

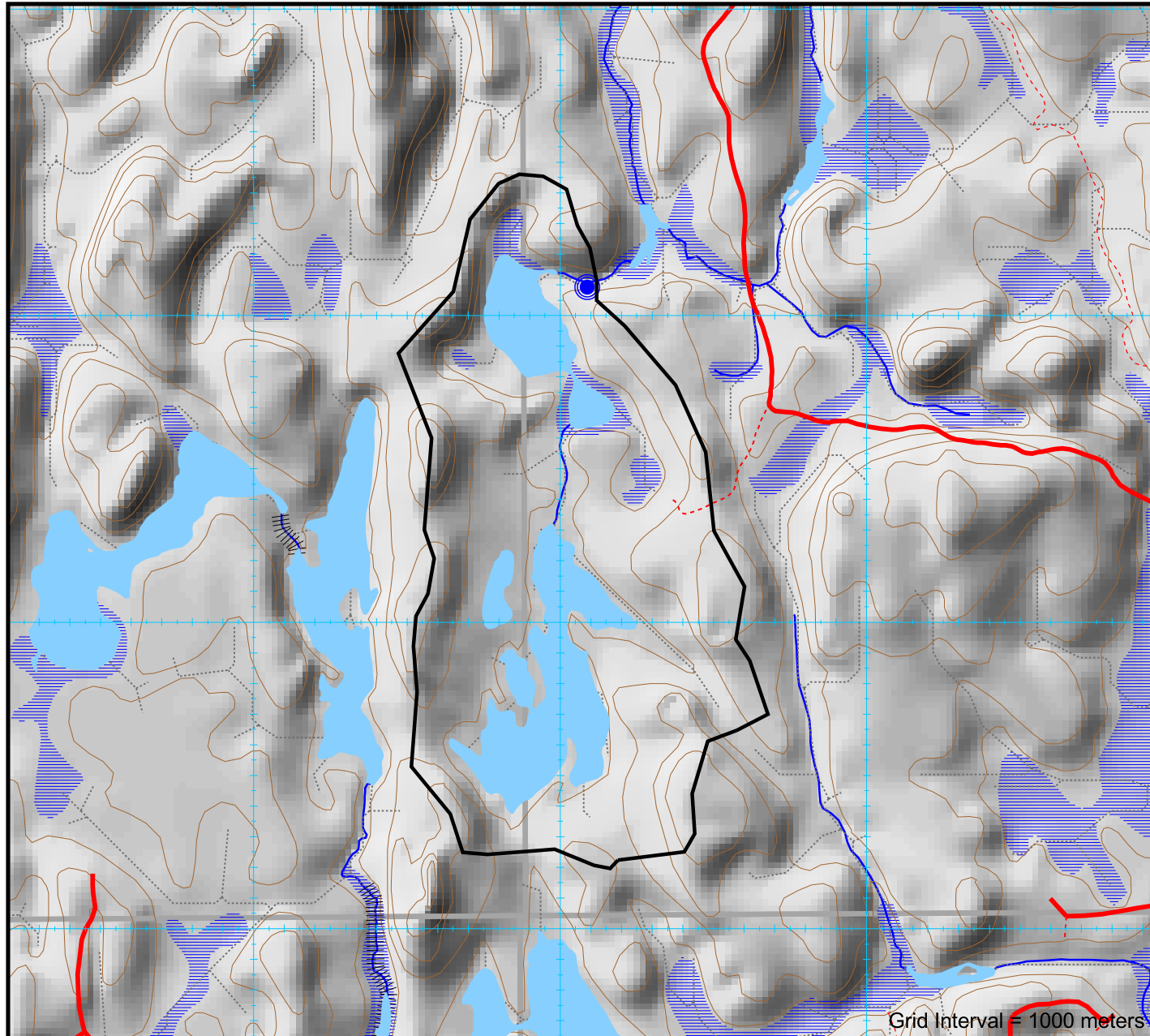
TFAI Appendix 1: Form for Submission of Information on a Proposed Crossing

Shaded Area for Office Use Only	TFAI Road Network No. 43	Distance Along Road Segment	Crossing Evaluation Reference Number 6622
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Publication Date: **March 30, 2021** Road ID: **Rankin 172, Network Name: Zig Zag Lake Road**

