



***FMG WEST
LOG QUALITY
SPECIFICATIONS***

Summer 2016

Version: May 1st / 2016



Section 1 - Defect Descriptions & Specifications

Logs delivered to Canfor's manufacturing plants must comply with the log manufacturing specifications and guidelines as follows. These specifications reflect Canfor's License utilization requirements and individual plant specifications. Log quality specifications are re-assessed seasonally.

Log quality will be monitored using MOF/Company Samples and joint on-block sampling by Harvesting Supervisors and Contractors. Bush results are documented and shared with Harvesting Contractors on the harvesting site. Both will be entered into the LQ Management system and distributed as required.

SPECIFICATION

DEFINITION

Length Tolerance

All CTL Logs: 10' - 37'	2" short and 2" long
Long Log Lengths 37' - 62'	2" short and 3" long
Long Log Lengths >62'	2" short and 6" long

Top Size

Sawlogs: see individual mill specifications.
Top diameter measured inside the bark, 1/4" tolerance allowed. Tops are measured across the widest direction.

Grade 6 log

Grade 6 Logs are Acceptable
Feller Buncher butt cut must not be cleaned up for any reason other than for butt defects that do not meet spec. Unless approved.

Grade 6 logs are Pine logs 6" or less, all other specie 8" or less. Measured 6" up from the butt cut.

Spiral Checking

Maximum Spiral Check of 1/4 turn in 16'.
West Mills see individual mill pages.
See individual mill specifications for length details.

***Straight Checks***

A single straight check is acceptable to a depth of center of the butt. Seasonal checking is acceptable at all sawmills.

Multiple Checks

*Obvious multiple checks on a log are acceptable if the checks, **assessed in combination** affect less than 50% of the volume. Most checks have sufficient depth to affect significant volume when several checks are present.*

Twist

Twisted grain on any green log greater than $\frac{1}{4}$ turn in 16'. See individual mill specifications for length details.

Processor Damage

Spike holes greater than $\frac{1}{4}$ " deep into the wood caused by a processor are not acceptable.

Poor Falling or Bucking Cut

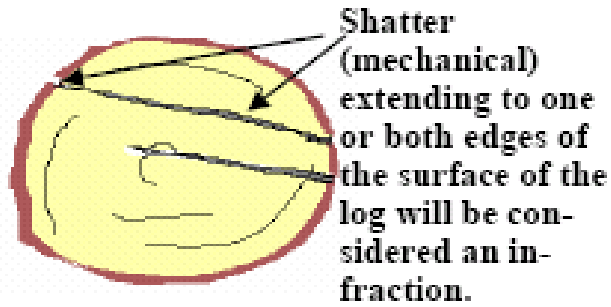
A log with a step cut or slanted cut, which exceeds 2". Buncher Double Cuts often result in splits up the stem, this creates a huge recovery loss for the mills. If you cannot fall the tree without damage, it should be handfell.

***Machine Damage/
Deep Bucking Cut***

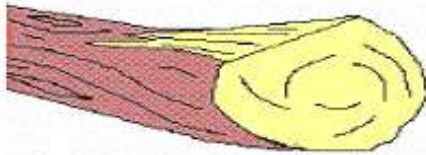
Damage to any part of the log that is deeper than 2" beyond normal taper is unacceptable. Logs 20" and over may have machine damage of 4" into normal taper. This includes spearing, dents, gouges, buncher damage, processor damage, or shatter.

Split Tops and Butts.

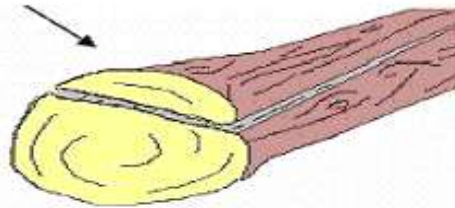
Splits occurring within the outer 10% of the butt or top are acceptable, provided that the split travels straight or towards the outer edge of the log.



Shatter confined to flare **OK**



Shatter effecting recovery is unacceptable



Snipe

A log with an incomplete cut at either end, leaving a snipe greater than 2" long and 1/2" in thickness, is not acceptable.

Snipes that cannot be physically removed by quality assessor will be considered an infraction



Dead/Dry logs:

Sawlogs: are acceptable at all sawmills, See individual mill pages for dry Balsam.



