



Stantec Experts-conseils ltée
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June 7, 2017
File: 157710050-202-105-EN-R0005-00

Attention: Mr. Martin Desgagné

Interim Director
Cree Nation Government
Capital Work & Services
2, Lakeshore Road
Nemaska QC
J0Y 3B0

Reference: Project Notice for Nemaska Access Road

Resurfacing and Paving works from km 4.5 up to km 10 on Categories 2 and 3 lands

Dear Mr. Desgagné,

Pursuant to the Environmental and Social Impact Assessment (ESIA) and Review Procedure established by the James Bay and Northern Quebec Agreement (JBNQA), Stantec prepared for the Cree Nation Government (CNG), the Project Notice for the Resurfacing and Paving of the Nemaska Access Road from the community up to km 4.5, i.e. at the limit of Category 1A lands, along with a Model of Request for an Attestation of Exemption, which were transmitted to the Comité d'évaluation (COMEV) on March 6th, 2017. A complementary information letter followed on May 15th. As a response, you received the Attestation of Exemption for this project on May 23rd, 2017.

Following the desire of the CNG to extend the Resurfacing and Paving works from km 4.5 up to km 10 at the intersection with Route du Nord, on Categories 2 and 3 lands, a new project notice must now be presented to the provincial administrator of the COMEV with a request for an attestation of exemption for this part of the proposed work. Therefore, you will find below the information necessary for this demand.



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1. DESCRIPTION OF PROJECT

1.1. OBJECTIVES AND JUSTIFICATION OF PROJECT

The general objective of the proposed project consists in road rehabilitation and paving on the Categories 2 and 3 lands section of access road, approximately 5.5 km in length, running from the km 4.5 to the intersection with Route du Nord at km 10.

Rapidly increasing population growth of the community of Nemaska has resulted in increased transportation on the access road, whether by the inhabitants themselves or by freight trucks. Thus, the access road of this community suffered several damages each year that requires more and more repair work, which also represents risks to road safety.

1.2. PROJECT LOCATION AND LAND OWNERSHIP

The section of the Nemaska Access Road to which the present project notice relates is 5.5 km long, starting at km 4.5, i.e. at the limit of Category 1A lands and ending at km 10 at this intersection with Route du Nord. The road is gravel-surfaced, but in some places the original surface layer of MG-20 aggregate has completely dispersed, having been pushed to the side of the road and ditch over time, and as a result the road now appears to be 12 m wide, whereas the actual width of the existing road structure available for construction is approximately 8 m.

The proposed works are located on Category 2 lands from km 4.5 to km 8.1 and on Category 3 lands from km 8.1 to km 10.

Figures 1 show the 5.5 km portion of Nemaska access road with the aerial view.

1.3. SUMMARY OF PREVIOUS STUDY

In order to provide details, recommendations and estimate for the work required to deliver a sustainable road for the community, CNG mandated Stantec in 2014 to assess the existing conditions of the road and determine what needs to be done. As part of this mandate, a site inspection (May 11, 2015), a topographic survey and a geotechnical study were carried out. This study was conducted for the entire access road, covering a distance of 10 km, from the community to the intersection of the access road with the Route du Nord. Since the work to be carried out on the first 4.5 km were described in a first Project Notice, only the details of the work between km 4.5 and km 10 are presented below.



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1.3.1. Site inspection and field survey

The table below summarizes the key information gathered during the site inspection on May 11, 2015, applicable only to the 4.5 km of the present project.

