

# 2004 WFL Contractor Conference



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Historian  
Past to Future

March 10, 2004

Portland, Oregon

2004 WFL Contractor Conference

# Highway Construction

A Historical Perspective

1920s-1930s

**WAGON ROAD (1920s)  
SOON TO BE HIGHWAY**





**BLEWETT PASS, WASHINGTON (1922)**  
**OLD ROAD LEFT – NEW ROAD RIGHT**



**THE PINNACLES – CRATER LAKE NATIONAL PARK  
(1920s)**



**JULY IN CRATER LAKE NATIONAL  
PARK (1930s)**



**COLUMBIA RIVER HIGHWAY – BONNEVILLE DAM (1938)**



**LOG BRIDGE (1920s)**



SEA LION CAVES- OREGON COAST HWY (1930s)



MT. HOOD – MT. HOOD LOOP HWY (1920s)



FOOT BRIDGE – GARDINER, MONTANA (1920s)

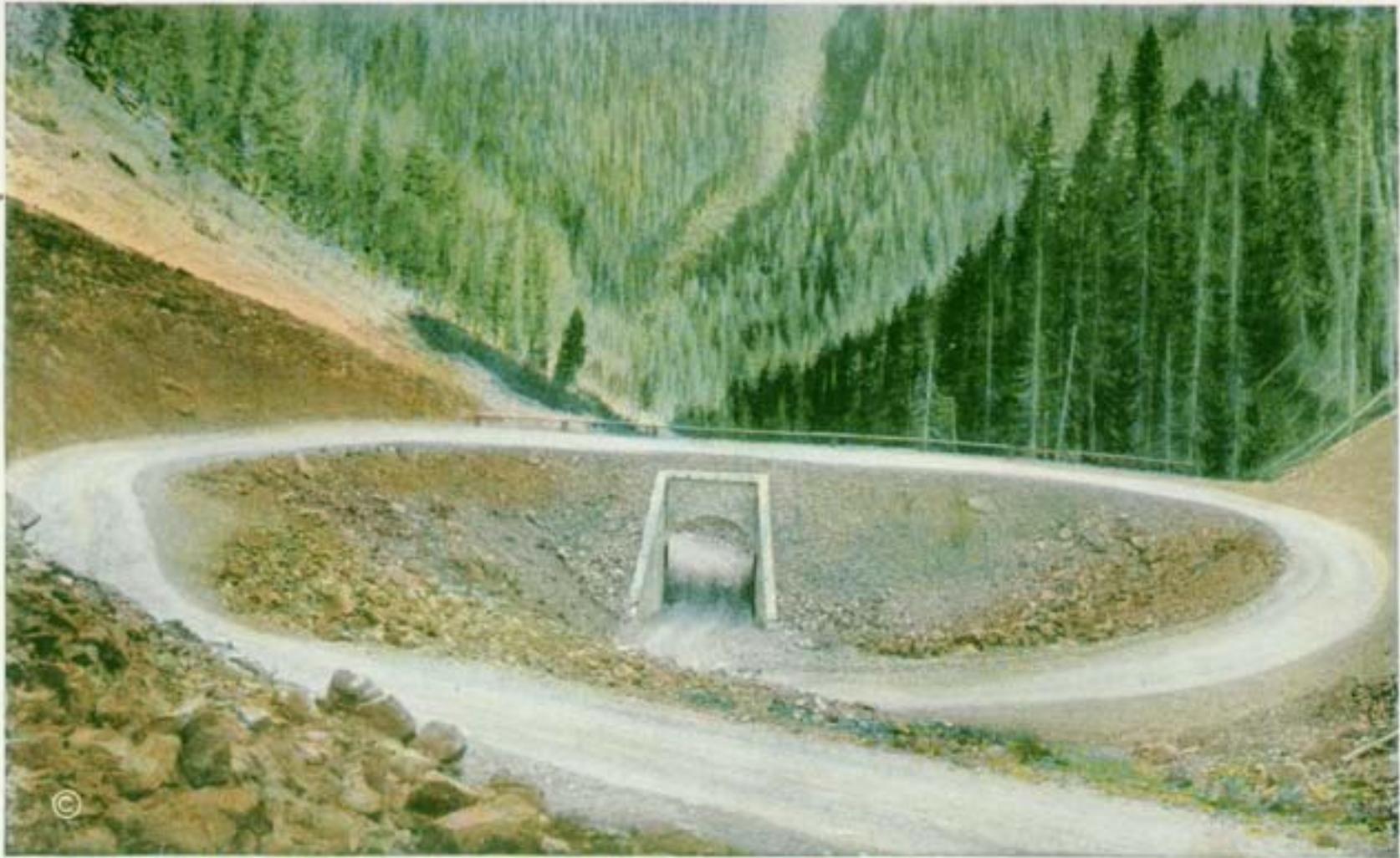


**HIGHWAY BRIDGE – GARDINER, MONTANA (1920s)**

DEAD MAN'S CURVE, ON THE RED LODGE-COOKE CITY, MONTANA HIGHWAY  
TO YELLOWSTONE NATIONAL PARK



**DEAD MAN'S CURVE – RED LODGE TO COOKE CITY, MONTANA**



22749. SPIRAL BRIDGE, "S" HILL, CODY ROAD, YELLOWSTONE PARK.

HAYNES.