Butt Rot

(Spruce, Pine, Fir)

Includes white fleck

Logs 18" and less across the butt, no more than 25 % of the diameter allowed for rot. Logs greater than 18" at the butt, no more than 40 % of the diameter allowed for rot. Logs < 8" No rot acceptable. Stain is not considered rot as long as it is hard and growth rings are still visible.

White fleck rot is unacceptable.

Butt Rot by Diameter – Spruce, Pine, Fir – 25% and 40%

<i>Butt Diameter < 18"</i>	<i>Acceptable Rot Diameter</i>	<i>Butt Diameter > 18"</i>	<i>Acceptable Rot Diameter</i>
8"	2"	20"	8"
10"	2.5"	22"	8.5"
12"	3"	24"	9.5"
14"	3.5"	26"	10.5"
16"	4"	28"	11"
18"	4.5"	30"	12"
		32"	13"
		34"	13.5"
		36"	14.5"
		38"	15"
		40"	16"

Butt Rot (Balsam)

Saw logs: *No more than 25 % rot by diameter allowed for any size of butt.*

-Logs < 8" No rot acceptable.

-No rot in dry Balsam sawlogs.

Top Rot

No rot allowed on tops < 6". Logs greater than 6", 20% of diameter is allowed. Stain is acceptable, white fleck is unacceptable. OSB top rot of up to 50% is acceptable.

Sap Rot

No more than 20% of diameter sap rot. A residual core of 4.5" must remain in all cases. Sap rot is defined as fiber that is soft or crumbles and has lost its integrity.

Excessive Sweep

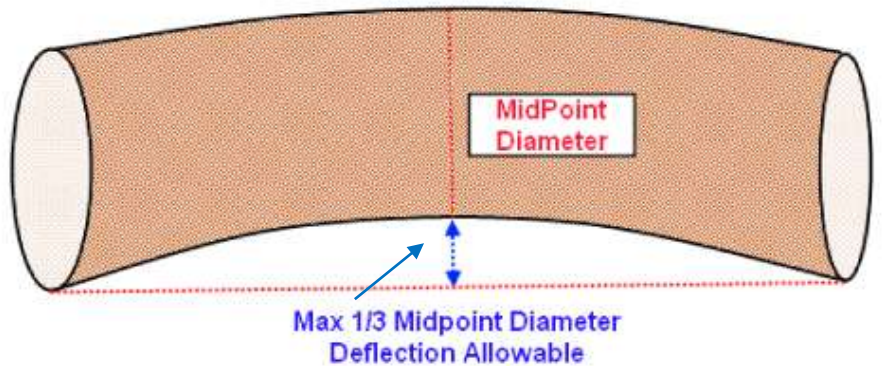
Sweep is acceptable if in any 16' 3" section of log, (12' 3" at IP / Chetwynd) When measured horn to horn the deflection from the tape to the log is less than 1/3 the mid-point diameter.

The picture, illustrates how sweep is measured. Logs that are 3" or more over the acceptable sweep tolerance will be treated as production killers. Snake sweep must still leave 50% or more volume available for manufacture.

Mid-Point Diameter - Allowable Deflection Chart

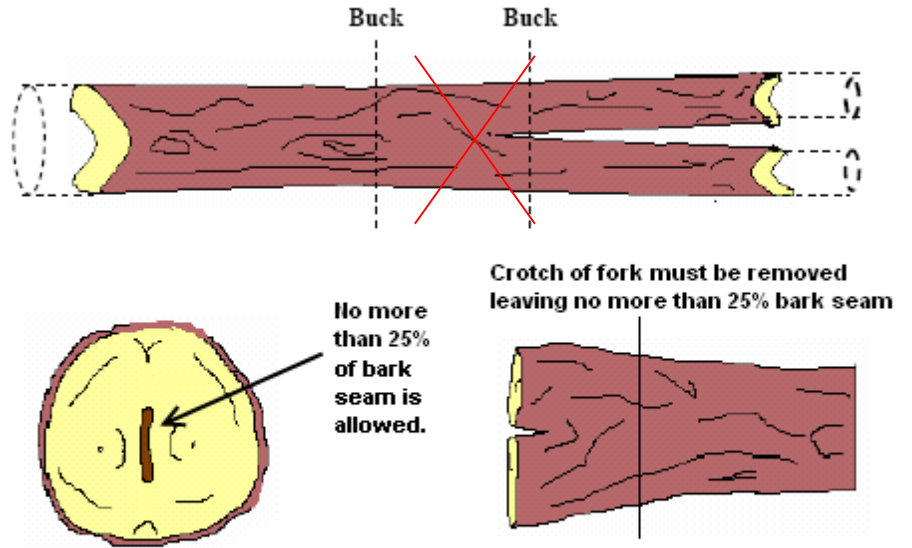
Midpoint	Deflection
< 7.5"	2 "
7.6" - 10.5"	3 "
10.6" - 13.5"	4 "
13.6" - 16.5"	5 "
16.6" - 19.5"	6 "
> 19.5"	7 "

