Adams Township, MI

Report on Proposed White Pine Mining Method as prepared by Mr. F. W. Denton and Mr. John J. Vitton

December, 1944

Proposed White Pine Mining Method

This is the last scheme proposed by Mr. William H. Schacht to mine White Pine on a room and pillar system. The following is his plan to mine the rooms. No proposal was made to mine the pillars.

After the main haulage levels have been driven, raises are put up in the parting shale from one level to the level above. They are spaced 48 feet center to center and are 12 feet wide and the full height of the parting shale or about 7 feet high.

The dimensions of the rooms are 36 feet wide measured along the strike and 300 feet to 400 feet on the slope from level to level.

Pillars measuring 12 feet wide along the strike and extending from level to level are left standing between the rooms.

When the raises are completed, miners start drilling holes 12 feet deep to the pillar line along each side of the raise in the parting shale; in the direction of the strike. When the bottom end of the raise has been drilled and before the drilling at the top end is completed both sides of the raise are blasted for a distance of 12 feet up the raise, as shown in drawing W.P.-P.H. 3-50 figures 1 and 2 step 1. This ore is thrown by the blast into the haulage drift and is loaded into cars either by a mechanical shovel or an inclined slide and scraper.

The next operation is to set up stopers in the area blasted by step 1. Holes are then drilled with the stopers into the overlying sandstone waste for the full width of the room. These holes will average about 5 feet in depth, as shown by

step 2.

All of the following operations refer to drawing W.P.-P.H. 3-50, unless otherwise specified.

All of the waste sandstone drilled in step 2 is then blasted.

The next step is to set up on the broken pile of sandstone with Leyners and drill holes in the sandstone parallel to the dip of the parting shale and the full width of the room. These holes are drilled 12 feet in depth shown by step 5. After these holes have been drilled the Leyners are then turned up on their arms and holes in the back or hanging are drilled, the entire width of the room, to a depth of about 2 feet as shown in step 3. These holes are in ore and are left standing for the present.

The block of sandstone in step 5 immediately over the raise is then blasted. This pile of broken sandstone is left in the raise and the miners set up again on the pile and drill the block of sandstone over the raise in step 8, which is also blasted. This cycle is repeated with blocks over the raise of steps 11, 14, 17, 20, etc. To expedite this operation and advance this face as rapidly as possible, two and possibly three machines can set up on the broken sandstone.

Directions "right" and "left" will be used from here on and are referred to by a person looking up the raise.

While the miners are advancing the face in sandstone beyond step 20, a scraper is set up and the waste sandstone in the raise is scraped into a car on the haulage level, starting

at the bottom. When the sandstone from step 5 and 8 has been removed, the previously drilled sandstone of step 5 right is then blasted into the raise. This operation affords another face for one or two miners to drill on. They set on the top of the parting shale and drill sandstone of step 8 right. While this drilling is being done the scraper continues to remove the sandstone from the raise.

Then steps 5 left and 8 right are blasted.

The reason for offsetting the drilling in the sandstone is to make room in the raise for the broken sandstone. If the sandstone was blasted on the right and left side of the raise opposite one another, the raise could not hold all of the dirt and some would spill over on top of the parting shale. It was Mr. Schacht's belief that there would be no waste sandstone left on top of the parting shale by offsetting of these blasts, but should there be some, it would not be difficult to scrape it off with a small scraper set on top of the parting shale. Mr. Schacht, at one time, considered making the rooms 30 feet wide instead of 36 feet. This would leave 9 feet of parting shale on each side of the raise instead of 12 feet. It was Mr. Schacht's belief that this dimension would be more apt to leave the top of the parting shale clean after blasting the waste sandstone above. However, by making the rooms 36 feet wide, 33% more ore is broken, over that of a room 30 feet wide.

The machines again set up on the parting shale and drill the sandstone in step 8 left and 11 right. From this same

setup the 2 feet of ore above the sandstone is drilled with "uppers" as shown in step 6, for the full width of the room. The holes in the sandstone are blasted, but the holes in the ore are left standing. All rounds in the sandstone are drilled 12 feet deep.

The cycle of drilling the sandstone from setups on top of the parting shale is repeated again and again until the lowest sandstone face is 48 feet from the bottom of the raise. No more drilling is done in the ore above the sandstone for the time being.

