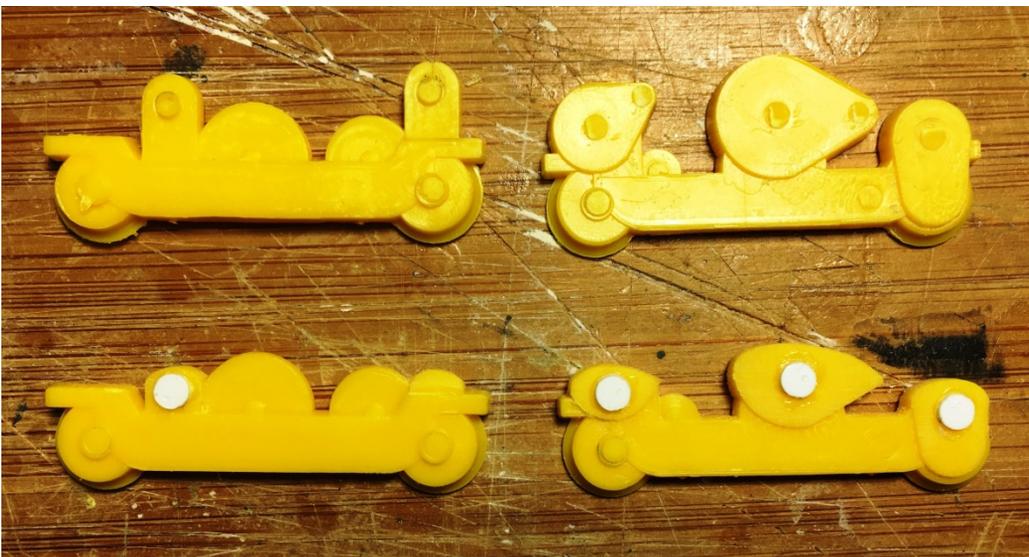
Up next are the trolley rails. Cut two pieces of 1/16 rod, or a similar size square rod, 64 HO scale feet long, center one piece on top of each beam and glue in place. Take care to leave spaces at the end of the rails so the beams will slide into the trolley rail grooves.

Slide the ends of the trolley support beams into the grooves on the crane rail trollies and glue into place. Make sure the trolley support beams are square with the crane rail trollies, then test them on the building crane rails.



Assemble the drums and wind the cables on them before assembly to the trolley frame. For the cables, I used black thread. For each drum, wind two separate and equally spaced sections, periodically adding a dab of Plastruct liquid cement to hold the thread in place. Tidy up the thread, leaving nothing hanging down as we will add the block threads later.

The trolley side frames are too tall to fit under the roof trusses so they have to be trimmed down. Use a spruce cutter to reduce the height of the protruding pieces and then shape them with an emery board. Finally, add punch outs for the shaft ends. I used a leather punch to make the discs and the ones shown are the smallest the punch would make. Maybe a craft store, such as Michaels has a punch that makes smaller discs. I never had an original idea in my life so credit for this idea goes to Jeff Borne, the person I got it from. You will lose a little detail, but when the crane is placed inside the building, it won't be noticeable. Once this task is accomplished, assemble the drums to the trolley frame according to the Walther's instructions



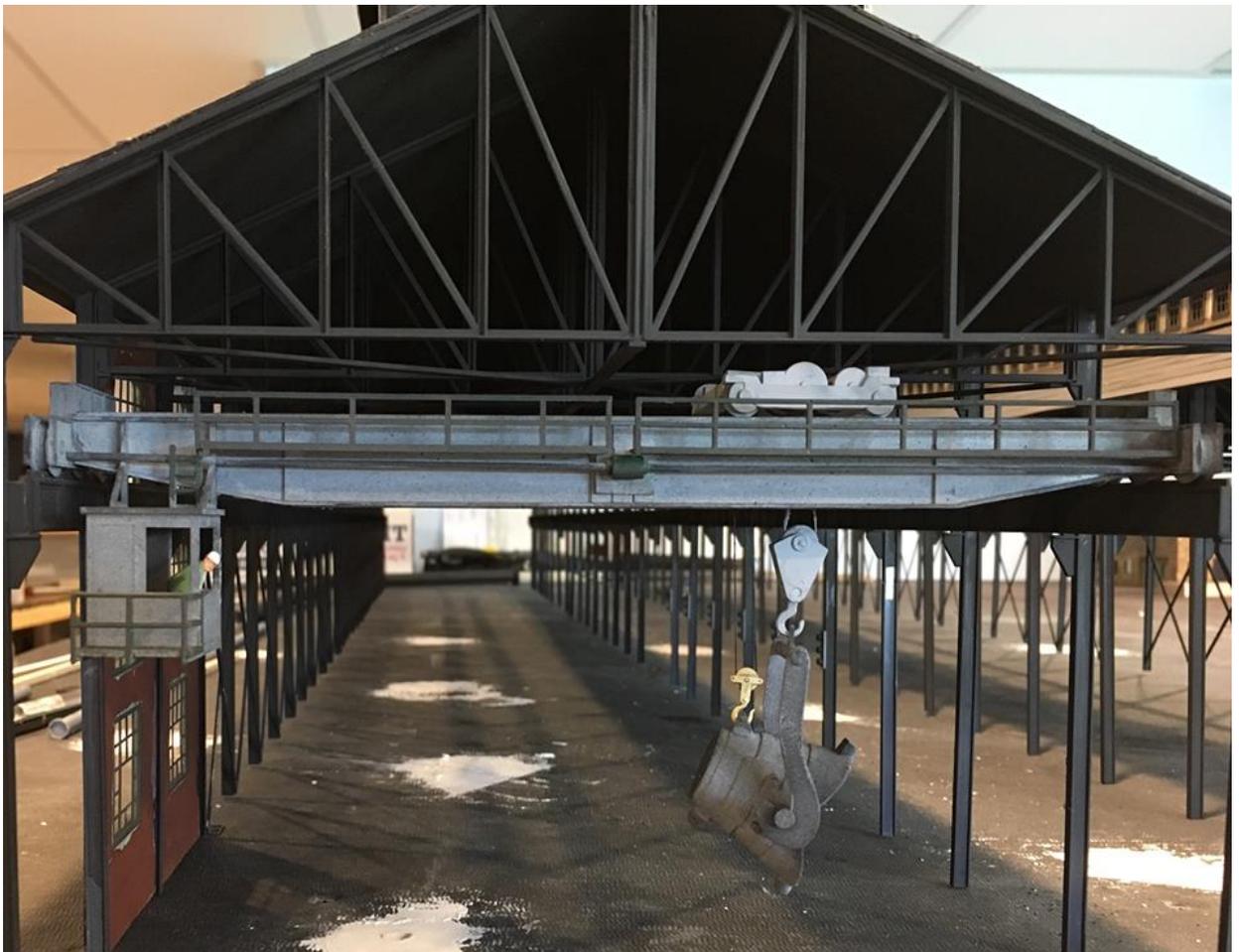
Next, we want to add the trolley block (assemble the block according to the Walther's instructions). Cut two pieces of thread and string them thru the block. At this point, I put a dab of Plastruct liquid cement on the threads to secure them in place. The next step is to secure ONE side of the trolley cables. Determine the length you want the block to drop down and then secure the cables to the other side. Clean up the thread on the drums. Because the block has no weight, it won't hang straight down. To correct this, put the crane on the rails, pull down on the block and add Plastruct liquid cement to the thread, it will stiffen it up nicely.