Sweep Measured Horn to Horn. 1/3 Mid-Point Diameter is the Maximum Allowable Deflection



School Marm

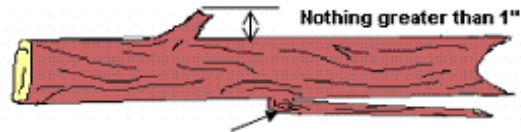
A properly bucked school marm will have no more than 25% of the diameter of bark seam showing.



Avoid the practice of splitting forks. If forks are split during the logging process, remove fractured portion.

Limbs, Spikes

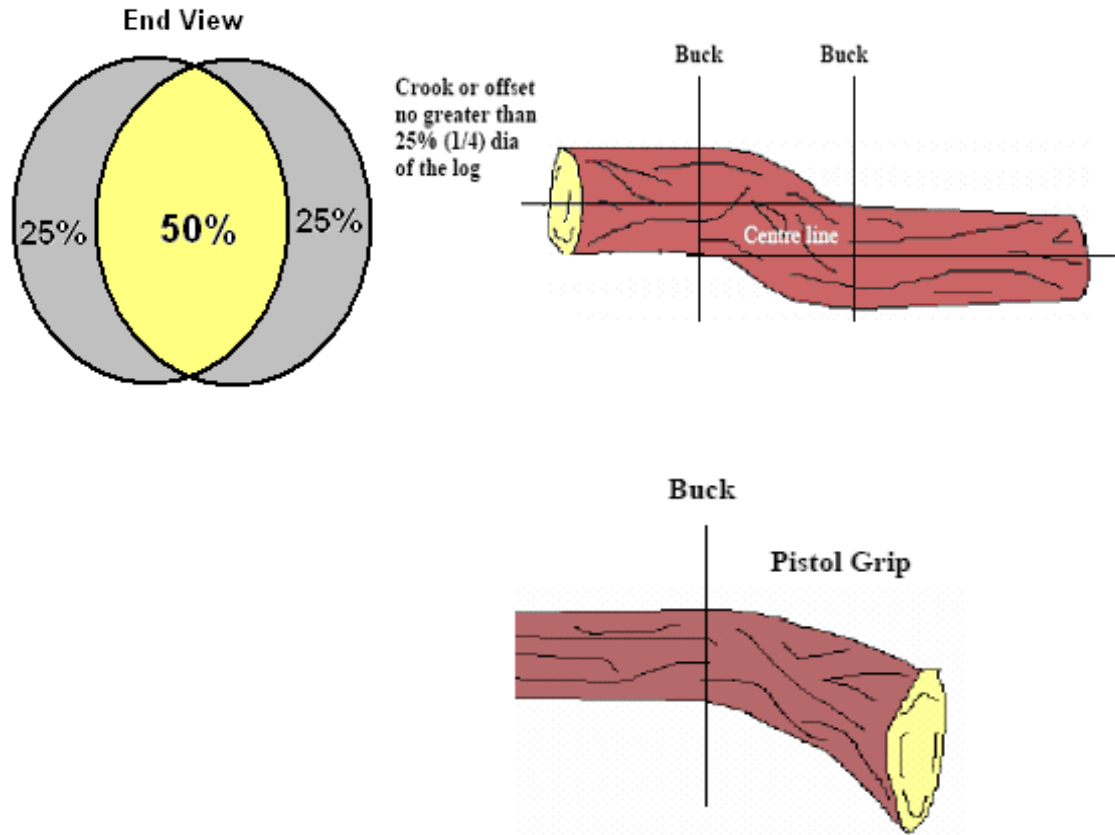
All limbs and spikes must be bucked flush. A maximum tolerance of 1" is allowed. (3" for OSB) Discretion must be used with repeated delimiting for machine damage.



