

FMG Soil Disturbance Measurement Tool

Standards:

1. Soil disturbance caused by harvesting activities and site preparation must be less than the disturbance levels identified in the Site Plan or Silviculture Prescription (SP).
 - Areas with sensitive soils must have less than 5% of the area disturbed. Other soil types must have less than 10% of the area disturbed. Note: any continuous area > than 1 ha that exceeds these limits is in non-compliance.
 - The area covered by the roadside decking and possibly processing must be less than 25% of the area.
 - The area covered by permanent access structures must not be more than the maximum % stated in the SP.
2. The contractor is responsible to meet these standards, and will use the method below to determine if the disturbance levels are approaching the maximum %, as in the SP.
3. If results of this tool show that disturbance levels are being exceeded, **STOP WORK**, and contact your Supervisor
4. This tool will be used by the Harvesting Supervisor if they feel the contractor is exceeding levels.

Procedures:

Responsibility

	<u>Procedures:</u>	<u>Responsibility</u>
1	Communicate soil disturbance targets (% & location) to the contractor at the pre-work.	Forestry Supervisor
2	Assess site characteristics and develop a plan to ensure soil disturbance does not exceed maximum disturbance levels. Communicate this plan to applicable equipment operators.	Contractor
3	Monitor site disturbance levels on an ongoing basis to ensure disturbance limits are not being exceeded.	Contractor
4	Measure Site Disturbance using this tool (following the Method in Step 5) if monitoring observations indicate soil disturbance is approaching the maximum %	Contractor
5	<p>Method to measure Soil Disturbance Levels on felled and skidded areas:</p> <ul style="list-style-type: none"> • Identify areas within the block that are 5% and 10% soil disturbance areas. • Walk perpendicular to direction of machine traffic, concurrent with operations. • Walk 5 paces and record your observation directly under your heel on the 5th pace. This will be called “The Point”. <ul style="list-style-type: none"> - If the point falls on disturbed ground, identify the type of disturbance then record the point as soil disturbance. - If the point falls on undisturbed ground, then record the point as “none” • Draw your route on the block map, and provide the point numbers (see example) • Walk a minimum of 5 strips (collecting 20 points per strip) within the area of concern. If the area is greater than 1 ha, walk at least 5 strips per ha (collecting points). <p style="text-align: center;">Soil Disturbance = $\frac{\text{\# of Disturbed Points}}{\text{Total Points Measured}} \times 100$</p>	Contractor
6	<p>Frequency of conducting soil disturbance measurements will depend on the following factors:</p> <ul style="list-style-type: none"> • Observations of the current level of disturbance. Amount of 5% and 10% ground in a specific block. • Consistency of soil types across the block. The finer the soils, the higher the risk of disturbance. • Soil Conditions and weather – Contractors may need to monitor less during extended dry or frozen weather conditions. Monitoring should be increased during wet conditions, in the transition between seasons, specific harvest units within the block, or if inadequate snow or frost conditions exist. 	Contractor

7	<p>Stop Work, revise the plan as needed and contact your Canfor supervisor when the following occurs:</p> <ul style="list-style-type: none"> • On 5% Site Disturbance Areas: if disturbance is exceeding 4% • On 10% Site Disturbance Areas: if disturbance is exceeding 8% • On 25% Road Side Areas: if disturbance is exceeding 20% 	Contractor
8	Contractors must be able to produce the results of soil disturbance monitoring cards and mapped location of survey on site at the request of the Canfor Supervisor if the disturbance levels appear to be approaching the disturbance limit. (refer to back page) Canfor will make survey cards available to the contractor.	Contractor
9	Confirm site disturbance is within the acceptable range, and record on the final harvest inspection form.	Forestry Supervisor
10	<p>If the disturbance exceeds the identified thresholds as in step 7:</p> <ul style="list-style-type: none"> • Contractor contact Canfor Harvesting Supervisor • Canfor Supervisor assess the site, complete a soil disturbance survey to compare results, and assess size of disturbed area in the SU • Depending on the results and the size of the area disturbed, consider if there is a need to complete a more detailed survey by an expert • If % disturbance is well over the maximum in the SP <ul style="list-style-type: none"> - Review with FMS Coordinator. FMS Coordinator may refer to expert for advice. - Canfor Harvesting Supervisor to assess options for moving contractor to another area of the block, to another block or cease operations until the soil conditions/weather improve. . 	Contractor and Forestry Supervisor