Table 1: Notes on site inspection

Station	Notes	Description
4+500	Surface	Sub-base blocks at the surface, MG-20 pushed against embankments, so the road appears to be 12 m wide
5+100	Surface	Soft soil over 10 m
5+250	Surface	Very soft area between two curves
8+100	Surface	Depression (R) over 30 m
8+580	Surface	Depression (R) over 20 m
8+950	Surface	Depression in centre at top of slope
9+200	Drainage GCSP 1200	Good condition, aggregate cover 1250 mm
9+300	Surface – red tape	Frost heaving (R), peat bog area
9+400	Surface – red tape	Frost heaving on the left, peat bog area with standing water
9+615	Surface – red tape	Frost heaving (R), peat bog area
9+900	Other	Ditch to be cleaned out, soft shoulders both sides (MG-20 pushed to the side)
10+000	Intersection with the North Road	

1.3.2. CONSTRAINTS AND RECOMMENDATIONS

1.3.2.1. MG-20, SURFACE AND ROADBED

Over the whole 5.5 km length of road inspected (from km 4.5 to km 10), the original MG-20 aggregate of the travelled surface is absent; as it has been pushed over time to the sides by traffic – see **photo 04** – making the road appear wider than it actually is.



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In some places the MG-20 granular material has completely disappeared, and vehicles travel on the coarse aggregate sub-base– see **photo 20**. On both sides the area of displaced MG-20 aggregate is about 2 m wide, but this surface cannot bear traffic. The actual width of the road is about 8 m. In order to ensure satisfactory frost behaviour of the planned road and the structural capacity required for the volume of local heavy traffic, the geotechnical study recommends the following road structure:

- Asphalt: latter revised to 70 mm;
 - o Single layer ESG-14: 70 mm.
- Granular sub-base: 200 mm, MG-20;
- Subgrade: 250 mm, MG-112.



Photo 04: General – Soft shoulders



Photo 20: 4+500 Sub-base Course aggregate – Surface



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1.3.2.2. SOLFT SOIL

Two soft soil areas were noted in a peat bog section. These sections must be corrected prior to paving. Rehabilitation will involve granular resurfacing: MG-112 subgrade of 300 mm thickness with G-20 granular sub-base of 200 mm thickness. In addition, ditch reshaping in these areas will be required to allow the sub-base to drain adequately.

Table 2: Locations of problem areas

Station	Detail	Description
5+250, photo 11	Between two curves	Soft area
8+100	Right side, over 30 m	Depression
8+580, photo 10	Right side, extending over 20 m	Depression
8+950	Top of slope, in centre	Depression



Photo 10: Depression – 1+420



Photo 11: Very soft area between curves – 5+750



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Problem sections caused by depressions

To rehabilitate the road structure, surface-to-surface transition is required with a longitudinal slope of 1:20, which involves excavating to a depth of 2.2 m (depth of frost) and backfilling with a controlled fill composed of frost-resistant materials up to the infrastructure line, which will eventually be backfilled with MG-112 granular subgrade to a thickness of 600 mm and an MG-20 granular or crushed stone sub-base to a thickness of 300 mm.

Soft areas

For areas where the road surface is soft, rehabilitation will involve granular resurfacing such as:

- MG-112 subgrade, 300 mm thickness;
- MG-20 granular sub-base, 200 mm thickness.

In addition, ditch reshaping in these areas will be required to allow the sub-base to drain adequately.

1.3.2.3. Frost heaves

At three locations listed below, extending over 300 m in a peat bog at the north end of the project area, frost heaves were observed and red marker flags were in place on both sides of the road. We recommend corrections to the road structure using surface-to-surface transition as described in point 3.3.1.

Table 4: Defect locations

Station	Description
9+300 (R)	Peat bog area
9+400 (L)	Peat bog area, standing water
9+615 (R)	Peat bog area



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1.3.2.4. CONCLUSION

The following work is recommended:

- Posted speed limit of 70 km/h;
- Excavating roadside ditches for 1600 m at the north end of the road;
- Reprofiling the subgrade surface of the road to an average thickness of 250 mm;
- Granular resurfacing of the road, to an average thickness of 200 mm;
- A single layer ESG-14 asphalt 70 mm thick for lanes 3.4 m wide;
- Paving of interior of radius of curves;
- Resurfacing shoulders after paving with MG-20, over a width of 1.0 m;
- Pavement marking;
- Traffic and signage management.