No long folded limbs

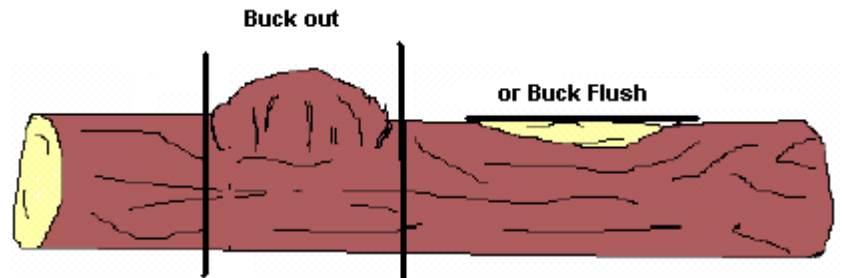
Crook/Pistol Grip

*A log that has an abrupt offset at a point along its length. Crooks that have greater than 25 % displacement by diameter should be bucked out minimizing the avoidable waste. 25% offset still leaves about 50% or minimum heart of 4.5" **core** available for lumber, the picture below is more than 25% offset. ****Crooks are assessed at the point of the defect and not over the length of the log*****



Burls or Natural Deformities

Any burl or deformity that protrudes greater than 1" from the natural taper of the log must be bucked flush or bucked out.



Gnarly top

Gnarly tops should be bucked off leaving a primary or secondary log length. If a top looks gnarly and/or ugly, it is not acceptable.

Buck at red line



Buck at red line



Buck at red line

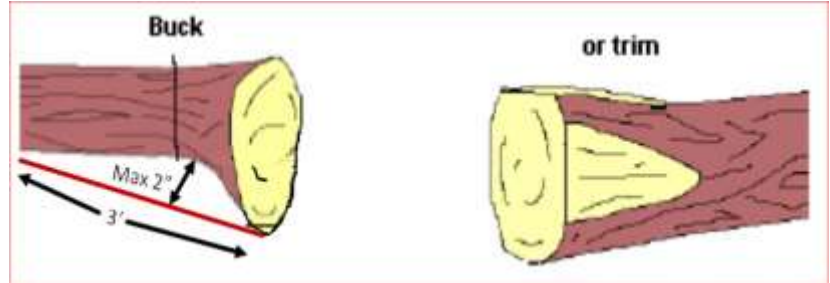


Cat Face

*All wood within the cat face must be tight with no charcoal acceptable. If a Cat Face is the only butt defect and the butt is straight (not hooked), the Cat Face can go to a depth of 1/3 of the butt diameter. Mid stem, Cat Faces must still allow for at least 50 % lumber recovery, or a minimum of 4.5" **core** of firm wood. Multiple cat faces will be assessed in combination over the length requiring 50% volume available for manufacture.*

Excessive Butt flare

Any flare greater than 2" on either side, outside of the normal taper of the log measured over a 3' 0" length.



Broken Ends

Off-length top logs resulting from breakage are to be cut clean, to the receiving sawmill's preferred length or secondary length. **See individual mill pages.**

Incorrect Product Sort

Logs sent to the wrong destination or not sorted as per sawmill specifications.

Non-Merch. Chunk

Sawmill/Chip plant - a processed log that is shorter than 10' 0" in length.

Burned Wood

A burned log, partially burned log or catface containing charcoal that has not been approved for delivery, normally burnt wood is not accepted at any processing facility.

Random Length

Random length means a log not cut to a measured length, but cut to within 1" of the specified mill top size (up to 5.5").

Preferred Lengths

Buck logs to the preferred lengths shown for each mill, only use secondary lengths when bucking back for defect, unless specified for that mill.



Multiple Defects

Logs with multiple defects that assessed alone, each defect meets spec, but all defects combined, affect greater than 50% lumber recovery, are not acceptable. (Example... logs with 2 catfaces down one side, a crook in the center and a ¼ turn check on the other side.)

Cull Log

Obvious cull logs are not acceptable, only sawlogs with greater than 50 % rot by diameter at both ends, or deciduous in sawlog loads or burnt wood can be culls.

