

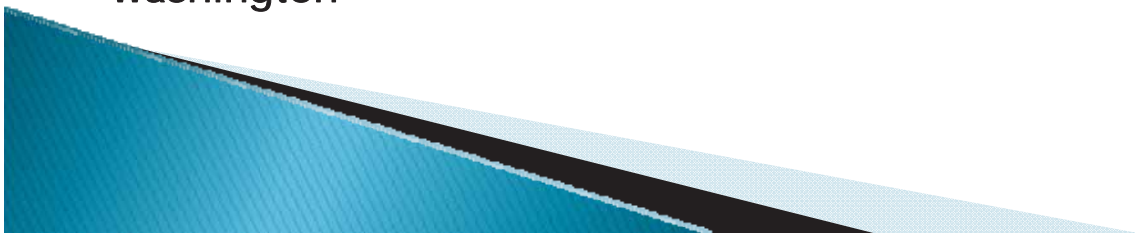
TMS
Thursday 10:30 AM April 8, 2010



Log Yard Inventory Measurements

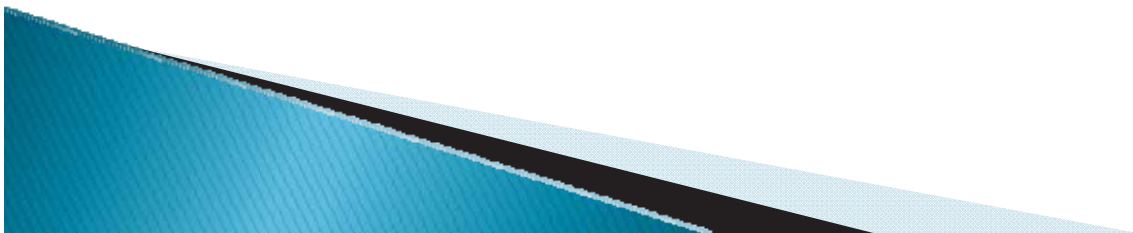
Lessons Learned

John Calkins,
Check Scaler/Log Quality
Simpson Lumber Company
Tacoma, Shelton, Longview
Washington



Goals

1. Improve the physical log deck measure for more accurate log accounting.
2. Take more measurements using one person.
3. Devise a procedure that is easy to understand.
4. Devise a procedure that is acceptable to Accountants and Auditors.





Commencement
Bay Operations

The Challenge

Mountains to Measure

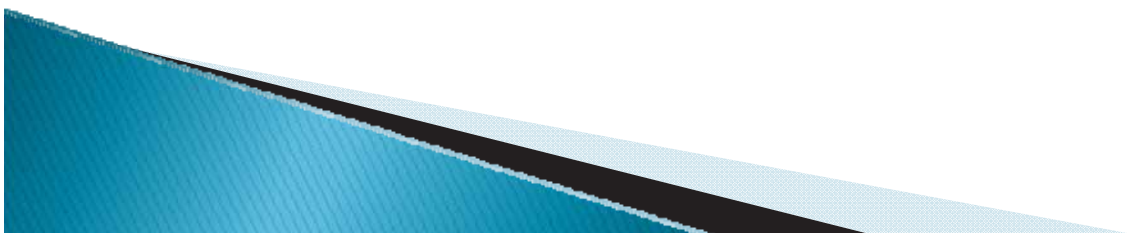


Always Changing

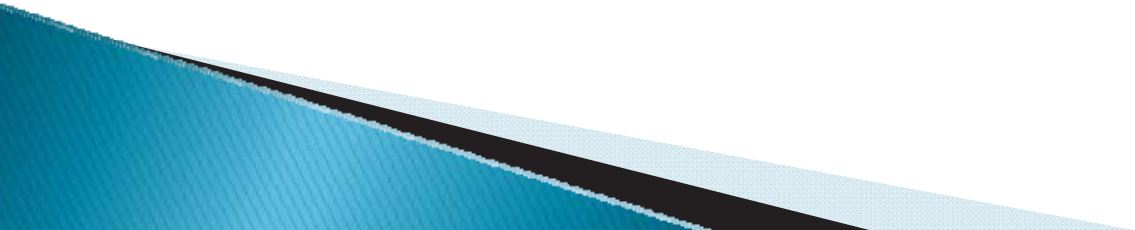


Where do you start?

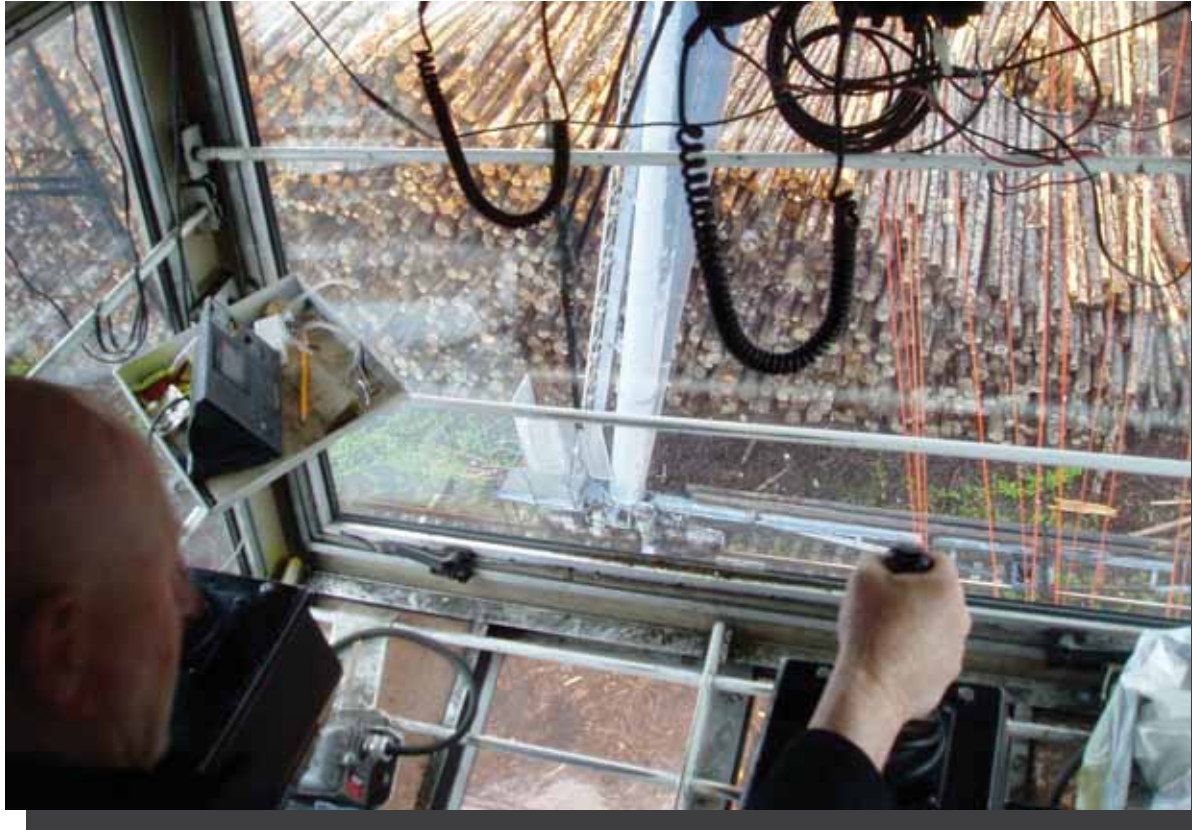
Study how each log yard is run.
Watch how they build and use decks.
Understand why they have to build them certain ways.



Learn what the Operators do by watching them in action



Bring the Operators into the project.



Without their co-operation,
accountability and safety could be jeopardized



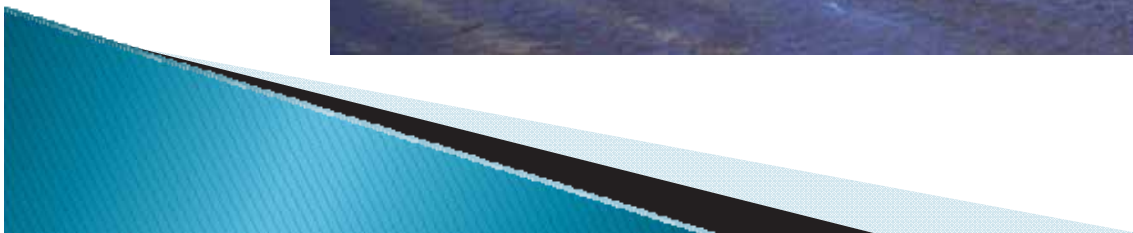
Most Operators have many years of experience and have developed reasons for what they do that isn't apparent at first.

Seek their advice and respect their judgment, later this will pay off with co-operation.

Try to see things from their perspective.



An experienced Operator will build decks consistently.



Study the log accounting system.

See how flexible they are to help with test data.

Processed On: 3/28/2009

Deck Summary Report

Page 2 of 339

Deck: W999

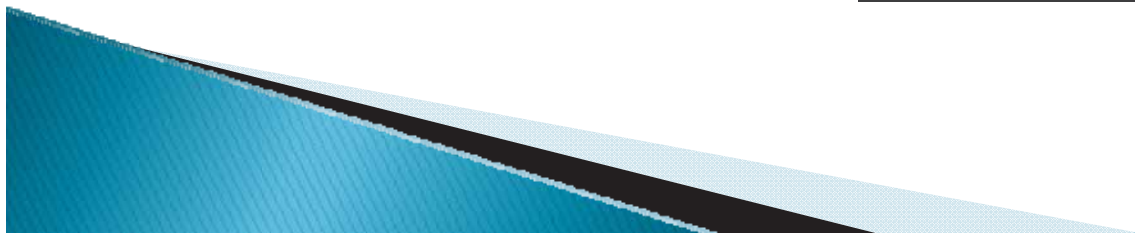
Finished Date:

Hot Deck Date:

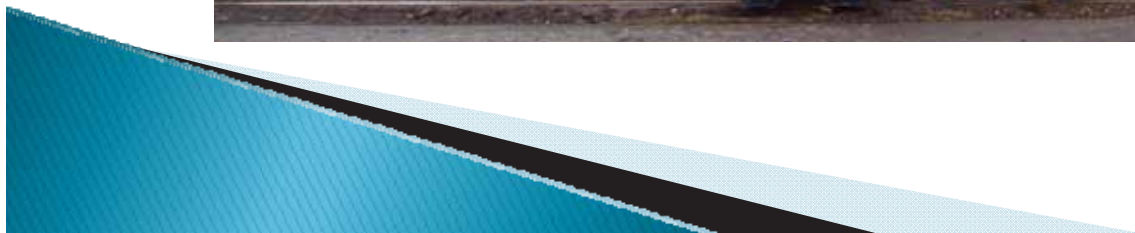
<u>Tbl</u>	<u>Weight Tkt</u>	<u>Trip Ticket</u>	<u>Adj</u>	<u>Ticket Date</u>	<u>Gross Vol</u>	<u>Net Vol</u>	<u>Util Vol</u>	<u>Net Wgt</u>
DSY - W999								
P	W00005	WY50580		9/18/2008	6,380	6,100	40	49,999
P	W00005	13426		12/4/2008	5,570	5,480	0	49,999
P	W00005	13469		12/4/2008	6,270	6,200	20	49,999
P	W00008	GD528875		10/1/2008	5,560	5,450	0	49,999
P	W00009	13605		12/9/2008	5,700	5,440	190	49,999
P	W00009	13639		12/9/2008	5,470	5,180	270	49,999