Timiskaming Forest - S.F.L. # 542247
 Proponent: Timiskaming Forest Alliance Inc.
 22 Paget Street
 New Liskeard, Ontario
 POJ 1P0
 (705) 680-0033 ext. 0222
 Plan Term: 2021-2031
 AWS Year: 2021-22

Fisheries Operational Management Zone (OMZ):
 Standard for Self-assessed Water Crossing Construction, Removal and/or Decommissioning: **Single, Small Closed-Bottom Round Culvert**
 Previous Assessment Year (incl. SA): **2021**
 SAR species likely to be impacted: **NO**
 Preconstruction photos available: **NO**
 Within 500m of Brook Trout stream: **NO**



Culvert Design Options	Q ₂₅	Q ₁₀	Q ₅	Q _{2.33}
Design Flow	0.809 m ³ /sec	0.679 m ³ /sec	0.566 m ³ /sec	0.437 m ³ /sec
1 Round	900mm	900mm	800mm	800mm
2 Round	800mm	800mm	600mm	600mm
3 Round	600mm	600mm	500mm	450mm
1 Arch (BxD)	1150x820mm	1030x740mm	1030x740mm	910x660mm
2 Arch (BxD)	910x660mm	800x580mm	800x580mm	800x580mm
3 Arch (BxD)	680x500mm	680x500mm	680x500mm	680x500mm

• Required Opening for bridges is calculated as per the Crown Land Bridge Management Guidelines.

Conditions on Culvert Design Options

- Initial Fisheries Review based on one pipe. Two or more pipes requires a re-assessment.
- Round culvert calculations assume 10% fill. For 20% fill, increase diameter to next highest standard diameter.
- For 40% fill, use a round culvert diameter of the Base distance of the corresponding Arch style culvert.

General Standards

- No watercourse realignment, nor use of explosives is permitted.
- Minimize loss or disturbance to riparian vegetation. Restrict removal of riparian vegetation to the disturbance footprint required for construction, maintenance and decommissioning of the water crossing.
- Install erosion and sediment control measures prior to commencement of construction or decommissioning to prevent release of sediment or other deleterious substances into watercourse.
- Fill material placed below the normal high water mark must be erosion-resistant and/or protected from erosion.
- Direct storm water runoff from bridge decks, side slopes, road approaches and ditches away from the watercourse and into a retention pond or vegetated area.
- Ensure erosion and siltation in ditch lines adjacent to the watercourse crossing approaches are controlled using sediment traps such as rock/soil dams or log jams as site conditions warrant.
- Do not block or impede the free passage of water and fish at any time of year up and down stream, with the exception of potential and temporary blockage due to water crossing construction/decommissioning activities.
- Abide by fisheries in-water timing windows in the approved FMP and/or forest management guides. Where fishery communities are not well documented, the most restrictive in-water timing window must be used.
- Complete all in-water construction and decommissioning activities in an uninterrupted fashion and in an appropriate timeframe to minimize potential for site disturbance.
- If installation requires inwater work, do not locate within 100m of spawning or sensitive fish habitat eg. rapids, riffles, known overwintering areas.
- Maintain machinery free of fluid and fuel leaks. Wash, refuel and service machinery at least 30m from watercourse. Store fuel and other materials for machinery a minimum of 30m from the watercourse.
- Operate machinery on land with tracks/wheels above the normal high water mark, or on ice in a manner that avoids disturbance to the banks of the watercourse and adjacent riparian vegetation areas.
- Remove all debris from construction and decommissioning work from the site following completion of the undertaking.
- If machinery fording is required, limit to a one-time event (over and back) per piece of equipment essential to implementing the project, and only if using an existing crossing at another location is not available or practical.
 - If minor rutting is likely, watercourse bank and bed protection methods (e.g., swamp mats, pads) are to be used provided they do not constrict flows or block fish passage;
 - Grading of the watercourse banks for the approaches is not permitted;
 - If the watercourse bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion or degradation is likely, use a temporary crossing structure or other practice to protect them;
 - The one-time fording must adhere to the appropriate in-water timing windows; Forging must occur under low-flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