If you put two trolley assemblies on top of this shortened crane, it will get crowded. I opted to add a second set of smaller drums to the trolley, which is a prototypical arrangement. These smaller drums and block were assembled the same way as the larger drums and block. The drums were made of Evergreen tubes with a smaller block and hook from American Scale Models.

Determine where you want the trolley to be, then position it on the trolley support beams and glued in place with a few dabs of Plastruct cement.

Assemble the cab according to the Walthers instructions, position it on the trolley support beam and secure with a few dabs of Plastruct cement.

At this point the basic crane is done. If you want to add more details, go for it. I added a walk way, motor with shaft, reduction gear boxes and electric cabinets. You can drive yourself crazy with this project, so at some point you have to say, it's done.



**Modeling Coke cars using Accurail hoppers**  
**Article and Photos by Garry Lance**

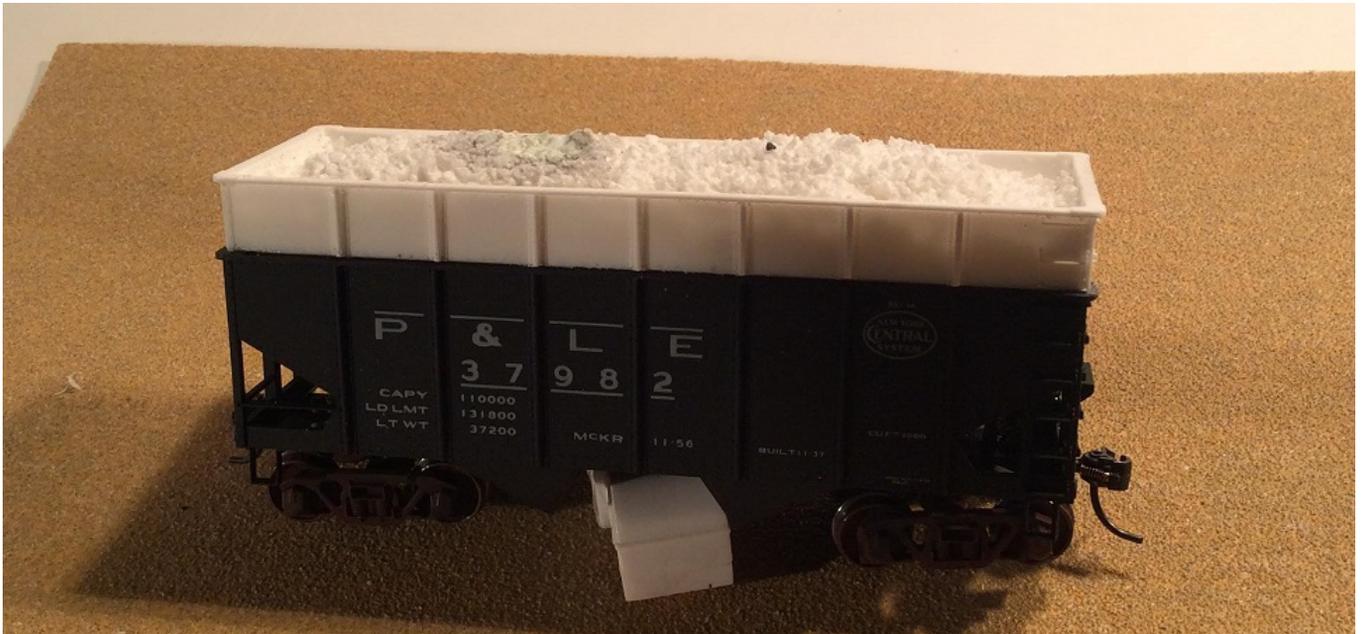
I've been working on my coke works and figured I should make some coke cars loaded and empty. Since I have just a small switching layout in the 50s - 60s I decided to use Accurail 2 bay rib side hoppers, already had a lot from another layout.