Break the project down into

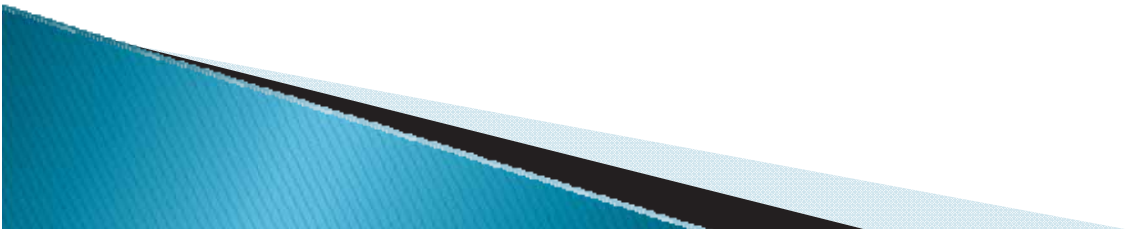
Smaller manageable pieces



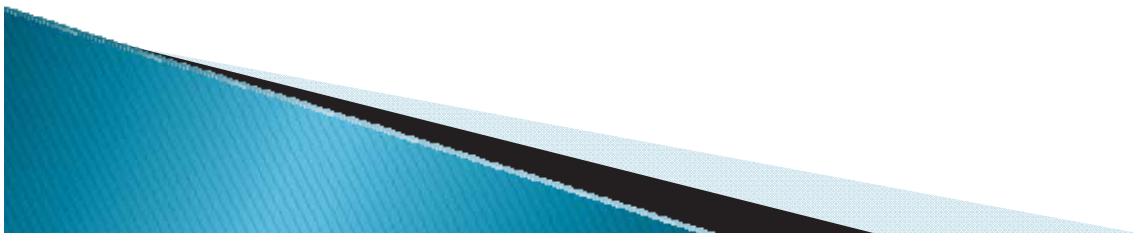
There are physical limits to how the machines build decks. Look how close the dimensions can be, such as the angle of these two decks.



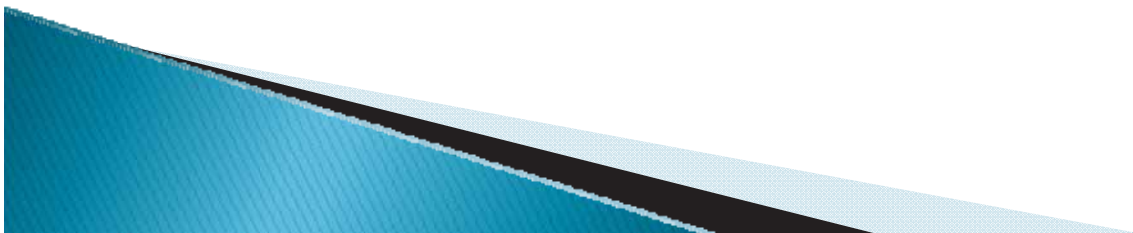
Recognize the geometric shapes



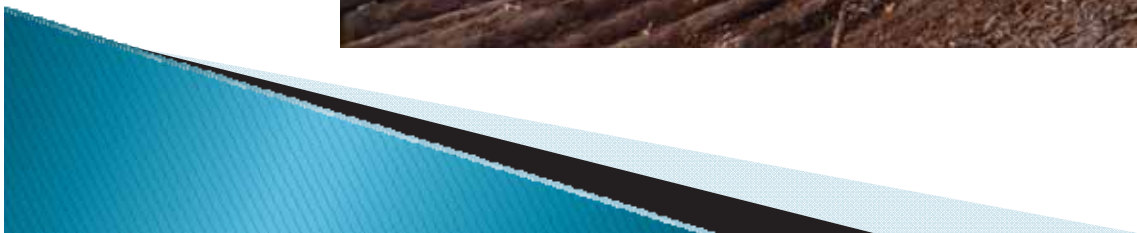
It's easy to explain this intersection
and repeat the procedure.



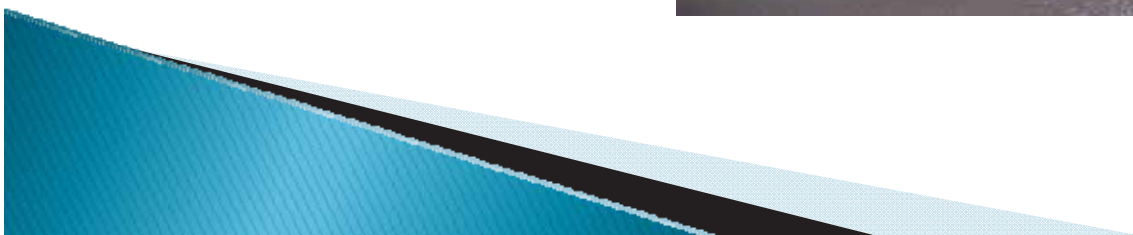
Now you can use the simple geometric areas of right triangles and rectangles to figure the Square Foot Surface area of any log deck.



Vantage points are key

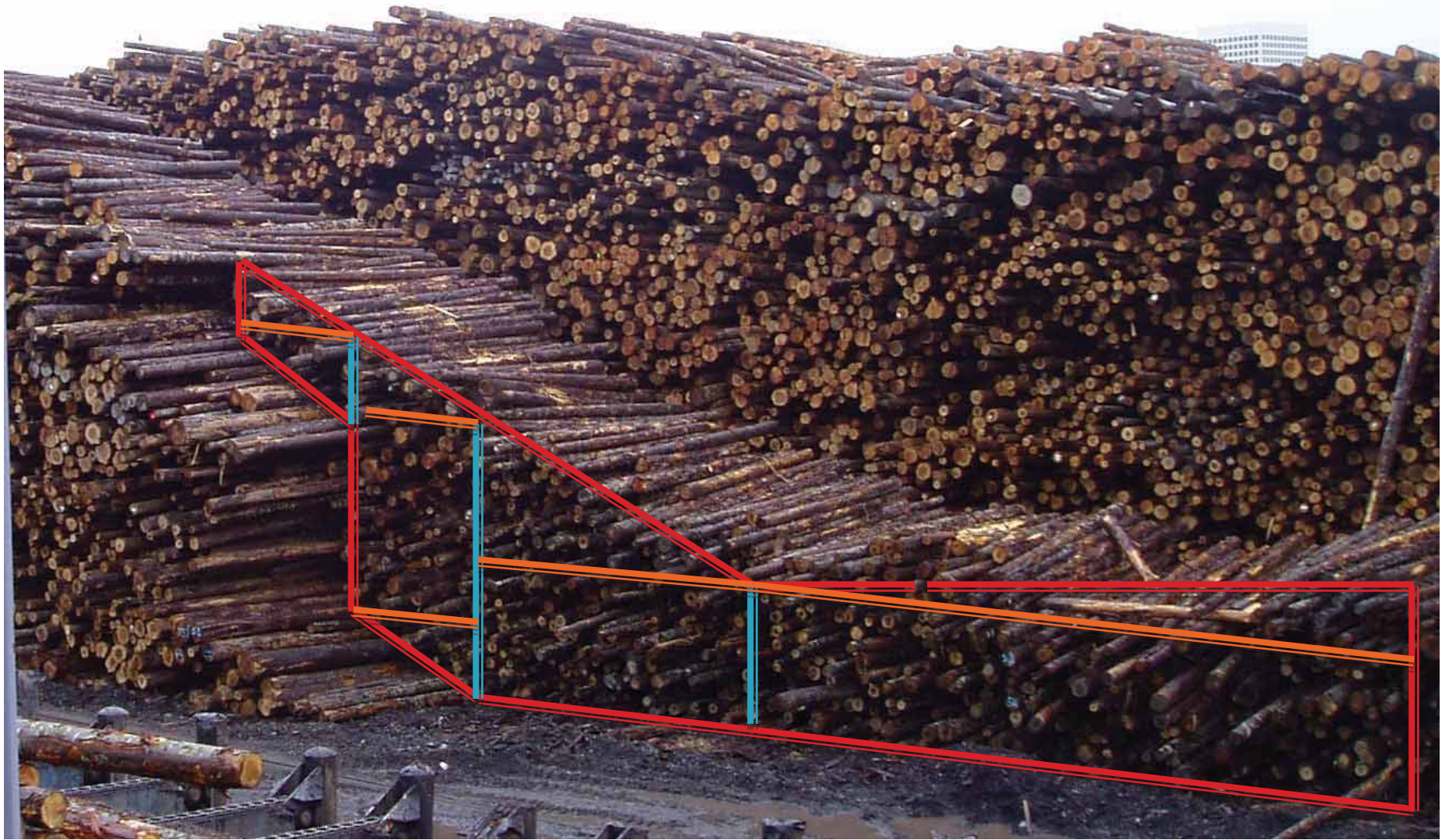


As the decks
get bigger, the
triangle ends
smooth out...
gravity.



Learn why they build decks the way they do.
Try and spot the geometric shapes.

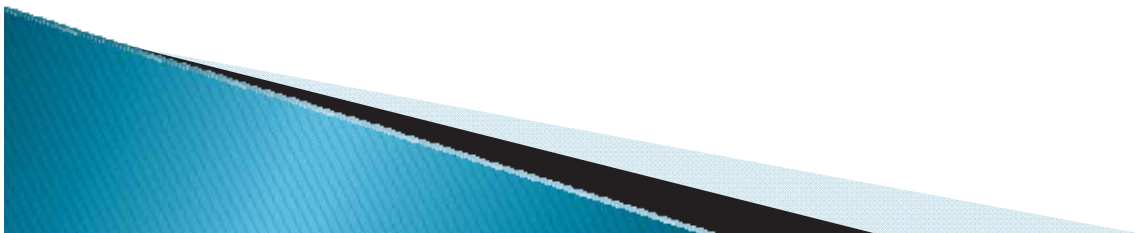




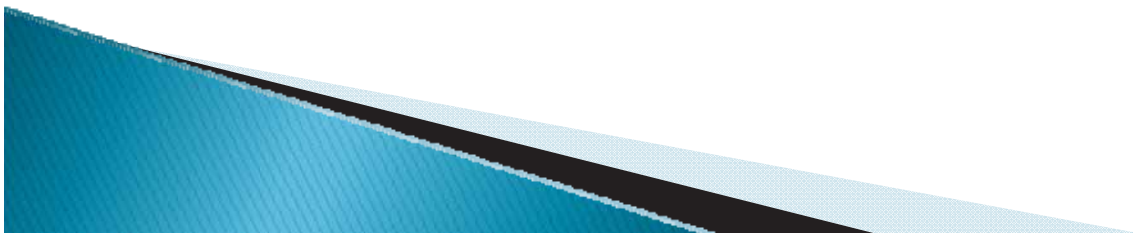
Find the area of these Right Triangles and Rectangles for the SqFt. Measurement



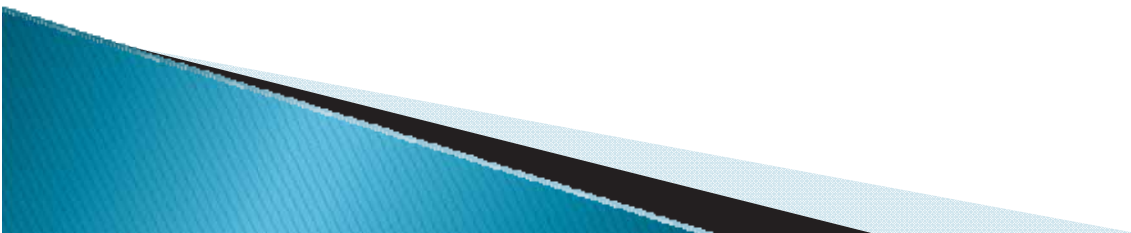
This method is the easiest to understand even under complex shapes.



