

Alberni-Bamfield Road

Corridor Overview of the Sealcoat Design

1. DESIGN CONSIDERATIONS

For the Alberni-Bamfield Road sealcoating project the existing uses were considered to be the main driving factor for the design and construction. The direction for the work was to improve the safety and surface of the existing corridor. As stages of the project will be directed by the Huu-ay-aht and the team structure laid out in the attached organizational chart found in Appendix A.

1. Design Criteria

- 70km/h design speed where possible, ambient condition with signage on rest;
- 10m Sealcoated surface;
- Retain existing grades, improve if possible;
- 4% cross fall for positive drainage, improve wherever possible;
- Ditching and cross culverts as defined by drainage design; and
- WB-20 design vehicle. Ensure Forestry Company requirements are met.

2. Design

- Design will be carried out for the complete corridor working with detailed field survey data augmented by LiDAR data;
- All design will incorporate geotechnical, drainage, environmental, and sealcoat requirements;
- The design team will work closely with Huu ay aht on first nations concerns, requirements and specific requests;
- Interested Huu-ay-aht citizens will be incorporated into the field survey team and design team to learn new skills and careers.

3. Structures

- Structures will not be address for replacement and this role will be left with Western Forest Products. New structures will be reviewed to meet new requirements for the road;
- 800 mm high Thrie beam railings will be added to bridges to provided safety on the bridge.

4. Drainage

- Improve roadside ditching and cross culverts along construction area to meet current standards.
- Replacement of existing larger culverts to be completed as required to meet standards of the time. This is the current process being used by WFP.
- Existing culverts that are identified as needing to be replaced will be replaced where possible. (requires detailed survey and modelling to confirm).

5. Environmental

- Environmental impacts will be addressed by design and compensation , where required, after Environmental Impact assessment and detailed field survey.



- Environmental requirements will significant to design work and will be included along with input from the Huu-ay-aht environmental team.
6. Geotechnical
- Geotechnical investigation will be carried out to investigate the conditions, retaining walls, rock, and soils;
 - Geotechnical recommendations will be incorporated into the design and define areas for reconstruction and sealcoat design.
7. Sealcoat
- Sealcoat will be completed by company with significant experience in the region and across BC.
 - Costs have been provided that are relevant as of Dec 2;
 - Sealcoat design will be completed by company and Geotechs;
 - Maintenance procedures will be taught to maintenance crew by company during construction.

2. AREAS IDENTIFIED FOR SAFETY IMPROVEMENTS

Table below presents the know issues along the road and the highest priority items have been identified. These tasks are to be confirmed for order of completion by the team.

Priority	Location	Comment
	Throughout	Upgrading three culverts for every 1 km of roadway in lieu of 1.5 culverts to account for climate adaptation
	Throughout	Granular materials include the gravels placed below the seal coating. It has been recommended that 150 mm of 25 mm WGBC be placed below the seal coat. Additional 25 mm WGBC will be placed to establish appropriate road crossfall and/or superelevation which will ensure proper drainage of the road surface. SGSB will be required for the reconstruction areas.
HIGH	Throughout	Approach treatments to bridges are substandard and need replacement with proper barrier and approach flares
HIGH	Throughout	There are many unprotected slopes that would likely meet highway barrier warrants. Barrier warrants will be used to place barrier.
Info	Throughout	For constructability, simply building on top of the existing base is recommended. Care should be taken to remove any deep potholes excavating and daylighting the springs, so there are no pockets in subgrade that could collect and trap water.
HIGH	Throughout	Many horizontal curves did not appear to meet a 70 km/h design speed, and no curves were posted with advance warning signs
	Throughout	Hot mix asphalt paving should be included on: <ul style="list-style-type: none"> • steep hills; • bridge approaches; • intersections; • tight corners; and • where proper recommended drainage measures cannot be implemented due to specific site constraints.
	Km 0 to 37	Good road surface condition with only minor gravel and grading required prior to sealcoating 150 mm WGB road base gravels required