Site Disturbance Codes

<u>Disturbance Type</u>	<u>Code</u>	<u>Description</u>
Extensive Compaction	C	75% compaction with 2 meter circle of "the Point". Includes skid trails for conventional skidding. Look for signs of platy blocky soil, and is difficult to push a shovel into compared to undisturbed areas
Gouge	G	1.8 m long X 1.8m wide X 5 cm deep or greater
Track/Wheel Rut	R	2m long X 30 cm wide X 5 cm deep or greater
Scalp	S	1.8 m long X 1.8 m wide or larger (duff/organic layer removed)



FMG Soil Disturbance Measurement Form

Contractor:	Surveyor:	Date(s):
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CP / Blk:	
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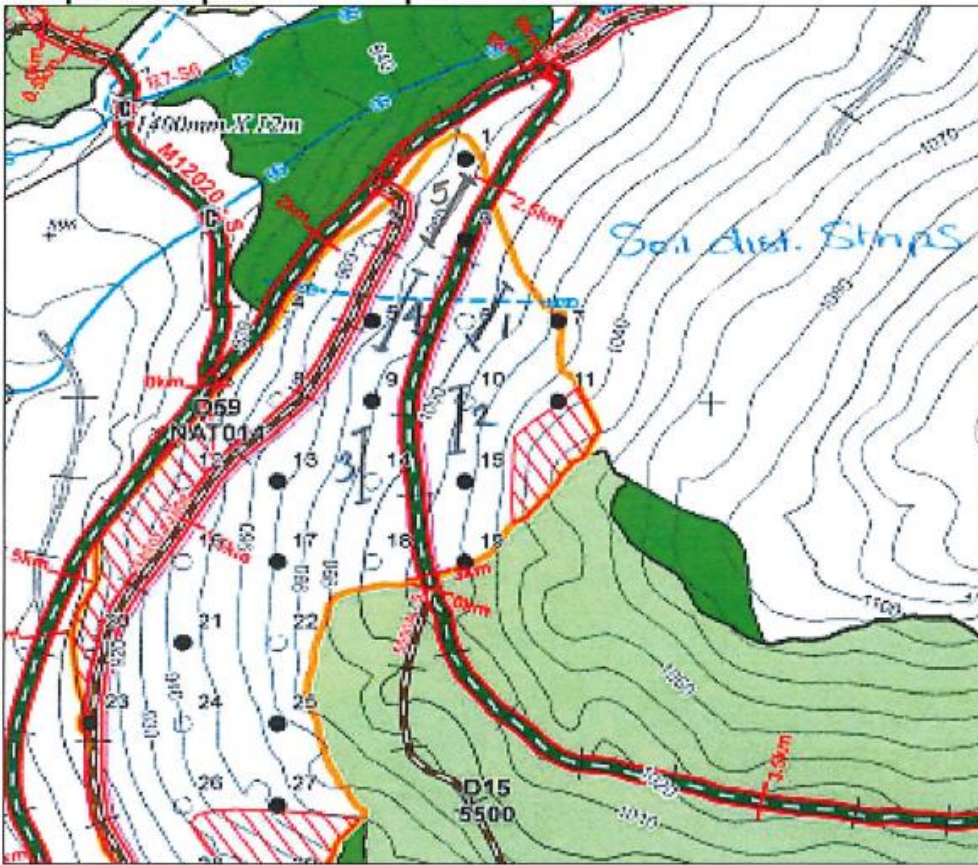
Remember: Every 5th step is a point. Record the disturbance type code at the point