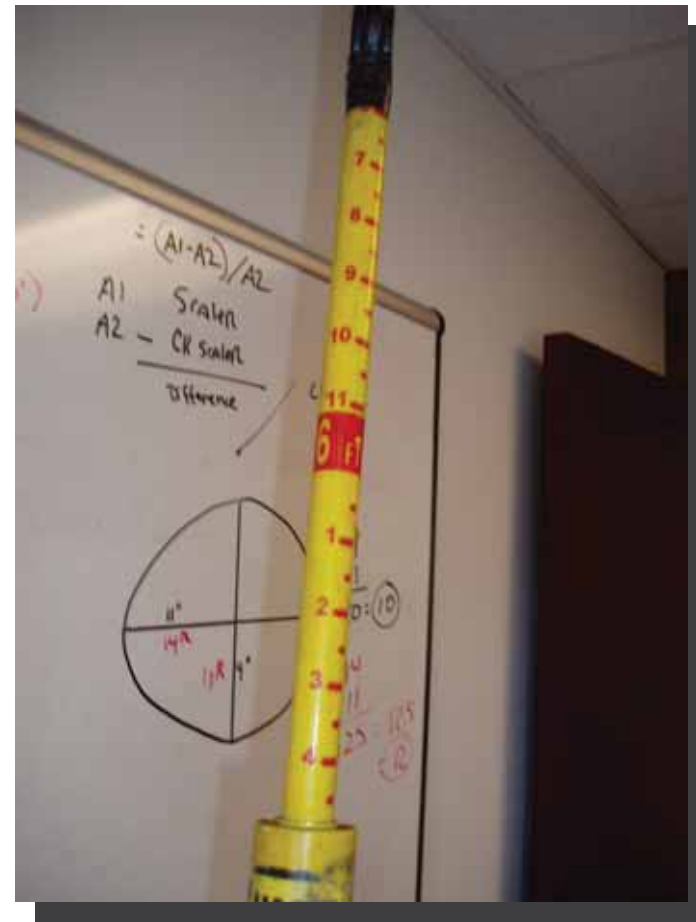
So at what point do we stop measuring the finer detail and use reasonable incremental measurements?



This deck was measured with a height pole and a 50' tape with the observer standing well away from the deck to see the geometric shapes.



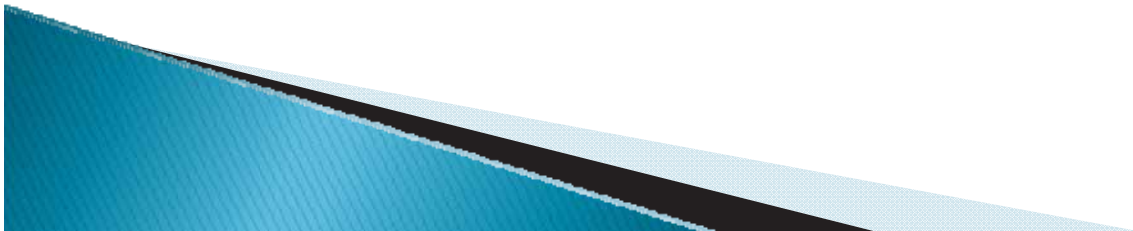
Hastings Pole





Take the time to understand the current measuring methods and why they are used.

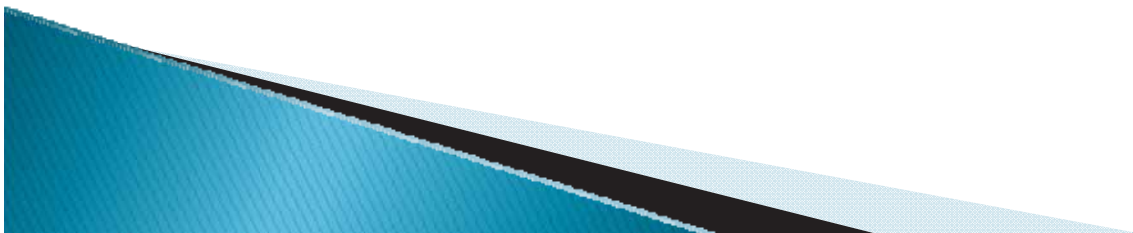
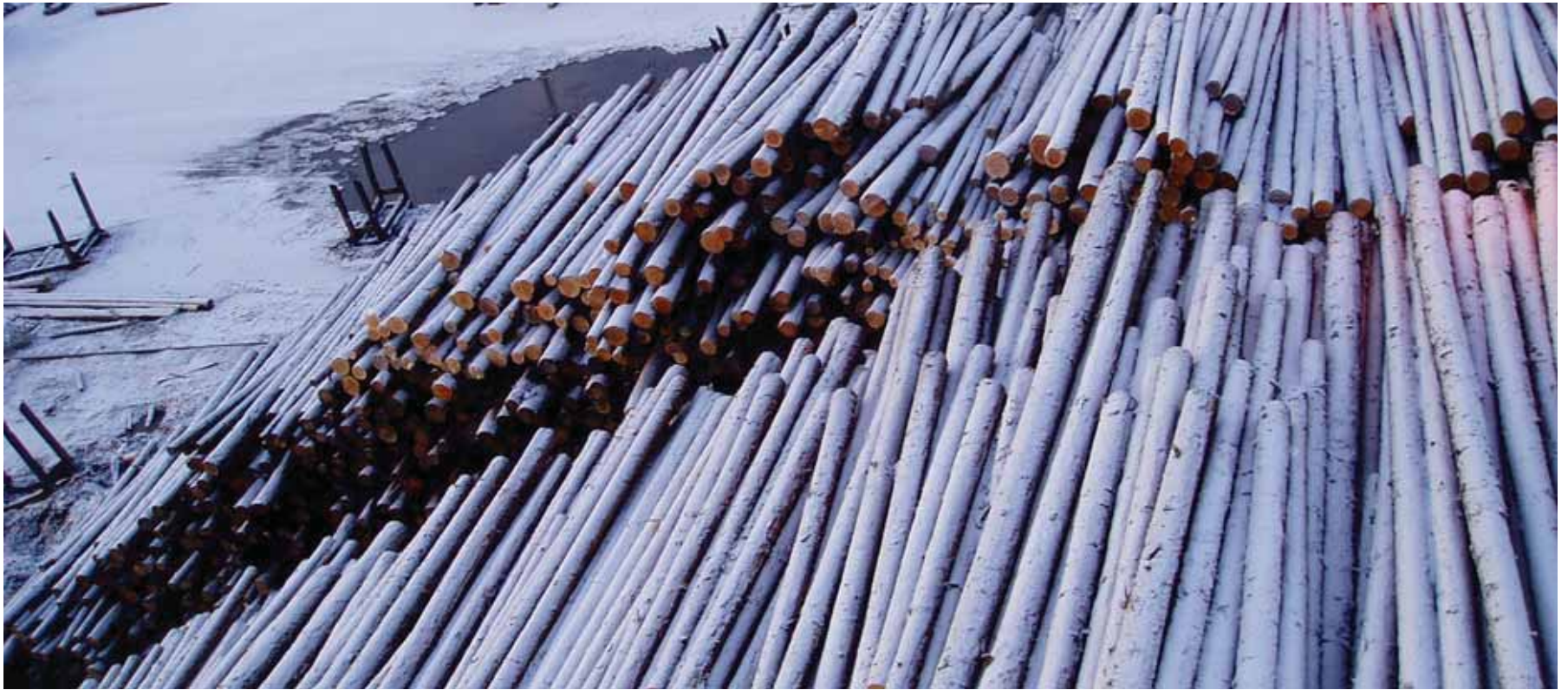
Try new ideas



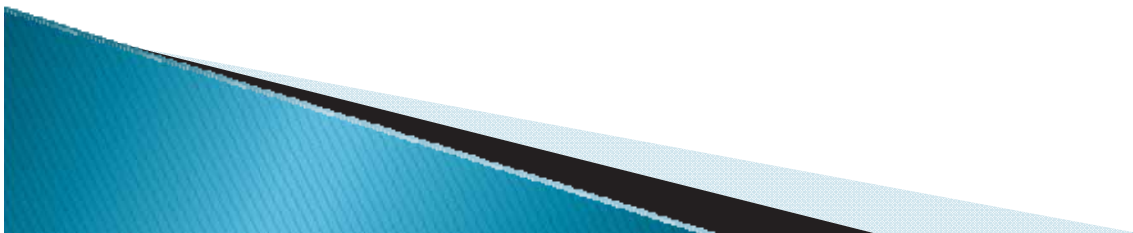
Each deck has its own challenges.



Keep looking for the best vantage point



The weather plays a large roll in the motivation to find a better way to measure these

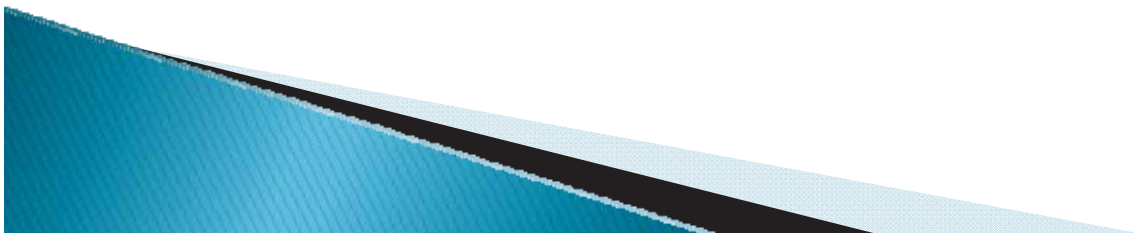


New Ideas spring from tried methods.