Production Killers

Production Killers are any log that has the potential to cause any loss of production in the sawmill or jeopardize the safety of sawmill employees, such as jam up. A few examples of production killers are: runaway length, severely excessive sweep, excessive oversize. See individual mill specifications for production killer details.

Log Lengths

Log Lengths / Targets CM's
******* Check Correct Mill Target Length*****

-5 CM's	-2"	Target	+2"	+5 CM's
307	10' 1"	10' 3"	10' 5"	318
310	10' 2"	10' 4"	10' 6"	320
368	12' 1"	12' 3"	12' 5"	379
371	12' 2"	12' 4"	12' 6"	381
429	14' 1"	14' 3"	14' 5"	440
432	14' 3"	14' 4"	14' 6"	442
490	16' 1"	16' 3"	16' 5"	501
495	16' 3"	16' 5"	16' 7"	505
551	18' 1"	18' 3"	18' 5"	562
556	18' 3"	18' 5"	18' 7"	566
612	20' 1"	20' 3"	20' 5"	623
617	20' 3"	20' 5"	20' 7"	627
678	22' 3"	22' 5"	22' 7"	688
739	24' 3"	24' 5"	24' 7"	749
744	24' 5"	24' 7"	24' 9"	755
810	26' 7"	26' 9"	26' 11"	820
871	28' 7"	28' 9"	28' 11"	881
996	32' 8"	32' 10"	33' 0"	1007
1496	49' 1"	49' 3"	49' 6"	1509
1997	65' 6"	65' 8"	66' 0"	2013



Section 2: Other Specifications Loading/Sorting

Balsam

Balsam is to be sorted when directed by the Forestry Supervisors. See individual sawmill specifications.

Cedar/Hemlock/Fir

No Cedar, Hemlock or Fir to any mill or pulp facility unless previously authorized by Forestry Supervisor. Must be sorted separately and delivered as directed.

Loadslips

Loadslips must be correctly and completely filled out, with all fields completed. Sorts, Species id, Bundles etc. are all critical information. Loaderman will complete the loadslips. Improperly completed loadslips could result in infraction penalties to the contractor.

Oversize (O/S)

See individual sawmill specifications.

Cleanup Loads

Cleanup loads which have a mixture of species or sorts but does not include pulp. Number of loads must be minimized to 1 or 2 per cutblock. A "C" must be painted on the front driver side of the load, marked on the trucker slip and identified at the scales for safe and proper millyard handling. Check with Harvesting Supervisor to see if prior approval is required.

Sorting

1" tolerance on diameter sorting, measured across the maximum width on the larger end of the log.

Butt or Top Diameters

All Butt or Top Diameter measurements are measured across the maximum width on the larger end of the log.

Foreign Material/Debris

Is not acceptable, no loose debris in the load (limbs, chunks, long butts, and rat tails). Any log or a load of logs, which contains any material other than wood (ie. rock, wire, nails, etc.)

Foreign debris will be assessed as production killers.



Houston Sawmill Specifications

250-845-5270

Top Diameter 4 3/4"			
Lengths Tolerance:		± 2"	
Sorts	Butt Diameter	Prime Lengths	Other Lengths
Small	<8.5"	16'5"	12'4", 14'4"
Medium	8.6" - 14.0"	16'5"	12'4", 14'4"
		20'5"	12'4", 14'4", 16'5", 18'5"
Large	>14.1"	16'5"	12'4", 14'4"
		20'5"	12'4", 14'4", 16'5", 18'5"

Production Killers: CTL Log over 22'0"

Spiral Checking / Twist: Maximum of 1/4 turn in 16'

Sorting:

- Harvesting Supervisor will direct the contractor on which prime length to target in each sort
- "Other Lengths" are only to be used when bucking for defect or utilization
- Contractor may only use the 1/2" tolerance on top size to buck a **prime** length (i.e. can go to 4 1/4" to hit a 16' 5" length)
- All Balsam must be sorted and delivered separately, no dry Balsam
- Size Sorting:
 - All size sorts must be sorted to **100%** accuracy based on number of pieces.
 - Diameter Sorting Tolerance – 1" Maximum.

Loading:

- Maximum 2 sorts per load.
- Clean-up bundles:
 - Priority sorting is species over size sort.
 - Small/medium of the same species can be mixed in a bundle.
 - Large **must be** sorted separately and placed **on the bottom** of the small and/or medium bundle.
 - If Spruce/Pine and Balsam is in the same bundle, it must be separated within the bundle.
 - Maximum target is 1 clean-up bundle per 100 bundles delivered.