1.4. GENERAL DETAILS ONT THE ENTIRE PROJECT

1.4.1. Aggregate supply

In order to carry out the resurfacing and paving of the access road, the CNG is planning to use gravel pit at km 322 of Route du Nord, for which the Cree Nation of Nemaska have active certificate of authorisation and gravel pit 1611756 where the contractor will be in charge to obtain a BNE.

The granular requirements are approximately the following:

- MG-112: 76,296 metric tons;
- MG-20: 42,230 metric tons;



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1.4.2. Location of the bituminous concrete plant

The exact location of the bituminous concrete plant will be determined by the contractor that will be chosen by the executive committee of CNG. However, whether the plant is located on Category 1 or Category 2 lands, the Contractor shall be required to comply with the location standards described in section 254.1 of the Environment Quality Act, namely:

- Outside a residential, commercial or mixed area and more than 300 meters from such a territory;
- A minimum distance of 60 m from any creek, river, river, sea, swamp or shoal and a minimum distance of 300 m from any natural lake;
- At least 35 m from the public thoroughfare;
- A minimum distance of 800 m from any dwelling, school or other educational, religious, camping or health facility.

The plant shall, among other things, respect the following requirements:

- The plant will only use liquid or gaseous fossil fuels other than waste oil;
- The plant, as well as any place of loading, unloading or depositing of the aggregates and any sedimentation pond used for the purposes of such a plant, will not be located in a stream of regular or intermittent flow, lake, pond, marsh, swamp or bog;
- The plant will not use residual materials in its process, except for dust recovered from a dust collector;
- There are no other bituminous concrete plants within a radius of 800 m.

Where the bituminous concrete plant is located on Category 2 lands, the Contractor will also be required to submit a Declaration of Compliance to the Minister of Sustainable Development, Environment and Fight Against Climate change at least 30 days before establishing the plant.



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2. ENVIRONMENTAL COMPONENTS AND PRINCIPAL CONSTRAINTS

The main biophysical and human components surrounding the proposed work area are defined as follow:

2.1. PHYSICAL ENVIRONMENT

Topography

The work area has a relief with a slight slope toward Route du Nord. The average elevation at km zero (4+500) is approximately 226 m to reach an elevation of 255 m at the end point at the intersection of the Access Road and Route du Nord (10+000).

Surficial geology

A geotechnical study was carried out by Englobe in. A total of three stratigraphic boreholes were drilled in the exiting roadway (1+000, 3+000, 4+700). The natural soil, consisting of a clayey silt deposit was intercepted from respective depths of 2.60 and 2.8 m in two of the three boreholes.

Hydrography and Hydrology

According to the topographic map of the area, the existing road crosses a wetland over a distance of 600 m. After the crossing, a wetland follow the west side of the road for about 1.5 km. The road crosses one watercourse.

Hydrogeology

According to the topographic map, presumed direction of groundwater flow in the work area is south-west, towards Champion Lake.

2.2. BIOLOGICAL ENVIRONMENT

No floristic or wildlife inventory has been carried out within the framework of this mandate. However, the works are to be realized on an existing road. It should be noted that the road passes through one watercourse and a wetland for a distance of approximately 600 m.

2.3. HUMAN ENVIRONMENT

The proposed rehabilitation work will be carried out in the village for a distance of about 4.5 km.



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2.4. PRINCIPAL CONSTRAINTS

From the above, the principal constraints are the crossing of one watercourse, the crossing of a wetland over a distance of approximately 600 m and the proximity of a wetland on the west side of the road for about 1.5 km.

3. PRINCIPAL IMPACTS

The main impacts associated with the redevelopment of the curve and road rehabilitation and paving of access roads will relate to:

- ✓ Transportation, traffic and operation of machinery;
- ✓ Management of hazardous waste and materials;
- ✓ Installation of a culvert;
- ✓ Reconstruction of ditches;
- ✓ Rehabilitation and paving work.