**SPIRAL BRIDGE (THE CORKSCREW) – CODY ROAD  
YELLOWSTONE NATL. PARK**



**SAM ORINO (LEFT) CONTRACTOR, WALT THOMAS (CENTER) FOREMAN  
AND C.B. SPEAKER (RIGHT) OF THE STATE HIGHWAY DEPARTMENT  
TOOTH ROCK TUNNEL – COLUMBIA RIVER HWY (1938)**



**BPR RESIDENT ENGINEER  
(1937)**



**GUARDRAIL CREW – MONTANA (1925)**



**FINISHING SLOPES- DAY LABOR CREW (1930s)**



**BPR TUNNEL CREW (1930s)**



**DRILL CREW ON JUMBO (1938)  
SALT CREEK TUNNEL, OREGON**



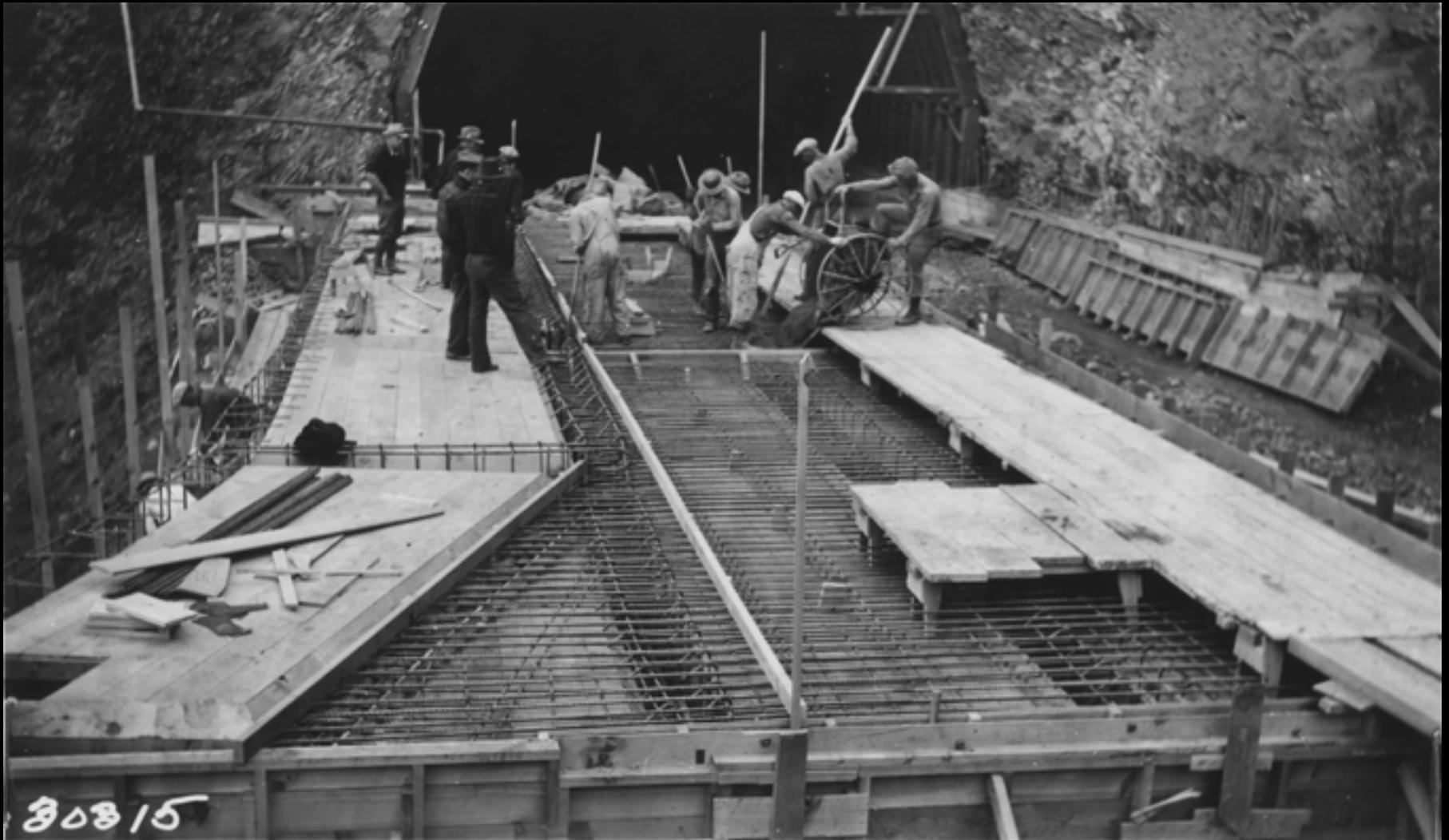
**STONE MASONS (1930s)**



**STONE MASONS SETTING RINGSTONES (1930s)**



**WALTER DURBIN, TRACTOR OPERATOR, SITTING ON  
LE TOURNEAU SCRAPER TIRES AND  
D.H. CADMUS, RESIDENT ENGINEER (1937)**



CONCRETE POUR (1930s)



CONCRETE FINISHING (1930s)



