Foothills Stream Crossing Partnership

Geotextile Reinforced Soil Arch Photo Gallery

Hardisty Creek – July 2009

www.foothillsresearchinstitute.ca

View of outlet before construction with a hanging culvert

Removal of the culvert

Removal of the culvert

Removal of the culvert

Installing a temporary net to prevent fish from moving upstream during

Installing the temporary net

Stream diversion ditch upstream

Geotextile lined diversion ditch to prevent scouring of forest floor

Downstream diversion ditch in action

View of the diversion ditch outlet. A culvert was placed under the road and upon construction

Metal Cages

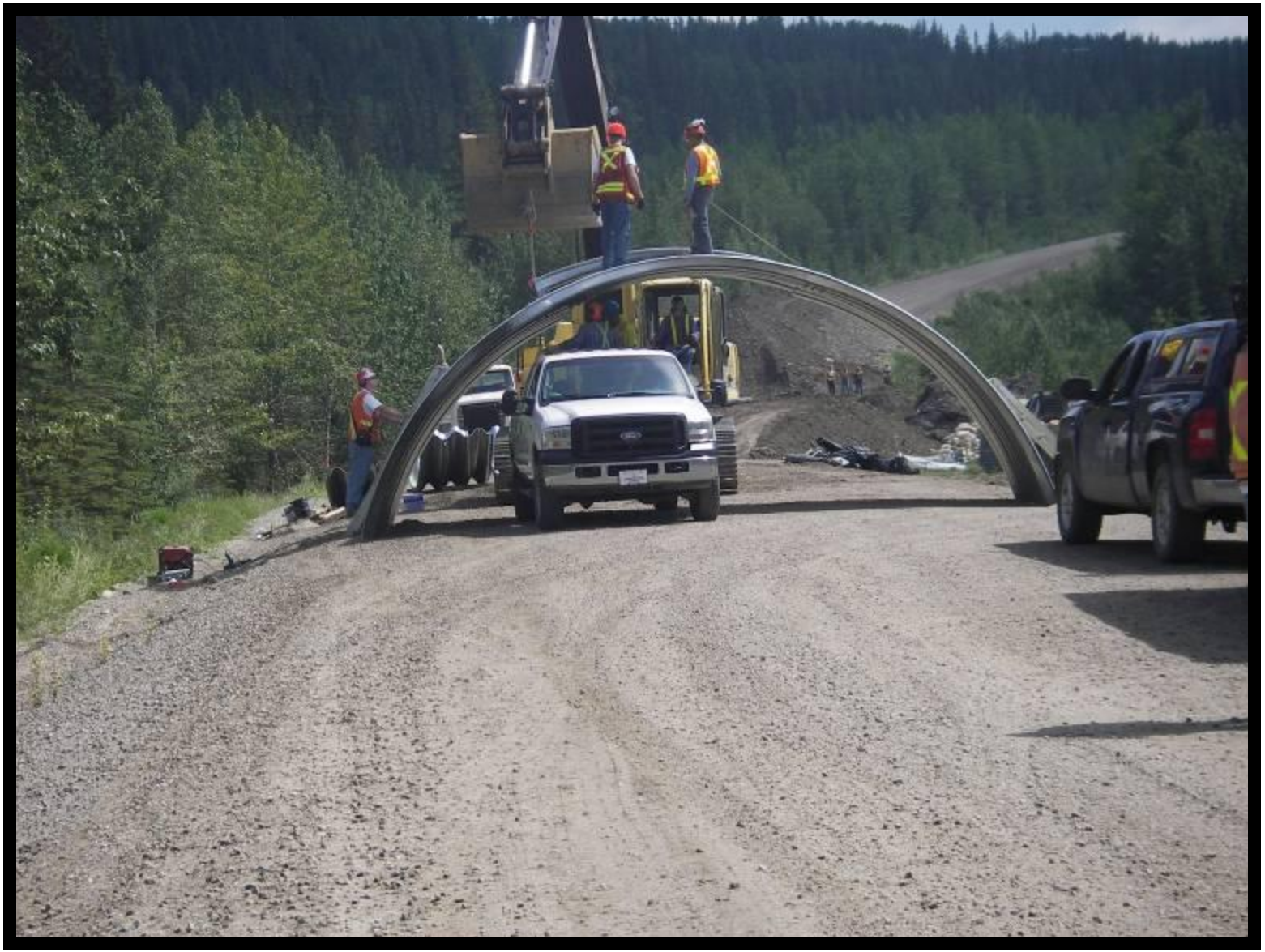
Metal cages layered with geotextile to contain the compacted soil