Oversize:

- Logs over 26" on the butt are Oversized
- If bundle is not pure oversize, the butt of the oversized logs are to be marked with "O/S".
- O/S logs mixed with large (or small/medium in the case of a clean-up) will be placed **on the bottom** of the bundle.



Isle Pierre Sawmill Specifications

250-441-5928

Log Yard Supervisor: (250)441-5914			
CTL Lengths <u>Target +/- 2"</u>	Top Size at widest diameter <u>Green Target 4.5"</u> <u>Dry Target 4.75"</u>	Max Butt Diameter Average of two measures <u>Target 12"</u> Up to 15" max with Canfor approval	Plateau logs (2 classes) <u>Large: 12" to 25" butts go to Plateau as long log 32'10" OR 16'5" CTL log</u> <u>Oversize: logs >25" butt go to Plateau as 16'5"</u>
CTL Small (<12" butt) →	Preferred : 12'3", 24'7", 32'10" – Acceptable: 10'3" (utilization only)		
Plateau wood →	Large: 16'5" OR 32'10"; Oversize: 16'5"		

Production Killer

- 13' or longer piece in the 12' CTL sort
- Swept logs where tape line held center of butt to center of top falls off a 12'3" log
- Unsorted balsam is not a production killer, but a cost killer when drying lumber

Spiral Check / Twist

- Target is $\leq \frac{1}{4}$ turn in 16 feet
- $\frac{1}{4}$ to $\frac{1}{2}$ turn in 16 feet = 3 logs per 1 defect point
- $> \frac{1}{2}$ turn in 16 feet = 1 log per 1 defect point

Sorting

- Three (3) Spruce/Pine sorts
 - **1) 12'3", 2) 24'7", 3) 32'10"** logs will be manufactured targeting \geq to 8" butts.
- Balsam will be sorted and delivered separately if more than 3% of net cruise volume. Sorting will occur when there is sufficient density of balsam that complete bundles can be sorted.
- No dry Balsam Allowed
- Logs 12" butt to 25" butts are sent to Plateau as LARGE 32'10" long log **OR** 16'5" CTL logs as directed by a supervisor. Logs >25" butt are sent to Plateau as OVERSIZE 16'5" CTL logs.

Loading

- Butts may be loaded both ways
- 10'3" and 12'3" are acceptable in the same sort / bundle. DO NOT mix them with 24's or 32'10"
- 24'7" is a sort. DO NOT mix them with 32'10" unless the load is a cleanup load (slip marked)
- DO NOT mix Spruce/pine bundles and balsam bundles on the same truck.
- For Plateau logs, do not mix long log 32'10" and 16'5" CTL up to 25" butts. DO NOT mix butts >25" with any other wood. Ship these >25" pieces as pure loads or as pure bundles.
- Plateau Cleanup: you may mix logs of the same length. Mark logs >25" butt as oversize (O/S).



Plateau Sawmill Specifications

250-567-8311

Logyard Supervisor 250-567-8360

Top Diameter 4.5"	Max Butt Diameter: 25" for long/CTL	Preferred Lengths	Other Lengths
CTL			
CTL Small	< 11"	16'5"	12'4", 14'4", 26'9", 28'9"
CTL Large	11" - 25"	16'5"	12'4", 14'4"
Oversize	>25.1"	16'5"	12'4", 14'4"
LONG LOGS			
Small	< 11"	Min 32'10" - Max 65'8"	
Large	> 11"	Min 32'10" - Max 65'8"	

**** Non Preferred Long Log Lengths - 36' to 40' and 52' to 55'**

Production Killer

- Logs greater than 16'8" in 16' sort
- Excessive Sweep

CTL Spiral Check / Twist - ¼ turn in 16'

- ¼ to ½ turn in 16' = 3 logs per 1 defect point.
- > ½ turn in 16' = 1 log per 1 defect point.

Broken Tops on Random Length Logs: Acceptable - no mud / rocks allowed.