Started by cutting the top off of one of the cars right where it starts to slope. Have a micro-mark small table saw for this makes perfect cut very little clean-up.

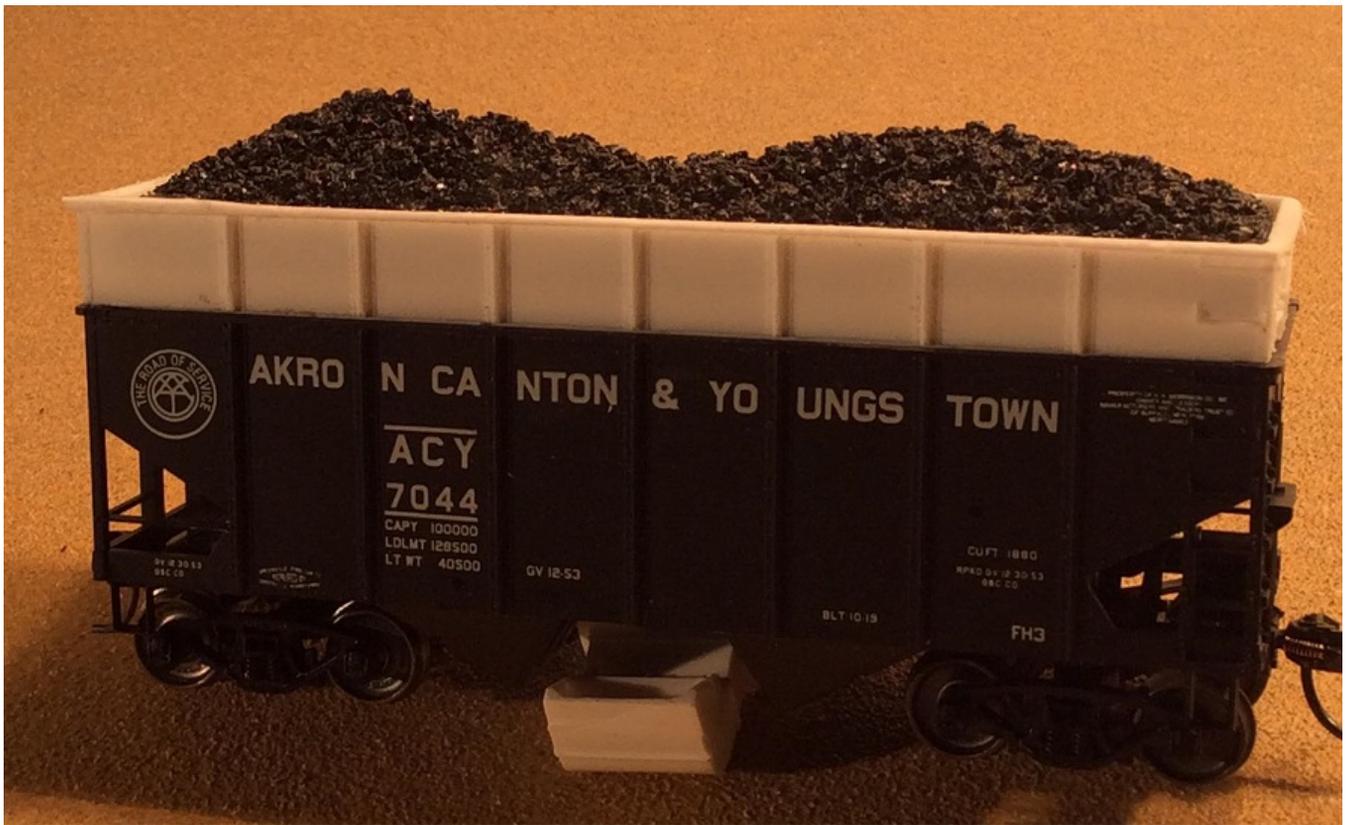
Added 40x250 styrene on bottom of the new top.



These were cut to fit tight so when you put it on the top of your car it is a snug fit. If you want you don't even have to glue them in.