Strip 1	Strip 2	Strip 3	Strip 4	Strip 5	Strip 6	Strip 7	Strip 8	Strip 9	Strip 10
1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -	1 -
2 -	2 -	2 -	2 -	2 -	2 -	2 -	2 -	2 -	2 -
3 -	3 -	3 -	3 -	3 -	3 -	3 -	3 -	3 -	3 -
4 -	4 -	4 -	4 -	4 -	4 -	4 -	4 -	4 -	4 -
5 -	5 -	5 -	5 -	5 -	5 -	5 -	5 -	5 -	5 -
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18 -	18 -	18 -	18 -	18 -	18 -	18 -	18 -	18 -	18 -
19 -	19 -	19 -	19 -	19 -	19 -	19 -	19 -	19 -	19 -
20 -	20 -	20 -	20 -	20 -	20 -	20 -	20 -	20 -	20 -

Summary: % Disturbance = Disturbed Points / Total Points Measured

Strip 1	# Points		# Disturbed points.		% Dist.		Block Summary:	
Strip 2	# Points		# Disturbed points.		% Dist.		Total # Disturbed Points (A)	
Strip 3	# Points		# Disturbed points.		% Dist.			
Strip 4	# Points		# Disturbed points.		% Dist.		Total Points (B):	
Strip 5	# Points		# Disturbed points.		% Dist.			
Strip 6	# Points		# Disturbed points.		% Dist.		= A / B * 100	%
Strip 7	# Points		# Disturbed points.		% Dist.			
Strip 8	# Points		# Disturbed points.		% Dist.		** Refer to Step 7: If the results exceed the threshold % disturbance, STOP WORK and contact your Supervisor	
Strip 9	# Points		# Disturbed points.		% Dist.			
Strip 10	# Points		# Disturbed points.		% Dist.			
	total	(B)	total	(A)				

Example of map to show strip locations



- Areas close to road appeared to the contractor as approaching max soil disturbance.
- Striplines were established parallel to the road, but perpendicular to the machine traffic
- Only 5 strips were established for this scenario. The more paces the better the survey results.
- Provide the Supervisor a copy of the map with the Strips identified by the Strip #, and a copy of the Soil Disturbance Measurement Form.

Example of point collection on Soil Disturbance Measurement Form:

Contractor: <i>ABC</i>			Surveyor: <i>Joe Smith</i>			Date(s): <i>06/15/15</i>			
CP / Blk: <i>001-002</i>									
Remember: Every 5 th step is a point. Record the disturbance type code at the point									
Strip 1	Strip 2	Strip 3	Strip 4	Strip 5	Strip 6	Strip 7	Strip 8	Strip 9	Strip 10
1 - /	1 - /	1 - /	1 - /	1 - /	1 - /	1 - /	1 - /	1 - /	1 - /
2 - /	2 - /	2 - /	2 - /	2 - /	2 - /	2 - /	2 - /	2 - /	2 - /
3 - /	3 - /	3 - /	3 - /	3 - /	3 - /	3 - /	3 - /	3 - /	3 - /
4 - /	4 - /	4 - /	4 - /	4 - /	4 - /	4 - /	4 - /	4 - /	4 - /
5 - /	5 - /	5 - /	5 - /	5 - /	5 - /	5 - /	5 - /	5 - /	5 - /
6 - /	6 - /	6 - /	6 - /	6 - /	6 - /	6 - /	6 - /	6 - /	6 - /
7 - /	7 - /	7 - /	7 - /	7 - /	7 - /	7 - /	7 - /	7 - /	7 - /
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20 - /	20 - /	20 - /	20 - /	20 - /	20 - /	20 - /	20 - /	20 - /	20 - /

Summary: % Disturbance = Disturbed Points / Total Points Measured									
Strip	# Points	# Disturbed points	% Dist.	Block Summary:					
Strip 1	20	3	15	Total # Disturbed Points (A)	10				
Strip 2	20	2	10						
Strip 3	20	1	5	Total Points (B):	100				
Strip 4	20	2	10						
Strip 5	20	2	10	= A / B * 100		10 %			
Strip 6				** Refer to Step 7 If the results exceed the threshold % disturbance, STOP WORK and contact your Supervisor					
Strip 7									
Strip 8									
Strip 9									
Strip 10									
total	100 (B)	10 (A)							

Note: In this example the % is at 10%, since this is a Roadside work area, the result is acceptable