While the drilling of the sandstone is going on, the broken sandstone is being scraped from the raise and hoisted to the surface. The sandstone must be removed as fast as possible so that the blasting of the parting shale can start.

When the lowest sandstone face has been advanced 48 feet above the bottom of the raise, the ore above the sandstone which has been previously drilled (steps 3 and 6) is blasted for the entire width of the room. Machines are again set up on top of the parting shale and holes in the ore of step 9 are drilled the width of the room.

Now the parting shale of step 4 right and left is blasted together with the ore above the sandstone of step 9.

After the blast, machines are set up on the parting shale and the ore of step 12 is drilled at the same time that the ore from the blast is being scraped and loaded into cars. See Figure 4, Section B-B. After the ore has been removed the

scraper then goes further up the raise and scrapes out the broken waste sandstone which has been produced by the machines working in the sandstone on top of the parting shale further up the raise.

These cycles in both the ore and waste sandstone are repeated over and over until the parting shale of step 19 right and left, is blasted. When this parting shale is blasted and scraped out the ore underneath the parting shale or at the top of the No. 2 sandstone is drilled to about a depth of 1.5 feet depending on the depth of the values. This is shown as step A, Figure 2, Section A-A. This ore is not drilled the entire width of the room, but only for a width of 26 feet as shown in the cross section B-B of drawing W.P.-P.H. 3-51. The reason for not drilling this ore the full width of the room is to allow a smooth floor for the scraper to pull the ore down on, in future operations. This bottom ore is then scraped out.

At this point in the operation, stulls and lagging are put up at the bottom of the room alongside of the haulage level preparatory to the storage of the waste sandstone in the room. See Figure 3.

Up to here in the operations of the room, all of the waste sandstone must by removed. If the raises are 300 feet long from level to level, this means about 44% of the waste sandstone has to be hoisted to surface. When the room has been completely mined out there will be left, at the top of the room, an unfilled space, equal to about 44% of the room, not including

the ore scraper way. If, however, the room was developed from a lower level first, then when developing a room on the level above, all of the waste sandstone produced in the early stages of opening the room above, could be gobbed into the room below and no waste sandstone would have to be hoisted.

Drawing No. W.P.-P.H. 3-51, Figures 1 and 2, shows the method of mining the room from the point where the waste sandstone is first gobbed, to completion. It will be noted that an ore scraper way is made on the left of the room and alongside of the gobbed sandstone.

Mr. Schacht made plans for the general scheme of mining the rooms, but had not reached the point of making plans for the handling of supplies and explosives, etc. into and out of the rooms, nor the location of air and water pipes.

This report has been prepared from the recollections we have from discussions of the scheme with Mr. Schacht.

Respectfully submitted

Fred W. Denton

Fred W. Denton

John J. Vitton

John J. Vitton

Painesdale, Michigan
December 18, 1944

Attached hereto are photostats of five sketches on the White Pine mining method as drawn by Mr. William H. Schacht prior to his death on September 29, 1944.

COPPER RANGE COMPANY

PAINESDALE, MICH.

SEPT. 29, 1944

BY W. H. S.