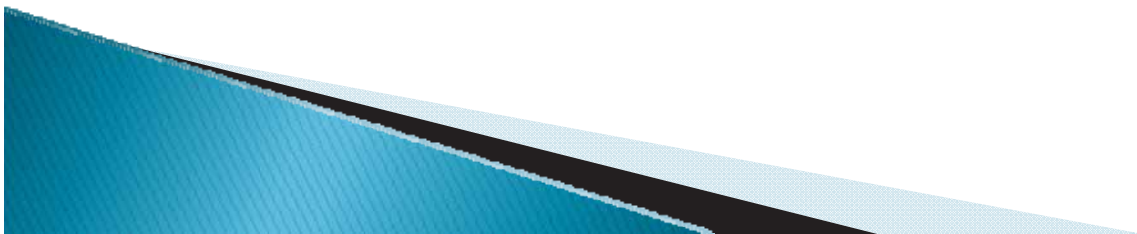




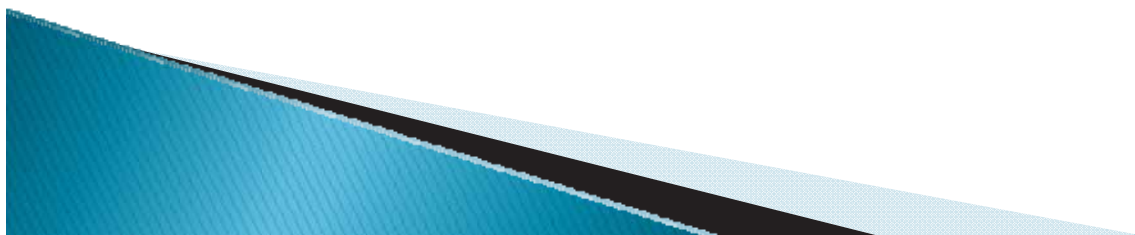
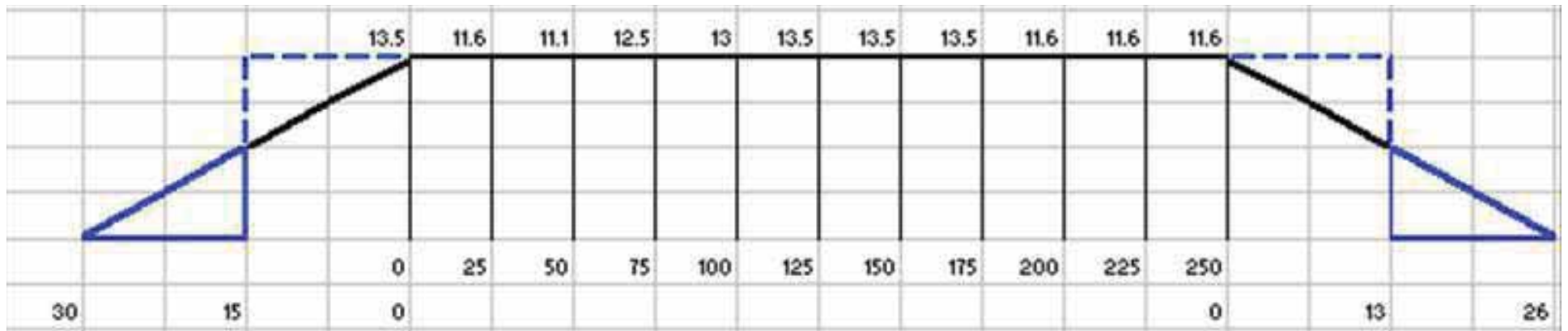
The
accessibility
of the deck
creates
some
innovative
approaches



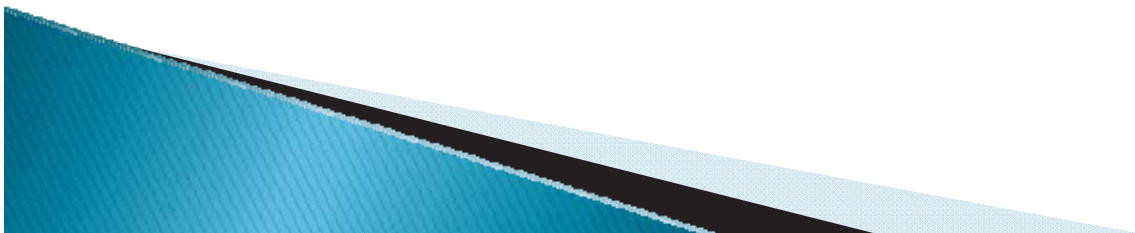
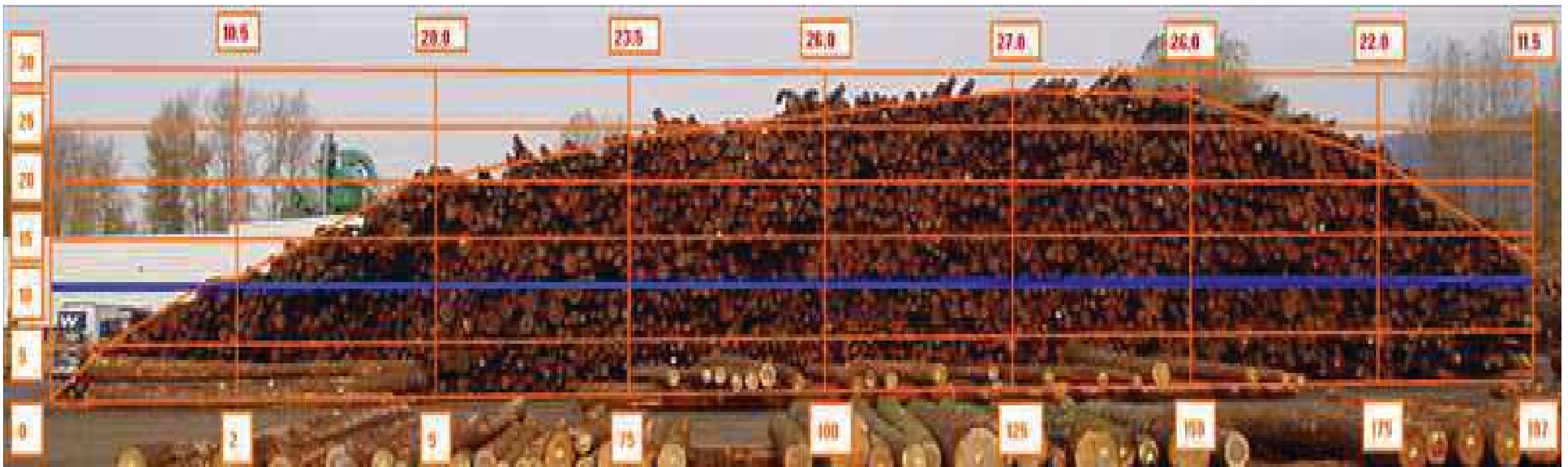
Looking for the Right Method



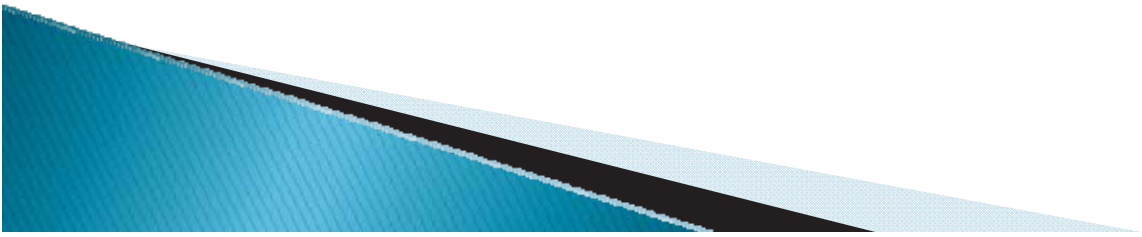
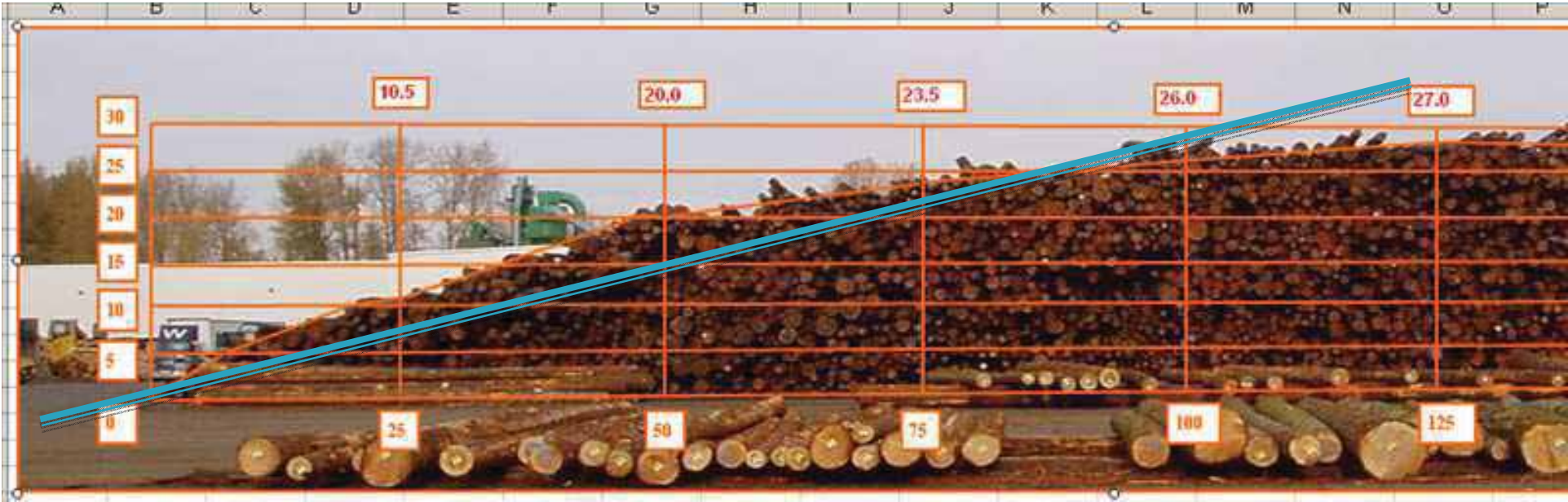
This is an accepted method used to visually fold the triangle ends up in the field then measure at regular intervals to average the top rectangle shape of the deck.