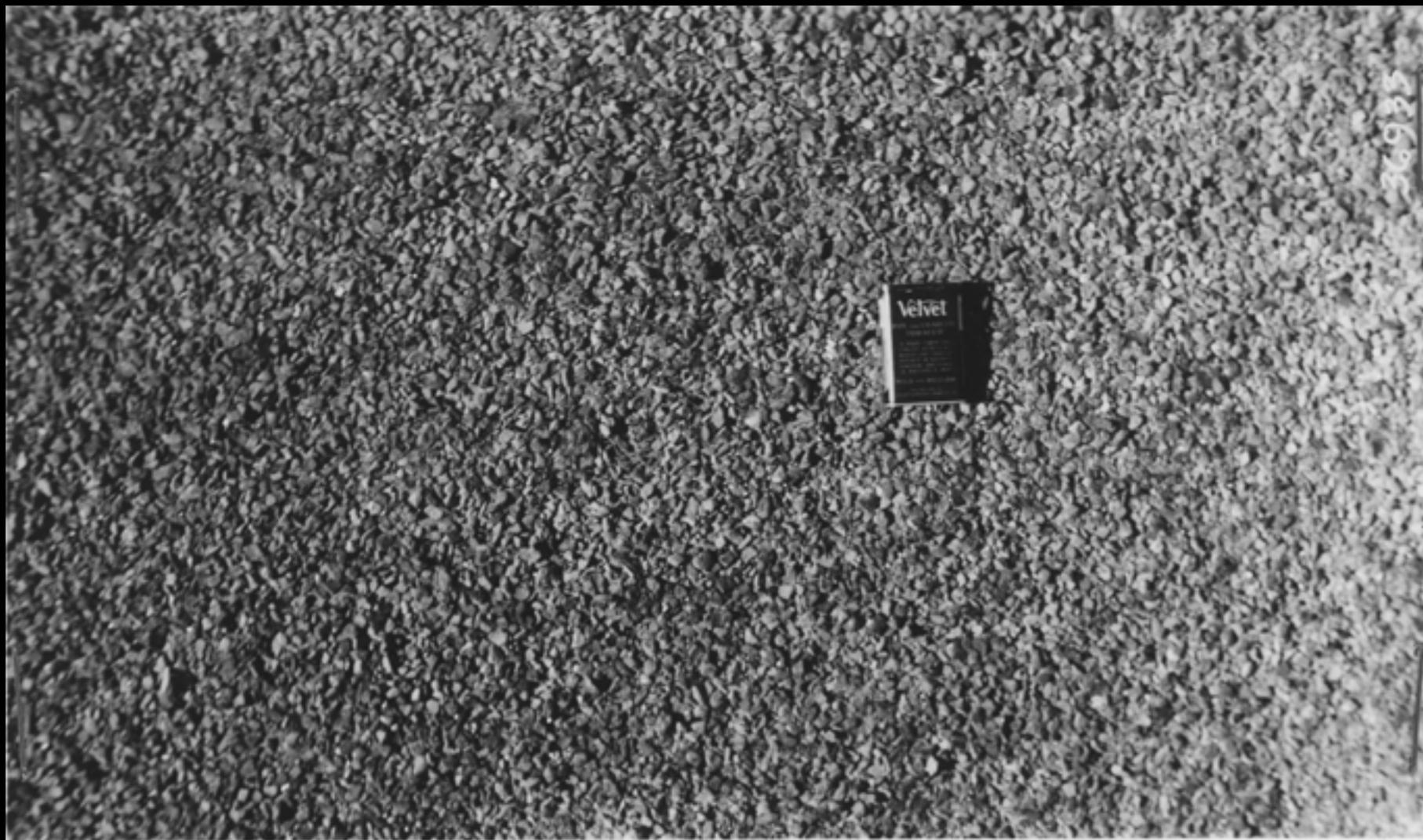
**GRADUATED ARC (1930s)  
FOR TUNNEL BORE MEASURE**



ARC IN THE BORE (1930s)



**ARC IN USE MEASURING BORE**



**VELVET TOBACCO TIN AS A SCALE REFERENCE (1930s)**

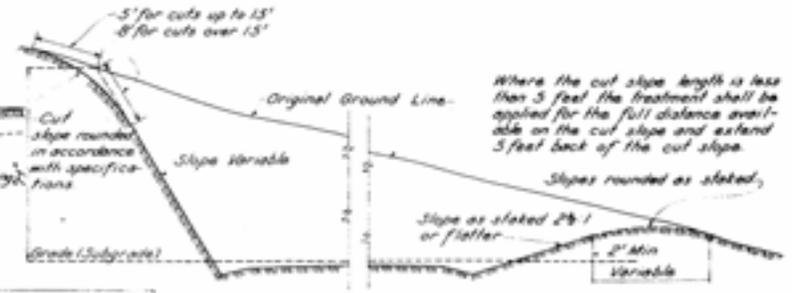
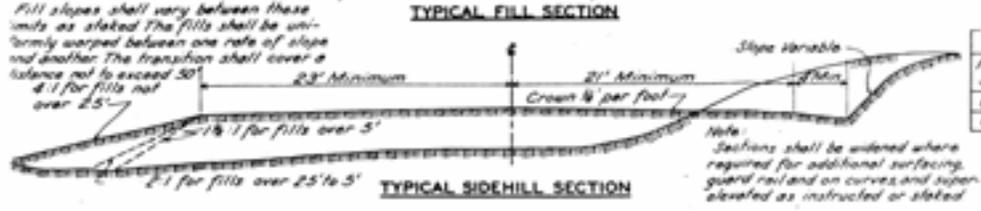
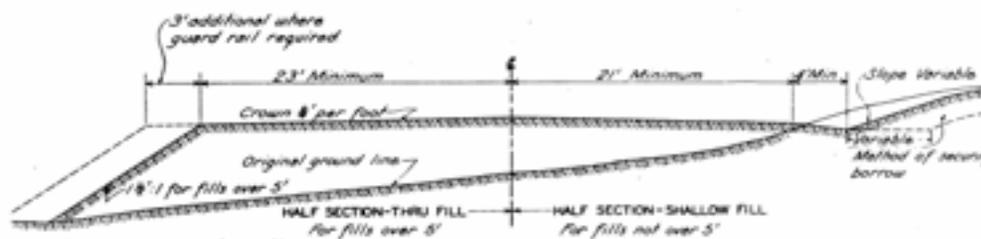
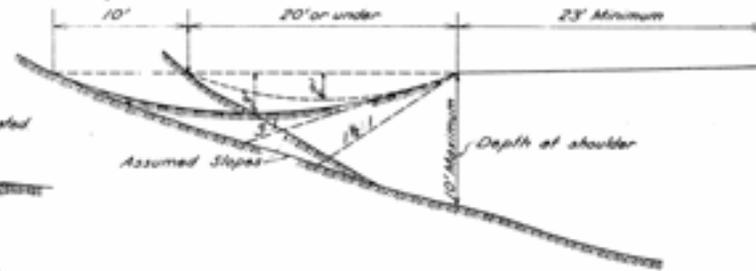
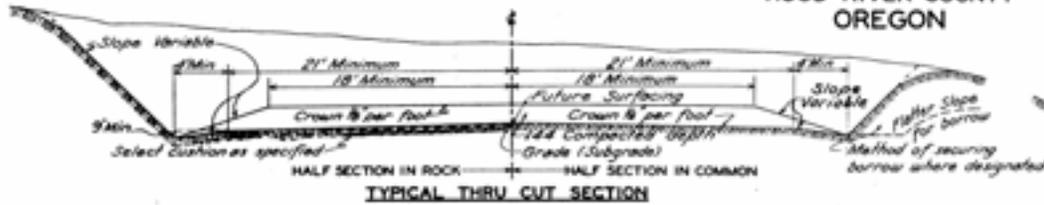


