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Municipality of Sanikiluaq
Sanikiluaq, Nunavut, Canada, X0A 0W0
Tel: (867) 266-8874 Fax: (867) 266-8903

To: Nunavut Water Board

From: Robert McLean, CEDO, Municipality of Sanikiluaq

RE: Pullalik Bridge Project - File # 8BW-PUL0607

Please find enclosed:

- a web link to ALL photos of trail and Bridge construction
- a short description of the project
- 6 photos showing before and after

Description of Pullalik Bridge Project

The bridge at Pullalik River has been completed by summer students and employees from the Municipality of Sanikiluaq. The trail to the bridge over the Pullalik River is 3.78 miles south-east from the community. Long 79*08'57.90W and Lat 56*30'58.74N
This is the main trail from the community that is used by most travellers, hunters, fishermen, berry-pickers, and people going for a picnic, owners of several outpost cabins as well as the main route to get to south camp at the far end of our island. The trail is narrow and winding and when it crosses the flood plain of the large river, which drains Windy Lake, it is always very rough and/or muddy from all the silt that gets washed downstream.
The narrow wooden bridge that is left in place at the present time was constructed many years ago and is becoming unsafe. The approach trail that leads up to the bridge was very rough and has caused extensive damage to vehicles that have had to use it.
Our major concern was to make a trail that is safer and faster to travel for any Search and Rescue teams that have to assist any residents that are in trouble.
The single span bridge we constructed was made from steel I-beams with wooden planks for the roadbed. The approach to the bridge on the west side has been built up approximately 8-10 feet to give clearance underneath for the spring run off and any ice that comes downstream. The trail that is the roughest covers approximately 400 yards on the north west side and only 100 yards on the south east side of the bridge. The rest of the trail from town took minimal work to get into safe and comfortable condition.
The material that was used to improve the trails, build the access approach to the bridge and fill the bridge abutments was locally obtained beach gravel from drier areas.

The equipment that was used to improve the trail consisted of a Caterpillar front-end loader, 5 ton tandem dump truck and a D6 Bulldozer. A local labour force of six students and the CEDO, acting as supervisor, constructed the bridge and directed the heavy equipment. Over 80% of the funding remained in the community as local wages and the remainder used to purchase the steel I-beams and wooden planks for the roadbed of the new steel bridge.

The front end loader and tandem dump truck hauled small rocks and gravel from drier areas to build the approach and fill the bridge abutments. The loader was only able to fill the wooden crib box with small rocks and gravel on the west side only.

The front end loader carefully forded the river at its shallowest area and tried to find rocks and gravel to fill the crib box abutment on the East side of the river. It travelled up the trail to the area where gravel could be obtained on the East side of the river. The trail could not support the loader with its bucket full of gravel and rocks for the many trips that would have been needed so an alternate method to fill the crib box on the East side had to be found. The tandem dump truck hauled 5 full loads (approximately 100 tons) of small rocks and gravel and dumped them near the west side approach and the students hauled across the new bridge by wheelbarrow, many loads of small rocks and gravel to fill the East side crib box. Many large rocks on the East side of the river were also used to fill the box and placed around the base of the box to prevent erosion.

A wooden ramp was constructed from large wooden timbers for the approach to the new bridge from the East side.

A wooden railing approximately 30" high was fastened to the new bridge to provide safety.

Two coats of metal rust inhibiting paint was applied to the steel and two coats of high gloss enamel paint was applied to the wooden railing. The bridge flooring was left in its natural state to provide traction to the ATV's that cross the bridge.

Web Link to all photos:

http://picasaweb.google.com/soapstoneartist

Should you have any questions, please do not hesitate to contact Thomas Kutluk, SAO Municipality of Sanikiluaq or myself.

Your co-operation with providing direction and guidelines is greatly appreciated.

Robert McLean
Community Economic Development Officer
Municipality of Sanikiluaq
867-266-7912 (office) 867-266-7924 (fax) sanicedo@yahoo.ca

Picture Descriptions:

Picture #1: This is the "Before" picture showing the original wooden bridge that is starting to become unsafe.

Picture #2: This shows the students erecting the "silt fence" which was to contain any debris, small rocks and gravel from entering the waterway. The two wooden boxes (or cribs) are shown to hold approximately 100 tons of local rocks and gravel. This is to support the two vertical support beams for the main steel girders which cross the river.