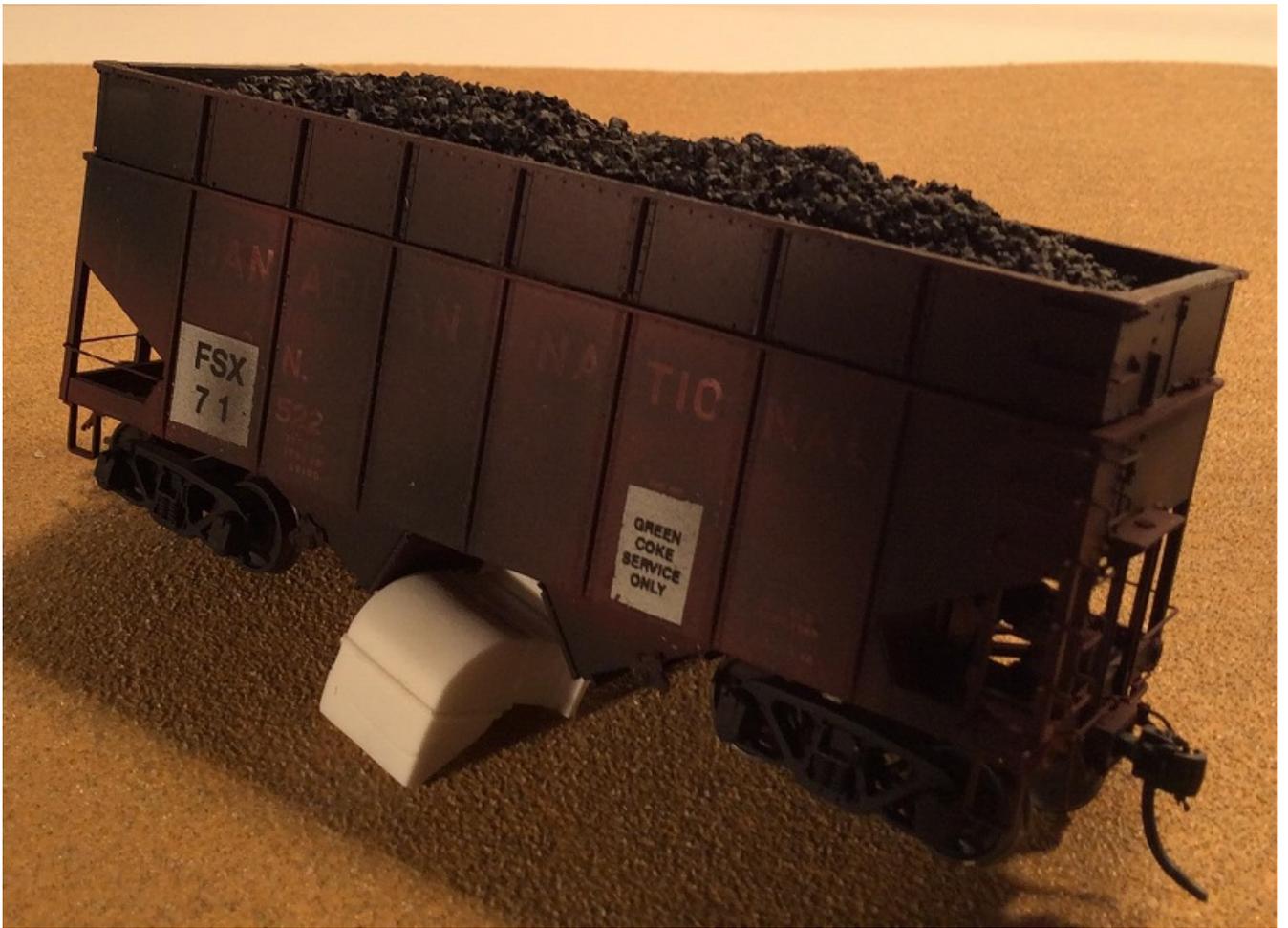


I wanted to make about 10 to 12 of each loads and empty's so time to make a mold your master. The loaded car was done with top up empty was done with top down.



Cut 3/4 inch strips of styrene for mold box. Casting is pretty easy with these kinds of molds one part. You could do any kind of hopper this way. Athearn 34 & 40 and MRC 40 foot cars. What's nice about these is you don't have to glue them in so you can run loads or empty's coke cars or regular hoppers.

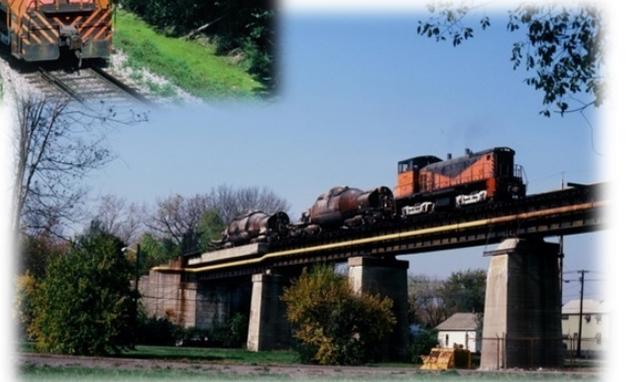
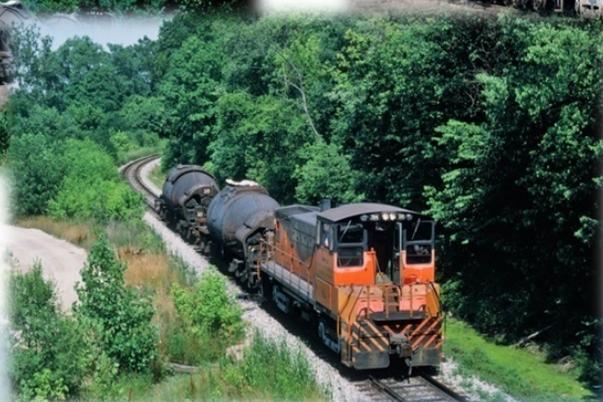