Placement of metal cages to prepare for another layer of soil

Steel anchors used to secure the arch once in the streambed

Construction of the arch, pieces must be aligned

Construction of the metal arch



Construction of the metal arch before installation

Placement of boulders into streambed where the culvert was previously

Placement of Arch - Placement of the first arch piece into the streambed

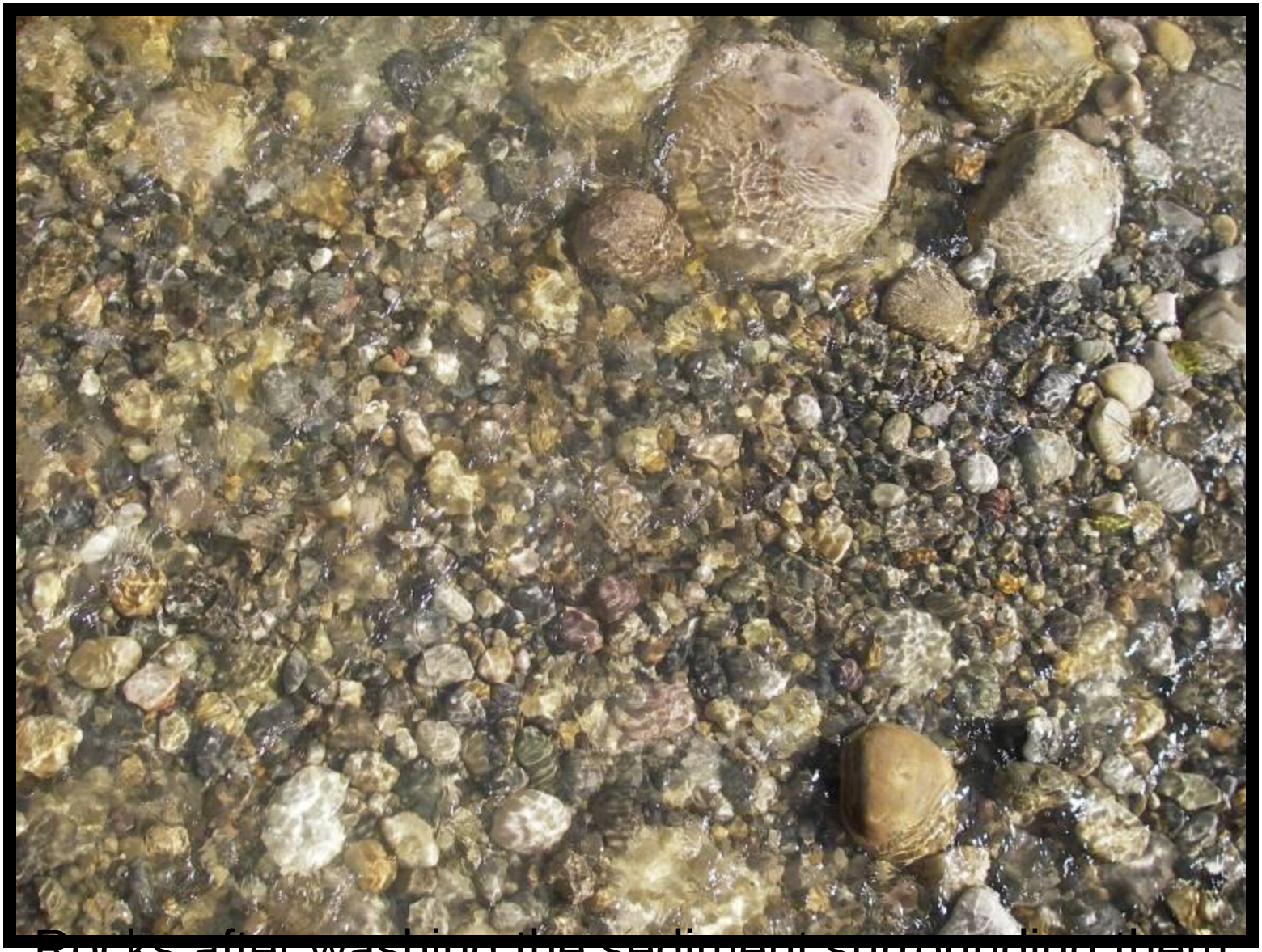
Preparing to release the stream into the stream diversion ditch