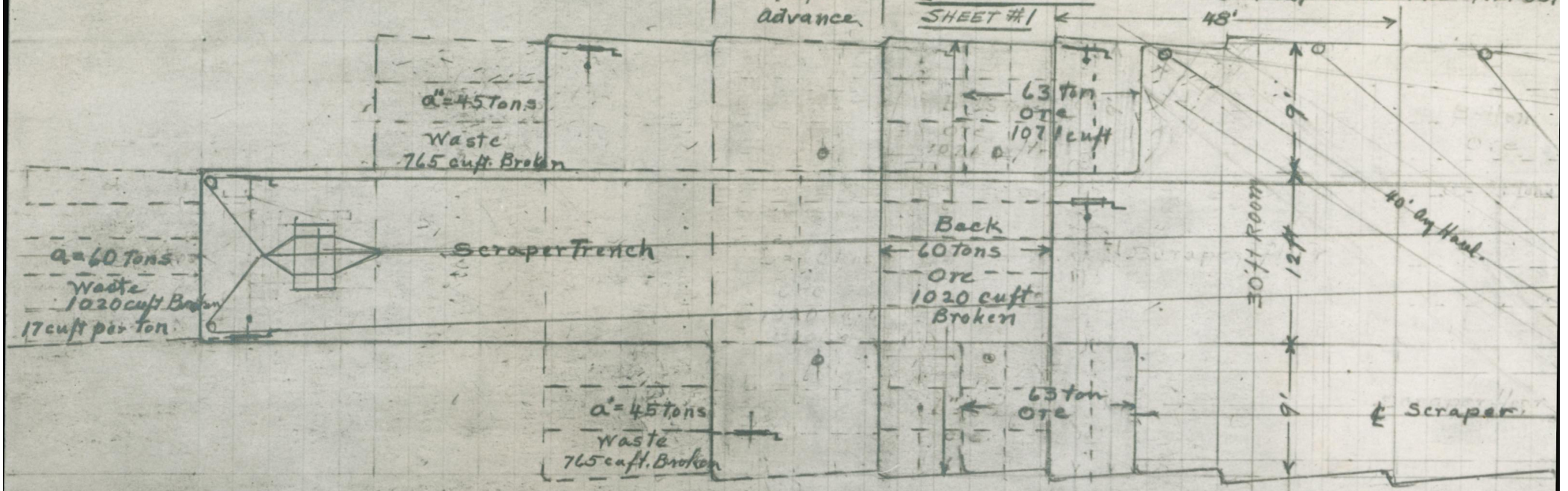
Scale 1" = 10'

SHEET #1

Ore = 186 ton + Bottom 21 = 207 ton

" Waste " " = 150 ton

80 tons per Machine Total = 357

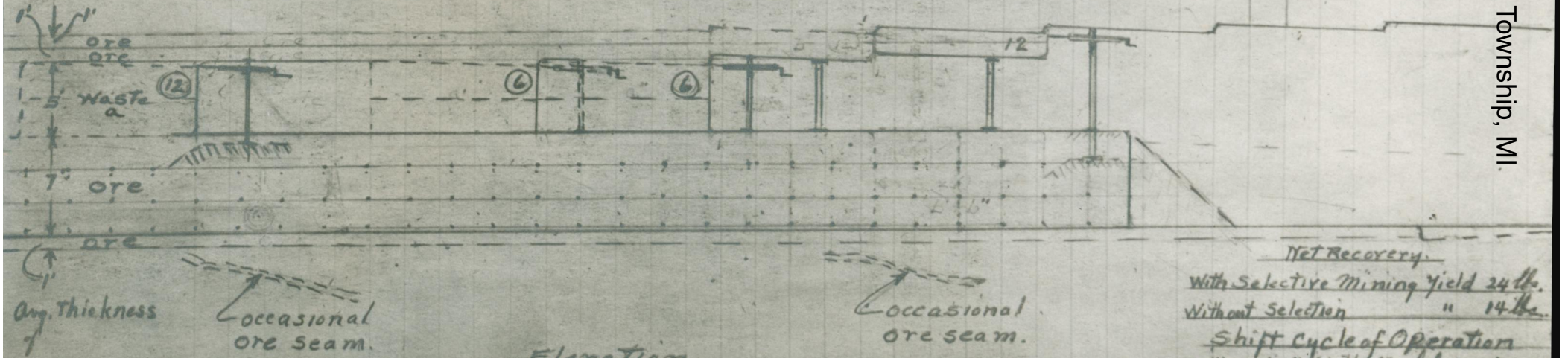


Plan.

a, a', a" = Simultaneous blasts in Waste

b, b', b" = " " " in ore

(Figures) = Number of holes to each blast.



Elevation

Drilling for Trench Scraping

Stage A and B Drilling

Net Recovery.

With Selective Mining Yield 24 lbs.

Without Selection " 14 lbs.

Shift Cycle of Operation

Drill a-a'-a" first half while mucking Out

" b-b'-b" Second " " " Waste

Blast (a) at Lunch + he end of Shift

Adams Township, MI.