- All calculations are for projecting ends. Total pipe length normally not to exceed 20m.
- All calculations assume a Headwater Depth of 1.0.
- MP = Multi-Plate (i.e. SPCSP)

Standards for Single, Small Closed-Bottom Round Culverts

- This standard applies to single, round, corrugated, closed-bottom steel, aluminum, or plastic culverts less than or equal to 1200mm in diameter that do not require site-specific engineering approval per MNR's Crown Land Bridge Manual.
- This standard only applies if the project does not:
 - Replace an existing open-bottom crossing (e.g., clear span bridge, arch culvert);
 - Replace an existing closed-bottom culvert larger in diameter than that being installed; or
 - Involve the installation of more than one closed-bottom culvert at the crossing location.
- Locate, design and construct to minimize likelihood of ongoing outlet scour, culvert undermining or erosion of fill in order to provide stable, non-perched culverts that provide for fish passage.
- Do not locate on meander bends, braided streams, or any other area inherently unstable that may result in alteration of natural stream functions or erosion and scouring of the structure.
- Size to a minimum Q25 design flow. If an unmapped stream is encountered and proper analysis cannot be completed to determine Q25, size to ensure it spans from bank to bank.
- Do not install where channel slope at crossing location is of a gradient greater than 2.0%.
- Do not install where slope of road approaches or either bank approach is greater than 30% (17°).
- Locate where culvert can be embedded below grade of stream bed.
- Use site-specific mitigation measures to ensure no ongoing erosion of fill. As a minimum:
 - Stabilize both inlet and outlet ends with appropriately sized non-erodible material;
 - Rock used is clean, free of fine materials and of sufficient size to resist peak flood events;
 - Place rock at original bank grade to ensure no infilling or narrowing of watercourse;
 - Fill material placed below normal high water mark must be erosion resistant and/or protected from erosion.
- The Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales refers to the normal high-water mark as the edge of vegetation communities capable of providing an effective barrier to the movement of sediment.
- Do not locate within 100 metres of fisheries spawning or sensitive habitat.
- Do not locate within 500 metres of any brook trout spawning or upwelling areas.
- Do not locate on watercourses that flow into, and are within 500m of, known naturally reproducing brook trout lakes.
- Mix of size, length, slope & drainage area must not increase flows to consistently & predictably impede fish passage.
- Install under low-flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
- Both interior and exterior of culverts must be corrugated to ensure structural stability and facilitate fish passage.
- The grade of the culvert must reflect the grade of the natural watercourse bed.
- Compact backfill adequately around the culvert. Use only clean sand or gravel and compact around the culvert in layers.
- Length of culverts must permit banks to be sloped at an angle of 2:1 or a stable angle of repose for the materials used.

Reviewed by MNR. Follow standard as well as any Appendix 2 conditions.

MNR Appendix 2: Biologist Risk Evaluation

Concerns and Conditions on Construction

— Concerned that this is unnecessary crossing location as access can be obtained for both blocks from the corridor to the west and east. Cumulative impact a concern, as 4 crossings are proposed within the same watershed area. Call to discuss.

Risk Evaluation: **MEDIUM** Site Inspection Required: **NO**

Date Completed _____

Watershed Thermal Code : CL

MNR Assigned Thermal Code



Crossing's Watershed Characteristics


Watershed Area : **1.81 km²**
 Lake Area : **0.33 km²**
 Swamp Area : **0.05 km²**
 Retention Area : **0.38 km²**
 Retention Factor : **21.15 %**
 Base Class : **4.45**
 Watercourse Type : **Permanent**
 Watershed Number : **173**
 Watershed Name : **Cleaver Creek**

Crossing Characteristics for Fisheries Evaluation

NOTE: See current AWS Tables 1 and 2 and AWS maps for approved AWS details for year of installation.