3.1. PHYSICAL ENVIRONMENT

The project activities could have an impact on certain components of the physical environment:

- ✓ Soil quality can be impaired by the accidental spill of petroleum or other products during refueling of vehicles and machinery. Much of the work will be done on existing infrastructure. A low environmental value is given to this element;
- ✓ Changes in air quality caused by dust particulate emissions from the passage of heavy trucks and the operation of machinery;
- ✓ Risk of contamination of surface water by accidental spills (on land with runoff to a watercourse or directly into a watercourse) of petroleum products during handling or by the use of machinery, and by temporary storage of construction waste on site (leaching);
- ✓ Risk of contamination of groundwater by accidental spills (on the ground with migration to groundwater) of petroleum products during handling or by the use of machinery, and by the temporary storage of waste construction on the site.



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- ✓ The modification of surface drainage and the addition of suspended matter in the water courses during the cleaning, reconstruction or replacing of culverts and construction of ditches can impair the quality of surface water. Considering the presence of wetlands around the work area and the crossing of watercourses, a high environmental value is given to this element;

3.2. BIOLOGICAL ENVIRONMENT

The project activities could have an impact on certain biological components of the environment or on the aquatic fauna, flora and habitats. Indeed, the activities could emit debris and fine particles to fish habitat. Here is a list of possible impacts:

- ✓ Destruction of aquatic and riparian vegetation by the cleaning, installation of culvert and construction of ditches;
- ✓ Disturbance of aquatic habitat by the installation of a culvert and construction of ditches near the watercourses;
- ✓ Ditches can drain wetlands in the vicinity, possibly drying out wetlands.

3.3. HUMAN ENVIRONMENT

The project activities will have an impact on certain components of the human environment or quality of life (traffic associated with the construction site, noise, road users, long time, etc.) and health and security. Here is a list of possible impacts:

- ✓ Disruption of traffic (slowing down) on access roads during works;
- ✓ The coexistence of construction equipment, trucks and passenger vehicles on access roads during works may cause accidents due to distraction by motorists;
- ✓ The goal of rehabilitating and paving access road is to increase the safety of users who use it.



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4. MITIGATION MEASURES

Several mitigation measures will be applied during the work. Without limitation, these are the main measures that will be applied:

4.1. PHYSICAL ENVIRONMENT

- ✓ The contractor will have an emergency oil recovery kit;
- ✓ The contractor will dispose of its waste, oils, chemicals or other, whatever their nature, in compliance with applicable laws and regulations;
- ✓ Parking and storage areas or other temporary development will be located at least 60 m from the water environment. The only permitted deforestation is the one necessary for the execution of the works.
- ✓ Filling up of gas and mechanical maintenance and repair of rolling stock will be carried out at a distance of at least 15 m from a body of water. The contractor must avoid contamination of the environment.
- ✓ It will be forbidden to work in the watercourse, to circulate or ford it with heavy equipment.
- ✓ In all areas of the site where there is a risk of erosion, the soil will be stabilized;
- ✓ If the vehicles running on the granular foundation cause excessive dust emanation, the surface will be treated with water or dust-control products.
- ✓ Temporary or permanent measures will be implemented to protect the soil against erosion or to capture suspended matter.
- ✓ During construction, sediment traps or retention ponds will be installed to avoid directing runoff directly to watercourses and wetlands;

4.2. BIOLOGICAL ENVIRONMENT

- ✓ The effectiveness of the plant recovery over a period of 24 months will be ensured after completion of the work;
- ✓ Shoreline interventions will be limited by maintaining maximum vegetation and avoiding the use of machinery;



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- ✓ A 10 m protected band of shoreline will be kept to maintain the integrity of the shoreline.
- ✓ Circulation in wetlands will be limited as possible;
- ✓ A work restriction period based on the life cycles of the species present in the aquatic environment will be schedule and respect;
- ✓ Maintain free movement of fish by avoiding the creation of obstacles in the watercourses;

4.3. HUMAN ENVIRONMENT

- ✓ The work will be planned taking into account the possibility of holding special events (festival, regional popular festival, etc.);
- ✓ A proper maximum speed will be ensured for traffic on access road;
- ✓ Work announcements indicating the progress of future activities will be issued to inform the users and representatives concerned (communication plan);
- ✓ Adequate signage will be maintained in accordance with local requirements;
- ✓ Traffic lanes will be kept in good condition at all times and necessary measures will be taken so that they can be used and crossed without any problems by other users.