**SALT CREEK TUNNEL MODEL (1930s)**



TYPICAL CROSS SECTIONS

COLUMBIA RIVER HWY.  
MT. HOOD NATIONAL FOREST  
HOOD RIVER COUNTY  
OREGON



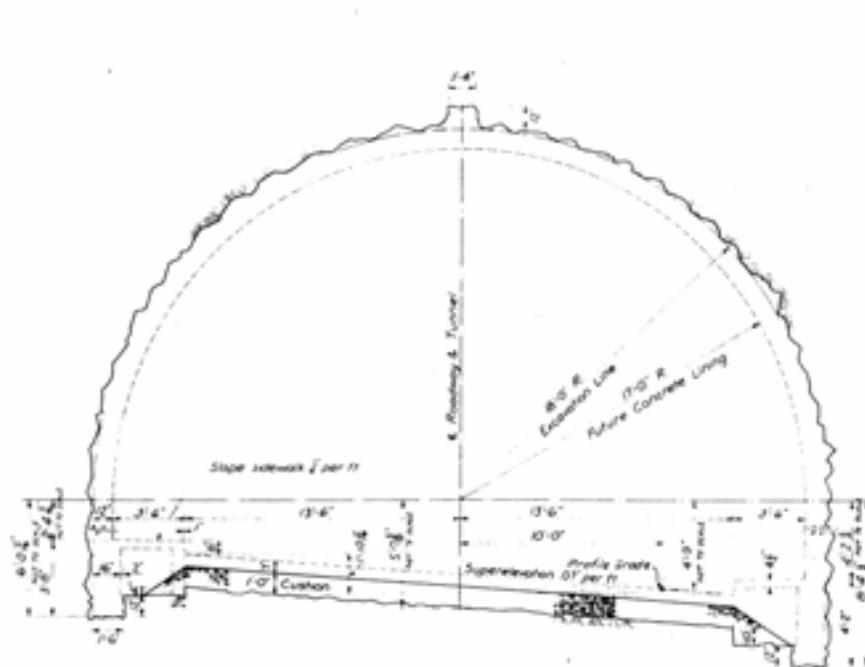
SLOPE ROUNDING	
Height of Slope	Roundness
0' to 15'	5'
over 15'	8'

SLOPE FLATTENING	
Height	Slope*
0' to 25'	2 1/2:1
3' to 5.9'	2:1
6' to 11.9'	1 1/2:1
12' to 20'	1 1/4:1
over 20'	1:1

\* Or flatter

Fill slopes shall vary between these limits as staked. The fills shall be uniformly warped between one rate of slope and another. The transition shall cover a distance not to exceed 50'.  
4:1 for fills not over 25'.  
14:1 for fills over 25' to 5'

Note: Sections shall be widened where required for additional surfacing, guard rail and on curves and super-elevated as instructed or staked.