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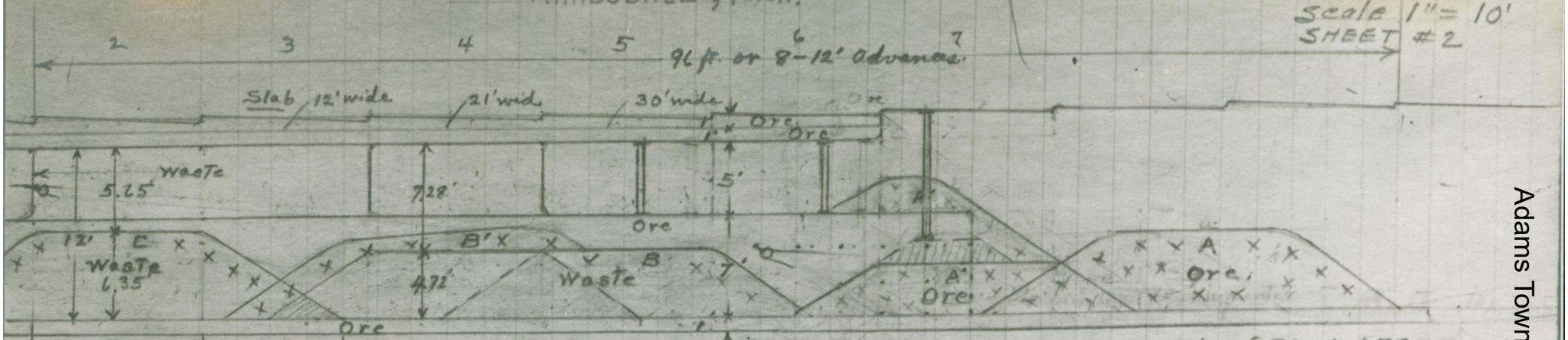
PAINESDALE, MICH.

SEPT. 29, 1944
BY W.H.S.
Scale 1" = 10'
SHEET #2



60 x 17 = 1020 cu ft

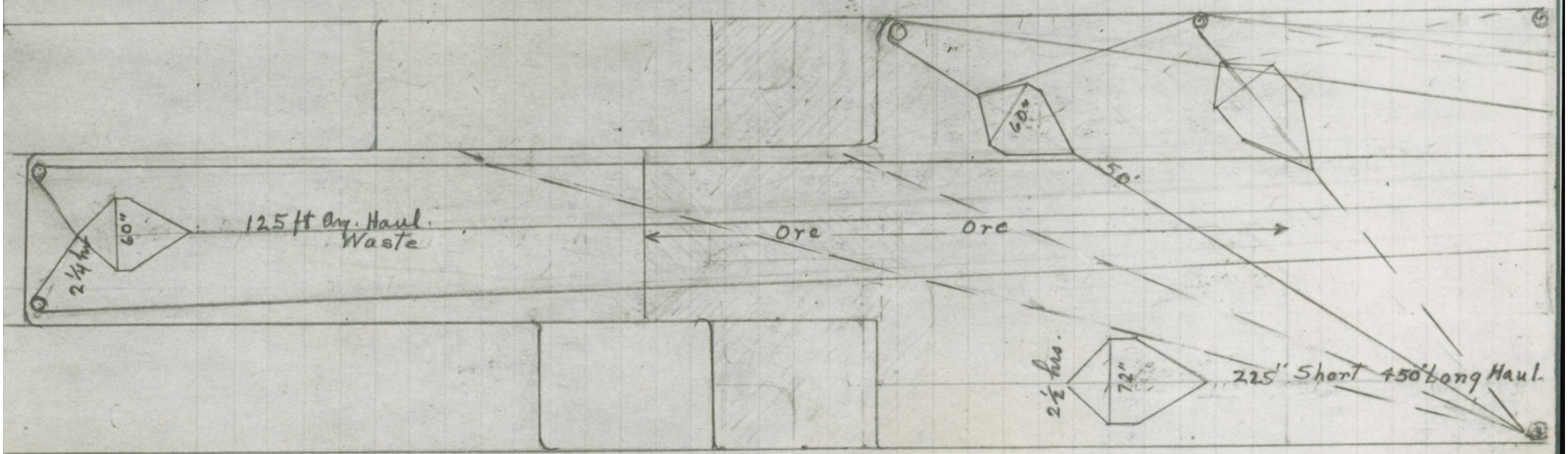
13) 1020 cu ft
13.5) 85 sq ft (12 ft wide)
2) 6.35' deep Trap.
3.67
10.02' Slope base