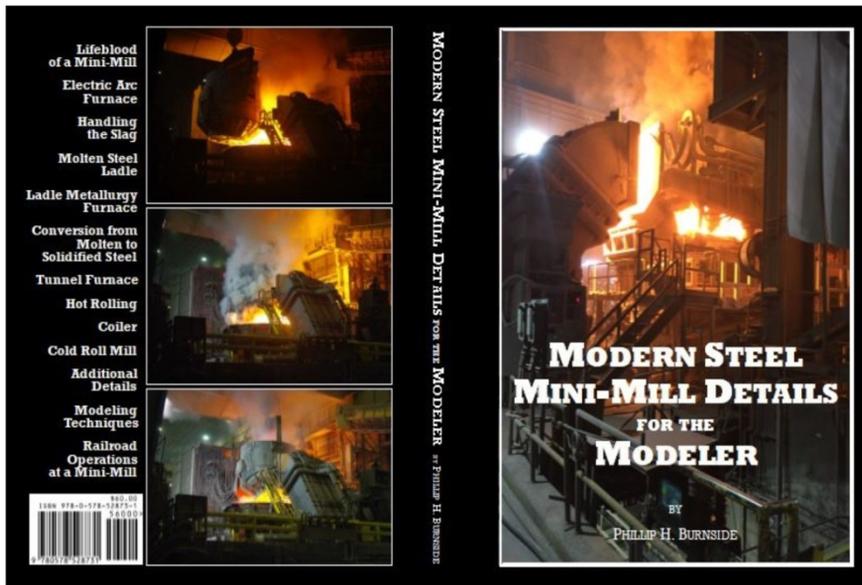






Frank Sabo is currently writing a book on Armco Steel -AK Steel. He is looking for images of Armco locomotives both roster and action, rolling stock, and also photos of any of Armco's structures. These photos can be from any year or any plant. If you would like to make a photo contribution, please contact 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](mailto:SP_Lives@rocketmail.com) or Facebook page. <https://www.facebook.com/frankie.sabo>





# 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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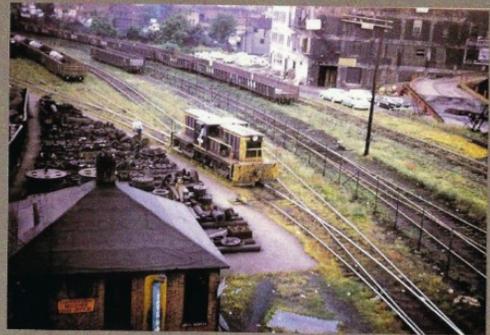


Above: 1986 Don Lakin rare view of Republic Steel "cold" blast furnace complex from the old Center Street bridge. The Mahoning River gently reflects the past.  
Below: 1950 view of Republic Steel Youngstown open hearth. Right: Blast Furnace #2, 1960. Republic Steel, BCIM collection



**GHOST RAILS XVI**  
**REPUBLIC STEEL YOUNGSTOWN**  
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**CRAB CREEK BASIN RAILROAD COMPLEX**  
 Wayne A. Cole

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A Bill Nixon view west from the old Cadiz Street bridge, August 8, 1958. Good Days for RSC Haselton. The river building the Republic Steel Bessemer Works Yard Office. Whitcomb Submarine 351 works standard gauge tracks to the left of the fence, Republic Steel territory, but shared by the B&O, Erie, and PRR. Gons hold coils in the yard bound for the Electro Weld and pipes. To the left of the tower, RSC dual gauge Hot Metal Track. To the right of the fence Erie and B&O Canal Branch. THIS IS THE RSC CRAB CREEK BASIN. LAKIN COLLECTION

Volume 16, hard bound, 170 glossy pages, 24 color is a detailed history of Republic Steel Youngstown 1850 to its demise in the 1980s and the aftermath. The book progresses from the old Bessemer Converter complex nearer Youngstown and follows the Republic steel dual gauge railroad several miles down the Mahoning River to the blast furnaces and open hearths on Center Street. All major mill departments are covered (not as in detail as some former books); however, the pipe mills for which Republic are known are covered in depth. Exceptional material is found in the Bessemer Converter and the RSC dual gauge railroad. Volume 16 is a first time history no doubt.

The railroad complexes that surrounded the plant are covered in depth: Center Street, the B&O Haselton Yard, the Safety Stop, the little known Crab Creek basin, PRR, the Republic tunnel, a touch of the P&O Canal, the Erie Canal Branch, and railroad conglomeration to West Federal Street. Of importance, the little recognized railroads and history of Poland Avenue and Republic Steel: Y&S, Ohio Central, PRR, LE&E, Y&SE. Two significant timelines (railroad and mill) are developed within the book. A strong start is made on Ghost Rails XVII USS Ohio Works, Youngstown and Northern, B&O, its New Main Line in 1905, the P&Y Railroad, Girard Branch—all depends on health and the Lord!

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# The Steel Photo Library Project

by Brendan Brosnan

As we all age we begin to think about what will happen to our collections, be they models, prototype artifacts or historic documents, maps, photos etc. In most cases our families have a vague idea that there is "some value to someone" in our personal collections, after all they saw the time and effort we spent on acquiring much of it. I know my wife cringes at the thought of disposing of my stuff, even though I have some written instructions. Which item goes with which description or list? Regardless of what the collection consists of we don't want our families burdened with the disposition of the items, but we also don't want these items donated to some organization that doesn't know their value, just leaves them in boxes or worse yet, eventually throws them away.

For the photographers, preserving the collection can be a real challenge. How do you put a value on a historic photograph? I have over 6,000 slides of which probably half are steel related. The majority of these are of mill facilities that no longer exist or are from tours that are unavailable due to newfound security concerns. These are important historic links to our history as an industrial society. It would be a disservice to the men and women who spent their lives building America if they were not preserved.