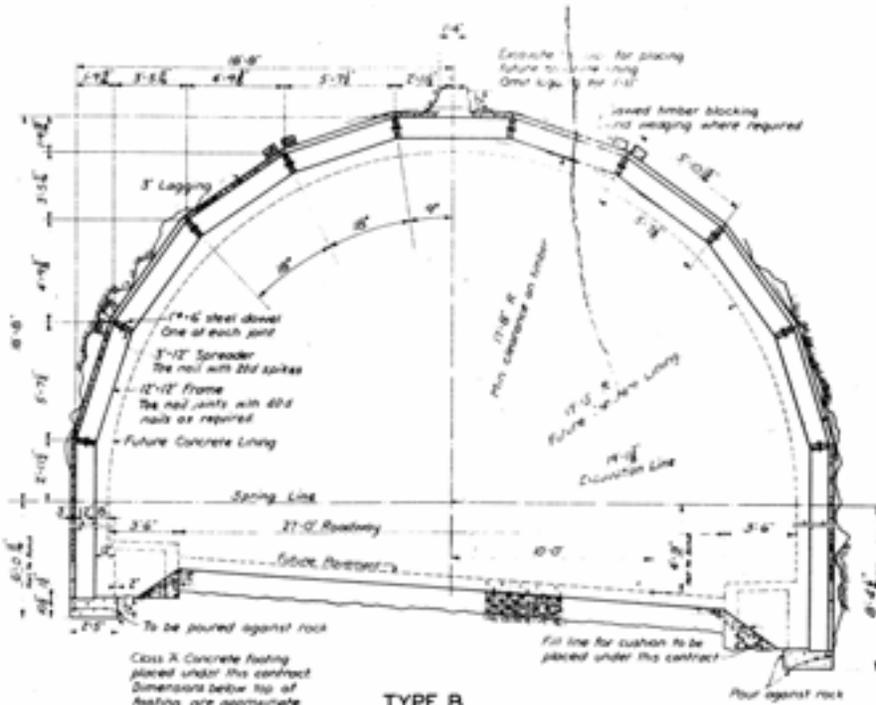


**TYPE A**  
**TYPICAL TUNNEL SECTION**

UNLINED  
Excavation 260 cu yds per lin ft

**NOTES**

**Specifications:** FR 50, 1935 and special provisions  
**Location and Grade:** Refer to sheet Nos 4 and 5  
**Length of Tunnel:** The length of tunnel as shown is approximate. The location of portals and the exact length shall be determined by the engineer.  
**Tunnel Excavation:** Tunnel excavation shall include all excavation required as shown in the section for Type A (unlined) and Type B (timber lined) tunnel. The sets shall also include placing the cushion material.  
**Timber Lining:**  
 Lumber Grading: Lumber shall be graded according to WCLA grading rules dated July 1, 1934. The 2"-12" size blocking shall be Select Structural Grade, per 210 and the lagging Select Structural, per 214. The contractor shall furnish WCLA or PLTB certificates of inspection for all lumber.



**TYPE B**  
**TYPICAL TUNNEL SECTION**

SHOWING TIMBER LINING  
Excavation 270 cu yds per lin ft

**Construction Sets:** The sets shall be spaced from 24' to 30' centers center as directed by the engineer.  
**Lagging:** The sets shall be partially or completely covered with lagging as directed by the engineer.  
**Screeders:** Screeders shall be omitted if considered unnecessary by the engineer.  
**Blocking of Joints:** All joints shall be securely held in position by sheets of steel, timber blocks, struts or wedges as directed by the engineer.  
**Quantity of Lumber:** The quantity estimated is for 300 lin ft of tunnel based on an average spacing for sets of 3'-0". The item of untreated lumber includes sawed timber blocking and wedges ordered placed by the engineer.  
**Rocking:** Cordwood packing or rock packing, or a combination of these items shall be placed between the lagging and the rock when it is considered necessary by the engineer and is so ordered.  
**Concrete:** The concrete roofings may be placed in short sections if desired. High early strength cement shall be used.

**ESTIMATED QUANTITIES**

Tunnel Excav. Type A	575 Lin Ft
Tunnel Excav. Type B	300 Lin Ft
Class A Concrete	100 Cu Yds
Untreated Timber	665 M B M
Cordwood Packing	50 Cords
Rock Packing	100 Cu Yds

U. S. DEPARTMENT OF AGRICULTURE  
 BUREAU OF PUBLIC ROADS PORTLAND, OREGON  
**TUNNEL DETAILS**  
 STA. 1493+85 TO STA. 1502+60  
 WILLAMETTE HIGHWAY ORE. FOREST PROJ. 21-12, M  
 SCALE - 1/4" = 1'-0" SEPT 1937



CONSTRUCTION SIGN (1937)



**PILOT CAR & LINE OF TRAFFIC (1937)**

FORM NO. 1  
ISSUED ONLY TO  
THE DISTRICT ENGINEER  
SECOND PORTLAND DISTRICT  
BY DISTRICT CLERK  
NONE TO FILE IN

WAR DEPARTMENT  
OFFICE OF THE DISTRICT ENGINEER  
SECOND PORTLAND DISTRICT  
PORTLAND, OREGON

*Case 28 a*  
Bonneville, Oregon  
May 26, 1937

Mr. Tolson	
Mr. E. A. Tamm	
Mr. Clegg	
Mr. Glavin	
Mr. Ladd	
Mr. Nichols	
Mr. Rosen	
Mr. Tracy	
Mr. Carson	
Mr. Egan	
Mr. Gurnea	
Mr. Harbo	
Mr. Hendon	
Mr. Jones	
Mr. Mumford	
Mr. Quinn	
Mr. Nease	
Mr. Gandy	

Mr. W. H. Lynch, Dist. Engineer  
U. S. Bureau of Public Roads  
P. O. Box 3900  
Portland, Oregon

Dear Sir:

Re. Tests on Concrete Cylinders

Mr. John Ross, Assistant Engineer for the Bureau of Public Roads, delivered to the Bonneville Laboratory on April 30, 1937, four cylindrical concrete specimens of your Class "C" concrete for compression tests.