Picture #3: This picture shows the main steel I-beams in place and the Cat 926 front end loader going up the trail in search of suitable gravel and rocks to fill the wooden box. This loader only crossed the river once and pulled the 40' I-beams into place on the supports.

Picture #4: This picture shows the wooden boxes filled with rocks and gravel to support the I-beams.

Picture #5: This shows the bridge section almost completed and a wooden ramp built on the east side of the bridge.

Picture #6: This is the completed bridge next to the original wooden bridge.

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Supplemental Technical Information Required for Water Crossings (linear/bridge/culverts)

1. Waterbody name (English and Inuktitut) and location (Lat & Long) **The name of the crossing is Pullalik River and is the same in English and Inuktitut Lat 56*31'02. 77N and Long 79*09'05. 73W**

2. Site photo, site map or air photo detailing location

   (see attached Google Earth picture)

3. Other Agencies contacted to date As of today's date of March 27, 2006 I have contacted:

   a. Nunavut Planning Commission and received a reply on March 10,2006 from Peter Wilson "The NPC does not have a land use plan in effect in the Sanikiluaq planning region. As a result, no conformity determination is required. This project proposal can proceed to the DFO application process."
   b. Nunavut Impact Review Board (no reply yet)
   c. Qikiqtani Inuit Association (no reply yet)
   d. Department of Fisheries and Oceans Notification Form sent on March 06,2006 (no reply yet)
   e. Department of Economic Development and Transportation, Government of Nunavut, requesting Community Initiatives Project funding (no reply yet)
   f. Nunavut Water Board (replying to your request)

4. Need for the project and alternatives considered – There has been much discussion by Municipal Council for many years regarding the need for an improvement to the Honda trail, which leads south from the community. This improvement would also include a new steel I-beam girder single span bridge crossing the Pullalik River. The narrow wooden bridge that is in place now is getting unsafe.

5. General condition of the site (s)
    a. The site for the bridge is at the narrowest point of the river where it leads out of a small lake and travels northward in several different channels before emptying into the salt-water harbour (Eskimo Harbour). The terrain is generally flat for up to 100 yards in all directions and then rises a gentle slope to a height of approximately 20 feet over a distance of ½ mile.
    b. The substrate is generally small to medium sized rocks. There is some silt and clay deposits from spring runoff.
    c. There is very little vegetation- mostly some wild grasses, wild oats and a few wild flowers Close to the bank of the stream there is only grasses.
    d. Flow rates at time of construction should be the lowest of the year because the spring runoff will have finished and it will be before the summer rains.

Channel meander pattern

The site that was chosen for the bridge is

a) the narrowest point of the stream
b) at the highest point of elevation to continue on the trail
c) at a point in the stream before it divides in to several channels and flows to the salt water.

General condition of the site (s) The site is natural undisturbed tundra and consists of rocks, small gravel and silt. Fresh water stream is runoff from several lakes inland.

6. Existing Habitat
    i. Fish travelling downstream in early spring include sea run lake trout, whitefish and arctic char. They return upstream in late fall after heavy rains.
    ii. Use of impacted are as spawning, nursery, rearing, food supply or migration route – Area would not be affected as we would be doing construction after the spring migration to salt water.
    iii. Presence of sensitive habitat - None

Assessment of impact to fish and fish habitat – Minimal effect on fish and fish habitat as we would be strictly limiting any construction in the water.

7. Construction Details
    i. In water work timing restriction for fishery **minimal in water work to be done**
    ii. Proposed start date and completion date –the overall project commences on July 05,2006 and completes on September 13,2006. The length of time working on the bridge would be

approximately 2 weeks during this time period (weather permitting)

iii. Type of crossing, We are planning a single-span steel girder bridge 8' wide by 40' long with 2" thick wood plank road bed

iv. Method of installation The bridge abutments will be welded steel I-beams 6' above high water mark and set in the ground approximately 2' and encased in a crib of rocks held in place with a wooden crib and covered completely with gravel. The long steel girders will be welded to the bridge abutment steel. 2" steel channel will be welded to the outside of the girders and the 2" wooden planks set inside the channel. The top layer of the roadway will be installed parallel to the girders and fastened to the underlay with hex screws.

