THE SURVEY CREW EXPERIENCE – PART II
MONTANA, 1962-1965

FROM AN INTERVIEW WITH ED BUSCH, SEPTEMBER 2010

Montana sometimes welcomes survey teams and construction crews with below-zero temperatures, blizzards, and frozen rivers. Keeping roads open for local transportation access – and national security – means the work must go on in spite of most weather conditions.

People working in engineering and surveying jobs at Western Federal Lands Highway Division quickly come to know the up-side and the down-side of moving around on the job. **Ed Busch**, who came to work as a surveyor in 1959, recalled the shock of his first move. "In the 1960's I was working down around Roseburg, Oregon…and we came into the office one night and they said to report to Stanford, Montana, out of Great Falls." He was told to report within two days, and recalls it was "45 degree temperatures (in) sunny, southern Oregon, and I hit Montana at 40 below, two days later."

It must have been late 1962 or early 1963 because the Cuban Missile Crisis was in full swing. "They were (building) the Minuteman Missile sites," he recalled. "We had to replace all the culverts and re-gravel all the roads. (There) was about 180 miles worth of roads and bridges and work to be done there."

In the three months he spent on that project, much of the work involved re-engineering farm roads. "The farmers had all their roads going up the section lines; they were 90 degree turns. To get the missile carriers around the corners, they had to put a 30 degree radius curve in so they could make the corners.

After spending three months on that job, Ed was sent to a project outside Gardiner, Montana. "I worked…about 15 miles north of Yellowstone Park along what they called Yankee Jim Canyon." The project was about five miles long and he noted "there were 400 foot cuts. We slope-staked up 400 feet and it was like ramp 20 feet, 20 feet flat, 20 feet down, 20 feet flat."

Long missile carriers dictated a change in Montana's roads from sharp corners to gentle curves. WFLHD Archives, 2006.

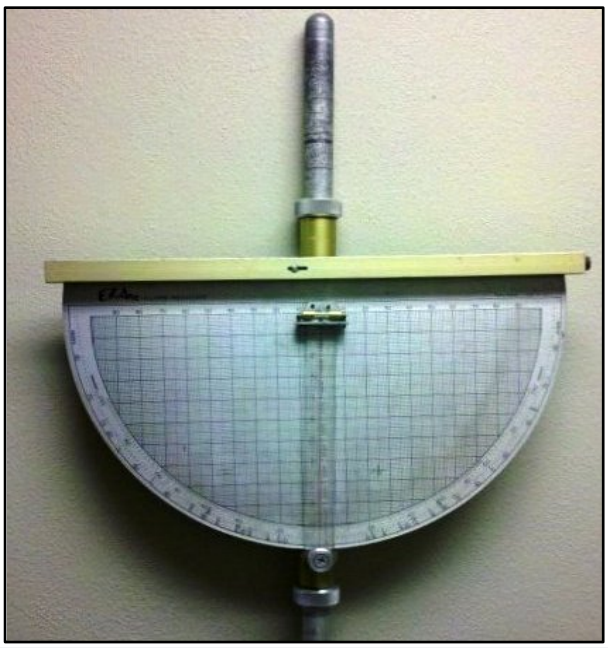
Some hair-raising moments occurred on those slopes. "The superintendant of the job was pioneering down the slope with one of the big Cats, 400 feet up. Those were the days they didn't have any protective cages on the Caterpillars," he added, "and he slid down the mountain sideways, clear down until just about to the road. There was a 30-foot drop-off" there, but luckily the Cat came to a stop before it went over. "He got off the equipment, walked to his car, and drove away," Ed remembered. "We never saw him again."

The job was also "full of rattlesnakes. We were there early in the spring" doing the surveying, he said, and later on "they were clearing the sagebrush for construction. One guy got bit by a rattlesnake and had some problems with it."

Ed recalled one of his own encounters with a rattlesnake on that project. "It was in October when there shouldn't have been any rattlesnakes," he said. "We were out one of the ramps coming down. (We) used this instrument called the Rhodes Arc and it would give you a working point." Ed and another fellow were shooting the stake set by a guy on the next ramp, 20 feet below them when "I heard this buzz. I didn't know where it was at," he said, but he took the staff of the Rhodes Arc "and I flipped up a rock, and there was a little 10-inch rattlesnake.