Bucking Scenarios:

- Highway Lengths - Target length of 49'3" or 65'8".
- CTL - Logs less than 32'10" will be bucked to 16'5" preferred or alternate 12'4", 14'4", 26'9", 28'9"
- Long Wood - Buck Logs greater than 11" Butt and 32'10" or longer, to the longest length possible.
- Off-Highway Bigwood - Buck at 65'8" - Max preferred length.
- Off-Highway Smallwood - Refer to above table.
- Maximum sweep of 36" measured from horn to horn on 65'8", including the diameter of the log, buck back to acceptable sweep criteria.

**Sorting:**

- Size sorts will be +/- 1".
- CTL sorting, 12'4" / 14'4" must be contained within 16 foot bundles.
- CTL sorting, 26'9" and 28'9" may be delivered together, do not mix with 16' foot sort.
- Balsam must be sorted and delivered separately if more than 3% by cruise volume or in areas of the block with sufficient density as directed by the Operations Supervisor – Balsam is a cost killer when drying lumber, so please sort when possible.
- **NO DRY BALSAM**

Loading:

- **Smallwood and Bigwood** – butts both ways is acceptable and all logs are longer than 32'10". When loading logs both ways make sure load it is balanced for a safe lift.
- No 26'9" or 28'9" mixed in a long log load. Minimum long log length is 32'10".
- Pure Balsam CTL bundles must be loaded separately, but require an individual loadslip if loaded with bundles of spruce/pine.
- Balsam to be shipped separately in long logs if more than ½ a load.
- **No Spliced Loads – No Long Loads stretched on hayracks that will compromise safety and/or breakage while unloading with the Wagner**

Oversize

- 16'5" (>25" butt) will be shipped as pure oversize CTL bundle
- A maximum of 5 O/S logs per regular CTL load may be delivered, but must be marked as O/S and placed on the top of the load and clearly marked on the loadslip. Every attempt should be made to have full bundles of O/S.



PG Chip Plant Specifications

250-962-3393

Top Diameter (Minimum) 4.0"	Max Butt 30.0"	Max length 20'5"	Min Length 12'4"
Sorts	Butt Diameter		
Small	< 10.0"		
Large	> 10.1"		

- *No deciduous.*
- *Maximum 70% rot by volume.*
- *No Grade 1 or 2 (saw logs) – called cull logs and given points on assessment sheet (unless previously approved by Harvesting Supervisor)*
- *All Balsam, Hemlock and Fir to be sorted and delivered separately as per Harvesting / Purchase Wood Supervisor direction.*
- *No broken ends.*
- *No Oversize greater than 30"*
- *Target lengths to be determined by Harvesting Supervisor.*
- *Diameter Sorting Tolerance – 1" Maximum.*
- *Production Killer – Any log longer than 21'4"*

Stella-Jones

Prince George, B.C.
PHONE: (250) 561-1161

LOGEPOLE PINE POLE SPECIFICATIONS

All over bark measurements are in inches

Peace Pole Spec

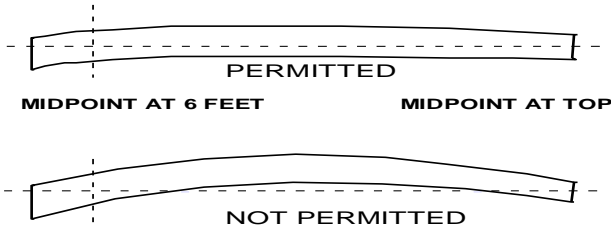
Prince George Pole Spec

LENGTH	BUTT over bark diameter Inside Flare		TOP over bark diameter	
	MIN	MAX	MIN	MAX
43' 4"	13"	15"	7"	11"
47' 4"	15"	16"	8"	12"
57' 8"	17"	18"	9"	13"
61' 8"	18"	20"	9"	13"

LENGTH	BUTT over bark diameter Inside Flare		TOP over bark diameter	
	MIN	MAX	MIN	MAX
45' 2"	13"	16"	7"	11"
49' 2"	14"	17"	8"	12"
53' 2"	15"	18"	8"	12"
57' 4"	16"	19"	9"	13"
62' 0"	17"	20"	9"	13"

Manufacturing

- Eliminate all rot
- No wood borer holes
- No mechanical damage, scars or catfaces
- that exceed 1" in depth and 1/5th of circumference
- No spike knots
- No single knots over 3" in diameter
- No full length checks
- No splits in butts or tops
- **POLES MUST HAVE A MINIMUM OF 1" OF SAPWOOD**
- **SWEEP**



Poles must have one straight side
No short crooks