Priority	Location	Comment
HIGH	Km 11.5	Poor vertical / horizontal alignment at bridge east approach. Realignment and signage required.
	Km 21.5	Culvert in deep gullet; poor sight lines on roadway. Signage required.
Info	Km 26.4	Current Bridge is being replaced by Western Forest Products along with new alignment section.
Info	Km 27.6	Culvert replacement project by Western Forest Products
HIGH	Km 31 to 33	Gabion catchment walls are used to protect the road between km 31 and km 33. The walls are between 1 m and 3 m high and are used to retain soil that mass wastes from the soil slopes. At the time of reconnaissance, the catchment volume behind the gabion walls was essentially full. There is evidence that some material has slid and overtopped the gabion walls based on the damage of the top row of gabions along portions of the wall. It is proposed to cut slope to achieve a minimum 1.5:1 slope, allowing the gabion bin walls to be removed eliminating the need for any type of restraining wall
Info	Km 32	Large culvert is being replaced by Western Forest Products
	Km 32 to 33	There is an MSE wall along the downhill side of the road. A portion of this MSE wall forms the headwall of a steep pipe culvert. The MSE wall is generally in poor condition and is undermined within the vicinity of the culvert. To be confirmed if repaired during culvert replacement.
	km 32.9	H-pile supported timber lagging wall that supports the downhill side of the road. The condition and extent of the wall is unknown, but the wall appears to be functional for the existing road
	Km 37 to 39.5	Road surface is generally poor and will likely require regrading, ditching and gravel placement prior to seal coating. This section will require the 300 mm of SGSB along with 150mm of WGB.
	Km 39.5 to 56	Mixed road surface condition is poor with mainly exposed rock and larger crushed rock gravel. This section will require the 300 mm of SGSB along with 150mm of WGB.
	Km 40	There is a concrete cast in place wall at approximately km 40 that is used to retain part of the road. The wall is founded on bedrock and appears to be functional for the existing road.
	Km 40 and 41	Groundwater seepage within the road has been identified. Will be considered during drainage design.
HIGH	Km 40-41	There is a narrow section of the road where the road is constrained by a rock wall on the inside and a steep downhill slope on the outside. The outside slope is retained in places by tied back cast in place walls and has discontinuous concrete roadside barrier that is interconnected by chain. The road narrows to a width of approximately 8.5 m between the rock face and the barrier and a 25 kV hydro line is situated in front of the rock face, within approx. 1 m from the road shoulder. Incremental gains in road width may be achieved but would not likely be able to provide sufficient width to accommodate all required features such as two full traffic lanes, proper roadside barrier, adequate ditching and sufficient containment for rockfall
HIGH	Km 48 to 49	Seasonal flooding area requiring design to raise road about the issue.
	Km 56 to 62	Road surface is generally good - will likely only require minor upgrading (Gravel, grading, etc.) prior to seal coating
HIGH	Km 57.8	Seasonal flooding area requiring design to raise road about the issue.
HIGH	Km 61.3	Poor sight lines at bridge approaches. Signage required.
	Km 62 to 76	Poor road surface condition (extensive maintenance, such as grading, ditching, and significant gravel placement prior to sealcoating) - 300 mm of road base gravels required



Priority	Location	Comment
	Km 62 to 76	Road surface is generally poor - will likely require extensive maintenance such as grading, ditching and significant gravel placement prior to seal coating. This section will require the 300 mm of SGSB along with 150mm of WGB.
HIGH	Km 66 to 67	Seasonal flooding area requiring design to raise road about the issue.

3. OPERATIONS

The operation and maintenance of the Road post construction will be handled by the HFN. During the construction projects, the HFN will train support staff on the numerous requirements for maintenance and the roles required. The bridge structures on Crown land will remain under the control and maintenance of Western Forest Products who currently carry that responsibility. The road maintenance will include as required:

- Sealcoat and pavement maintenance
- Spray Patching
- Ditching maintenance
- Clearing and grubbing for safety.
- Snow removal, salting and sanding.
- Signing maintenance
- Structural maintenance. Walls, barriers, etc.
- Electrical maintenance. Lights, etc.
- Emergency response
- And other roles standard to a road maintenance contract.

APPENDIX A

Project Organizational Chart