The results were as follows:

U.S.E.D. Lab. No.	B.P.R. No.	Curing Temp. Range	Weight of Spec. (lbs.)	Date Tested 1937	Age at Which Tested	Compr. Strength #/Sq.In.	Type of Break
HW 7735	5084	45°	29.69	4/30	48 hrs.	980	Cone
" "	"	55°	30.19	5/1	72 hrs.	1960	"
" "	"	70°	29.13	5/5	7 days	2920	"
" "	"	70°	29.81	5/26	28 days	3505	"

Yours truly,

*M. Myers*  
Colonel M. Myers  
Captain, Corps of Engineers  
Resident Engineer

## CONCRETE CYLINDER TEST REPORT (1937)





33020

**PRESIDENTIAL MOTORCADE (1937)  
COLUMBIA RIVER HIGHWAY PROJECT**



**MOTOR PATROL IN TRANSIT (1930s)**



**HAULING MATTING BY ROW BOAT (1920s)**



**TRANSPORTING ASPHALT BY RAILROAD (1920s)**



**WHEEL-SCRAPERS LOADING DIRT (1925)**



**4 UP & FRESNO CUTTING GRADE (1925)**



2 UP WITH DUMP WAGONS (1920s)



**WAGONS BEING LOADED WITH AGGREGATE (1920s)**



**STEAM SHOVEL & HORSE DRAWN  
WAGON (1926)**