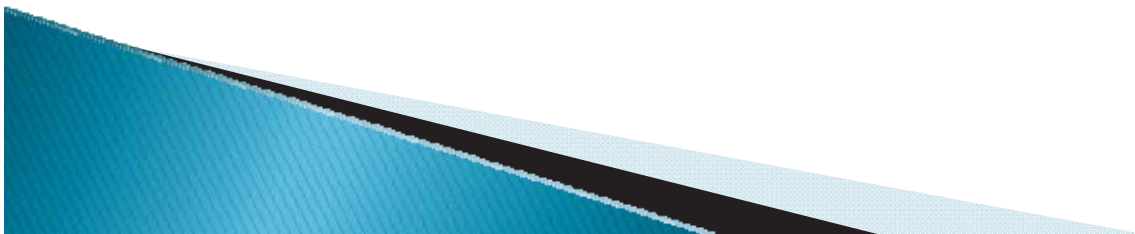
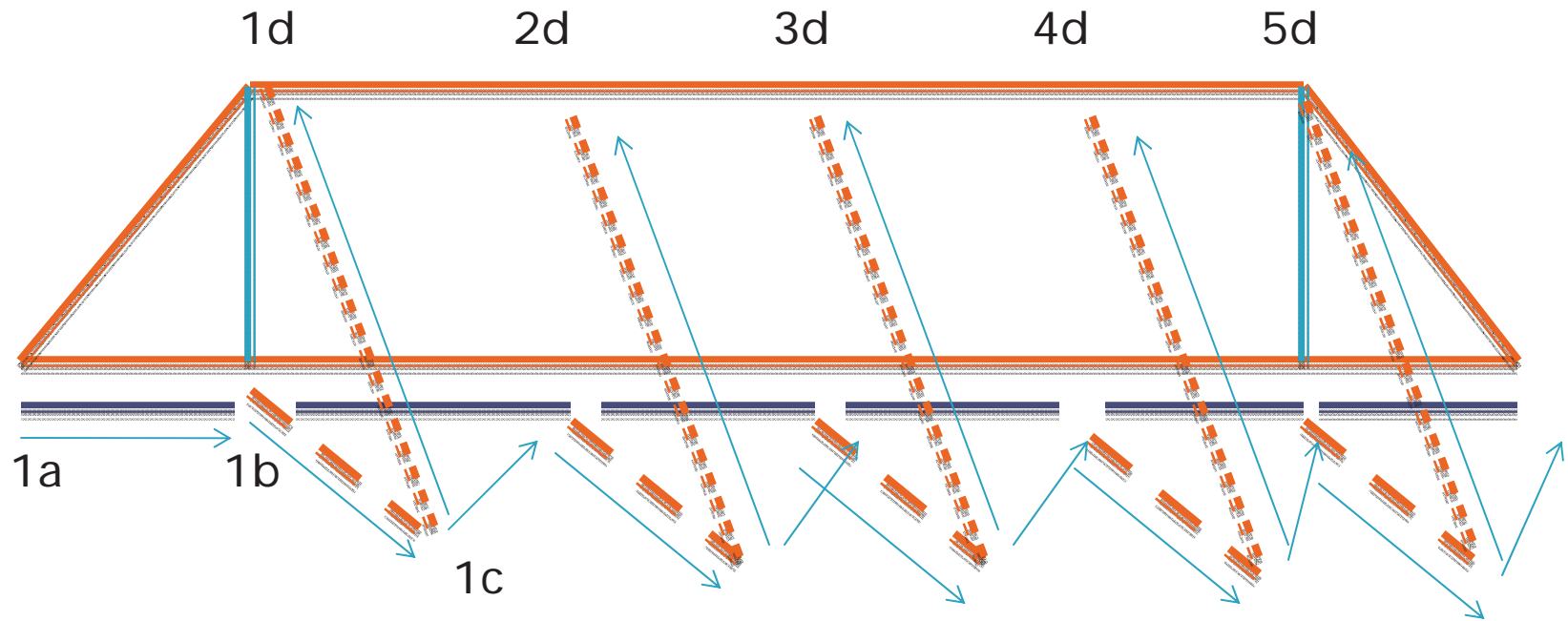
I used a camera and graphs to determine the size of decks by painting physical marks on the decks to line up with the graph.



I broke down the decks into smaller geometric shapes to see how much error there is in visually creating the larger Right Triangle and Rectangle shapes.



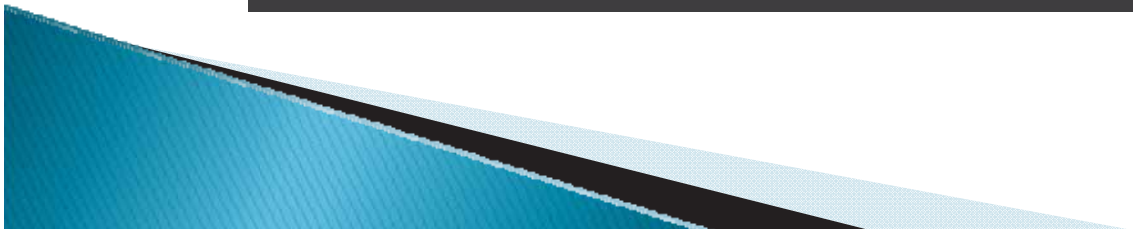
Clinometer procedure



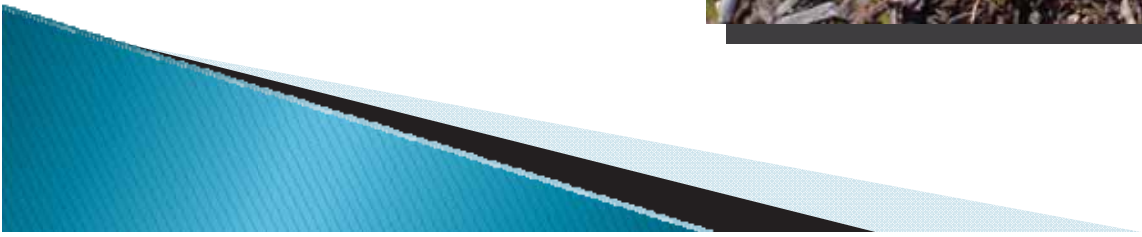
First Clinometer and Rangefinder



Second Clinometer

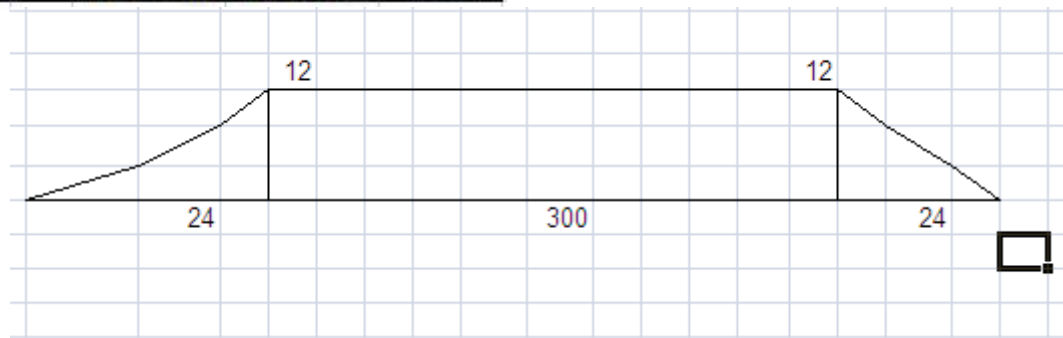


Clinometer and 50' Tape



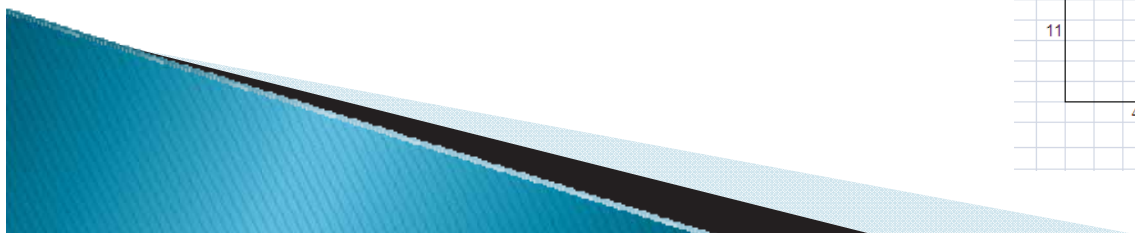
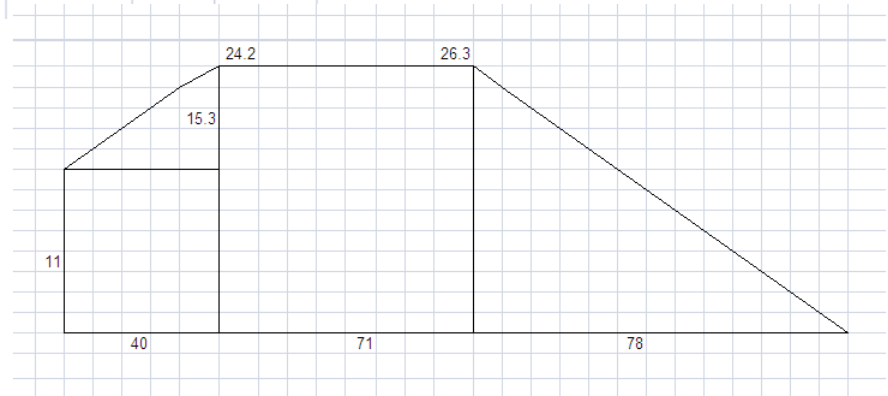
Clinometer Worksheet Method 1

	A	B	C	D	E	F	G
1	Method 1						
2	Deck Measurements		Clinometer Measurements			Height	
3	Deck Parts	ClinDistToDeck	Down -	Up+	Below Eye	Above Eye	
4	Average Height	25	10	17	4.4	7.6	12.1
5		25	5	24	2.2	11.1	13.3
6		25	3	25	1.3	11.7	13.0
7		25	1	29	0.4	13.9	14.3
8		25	6	28	2.6	13.3	15.9
9		25	2	28	0.9	13.3	14.2
10		25	5	20	2.2	9.1	11.3
11		25	6	19	2.6	8.6	11.2
12		25	5	26	2.2	12.2	14.4
13							
14							
15	Average Deck Height						13.3
16	Big Rectangle Length	390					
17	Triangle 1 Length	34	17				
18	Triangle 2 Length	18	9				
19	Total Deck Length		416	<i>Total Deck Square Feet:</i>		<i>5,529.1</i>	



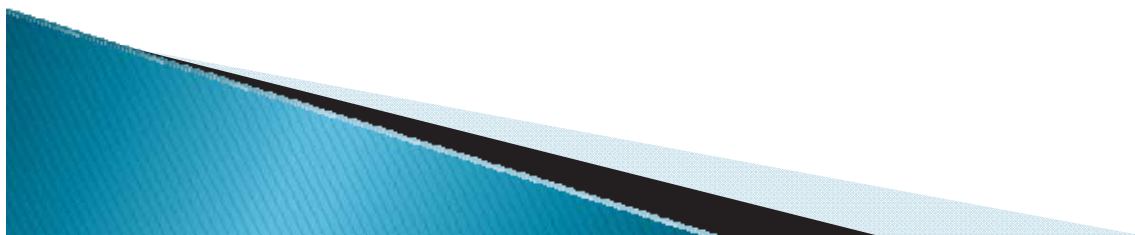
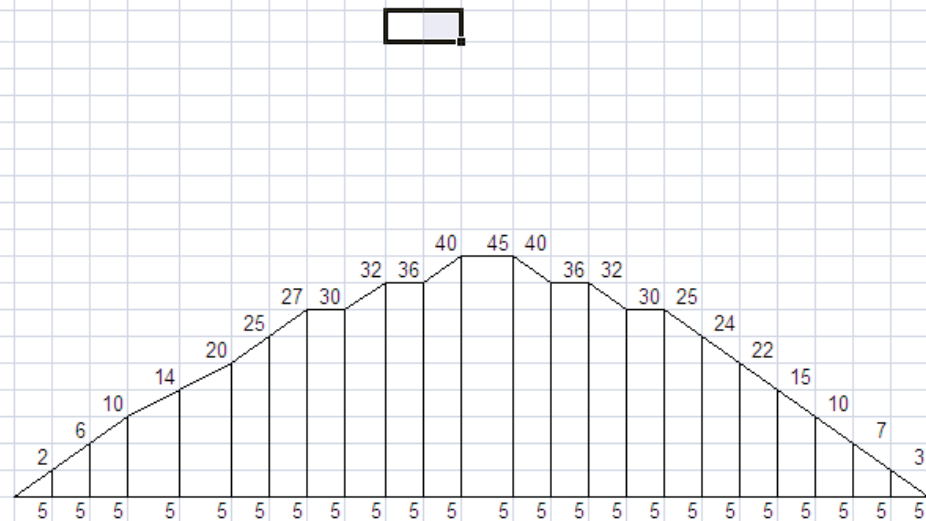
Clinometer Worksheet Method 2