12) 76.5
13.5) 63.7
2) 4.72
2.36
7.08

63 x 17 = 1071 cu ft

15) 1071
13.0) 72.
5.5 ft.
2.7
8.2

Order of Blasts A, B, C,
A' = Delay A
B' = " B



Adams Township, MI

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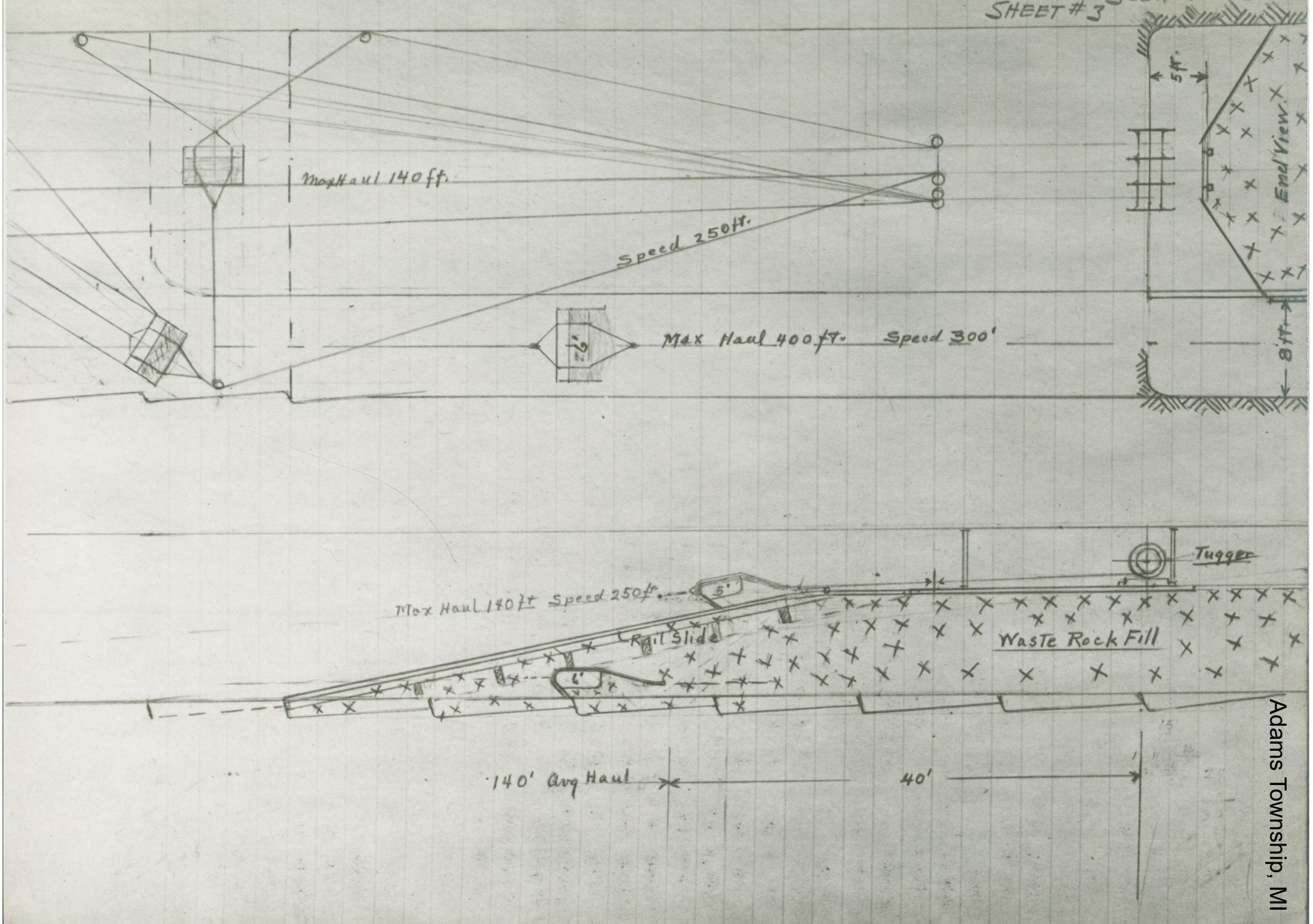
SEPT. 29, 1944
BY W. H. S.
Scale 1" = 10'
SHEET #3



COPPER RANGE COMPANY

PAINESDALE, MICH.