Evaluation ID No. : **6622**
 MNR Crossing No. : _____
 Geographic Township : **Morel**
 UTM Coordinates (NAD83) : **516087E, 5291092N**
 Structure Type : **Culvert - Round Steel**
 Road Type : **Operational**
 Fill Material Type : **Pit Run Gravel**
 Installer Experience : **As Per AWS Compliance Plan**

Stream Gradient at crossing (from GIS)	Is the Slope > 30% (17°)	Thermal Code	Design Flow
0%	NO	CL	Q25
Isolate Work Area From Flowing Water?	If "Yes", will stream be diverted or straightened?	If "Yes", will coffer dam or silt fence be used?	
NO	NO	NO	
Starting Date for In Water Work (if required)	Completion Date for In Water Work (if required)	Structure Removal Timeframe	
June 21	March 31	> 2 Years	


 Company Name _____ (Print)
 Company Signature _____
 Operator Name _____ (Print)
 Operator Signature _____
 Date _____



TFAI Crossing Installation Report (Must be completed for each crossing location)

Shareholder: _____

Block ID: _____

Contractor: _____

Road Name: _____

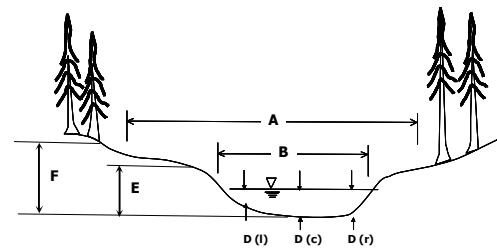
SITE CONDITIONS ENCOUNTERED

Crossing Located By: _____

Date Measurements Taken: _____

Stream Measurements (meters)

Flood Plain Width :	A
Bankful Width :	B
Channel width :	C
Depth - 25% of Channel :	D (l)
Depth - 50% of Channel :	D (c)
Depth - 75% of Channel :	D (r)
Depth - Bankful Flow :	E
Depth - Floodplain :	F
Stream Velocity :	_____ m/sec



Notes: _____

Foundation Soil Description :

- Sand Muck
 Silt Rubble
 Clay Gravel

Channel Type:

- Ephemeral
 Intermittent
 Permanent

TFAI Notification Provided :

- (TFAI Advised-Appendment)
 FRI Incorrect
 Unmapped

WATER CROSSING OPERATIONS CHECKLIST

Only certified inspectors are allowed to conduct Forest Operations Inspections for submission to the FOIP database

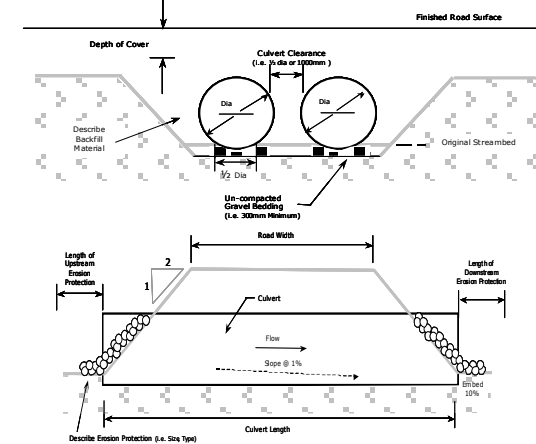
Inspector Name: _____

FOIP Report Number : _____

CULVERT

* 'As Built' Culvert Installation Measurements (meters)

Installed Diameter :	_____
Structure Length :	_____
Road Width :	_____
Depth of Cover:	_____
Water Depth in Pipe :	_____
Number of Culverts :	_____
Spacing Between Pipes :	_____



4 Photos must be Attached

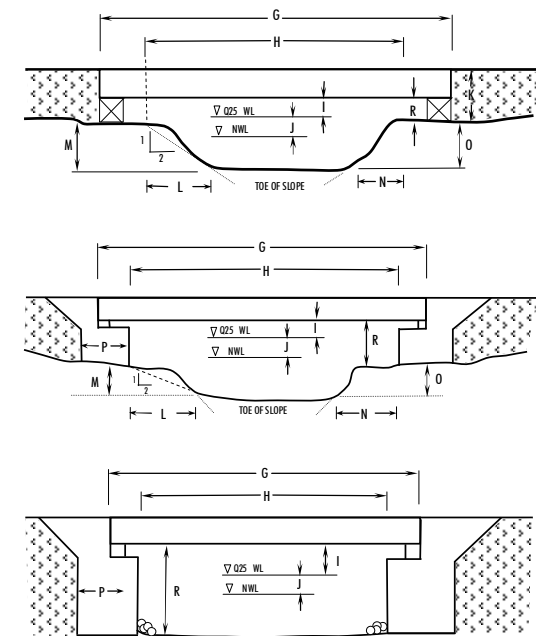
- Approaches
 Inlet
 Outlet
 Inside Pipe