4.4. ENVIRONMENTAL CLAUSES OF THE SPECIFICATIONS

Section E of the Specification specifies the following requirements:

12.0 PROTECTION OF THE ENVIRONMENT

Old and non-reusable equipment pieces, used tires, empty containers and waste liquids must be removed from the area and disposed of, according to regulations in force: they must never be burned on site

Maintenance and repair of equipment must be done in suitably designated locations; any temporary location must allow for recycling of used oils or any other contaminant; these locations must be located at least 150 meters away from any streams or rivers.

Exhaust systems of all vehicles or equipment being used for construction must be in good order of repair so they will not disturb residents unduly.



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Fuel depots or other oil products must be located in areas far enough away so as not to endanger any human life in case of deflagration; as well they must be located at least 60 meters away from any streams or rivers.

Deforestation can only be done with authorized mechanical methods. The use of herbicides is forbidden.

Permission must be obtained from the assignor or occupier, before cutting fences. Pickets must be braced on each side of the right-of-way, so as to maintain the same tension in the remaining sections.

When the works are ended, the Contractor has to remove from the right-of-way, not only his materials but also the unused, the waste and rubbishes, pebbles and rock, fragment of wood, stumps, roots; clean the places of materials and equipment's; put back in good condition ditches and streams which he blocked; repair or reconstruct fences and other necessary works which he demolished or damaged and to have all the removed materials by transporting them out of the right-of-way and it not so as to spoil the neighborhoods of the works or the related works; the whole to the satisfaction of the engineer. Finally, he has to repair all other damages he caused on the site of the works, in the public or private property caused by his operations, in plans of water, in sites of camp and storage of the material, the storing or the supply of materials, to the environment and/or to the agricultural territory.

36.0 CLEANING

When the work is completed, the Contractor shall remove on the right of way corridor not only their equipment but unused materials, waste and scrap, rocks and stones, woody debris, stumps, roots, clean the locations of materials and tools, repair damaged ditches and streams that he obstructed, repair or rebuild fences and other works necessary he demolished or damaged and have all the materials removed by carrying out right of way and that so as not to disfigure the edges of the work or related works, all to the satisfaction of the Engineer. Finally, he must repair all other damages or damage it has caused on the site of the work, to public or private property affected by its operations, water bodies, the camp site and storage of materials, storage or supply of materials, environmental and / or agricultural land. It should also proceed with the restoration of forest cover on forest land in the public domain.

It should also be noted that the construction work will be under the constant supervision of Stavibel, which will ensure that the contractor is in compliance with the regulatory requirements and the specifications requirements throughout the work.



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5. PUBLIC CONSULTATION PROCEDURES

Community local government administration (Director General, Treasurer & Capital Work Personnel) and ministère des Transports, Mobilité durable et Électrification des transports (MTMDET) have been consulted by the CNG about those modifications.

6. PROJECT SCHEDULING

The CNG would like to begin the rehabilitation and paving works and the end of June 2017.

The estimated duration of work for Wemindji Access Road is 14 weeks.

7. SUBSEQUENT PHASES AND RELATED PROJECTS

No subsequent phases or related projects are foreseen at the present time.

8. PUBLIC CONSULTATION PROCEDURES

No public consultations are planned ahead for the rehabilitation of access roads.

9. REMARKS

We confirm that all information presented in the present notice are precise to the best of our knowledge.

Regards,

STANTEC EXPERTS-CONSEILS LTÉE

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Attachment: Figure 1: Addenda – Location of the extension of works

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Design with community in mind