Method 2								
LLOP Deck Measurement	l3	Clinometer Measurements				Height	Lgth	Area
Deck Parts	ClinDistToDeck	Down -	Up+	Below Eye	Above Eye			
Big Triangle Height	25	12	40	5.3	21.0	26.3	78	1025.36
Big Rectangle Height	25	12	40	5.3	21.0	26.3		
	25	12	40	5.3	21.0	26.3		
	25	12	39	5.3	20.2	25.6		
	25	12	40	5.3	21.0	26.3		
					Average	26.1	71	1853.68
Small Triangle (Height -11)	25	12	40	5.3	21.0	15.3	40	305.828
Small Rectangle Height						11.0	40	440
Total SqFt Area								3624.87



Clinometer Worksheet Method 3

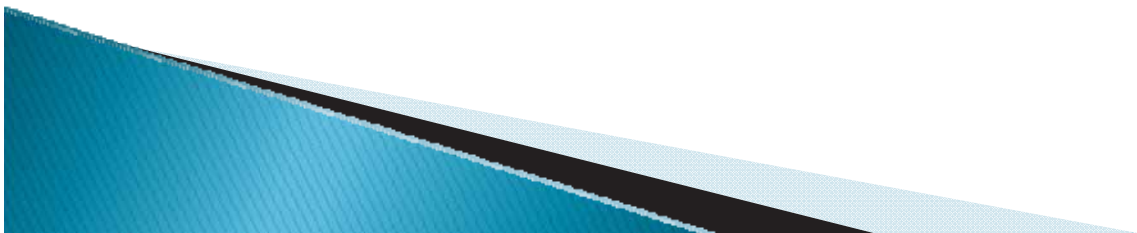
45	Clinometer Measurements				Height	Width	Area
46	Down -	Up+	Below Eye	Above Eye			
47	12	15	5.3	6.7	12.0		0
48	12		5.3	-	5.3		0
49	12		5.3	-	5.3		0
50	12		5.3	-	5.3		0
51	12		5.3	-	5.3		0
52	12		5.3	-	5.3		0
53	12		5.3	-	5.3		0
54	12		5.3	-	5.3		0
55	12		5.3	-	5.3		0
56	12		5.3	-	5.3		0
57	12		5.3	-	5.3		0
58	12		5.3	-	5.3		0
59	12		5.3	-	5.3		0
60	12		5.3	-	5.3		0
61	12		5.3	-	5.3		0
62	12		5.3	-	5.3		0
63	12		5.3	-	5.3		0
64	12		5.3	-	5.3		0
65	12		5.3	-	5.3		0
66	12		5.3	-	5.3		0
67	12		5.3	-	5.3		0
68	12		5.3	-	5.3		0
69							
70							0
71							



Constantly changing



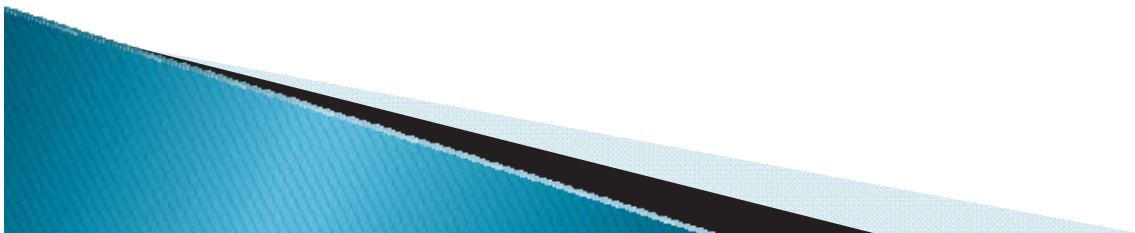
Inacceable



TruePulse360 Rangefinder



TP 360 – Nomad – GPS




The TP 360 appears to be the ultimate device for my project

TruPulse® 360 for Stockpile Volumes

Traditional methods require your crew to hold a prism pole and occupy areas of a large pile of loose material. Some areas make this impossible, which causes lack of detail and poor results. This process can be time-consuming and dangerous.

Arranging for an aerial fly-over is not only expensive, but you'll usually wait days, even weeks for the results. Finally, there's a quick, safe and easy solution to measuring stockpile volumes! Take the TruPulse 360, in conjunction with LTI's MapSmart™ with volume software, and you'll be able to accurately measure the volume of aggregates, wood chips or anything else. A single operator can quickly gather and record data from a safe distance, with results possible in less than an hour with the TruPulse 360. Having the combination of a hand-held compass/laser and a compact data collector, it doesn't get any easier or more portable than this. With zero setup time, you can find a safe location and start collecting field data immediately.




Measurement Solutions:

- Distance (Horizontal, Vertical, Slope)
- Inclination (Degrees and Percent Slope)
- Height (Flexible three-shot routine)
- Azimuth (Compass bearing for single-shot positioning)
- Missing Line (Distance, Inclination and Azimuth between any two remote points)

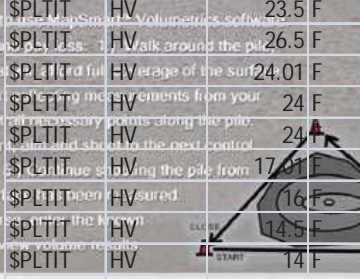
Basic Specifications:

- Distance Accuracy: ±1 ft (30 cm) typical, ±1 yd (1 m) max
- Inclination Accuracy: ±0.25 degrees
- Azimuth Accuracy: ±1 degree typical
- Data Communication: Serial, via wired RS232 (standard) or wireless Bluetooth® (optional)
- Max Range: ± 3,280ft (1,000 m) typical




Measure a stockpile with LTI's easy to use MapSmart™ with Volumetric software. Here's how you can measure more accurately:

- 1.) Use a laser to temporarily mark control points that define the perimeter of the surface.
- 2.) Open a new MapSmart file to start a new data collection.
- 3.) Aim and shoot at the temporary points along the pile.
- 4.) After collecting your last data point, aim and shoot to the next control point and then occupy that location.
- 5.) Continue shooting the pile from each control point until the entire surface has been measured.
- 6.) Once you have closed your traverse, press the CALC key to view the volume results.



\$PLTIT	HV	22.5 F	5 D	-14.8 D	19 F*43
\$PLTIT	HV	23.5 F	1 D	-14.8 D	19 F*45
\$PLTIT	HV	26.5 F	6 D	-14.7 D	18.5 F*4B
\$PLTIT	HV	24.01 F	2 D	-15.4 D	12.01 F*7B
\$PLTIT	HV	24 F	8 D	-9.5 D	23 F*43
\$PLTIT	HV	24 F	7 D	-7.7 D	23.5 F*4D
\$PLTIT	HV	24 F	5 D	-2.3 D	26.5 F*49
\$PLTIT	HV	24 F	1 D	-4.4 D	24.01 F*4F
\$PLTIT	HV	24 F	8 D	-4.9 D	24 F*49
\$PLTIT	HV	24 F	4 D	-4.8 D	24.5 F*4E
\$PLTIT	HV	17.01 F	13 D	-4.5 D	17.01 F*7F
\$PLTIT	HV	16 F	14 D	-3.8 D	16 F*76
\$PLTIT	HV	14.5 F	14 D	-4.6 D	14.5 F*74
\$PLTIT	HV	14 F	15 D	-5.7 D	14 F*7D
\$PLTIT	HV	15.01 F	15 D	-5.9 D	15.01 F*70
\$PLTIT	HV	24.01 F	17 D	-4.6 D	24.01 F*7E
\$PLTIT	HV	18.5 F	18 D	-3.8 D	18.5 F*7C
\$PLTIT	HV	28.5 F	349 D	-0.7 D	28.5 F*4A
\$PLTIT	HV	19.01 F	351 D	-3.8 D	19.01 F*40
\$PLTIT	HV	18.5 F	352 D	-3.9 D	18.5 F*42
\$PLTIT	HV	18.5 F	351 D	-4.1 D	18.5 F*4C
\$PLTIT	HV	18.01 F	349 D	-4.3 D	18.01 F*42
\$PLTIT	HV	16 F	347 D	-5.2 D	16 F*49
\$PLTIT	HV	5.5 F	9 D	-4 D	5.5 F*4E



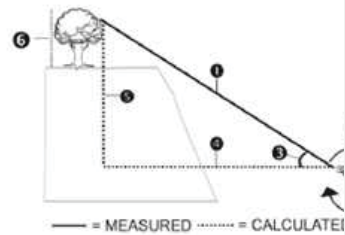
Authorized Dealer

www.lasertech.com/360
info@lasertech.com
877-OWN-A-LTI

Understand the devices

Section 5 - Measurement Mode:

When you power ON the TruPulse, the last used M to display the previous or next Measurement measurements that the TruPulse can take. For info see page 37.



Fig

Distance Measurements

The basic steps for taking any distance measurement:

1. Look through the eyepiece and use the crosshair.
2. Press-and-hold . The LASER status indicator will remain active for a maximum of 10 seconds.
 - o If the target is not acquired in the 10-second interval, the LASER status indicator will turn off.
3. Once the measurement is displayed, release indicating the measurement was downloaded. until you press any button or the unit powers off.

Firmware Version: A=3.05, b=3.35 [M]

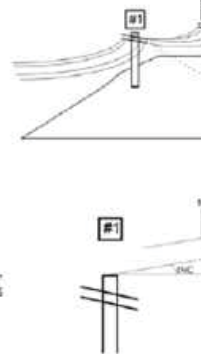
During the Height Routine:

- Press to re-shoot the previous point.
- Press to exit the Height Routine.
- The laser is not active while measuring the ANGI and ANI. As long as you hold , the inclination reading is displayed. When your aiming point changes, the measured inclination is displayed. When you release , the inclination reading is reset to 0.0.
- When the height result is displayed, just press to start the next routine.

Missing Line Routine

The Missing Line Routine calculates distances and angles to describe the relationship between two points in three-dimensional space (connecting vector). This routine is ideal for span lengths, remote slope determinations, and changes in elevation from one location.

The simple routine prompts you to take two shots to targets: "Shot 1" and "Shot 2". The TruPulse uses the results to calculate five variables between the two points: slope distance, inclination, azimuth, horizontal distance, and vertical distance as shown in Figure #23.