After considerable brainstorming on various solutions, I arrived at a concept that I am calling "The Steel Photo Project". I ran the idea by Steel Mill Modelers SIG Board Member John Muntean and he passed it on to the Board. While they have not yet agreed to "sponsor" this, I did receive a green light to continue developing the framework of the project. My limited research so far has led me to numerous libraries, historical societies etc. willing to accept the donation but they don't have the man power to digitize the images much less assign an accurate description.

Hopefully WE can produce a product that you can be proud of. To do that I need everyones expertise and contribution because I don't have the computer skills to pull this off by myself. There are a lot of photo database software applications out there. The main problem seems to be what I call the front-end software that can provide the robust search functions I have in mind. So if you have ever used or been associated with an organization that uses: *ACDSee Photo Studio*, *Content DM*, *Past Perfect* or *Adobe Bridge* please contact me.

## The Parameters of the Project

I envision a product similar to [railpictures.net](http://railpictures.net) and [railcarphotos.com](http://railcarphotos.com) but steel themed and not limited to railroad locomotives or rolling stock.

I think the database should be hosted on a SMMSIG website location but may use other sources software to provide the code of the database. Which software is the real challenge.

Contributors would be approved by the site "moderator".

Anyone, SMMSIG member, or the public can view the contents.

The data base should be searchable by categories such as: steel company name, geographic location, type of facility, equipment, etc.

The database must be able to accommodate captions.

Ability to download and or print any image is a desirable feature (possibly for a nominal fee to offset hosting expense, (not a profit). This can be addressed later.

A section of the database can be dedicated to photos of steel themed models.

The goal of this project is to preserve the photographic history of the steel industry for anyone interested in studying the subject. One of the museums libraries that I have talked with did express a willingness to take it over in perpetuity, once we get the database established. This can be explored in greater detail later.

So if you have computer knowledge, have used any photo hosting site successfully or would like to help get this project on the right track, please contact me either by email at [b.brosnan@epbfi.com](mailto:b.brosnan@epbfi.com) or call 423-602-5259.

Your comments on this project are always welcome.

# STEEL MILL DRAWINGS

HIGHLY DETAILED PROTOTYPE DRAWINGS OF  
EQUIPMENT AND BUILDINGS RELATED TO THE STEEL  
AND RAILROAD INDUSTRIES

BASED ON ORIGINAL ENGINEERING DRAWINGS AND  
INFORMATION FROM INDUSTRIAL SOURCES

Mike Rabbitt  
193 Holstein Rd  
King of Prussia PA 19406  
610-688-3352

- 1: 1970-1980'S BLAST FURNACE \$48.00**  
A typical large late 20<sup>th</sup> century blast furnace. Four sheets, up to 3' x 4', HO Scale. Plan and elevation of furnace, top works, skip hoist, cast house, stock bins, gas cleaning equipment, stoves and details of valves and equipment. This design is not of a particular furnace but is a composite of the best information from several sources.
- 2: 1940'S BLAST FURNACE \$48.00**  
Original furnace built in 1943 in the Pittsburgh district and still in blast. Drawings show the original design with only a few modifications. Smaller than #1 above. Three sheets, 3' x 4' HO Scale. Plans and elevations of the furnace, skip hoist, stoves, gas cleaning equipment, piping, stock bins, cast house and ore bridge.
- 3: BESSEMER CONVERTER PLANT \$38.00**  
Based on a facility built in South Chicago in the late 1890's, and in operation at least through the 30's and is similar to plants in use through the 40's. Five sheets, 2' x 3', HO Scale. Detailed plans, elevations, sections, including elevations of the building.
- 4: 120 TON HIGH LIFT CAR DUMPER \$44.00**  
Located at Sandusky, Ohio. Built in 1939 and still loading Lake Boats. Four sheets, 2'6" x 3'6", HO Scale. Elevations, plans and sections.
- 5: HULETT ORE UNLOADERS \$38.00**  
Plans, elevations, sections, details and several design variations of a "classic" Hulett Unloader of the early 20<sup>th</sup> century. Includes elevations of ore bridges and a section through a lake front blast furnace plant. Five sheets, 2' x 3', HO Scale.
- 6: LAKEFRONT STEEL MILL PLAN \$38.00**  
A medium size integrated steel plant in the Chicago District as it existed in the 1960's, now demolished. 3'4" x 7' with side extension, 1"=50'. Includes coke plant, three blast furnaces, open hearth, BOF, stripper crane, soaking pits, rolling mills and complete standard and marrow gauge track layout.
- 7: BLAST FURNACE PLANT PLAN \$22.00**  
Plan of the Carrie Furnaces in the Pittsburgh District as of the mid 1940's, now demolished. One sheet, 2'6" x 5'3", 1"=50'. Railroad supplied six furnace plant showing all trackage, blower and powerhouses, piping, ore bridges, pig caster and various maintenance buildings in addition to the six furnaces.
- 8: OPEN HEARTH PLANTS \$52.00**  
A 20<sup>th</sup> century open hearth plant. Three sheets, 2'6" x 3'6", mostly HO scale. Plans, elevations and sections showing scrap yard, charging floor, furnace, teeming aisle, mold preparation yard, overhead cranes and building structure. The fourth sheet shows a six furnace plant, material yard, mold preparation yard, mixer building, stripper building, and narrow and standard gauge trackage, 1/32"=1'0".
- 9: 1915 BLAST FURNACE \$48.00**  
Plans, elevations and sections of a typical 1915 period furnace as built at Bethlehem Steel on the site of an open top furnace. Five three pass stoves, cast house and gas cleaning equipment plus many details. Three sheets, 3' x 4', HO Scale. Similar to many built in the early 20<sup>th</sup> C at other plants.
- 10: 1890'S OPEN TOP FURNACE \$67.00**  
Plan and elevations of a typical charcoal or anthracite-manually charged open top furnace based on the furnace at Johnson City, Tenn. Furnaces of this type could still be found in use through the 1920's with one in use as late as WWII. Six highly detailed sheets, HO Scale. Includes stock house, furnace, charging elevator, dust catcher, stoves, boilers, blowing engines and much more.