**STEAM SHOVEL & LOCAMOTIVE (1920s)**



**SCARIFYING GRADE (1920s)**



**GRADER (1920s)**



**TRACTOR PULLING GRADER (1920s)**



**SELF-PROPELLED GRADER (1930s)**



**MOTOR PATROL (1930s)**



**POWER BROOM ATTACHMENT (1939)**



**1/8 CUBIC YARD SHOVEL (1930s)**



**RD-8 CATAPILLAR (95 HP) WITH BULLDOZER (1938)**



**TRACTOR PULLING GRADER (1936)**



**JAEGAR BITUMINOUS PAVER (1936)**



**JAEGAR BITUMINOUS PAVER (1936)**



**ROLLER WITH WATER TANKS TO MOISTEN WHEELS (1936)**



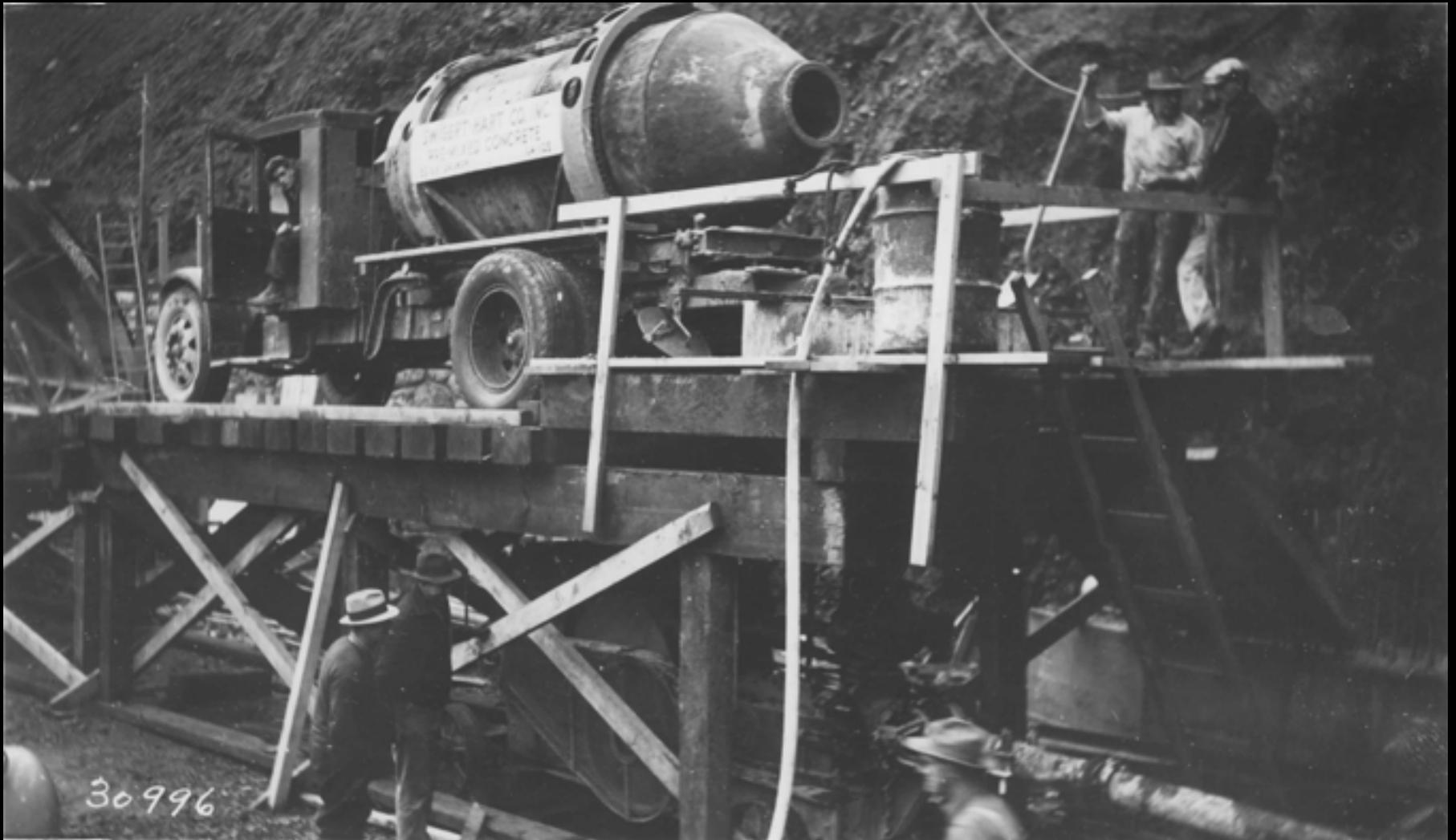
**THEW SHOVEL (1929)**



**PIERCE-ARROW TRUCKS (WWI SURPLUS) &  
THEW SHOVEL (1926)**



**TILTING JAEGER CONCRETE MIXER (1930)**



**CONCRETE TRUCK (1930s)**



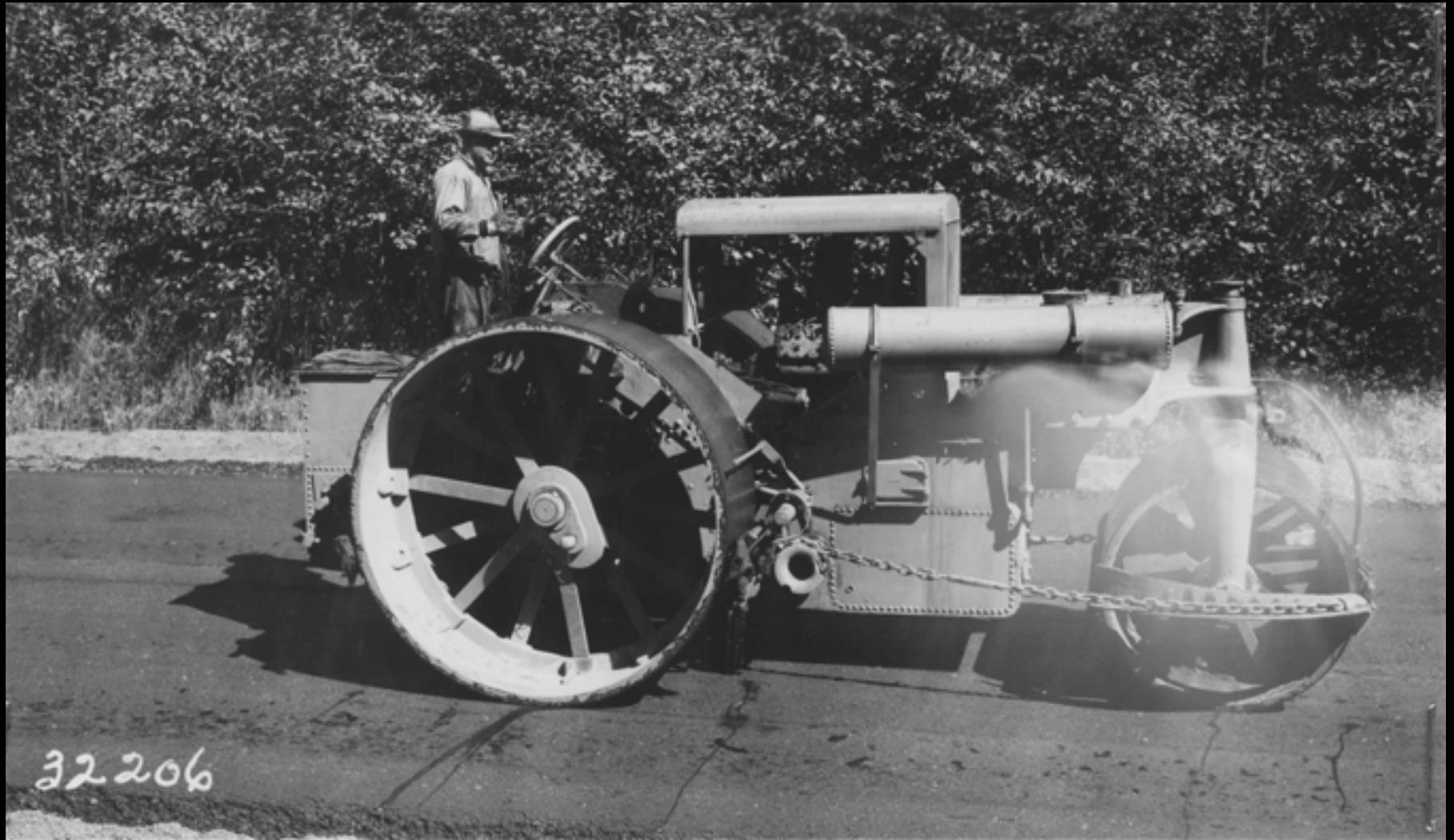
**RD-8 CATERPILLAR PULLING 28 CY LeTOURNEAU BUGGY  
(1937)**



**ADAMS MIXING MACHINE (1935)**



**DISTRIBUTOR & RAIL CARS (1935)**



ROLLER (1937)



DUMP TRUCK (1926)



DRILL (1939)



**JUMBO (1930s)**



ASPHALT PLANT (1937)