"We had a D-8 Cat and a D-9 working right below me, (and) the wind was blowing so you couldn't even hardly hear. But you could hear that rattlesnake," he emphasized. They killed the snake, but once the guys down below heard about it, they wanted to see it. "Where's it at?" they wanted to know, "so I just flipped it down to them….

"I encountered another one on that same job," he went on, when "we did an irrigation ditch for a farmer." They had to run the ditch across the road. It was a cloudy day and they had been working at it all day. "I went back to mark the fill and the stakes, and there was one lying on the rock. It was right where we (had been) working and we never had seen it." They killed the snake, but, he observed, "you wouldn't think at 5,000 feet elevation they would be there. But they were there….That was one thing about the job. In some areas, you had to always be on the alert and be watching."



An EZ Arc from WFLHD's collection. The original Rhodes Reducing Arc was invented by William T. Rhodes while surveying for the All Year Highway to the west entrance of Yosemite National Park, California, and was patented in 1930. Photo courtesy Wade Johnson; WFLHD Archives.

"The contractor brought all new equipment (to) the job," he remembered. "Evidently someone didn't get hired," however, and decided to get back at the contractor. "They drove a brand-new D-8 Cat in the river and let it run all night," he said, "and then shot a hole" in the engine of one of the big shovels.

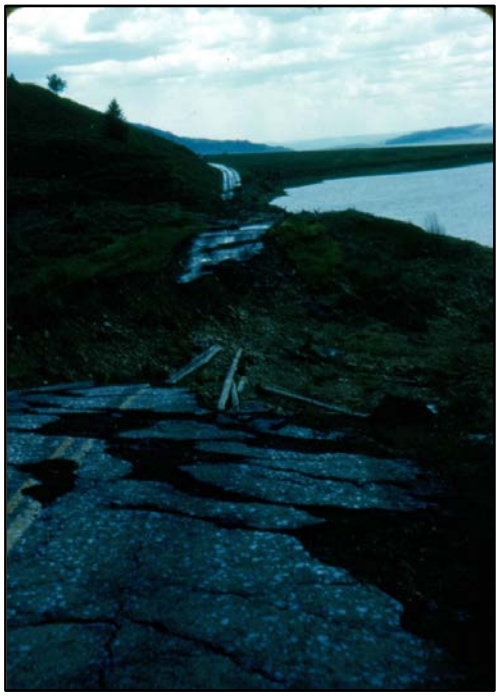
Other equipment damage that occurred on that project was accidental rather than malicious, such as when a rock wagon rolled into the river. "Yellowstone River in the springtime is cloudy because of the glacier runoff," he explained, and when they couldn't locate the lost rock wagon, they sent a diver down to find it. The diver located it, "he tied a rope around it—then he slammed into the side of it." Eventually, they were able to retrieve the lost vehicle. They "put it on a box car and took it back to the factory. It was back on the job before we finished."

As on some of the Oregon jobs he worked on, there was little concern about incidental upheavals to the environment in those days. "On the same job, (we) moved the Yellowstone River about 200 feet, and straightened out a curve in the

river," to make the road straighter. Whereas the practice today would be to realign the road, he pointed out, "in those days there were no environmental impact statements."

Nor were archaeologists or historians consulted for that project. "When we were doing the staking on this sand bar, we found Indian war clubs," he said, "and on certain parts of that job we found…a lot of Indian arrowheads." He noted there were also "a lot of mineral deposits (and) petrified logs," all of which helped to make the job more interesting.

When Ed left that project he went to work on a slide near Hebgen Lake in southwestern Montana. Often referred to as Quake Lake, it was non-existent until an earthquake hit the area in 1959. "I remember seeing it and reading about it in the National Geographic," Ed recalled. When an earthquake occurred, "the whole mountain came down…buried about 28 people in a campground." The slide occurred on the Madison River, southeast of Ennis. "The lake… just filled up instantly," he said. The mountain looked "like somebody took a cake cutter and cut it. That whole mountain just came across…and it filled up the camp and it made an instant lake." When he went to work on a slide repair project a few years after the earthquake, they were headquartered in Ennis, and he recalled that "they had (already) lowered the lake 60 feet."



Mat and roadbed slide caused by earthquake. Photo by Rexford G. Reilly.

He was working on a location crew for **Dave Cossell**. "It was 40 degrees below 0, and we were slope staking that job." The contractor, he said, "ran all their equipment 24 hours a day to keep it from freezing. They would never get it started if they stopped it."