v. Dimensions of pipe or structure The steel girder that will be used is 2X4"X10"X40' 5/16" thick beam; steel abutments will be made with 4X4"X10"X6' beam and the end piece support abutments will be made from 2X4"X10"X8' steel I-beam; steel channel 2"X2"X2" will be welded along the outside of the steel girders to hold the 2" wooden planks that will form the bottom layer of the roadbed. 2"X2" steel tubing will be used to form the railing set at 8' intervals. The steel posts will be set in the ground 2' and welded in a crossing manner with 2" angle iron. A wooden box with reinforced steel corners will hold large rocks and then completely covered with gravel to make the road approaches.

vi. Machinery to be used The trail will be upgraded with a Caterpillar D-6 bulldozer. The steel will be set in place with a Caterpillar 926 front end loader which will also be used for stockpiling gravel, loading a tandem dump truck for upgrading the trail in wet, marshy and muddy areas.

vii. Construction sequence The steel will be pre-cut in the community before being transported to the work site. The trail will be improved enough to transport the steel. The wooden cribs holding the support beams and posts will be constructed in the community and transported to the site by truck. The posts will be set upright inside the

wooden cribs in the ground, the support beams will be welded to them and the steel girders welded to the support beams. The wooden planks will be inserted into the steel channel, which was welded to the steel I-beam girders crossing the entire span. The top layer of wooden planks will be screwed to the underlay with lag screws. The railing will be constructed on site with 2X4 lumber. The steel girders will be primed with anti rust paint and one coat of finish paint.

viii. Sedimentation and erosion control measures The new wooden cribs will be filled with large rocks and covered with gravel to prevent erosion

ix. Monitoring during construction The supervisor shall have the Nunavut Operational Statement – Habitat Management Program posted at the job site and shall follow ALL rules and regulations pertaining to Clear Span Bridge construction issued by DFO.

x. Other mitigation measures Application pending from Qikiqtani Inuit Association for access to Inuit owned lands.

xi. Assessment of impact to fish and fish habitat There will be negligible impact on fish and fish habitat as we will be traversing the stream only once.

xii. Bank stabilization (size range of material) The bank shall be stabilized with wooden cribs containing large rocks in the one foot to 2 feet in diameter range and covered with coarse gravel which will make up the approach roadbed.

xiii. Cumulative impacts to area The impact to the surrounding area will be a much improved crossing of the stream and improvements to the Honda trail from town.

xiv. Contingency plan Only the vegetation required to be removed to meet operational and safety concerns for the crossing structure shall be removed. Disturbance to riparian vegetation shall be minimized and work does not involve dredging, infilling or excavating the bed of the watercourse.

xv. Revegetation proposed Re-vegetation is not possible due to climatic extremes and/or lack of appropriate seed or stock and the site shall be

stabilized using effective sediment and erosion control measures.

Proposed post-construction monitoring (photos taken of the site before construction, during construction and after construction; photographs should be taken form the same reference point for easy comparison) **Photos shall be taken before and after from the same reference point.**

8. **Bridge**

i. Bridge dimensions and type A single-span steel I-beam construction with two layers of full 2" rough plank roadbed. Overall dimensions are 8' wide by 40' long and shall be approximately 6' above high water mark.

ii. Any structures (abutments, pilings, piers) that will be placed in the water, on a temporary or permanent basis. There will be no abutments, pilings or piers placed in the water. The foundation for the support beams shall be placed on the banks of the stream in wooden cribs with steel reinforced corners on top of steel I-beams set in the ground approximately 2' and welded.

iii. Anticipated changes to the existing channel/shoreline morphology as a result of the proposed works. There will be minimal impact from the construction of the steel support cribs on the shoreline.

iv. Activities or structures that may cause a temporary or permanent barrier to movement of fish or flow of water There will be no structures to cause a temporary or permanent barrier to movement of fish or water

v. Coffer dams, dewatering, temporary watercourse diversions, excavation and temporary crossings There will be minimal impact due to temporary crossing of machinery once to construct the foundation on the far side of the stream.

vi. Total area of impact (m^2) The total area of impact to the stream bank will be 48 sq ft on each side of the stream.

Stabilization method and materials used at bridge abutments (include details of material size range) The steel reinforced cribs will be made from rough planks and filled with locally obtained rocks approximately 1' to 2' in diameter and filled with coarse gravel while building the approach trail.