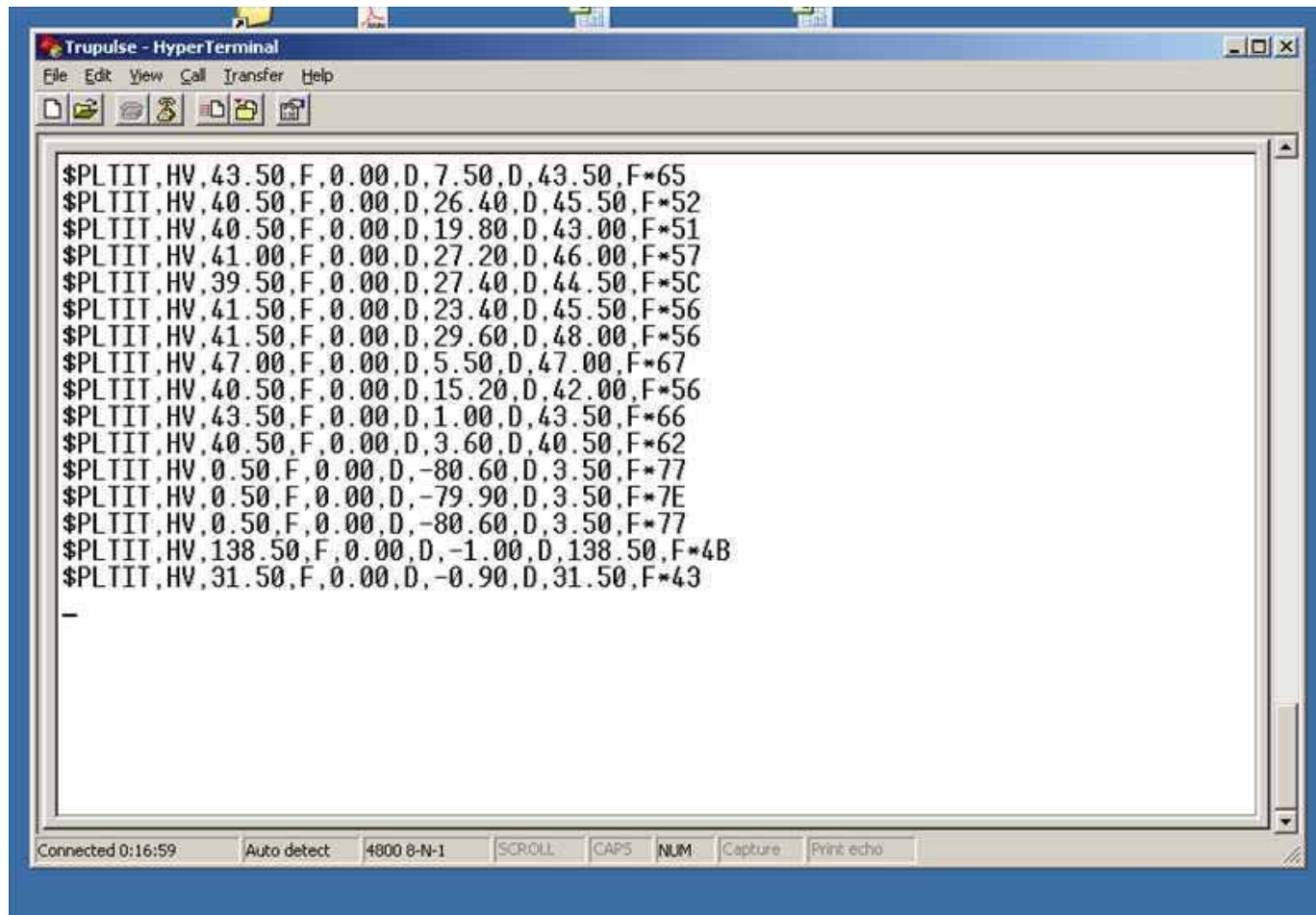
Fig

- o HD: Horizontal Distance: Horizontal component of the slope distance.
- o VD: Vertical Distance: Change in elevation between the two points.
- o SD: Slope Distance: Length of the missing line.
- o INC: Inclination between point #1 and point #2.
- o AZ: Relative Azimuth: Direction from the point #1 to point #2.

Firmware Version: A=3.05, b=3.35 [Manual DRAFT E: Upd

	A	B	C	D	E	F	G	H	I	J	K	L
1	SPLTIT	HV	18.5	F	14.5	D	-14.8	D	19	F	*43	
2	SPLTIT	HV	18	F	13.1	D	-14.8	D	19	F	*45	
3	SPLTIT	HV	18	F	11.6	D	-14.7	D	18.5	F	*48	
4	SPLTIT	HV	12.01	F	3.2	D	-15.4	D	12.01	F	*78	
5	SPLTIT	HV	22.5	F	9.8	D	-9.5	D	23	F	*43	
6	SPLTIT	HV	23.5	F	7	D	-7.7	D	23.5	F	*40	
7	SPLTIT	HV	26.5	F	7.5	D	-2.3	D	26.5	F	*49	
8	SPLTIT	HV	24.01	F	4.1	D	-4.4	D	24.01	F	*4F	
9	SPLTIT	HV	24	F	6.8	D	-4.9	D	24	F	*49	
10	SPLTIT	HV	24	F	9.4	D	-4.8	D	24.5	F	*4E	
11	SPLTIT	HV	17.01	F	13.6	D	-4.5	D	17.01	F	*7F	
12	SPLTIT	HV	16	F	14.2	D	-3.8	D	16	F	*76	
13	SPLTIT	HV	14.5	F	14.9	D	-4.6	D	14.5	F	*74	
14	SPLTIT	HV	14	F	15.1	D	-5.7	D	14	F	*7D	
15	SPLTIT	HV	15.01	F	15.2	D	-5.9	D	15.01	F	*70	
16	SPLTIT	HV	24.01	F	17	D	-4.6	D	24.01	F	*7E	
17	SPLTIT	HV	18.5	F	18.4	D	-3.8	D	18.5	F	*7C	
18	SPLTIT	HV	28.5	F	349.9	D	-0.7	D	28.5	F	*4A	
19	SPLTIT	HV	19.01	F	351.6	D	-3.8	D	19.01	F	*40	
20	SPLTIT	HV	18.5	F	352.6	D	-3.9	D	18.5	F	*42	
21	SPLTIT	HV	18.5	F	351.4	D	-4.1	D	18.5	F	*4C	
22	SPLTIT	HV	18.01	F	349.1	D	-4.3	D	18.01	F	*42	
23	SPLTIT	HV	16	F	347.4	D	-5.2	D	16	F	*49	
24	SPLTIT	HV	5.5	F	9.9	D	-4	D	5.5	F	*4E	
25	SPLTIT	HV	5.5	F	9.1	D	-4.2	D	5.5	F	*44	
26	SPLTIT	HV	5	F	6.9	D	-5.4	D	5	F	*44	
27	SPLTIT	HV	5	F	4	D	-5.4	D	5	F	*4F	
28	SPLTIT	HV	5	F	2.2	D	-4.9	D	5	F	*47	
29	SPLTIT	HV	5	F	1.1	D	-4.9	D	5	F	*47	
30	SPLTIT	HV	23.01	F	5.1	D	-4.9	D	23.01	F	*43	
31	SPLTIT	HV	23.5	F	356.6	D	-2.6	D	23.5	F	*48	
32	SPLTIT	HV	23	F	352.5	D	-2.9	D	23	F	*40	

TP360 Data Collection



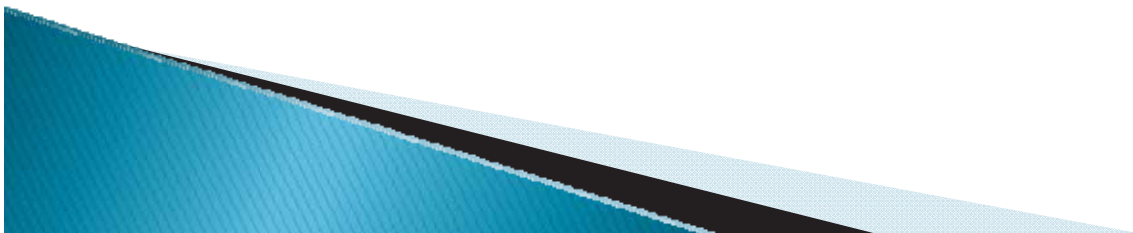
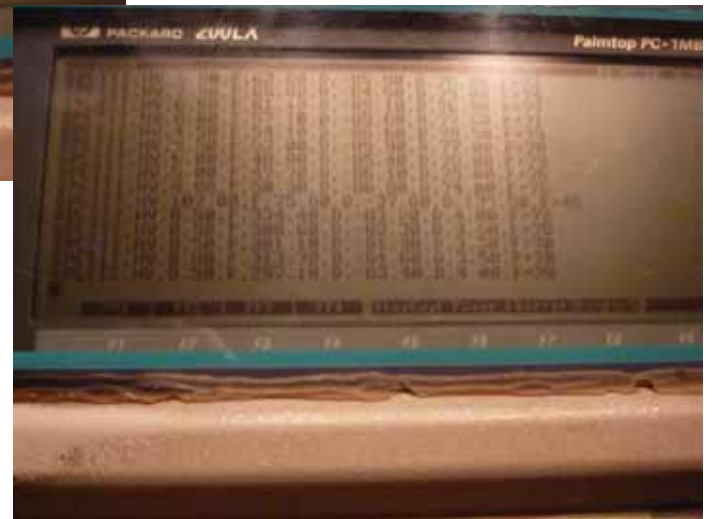
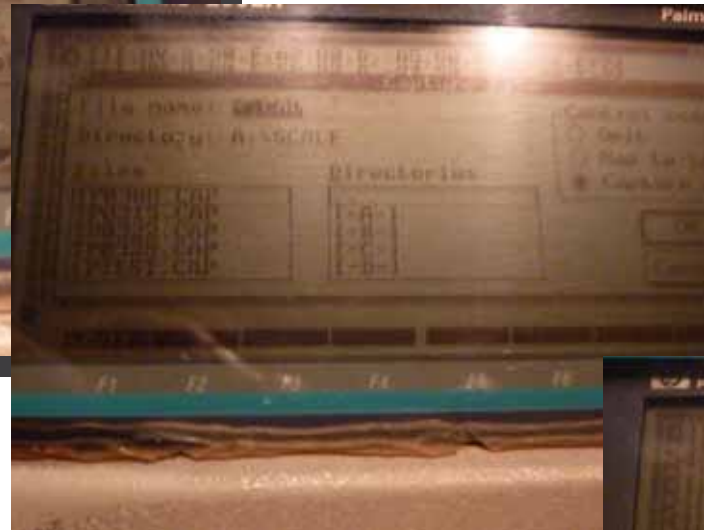
```
$PLTIT,HV,43.50,F,0.00,D,7.50,D,43.50,F*65
$PLTIT,HV,40.50,F,0.00,D,26.40,D,45.50,F*52
$PLTIT,HV,40.50,F,0.00,D,19.80,D,43.00,F*51
$PLTIT,HV,41.00,F,0.00,D,27.20,D,46.00,F*57
$PLTIT,HV,39.50,F,0.00,D,27.40,D,44.50,F*5C
$PLTIT,HV,41.50,F,0.00,D,23.40,D,45.50,F*56
$PLTIT,HV,41.50,F,0.00,D,29.60,D,48.00,F*56
$PLTIT,HV,47.00,F,0.00,D,5.50,D,47.00,F*67
$PLTIT,HV,40.50,F,0.00,D,15.20,D,42.00,F*56
$PLTIT,HV,43.50,F,0.00,D,1.00,D,43.50,F*66
$PLTIT,HV,40.50,F,0.00,D,3.60,D,40.50,F*62
$PLTIT,HV,0.50,F,0.00,D,-80.60,D,3.50,F*77
$PLTIT,HV,0.50,F,0.00,D,-79.90,D,3.50,F*7E
$PLTIT,HV,0.50,F,0.00,D,-80.60,D,3.50,F*77
$PLTIT,HV,138.50,F,0.00,D,-1.00,D,138.50,F*4B
$PLTIT,HV,31.50,F,0.00,D,-0.90,D,31.50,F*43
-
```