The sources include original engineering drawings, books, periodicals, photos and site visits. Almost all of the drawings are of actual equipment with some in use at present. A number of the sets are composites combining information from several facilities. All of the sets are done to full scale and are as close to the original as the information at hand allows. This enables the modeler to modify or selectively compress as needed.

- 11: 1940'S BESSEMER PLANT \$34.00**  
Two vessel Bessemer converter plant including building structure, charging and teeming cranes, stripper crane, mixer and converters. These drawings are not of a particular plant, but a composite showing the dimensions and details of a typical plant of the period. Two sheets, 3' x 4', HO Scale.
- 12: BASIC OXYGEN PLANT (BOF) \$66.00**  
Plans, elevations and sections of a 1960's BOF plant that was to be built using part of a existing open hearth building (shown) as the scrap and teeming aisles. Three sheets, 3' x 6'6", HO Scale.
- 13: BARGE AND SHIP UNLOADER \$10.00**  
Wood framed steam powered waterfront unloaded of the late 19<sup>th</sup> century. Typical of those found in lake ports, seaports and on river fronts. Based on field measurements of the unit located at Norwich, Conn. As of 1962-63. The unloader structure is close to the original with the bins free-lanced. Three sheets + photos, 1'6" x 2', HO Scale.
- 14: ELECTRIC MELT SHOPS \$67.00**  
A relatively small 1920's 3 furnace shop (scrap and hot metal charge) and a large modern 4 furnace shop based on a facility built in the mid 50's, subsequently expanded, and still in use. Includes plan views, sections and elevations. Five sheets, 3' x 4'6", HO Scale.
- 15: COKE PLANTS \$63.50**  
Plans, sections and elevations taken from several sources showing large and small plants. Includes ovens, coal bins, charging larrys, quench cars and related equipment. One sheet shows, to HO scale, the components of a typical by products plant in schematic form. Two sheets 2'6"x3'6", one sheet 3'x5' and one sheet 3'x10', scales vary.
- 16: 1950'S BLAST FURNACE \$66.00**  
A typical 1950's period design showing the rebuilt "A" furnace at Bethlehem Steel. Six sheets: plans, elevations and sections of furnace, stoves, cast house, venturi gas cleaner and precipitators. This is the second "A" furnace but still using the cast house and stoves of the 1915 furnace. Open top furnace #2 built in the 1860's was on the same center line. Sheet sizes: one 2'x3' and five 3'x4', HO scale. Furnace is still in existence.
- 17: BETHLEHEM PLANT 1924 MAP \$42.00**  
1"=100'. Track plan and all buildings B Fces. A-G, OH, Bessemer, rolling mills, no coke plant, lots of detail, 3'x12'.
- 18: ALAN WOOD STEEL & UMP RAILROAD \$62.00**  
Four sheets, 1"=50'. All buildings, NG & std gauge railroad. A medium size steel plant with 2 blast fce's, OH and, later, a BOF.
- 19: BETHLEHEM STEEL, 1950-1960 PERIOD \$250.00**  
47 2'x3' sheets, 1"=50". Everything in the plant including coke plant, interchange yards, all the rolling mills, open hearths, BOF, etc. Lots of detail. Price includes shipping 48 states.
- 20: BLAST FURNACE BLOWING ENGINES \$24.00**  
One sheet, 3' x 4', HO Scale. Detailed plan, elevation and section of a smaller blowing house with Allis Chalmers blast furnace gas powered horizontal reciprocating engines. Also, an example of a Mesta engine is included. U.S. Steel, Bethlehem and others used such designs. Bethlehem's in use until the 90's.
- 21: PIG CASTER \$20.00**  
Two sheets HO scale, sheet size 2' x 3'. A typical mid 20<sup>th</sup> C caster fed directly from the blast furnace cast house by tilting transfer ladles. The same basic caster design was used for rail delivered ladle cars.

**22: SOAKING PITS \$38.00**

One sheet 3' x 4' HO scale, two sheets 2' x 2' 6" perspective detailed views of a pit installation. The plans include the layout of a typical mid 20<sup>th</sup> C soaking pit building with detailed sections and elevations.

**HABS-HAER DRAWINGS Steel Mills and Coke Ovens  
Library of Congress**

Note: all drawing sets can be accessed at the Library of Congress web site. Many excellent photos accompany the drawings and can be downloaded easily. The drawings are very difficult to download in anything over 8-1/2" x 11" unless you have a computer with lots of memory and access to a large format drafting plotter.