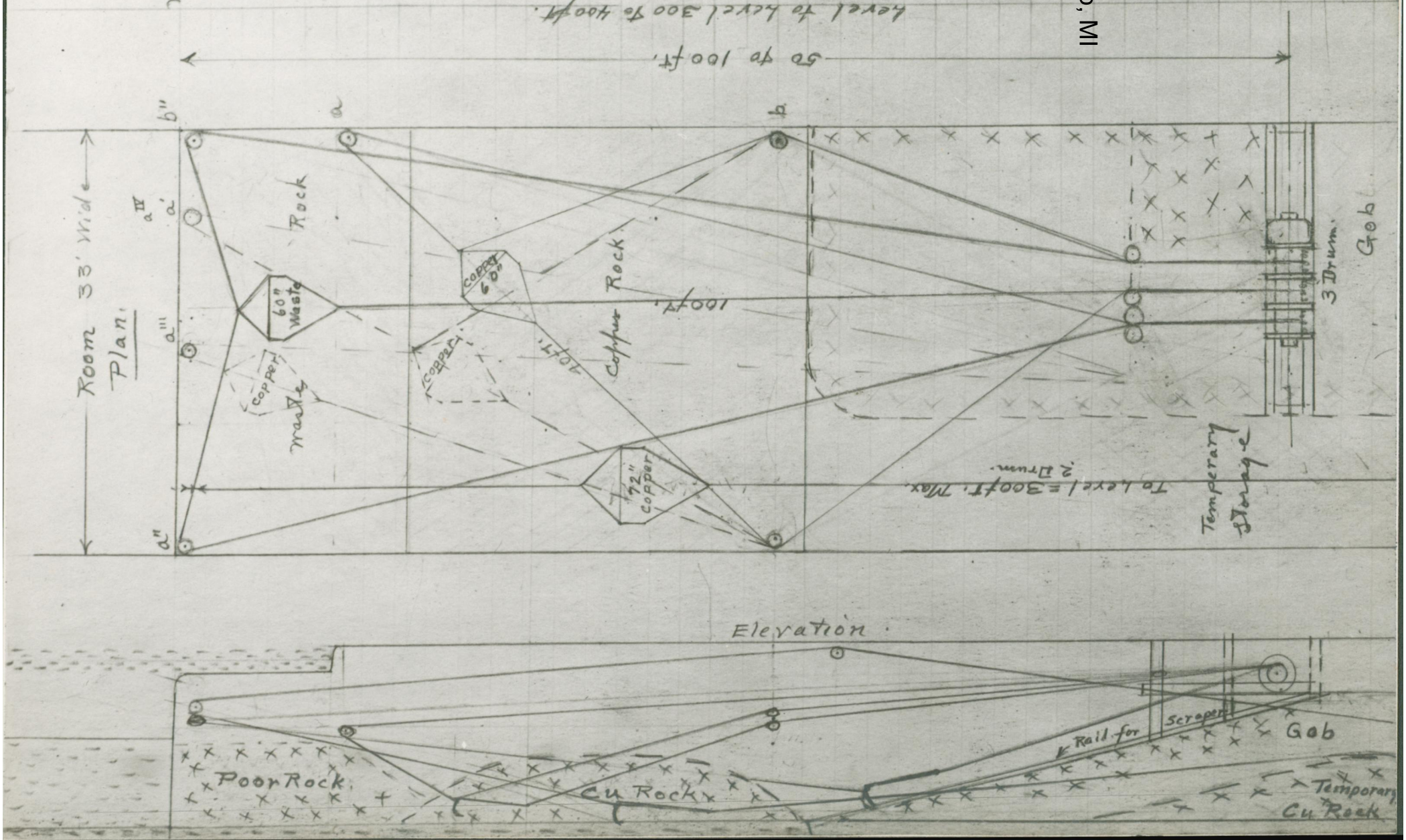
White Pine Stope Scraping.

SEPT 29 - 1944

By W.H.S.

Scale 1"=10'

SHEET #4



		Tons.	Raise Ore	Waste	Stope Ore	Pillar Ore	10 ft wide (½) Total Ore
a	= 7 × 13	91 × 1 =	91				
b	= 5 × 13 =	65 × 1 =		65			
c	= 5 × 11 =	55 × 2 =		110			
d	= 7 × 11 =	77 × 2 =			154		
e	= 2 × 35 =	70 × 1 =			85 (15)	add	
f	= 1 × 24 =	24 × 1 =			24		
			90 -	175	265	45	400 Ore/Room/shift.
				25			800 " " Day
				200 waste			

Pillar Waste

Waste = 233 sq ft.