Remedial action required

BRIDGE

* 'As Built' Bridge Installation Measurements (meters)

Bridge length :	G
Clear Opening Width :	H
Freeboard (min 0.5m) :	I
Flood Rise :	J
Fill Height :	K
Left Slope Length :	L
Left Slope Rise :	M
Right Slope Length :	N
Right Slope Rise :	O
Crib Width :	P
Crib Height :	R



Bridge Used (Identification #) :

5 Photos must be Attached

- Approaches
 Deck
 Underside
 Upstream (Inlet)
 Downstream (Outlet)

Remedial action required

Verified 'As Built' measurements consistent with proposed bridge dimensions on 'Bridge Site Data Form'

INSTALLATION CONDITIONS

Installation Supervised By: _____

Date of installation: _____

Crossing Permanency : Refer to Structure Removal Timeframe specified in AWS 4 and 5 Month / Year

Permanent Temporary Decommissioned Date: _____

Note: Measurements (*) must be included for all structures which remain in place beyond date of inspection Scheduled Removal Date: _____

Crown Land Bridge

NAD 83 (Record Actual Crossing Location on Stream Segment): _____

Bridge Record Form submitted (i.e. MNR/TFAI)

E
N

New Crossing Type:

Structure Description:

Type of Fill:

- | | | |
|--|--|--------------------------------------|
| Box Culvert <input type="checkbox"/> | Steel <input type="checkbox"/> | Sand <input type="checkbox"/> |
| Arch Culvert <input type="checkbox"/> | Plastic <input type="checkbox"/> | Gravel <input type="checkbox"/> |
| Round Culvert <input type="checkbox"/> | Wood <input type="checkbox"/> | Rock Rubble <input type="checkbox"/> |
| Portable Bridge <input type="checkbox"/> | Concrete <input type="checkbox"/> | Other <input type="checkbox"/> |
| Steel Stringer Bridge <input type="checkbox"/> | Ford (Engineered) <input type="checkbox"/> | |
| Winter Snow Pack <input type="checkbox"/> | | |

Erosion Prevention and Control (X): (Indicate applicable measures taken)

- Stable slopes on stream banks and drainage ditch banks
 Course, clean rock to high water mark
 Re-vegetate or seed slopes (stream banks and ditch banks)
 Divert drainage ditches to green belt
 Line drainage ditches with rock
 Use rock weirs in drainage ditches to impede water flow
 Use filter cloth on upstream side of culverts
 No grubbing or stripping of ground vegetation
 Use filter cloth (On top of ice if fill is used for Winter Crossings)
 Other:

Verification :

I have confirmed that the final crossing condition satisfies the mandatory water crossing standards and will not impede future transfer of responsibility

Notes: _____

Water Crossing Activity (X):

- Water crossing location same as AWS submission
- Installation of culvert and size same as described in AWS water shed calculations.
- No sediments or woody debris left in water body or streams
- Construction materials removed from site
- Embankment sloped properly (e.g. 2:1) with no possibility of slumping
- Timing restriction met
- Culvert properly installed (i.e. refer to FMP Standards)
- Sediment Control Plan in AWS followed
- No Erosion or Sedimentation present (e.g. filter cloth used to prevent material from entering waterway)
- No signs of equipment or machinery in stream (i.e. culvert installed before equipment progresses past crossing)
- Coarse clean rock used on all culvert crossings
- Natural vegetation protected
- Additional measures used to prevent erosion (e.g. seed, filter cloth, rip rap etc.)
- Drainage ditches properly installed
- Crossing removed before March 31 unless left for silviculture activities
- Road right of way width through unallocated stands , no larger than FMP requirement
- Road right of way width through AOC's (reserves), no larger than FMP requirement

Note: All of the above activities must be checked. ✓ - Verified to be within acceptable limits ✗ - Outside of acceptable limits. Refer to comments for additional details N/A - Not applicable

I certify that the activities inspected are fully compliant based on an inspection appropriate to support this decision.

Signature: _____ Date: _____