

March 1987

FIELD NOTE NO.: Roads and Bridges--8
Previous Sheet Reference Nos.: None

SUBJECT: ELLIOT GRID ROAD COMPACTOR/CRUSHER

The Elliot Grid roller is basically an Ingersoll-Rand vibrating compactor. A grid, (made up of parallel, zigzagging hard-steel ridges), is welded to the drum. The grid cracks stones and provides extra traction and stability.

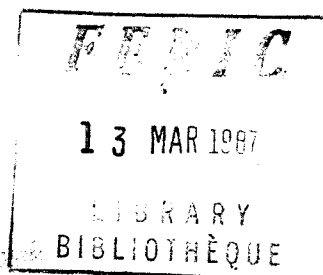
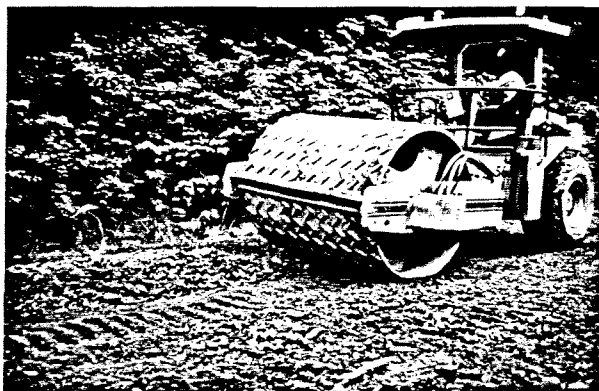


FIGURE A. Elliot Grid Road Compactor/Crusher.

MACHINE SPECIFICATIONS (Ingersoll-Rand SP-84G Vibratory Roller Compactor):

Total operating weight	13 925 kg	Rated power at 2200 rpm	123 kW
Drum weight	8 754 kg	Speed	0-8.7 km/h
Drum width	213 cm	Articulation	± 40°
Drum diameter	168 cm	Oscillation	± 15°
Shell thickness	3.8 cm	Fuel capacity	159 L
Vibratory frequency	0-1525 vpm	Fuel consumption (approx)	19 L/h
Engine	CAT D3208 NA	Gradability	41 %

PRICE: The approximate price of the Ingersoll-Rand SP-84G compactor equipped with an Elliot Grid is \$200 000 f.o.b. Vancouver, B.C. The unit can also be rented on a short-term basis for approximately \$11 000/month.

STUDY LOCATIONS: The use of an Elliot Grid compactor was observed and studied at Zeballos, Headbay, Holberg, and Port McNeill, B.C. At Zeballos, it was used to produce fines for a worn-out section of access road, which had been originally ballasted by coarse shot rock. On the Headbay road (Gold River to Tahsis) the goal was to crush small boulders recovered from the roadside. This road had been built with quarried granitic rock. At Holberg and Port McNeill, the machine was used to compact and crush the surface rocks of a new ballast layer during the rebuilding of main roads. The material at Holberg was bulldozer-ripped limestone, while at Port McNeill, pit-run gravel (rounded limestones of fluvial deposit) was used.

OPERATING TECHNIQUES: Three different techniques were observed. At Zeballos, the grader scraped all available material from the road and placed it in a windrow at the side of the road. The roller then was used to make 12-15 passes over the road and windrow to create fines and to break up the boulders showing at the surface of the road.

At Headbay, the grader brought the gravel and cobble-sized rock from the ditch and the roadside, and placed it in a windrow approximately 30 cm x 90 cm. The Elliot Grid compactor passed over the windrow twice and crushed about 20% of the large pieces (10 cm+). The grader then sorted the large pieces and moved them over to form a new, but smaller windrow. The compactor rolled over the windrow another two times. The process was repeated four to six times until crushing was completed. Both sides of the road were treated in similar fashion to crush all the available rock.

The third technique, (at Holberg and Port McNeill), involved compacting fresh ballast laid on old roads. Trucks dumped and partly spread the material. A bulldozer or grader finished spreading and smoothing the road surface. The compactor then made four to six passes over the ballast to compact it and to break up the large rocks on the surface.

Although the vibration frequency is adjustable on the machine, it was always set to the maximum during the trials.

PERFORMANCE EVALUATION: On the Zeballos road where the rock was hard, the Elliot Grid produced an average of 3.4 cm of fine crushed material in 12-15 passes. This depth represents a volume production of 40 m³/h. The production was much better in the soft granite of the Headbay road where the machine averaged 129 m³/h. The rock-crushing ability was also good in soft limestone (Holberg and Port McNeill). The machine also compacted the ballast 13-15% for the limestone roads. Although the limestone ballast had a low moisture content, the road was strong enough to support heavy freight trucks after two passes.

WHERE TO USE IT: The machine compacted the roads well in all applications that we observed.

Crushing ability of the machine was good in rock that was rippable by a bulldozer. However, hard blasted rock, some river gravel (granite), and large blasted basalt particles did not break as well, and the production was reduced. Rocks imbedded in fines took longer to break. In the studies, the roller performed well on grades up to 16 percent.

FUTURE DEVELOPMENT: Presently, the Elliot Grid is installed on Ingersoll-Rand compactors. The manufacturer, however, can install it on other compactor brands. Bolt on, do-it-yourself installation kits will also be available in the near future.

INFORMATION: The information in this report is based on limited field observation and is published to disseminate information to FERIC member companies. More information may be obtained from:

Maurice W. Kooting
Trans Global Equipment Ltd.
P.O. Box 528
Aldergrove, B.C.
VOX 1A0
(604) 856-1214

Otto Pflanz
M.O.F.L.
370 S. Dogwood Street
Campbell River, B.C.
V9W 6Y7
(604) 286-3282

Joe Ronyecz
Western Forest Prod. Ltd.
P.O. Box 250
Port McNeill, B.C.
VON 2R0
(604) 956-4446