Fill Pile Shown = 235 sq ft.

Nomid 5000 ton × 6 day = 30000 Tons per week for mill.

30000 ÷ 5 day = 6000 Tons per day for mine

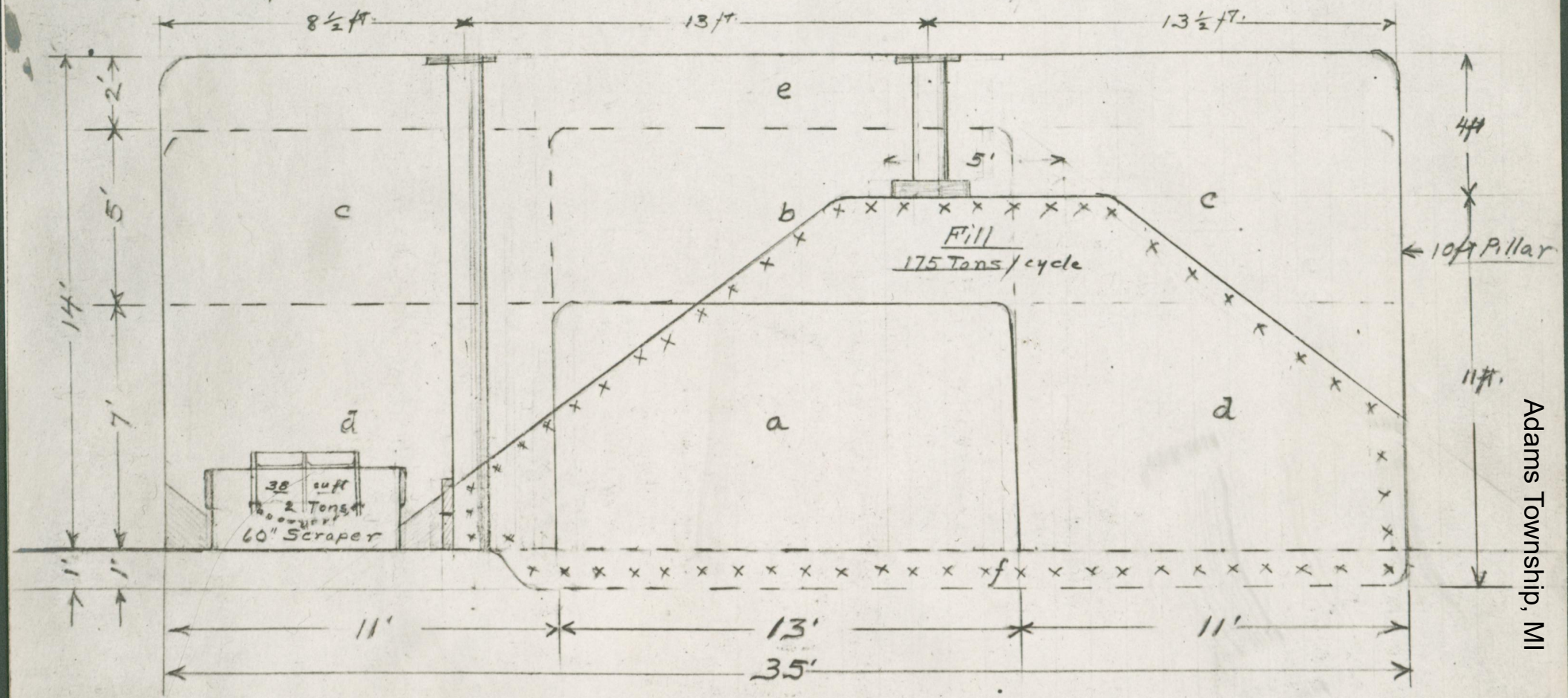
3 levels operating = 2000 Tons per day per level or 1000 Tons per shift.

1000 ÷ 400 = 2.5 Rooms or say 3 Rooms working per level

and Producing 2.5 × 400 = 1000 Tons + 100 = 1100 Tons per shift × 2 = 2200 / day

2200 Tons × 3 Levels = 6600 Tons per day for 5 day = 33000 Ton per week

33000 ÷ 6 day for mill or 5500 Tons per day



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PAINESDALE, MICH.

SEPT. 29, 1944
BY W. H. S.
Scale 1" = 40'
SHEET # 5