Connected 0:16:59 Auto detect 4800 8-N-1 SCROLL CAPS NUM Capture Print echo

Deck Measurement Tools



HP200 Data Comm



HP200 Data Collection

119.60,D,-81.10,D,4.00,F*7C

24. TRANSFILE WIN 200

186 File Disk Tree View HP Palmtop Options Help

186 [C-] C:\HP200*.* [C-] C:_DATA*.*

File Name	Size	Date	Time
.. <DIR>			
0434 .TXT	8185	02/13/08	20:05
0435 .TXT	8979	02/13/08	19:58
0436 .TXT	9417	02/13/08	19:58
0437 .TXT	9198	02/13/08	19:57
0438 .TXT	9636	02/13/08	19:57
0439 .TXT	6351	02/13/08	19:57
0440 .TXT	1111	02/13/08	20:17
0441 .TXT	6194	02/13/08	20:50
0442 .TXT	1332	02/13/08	20:49
0452 .TXT	7962	03/11/08	09:12
0460 .TXT	6816	03/11/08	09:36
0461 .TXT	6636	03/11/08	09:13
0462 .TXT	8625	03/11/08	09:14
0463 .TXT	5752	03/11/08	09:14
0464 .TXT	7520	03/11/08	09:15
0467 .TXT	5694	03/27/08	12:10

File Name	Size	Date	Time
.. <DIR>		01/01/80	00:00
COMPUSRV.DCF	628	06/01/93	12:56
DOWJONES.DCF	628	06/01/93	12:56
GENIE .DCF	628	06/01/93	12:56
MCI .DCF	628	06/01/93	12:56
TERMDEF .DCF	628	10/20/09	09:13
PHONE .PDB	4096	04/18/94	12:03
NOTES .NDB	20560	02/28/94	10:40
APNAME .LST	67	02/25/94	11:05
APPMGR .DAT	8374	01/01/80	23:12
SETUP *ENV	6366	10/20/09	09:32
APPT .ADB	2155	10/20/09	08:37
APPTBK .ENV	170	10/20/09	08:30
FILER .ENV	165	11/05/07	13:02
TP200910.CAP	1465	10/20/09	09:05
TERM .ENV	82	10/20/09	09:13

135 file(s). 1392462 Bytes 15 file(s). 46640 Bytes

Press F1 for Help. NUM

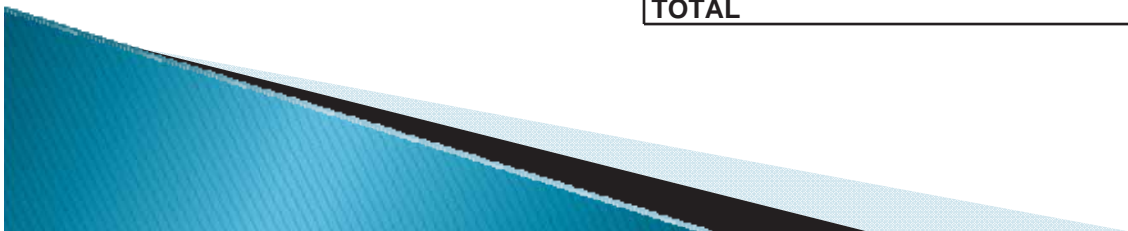
	A	B	C	D	E	F	G	H	I	J	K	L
1	SPLTIT	HV	18.5	F	14.5	D	-14.8	D	19	F*43		
2	SPLTIT	HV	18	F	13.1	D	-14.8	D	19	F*45		
3	SPLTIT	HV	18	F	11.6	D	-14.7	D	18.5	F*48		
4	SPLTIT	HV	12.01	F	3.2	D	-15.4	D	12.01	F*78		
5	SPLTIT	HV	22.5	F	9.8	D	-9.5	D	23	F*43		
6	SPLTIT	HV	23.5	F	7	D	-7.7	D	23.5	F*40		
7	SPLTIT	HV	26.5	F	7.5	D	-2.3	D	26.5	F*49		
8	SPLTIT	HV	24.01	F	4.1	D	-4.4	D	24.01	F*4F		
9	SPLTIT	HV	24	F	6.8	D	-4.9	D	24	F*49		
10	SPLTIT	HV	24	F	9.4	D	-4.8	D	24.5	F*4E		
11	SPLTIT	HV	17.01	F	13.6	D	-4.5	D	17.01	F*7F		
12	SPLTIT	HV	16	F	14.2	D	-3.8	D	16	F*76		
13	SPLTIT	HV	14.5	F	14.9	D	-4.6	D	14.5	F*74		
14	SPLTIT	HV	14	F	15.1	D	-5.7	D	14	F*7D		
15	SPLTIT	HV	15.01	F	15.2	D	-5.9	D	15.01	F*70		
16	SPLTIT	HV	24.01	F	17	D	-4.6	D	24.01	F*7E		
17	SPLTIT	HV	18.5	F	18.4	D	-3.8	D	18.5	F*7C		
18	SPLTIT	HV	28.5	F	349.9	D	-0.7	D	28.5	F*4A		
19	SPLTIT	HV	19.01	F	351.6	D	-3.8	D	19.01	F*40		
20	SPLTIT	HV	18.5	F	352.6	D	-3.9	D	18.5	F*42		
21	SPLTIT	HV	18.5	F	351.4	D	-4.1	D	18.5	F*4C		
22	SPLTIT	HV	18.01	F	349.1	D	-4.3	D	18.01	F*42		
23	SPLTIT	HV	16	F	347.4	D	-5.2	D	16	F*49		
24	SPLTIT	HV	5.5	F	9.9	D	-4	D	5.5	F*4E		
25	SPLTIT	HV	5.5	F	9.1	D	-4.2	D	5.5	F*44		
26	SPLTIT	HV	5	F	6.9	D	-5.4	D	5	F*44		
27	SPLTIT	HV	5	F	4	D	-5.4	D	5	F*4F		
28	SPLTIT	HV	5	F	2.2	D	-4.9	D	5	F*47		
29	SPLTIT	HV	5	F	1.1	D	-4.9	D	5	F*47		
30	SPLTIT	HV	23.01	F	5.1	D	-4.9	D	23.01	F*43		
31	SPLTIT	HV	23.5	F	356.6	D	-2.6	D	23.5	F*48		
32	SPLTIT	HV	23	F	352.5	D	-2.9	D	23	F*40		



TP360 Worksheet for Method 1

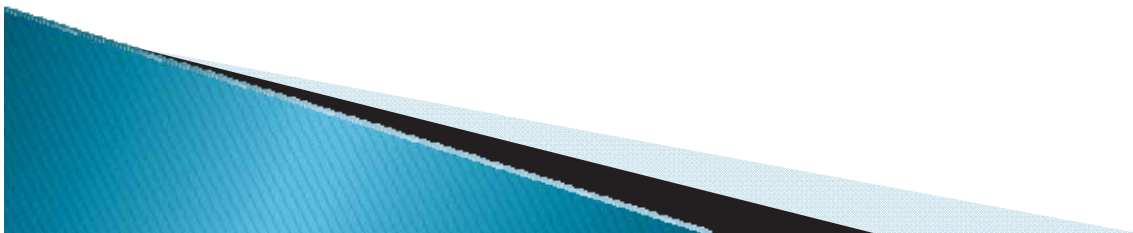
S5				
LGTH	DOWN	UP	HEIGHT	SqFt
-	3.5	(3.5)	-	
14.0	3.5	6.0	9.5	67
8.0	3.5	5.5	9.0	74
23.0	3.5	(3.5)	-	104
TOTAL				244

S7				
LGTH	DOWN	UP	HEIGHT	SqFt
-	5.5	(5.5)	-	
27.0	5.5	4.5	10.0	135
23.4	5.5	5.0	10.5	240
23.4	6.0	3.5	9.5	234
23.4	6.0	4.0	10.0	228
23.4	5.5	6.0	11.5	251
23.4	4.5	5.5	10.0	251
23.4	5.0	5.0	10.0	234
23.4	6.0	7.0	13.0	269
23.4	6.0	7.5	13.5	310
42.0	6.0	(6.0)	-	221
TOTAL				2,372



TP360 Worksheet for Method 2

<i>L2</i>				
LGTH	DOWN	UP	HEIGHT	SqFt
-	5.5	5.5	11.0	
65.0	5.5	20.0	25.5	1,186
24.3	5.5	19.0	24.5	606
24.3	5.5	21.5	27.0	624
24.3	5.5	22.5	28.0	667
24.3	5.5	21.5	27.0	667
24.3	5.5	20.0	25.5	637
24.3	5.5	20.5	26.0	624
24.3	5.5	20.5	26.0	631
24.3	5.5	19.0	24.5	612
27.0	5.5	5.5	11.0	479
TOTAL				6,734

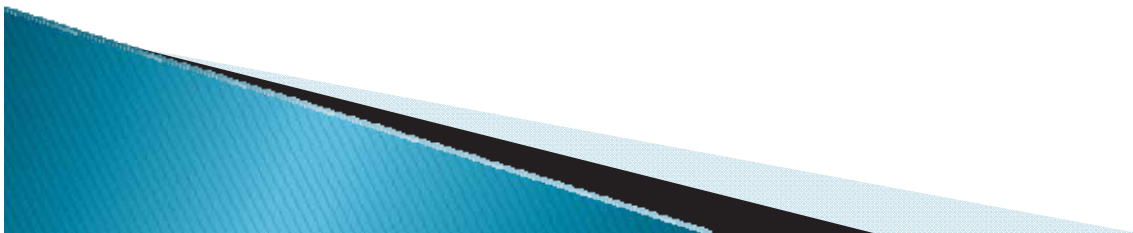


TP360 Worksheet for Method 3

C1S NEW				
LGTH	DOWN	UP	HEIGHT	SqFt
-	4.0	(4.0)	-	
17.0	4.0	9.0	13.0	110.5
18.0	4.0	9.5	13.5	238.5
18.0	4.5	7.0	11.5	225.0
18.0	5.0	8.5	13.5	225.0
18.0	5.0	12.0	17.0	274.5
18.0	4.5	12.5	17.0	306.0
18.0	4.5	10.5	15.0	288.0
24.0	4.5	(4.5)	-	180.0
149.0				
TOTAL				1,847.5

C1S NEW			
73.0	8.0	8.3	66.2
71.5	9.5	8.3	78.6
68.0	13.0	8.3	107.6
69.5	11.5	8.3	95.2
67.0	14.0	8.3	115.9
69.5	11.5	8.3	95.2
70.0	11.0	8.3	91.1
68.0	13.0	8.3	107.6
68.0	13.0	8.3	107.6
65.5	15.5	8.3	128.3
65.5	15.5	8.3	128.3
68.5	12.5	8.3	103.5
66.0	15.0	8.3	124.2
64.0	17.0	8.3	140.7
66.5	14.5	8.3	120.0
65.5	15.5	8.3	128.3
70.0	11.0	8.3	91.1
73.5	7.5	8.3	62.1
COUNT	18.0		
Lgth	149.0		
Int	8.3		
SqFt			1,891.5

**UNDER
CONSTRUCTION**



END

Calkins 4/8/2010