THINGS YOU WOULDN'T  
THINK  
OF DOING  
  
NOW



**UNCONTROLLED BLASTING (1930s)**



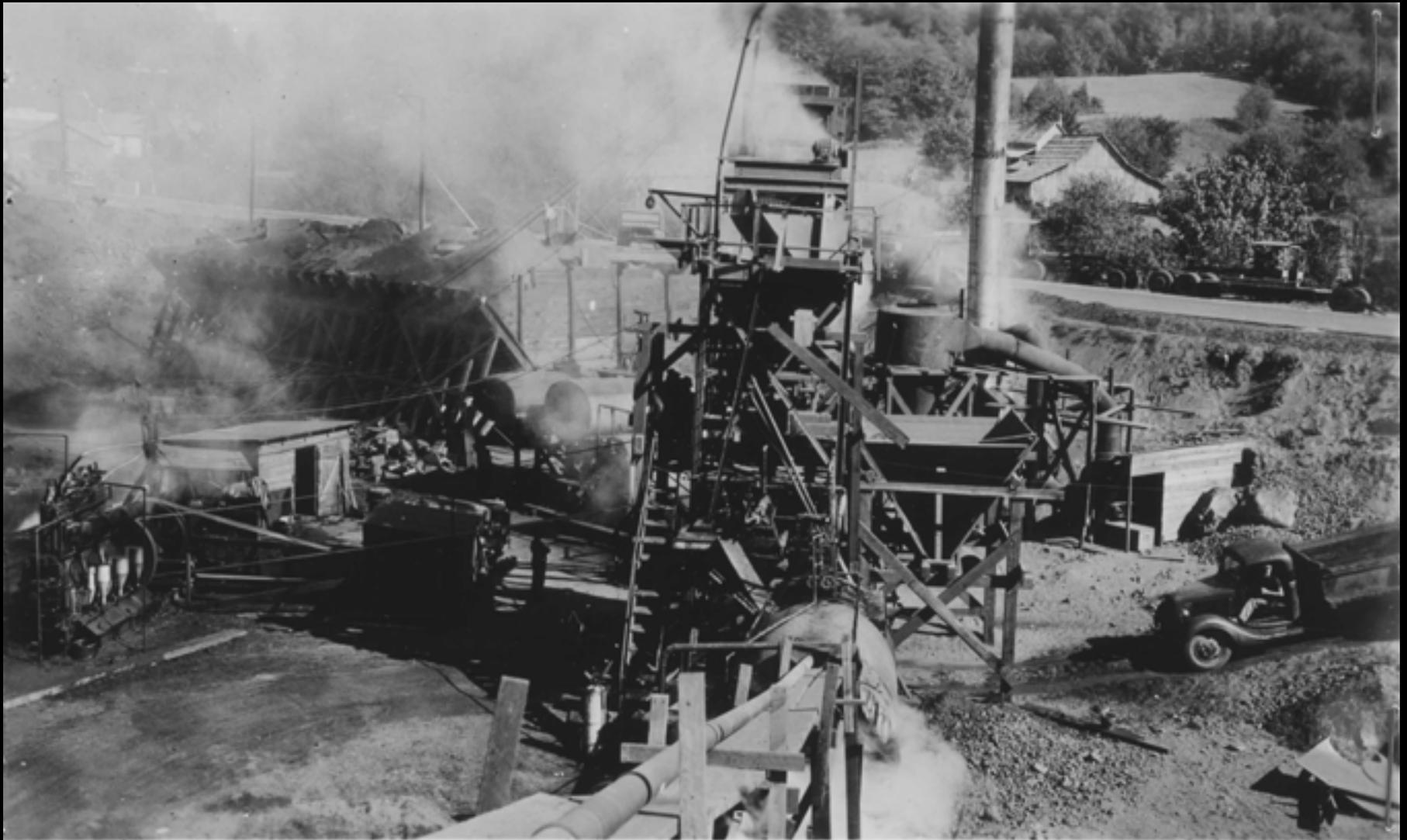
**MOVING RIVERS (1930s)**



**LOADING SAND AT WECOMA BEACH (1937)  
OREGON**



**TRANSPORT VIA PIGGY-BACK STYLE (1930s)**



**ASPHALT PLANT (1937)**



**ASPHALT PLANT IN OPERATION (1937)**



**FUELING AREA (1920s)**



**BPR FIELD OFFICE (1920s)  
MONTANA**



**CONSTRUCTION CAMP (1920s)  
LAKE CHELAN, WASHINGTON**



**CONTRACTOR CAMP (1930s)**  
**CRATER LAKE, OREGON**



**BPR FIELD OFFICE/CAMP (1930s)**  
**TUNNEL CR. MONTANA**



**CONTRACTOR'S CAMP (1930s)**  
**MT. RAINIER, WASHINGTON**



**BPR OFFICE – WILLAMETTE HWY, OREGON (1930s)**



**BPR CAMP – SALT CREEK TUNNEL, OREGON (1930s)**



**FHWA-WFL OFFICE (1930s)**



BOYER, OREGON (1937)



CASCADE LOCKS, OREGON (1937)



**GOVERNMENT CAMP, OREGON (1925)**



**MAIN STREET – THOMPSON FALLS, MONTANA  
(1928)**



ROSE LODGE, OREGON (1937)



PACKWOOD, WASHINGTON (1930s)



SPRAY, OREGON (1932)

YOU KNOW YOU HAVE HAD

A

BAD DAY

when.....



**YOUR HORSE GETS STUCK IN A SWAMP**



**TOPPLED CRANE (1937)**

**How big was that rock?**



**A SMALL BLAST (1930s)**



**BREAKS THE NEW RAILROAD PORTAL  
(1930s)**



**PARKING ON A SLIDE (1939)**



**ALMOST FINISHED (1930s)**

THE END

(ALMOST)

WESTERN FEDERAL LANDS HIGHWAY  
PRODUCTION

VANCOUVER, WASHINGTON