Compressing the bank to allow the water to flow through the diversion ditch

View of arch from downstream side during construction

Compaction of soil around the arch

Compaction of soil around the arch



Rocks after washing the sediment surrounding them to prevent sediment from entering the creek

View of arch from water level facing downstream

Inside Arch - View inside of the arch after construction

Coconut matting, silt fencing and rip rap was used as sediment control at the outlet

Outlet - View of outlet after construction

Inlet from Left Upstream - View of inlet upon completion of construction

Inlet from Right Upstream - View of inlet upon completion of construction

Inlet - View of inlet

Inlet - Arch inlet after completion of construction

View of inlet as a semi-truck passes over

View of the road after construction

Interpretive Signs at Crossing


HARDISTY CREEK
Geotextile Reinforced Soil Arch
Structures constructed using compacted soils with layers of tensile reinforcement elements were employed by ancient civilizations in China and Mesopotamia. Surviving examples include 3100 year-old Ziggurats in Iraq and 2000 year-old sections of the Great Wall of China. Modern day GRS composite structures share the same basic principle but use materials such as welded-wire mesh facing forms and closely spaced layers of geotextile.
BEFORE AND AFTER
THE GRS ADVANTAGE
CONSTRUCTION

Panel 1


STREAM WORLD
In a stream ecosystem communities of organisms are dependent on each other and on the physical characteristics of the stream. These organisms can be animals, plants, or micro-organisms and each individual species has a role to play. When one of these organisms is removed, negative effects can often be seen in the remaining species. Within Hardisty Creek a healthy invertebrate population is necessary for the survival of the fish who eat them.
WATER RESIDENTS
Invertebrates can be used as an indicator species in determining stream health. In other words, invertebrate's presence, absence or well being can indicate the health of the stream as a whole. The three main species found in Hardisty Creek are the caddisfly, the stonefly nymphs, and the mayfly nymphs.
ATHABASCA RAINBOW TROUT
Sediment Deposits
Turbidity

Panel 2


Foothills Stream Crossing Program
The Foothills Stream Crossing Program (FSCP) is an independent, industry-driven program focused primarily on improving the management of stream crossings. The Foothills Research Institute (FRI), the coordinating agency for the program, has established a close working relationship with the FSCP since its inception in 1994.
Currently the FSCP committee is composed of nine resource-based companies and both federal and provincial government agencies. This collaborative approach facilitates interagency and intercompany cooperation and enables companies to set aside the normal confidentiality which surrounds their liabilities on the landscape. They are able to discuss ways to set priorities and to plan for crossing repairs in an environment supported by government regulators. Decisions within the FSCP matrix are based on a watershed level which leads to greater overall gains in habitat quality, connectivity, and sediment reduction.
Foothills Research Institute Core Study Area
Major Partners
Participating Partners
armtec

Panel 3

Signs with crossing in background