Brothers David and Alan Reilly explore a road submerged in Earthquake Lake during a 1960 family vacation. Photo by Rexford G. Reilly

One thing he remembered about the Madison River and other rivers in that cold country near Ennis was that "those rivers freeze from the bottom up…The lakes would be frozen over, (and) then this ice would build up in the river and freeze…and it would come up over the bridges," he said. You'd look around and "you'd have these big banks of chipped ice on either side of the river" that had been pushed up during the process. "When you're not from there.…you'd say, well, how'd that get there," he said, not realizing "that when it got really cold over there, like 40 below in that canyon, that that water would freeze and would just keep on building up that ice and it would come up over the bridges….

"I drove through there a couple of years ago," Ed reflected, "and after 40 years it looks a lot different…It's grown up. You just think about how long it took you to get up (the hill) to…slope stake those 400 foot cuts. It would take you forever to get up, and get one section out."

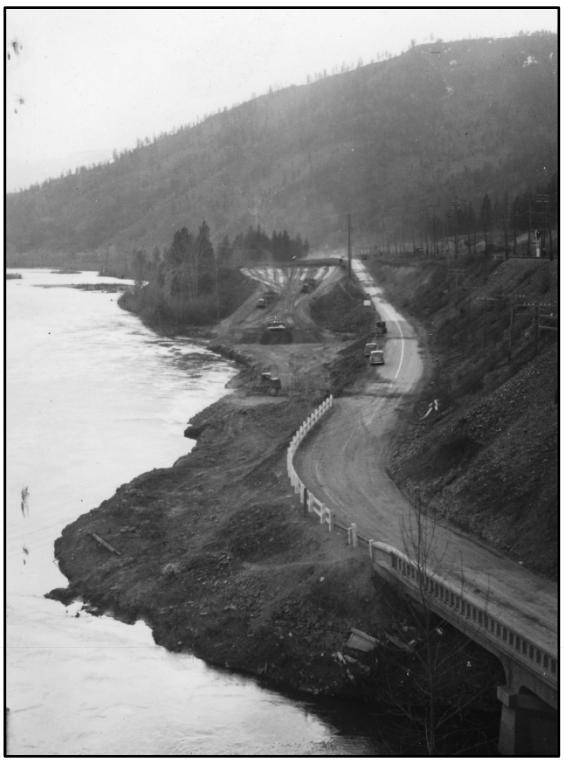
They finished up the job on Christmas Eve "and went home for Christmas," he said, and when

he returned, it was to another "location crew for Dave Cossell over in eastern Montana…We did a survey over there, Broadus to Miles City. We were working out there one day (when) it was 35 degrees above zero. Then within a half hour it went to 35 degrees below zero and blizzard conditions." This was on the plains, he said, "and you could just see the storms coming in. Of course when you get to that situation you just pack everything up and go home."

Although he left BPR long before retirement age, Ed continues to stay in touch with BPR retirees with whom he has remained friends. "The guys you worked with, you always got along; it was just a part of your lives.…

"They were all good engineers," he added, and the bosses didn't hold back on promotions. "If you had the ambition and you worked hard, you got a promotion. I was a GS-5 and probably up for my 6 when I left, and I was considered a party chief….

"It was a good job; it was one of my favorite jobs."



Projects constructed before the Environmental Protection Act, such as the 1939 project in the Lolo National Forest pictured on this page, often included placing a fill in a river. Top: Looking westerly as rock fill was being placed in the river to the left of the old road. RD-8 Caterpillar tractors and 13 cubic yard hydraulic scrapers are opening a dirt cut in the background. Bottom: The completed grade with concrete retaining wall and narrow non-participating bridge in foreground. The old road was left in place to provide an approach to the railroad station, right center. Final Construction Report, Yellowstone Trail Highway. WFLHD Archives.

After working on the Miles City-Broadus project, Ed Busch was transferred to Lolo Pass where he received training in soils testing. More about his experiences there will be covered in a future story. Dave Reilly, who retired from the Oregon Division in 2005, contributed the Quake Lake photos. Stories in this series have been developed by Marili Green Reilly from interviews, letters, and emails. If you'd like to share your experiences on Quake Lake, Missile Base Roads, or other Montana projects, email marili.reilly@dot.gov