**H-1 U.S. DUQUESNE WORKS \$54.00**

10 Sheets, 2' x 3' various scales

**H-2 HOMESTEAD 160" PLATE MILL \$40.00**

3 Sheets 2' x 3', scales vary, 3 sheets 22" x 3'8" HO

**H-3 BETHLEHEM STEEL, LACKAWANNA PLANT \$46.00**

8 Sheets 2' X3' scales vary

**H-4 PITTSBURGH STEEL CO. BLAST FURNACES MONESSEN, PA \$55.00**

10 sheets 2' x3', scales vary

**H-5 PITTSBURGH STEEL CO. OPEN HEARTHS MONESSEN, PA \$46.00**

8 sheets 2' x 3' scales vary

**H-6 THOMAS BY PRODUCT COKE WORKS THOMAS, AL \$78.00**

7 sheets 3' x 4' & 1 sheet 2' x 3'

**H-7 CONNELLSVILLE COAL & COKE REGION (BEEHIVE OVENS) \$55.00**

10 sheets 2' x 3' scales vary

**H-8 BETHLEHEM STEEL FORGE SHOP #1 \$24.00**

2 sheets 3' x 3'6"

**H-9 BETHLEHEM STEEL HEAT TREATMENT \$32.00**

3 sheets 3' x 3'6"

**H-10 SLOSS-SHEFFIELD STEEL & IRON CO BLAST FURNACES \$100.00**

20 sheets 2' x 3' very detailed dwgs of early 20thC furnaces

**H-11 CAMBRIA IRON CO BLOWING ENGINE HOUSE (BETHLEHEM STEEL JOHNSTOWN WORKS) \$36.00**

6 sheets 2' x 3' reciprocating steam blowers & building in good detail

**H-12 HULETT ORE UNLOADERS, CLEVELAND, OH \$31.00**

5 sheets 2' x 3' general isometric dwgs showing operation

**H-13 CAMBRIA MAPS FROM ORIGIN TO PRESENT \$46.00**

8 sheets 2' x 3' plant layouts various eras to present, buildings identified

**H-14 BETHLEHEM STEEL "HIGH HOUSE" HEAT TREATING BUILDING \$29.00**

3 sheets 2'9" x 3'6" designed for 16" naval rifles

**BETHLEHEM STEEL JOHNSTOWN PLANT DRAWINGS**

For the most part these are highly detailed building and track layouts of the various departments. There are some sections as the plant existed in the late 20<sup>th</sup> C just prior to demolition. The sources include original engineering drawings and material from engineering journals

**J-1 MASTER SET \$21.25**

Two sheets, small scale, showing all the various plants around Johnstown with most of the buildings and some identifications. One sheet, small scale of the Franklin Works including the coke plant behind the blast furnaces. One sheet Rosedale coke plant 2' x 3' and one sheet Lower Works (original Cambria plant) 2' x 3'

**J-2 FRANKLIN BLAST FURNACES \$24.00**

One sheet 2' x 11'4" Plan 1"=20'

One sheet 1'6" x 2' Section through blast furnace

**J-3 FRANKLIN OPEN HEARTH & ELECTRIC FCES \$22.00**

One sheet 2' x 11'3" OH & Elect furnaces plan 1"=20'

One sheet 1'6" x 2' Open Hearth section

**J-4 FRANKLIN ROLLING MILLS \$28.00**

Two sheets 2' x 8'2" Plan 1"=20'

One sheet 2' x 2' Plan 1"=20'

**J-5 LOWER WORKS (CAMBRIA WORKS) \$52.00**

Twelve sheets 2' x 3' Plan 1"=20" (1 sheet overall 1"=100")

**J-6 FRANKLIN COKE PLANT \$48.00**

Two sheets 2' x 12' Plan 1"=20'

One sheet 2' x 10' Plan 1"=20'

**J-7 1953 19 PAGE PLANT DESCRIPTION \$7.00**

General plant description with tables, photos and some very simplified drawings

**J-8 BOOK: ONE HUNDRED YEARS OF STEEL MAKING IN JOHNSTOWN 1857-1957 \$14.00**

A 60 page book published by Bethlehem Steel for internal consumption discussing the condition of the plant in 1957 and plans for the future. Many full page photos which look pretty good considering. The reprint is a quality copy of the original which was home printed cheaply by the plant. The original copy is located in the Hagley Library in Wilmington, Delaware.

SHIPPING: SENT ROLLED: up to \$50.00: \$10.50

\$51.00-\$100.00: \$13.50

\$101.00-\$250.00 \$18.00

\$250.00+ \$22.50

Overseas: please inquire for total.

Prices effective January 2013

## 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

\*NorthShore 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.com

\*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

## Steel Mill Related Books continued

\*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

<https://www.facebook.com/groups/1591376621172524/>

\*The Splitrock Mining Company layout

<https://www.facebook.com/The-Splitrock-Mining-Company-layout-326394957565987/>

\*Steel Mill Modelers

<https://www.facebook.com/SteelMillModelers/>

\*Steel Mill Modeling

<https://www.facebook.com/groups/708840849171343/>

\*Steel Mill Pictorial

<https://www.facebook.com/groups/1561038727264008/>

\*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](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](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://laser-cut-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/htrrc/info>

\*Steel

<https://groups.yahoo.com/neo/groups/steel/info>

## **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/>

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## **Museums**

\*Youngstown Steel Heritage

<http://www.todengine.org/>

## **Podcast**

\*A Modelers Life

<https://www.amodelerslife.com/>

\*Model Railroad Hobbyist podcast

<http://model-railroad-hobbyist.com/podcast/episodes>

\*The Roundhouse

<http://theroundhousepodcast.com/>

## **Steel Mill Related Picture CDs**

Prairie Works

\* Minnesota Iron & Steel

\* Heavy Industry Postcards

\* Coper & Nickel

\* Tod Engine Project