


PEANUT calculations

Three stylized peanuts are arranged in a row, slightly overlapping. They are rendered in a light gray, wireframe style. Each peanut has a pointed top with a zigzag pattern, a curved body, and a pointed bottom. The background is white.

Here to help you save time to tackle other endeavors!

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BY THE WAY HERE'S PEANUT

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DIRECTIONS FOR THE DYNAMETER TENSION SAG PROGRAM

TO ALL USERS,

We would like to thank you for your purchase and use of this program and the other programs in this series. We have set a goal at Peanut Calculations to save the person in charge of these job tasks in the field time. Because we know your time is valuable and if your like me there's not enough of it. With a few values entered from the sag charts, names, job name, company names, date, and temperatures all the calculations and reports are ready to print. A lot of the job, personnel names, company names and P.O. numbers only have to be entered once at the beginning of a project. If you have any questions or ideas about something you would like to see in this program or others please leave us a message at support@peanutcalculations.com or e-mail me at norman@peanutcalculations.com. We are here to support and help you with these programs and your ideas to make your job easier. But please remember these programs have copy rights so please use for your benefit but don't give unauthorized copies to others. If there is anyway we can support or help please contact us.

THANK YOU
NORMAN S. JAYJOHN
PRESIDENT OF PEANUT CALCULATIONS

PLEASE KEEP ONE COPY OF EACH PROGRAM IN A FILE TO MAKE A COPY FOR EACH PROJECT WORKED.

Disclaimer,

Please double check your input data and finished data to make sure program is working correctly. Peanut Calculations excepts no liability for miss information from our programs.

SHEET 1

DATA INPUT & SAG TENSION SHEET

1. With this sheet you enter known data in the yellow highlighted cells and the program does the calculations and report for you. The known data is, who's line, job name, contractor or crew name, P.O. or job number, who the sagger is and the high and low temperatures and sag in feet for the high and low temperatures for the span or spans you have chose to sag in from the engineers sag chart. Enter the line section being sagged, the span being sagged, span length, ruling span length, sag chart number, and finally the ambient temperature at the time of sag. Your sag calculations are complete and your sag report is ready to print at the same time.

figure 1 DATA INPUT & SAG TENSION SHEET WITH SOME DATA ENTERED

WHO'S LINE-----	GEORGIA POWER COMPANY	JOB NAME-----	McGRAW FORD TO CRESTVIEW 500 KV LINE	
DATE-----	10/17/2007			
CONTRACTOR-----	WILSON CONSTRUCTION			
WHO'S SAGGING--	NORMAN JAYJOHN	JOB # or P.O. #-----	P7891	AMBIENT TEMPERATURE-----
LINE SECTION TO BE SAGGED:-----				
	STRUCTURE-----	5	TO STRUCTURE---	7 WEATHER
				SUNNY/CALM
1. SAG SPAN-----	5 to 6	SPAN LENGTH-----	1442.10	HIGH TEMPERATURE USED FROM SAG CHART-----
CONDUCTOR HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART---				LOW TEMPERATURE USED FROM SAG CHART-----
CONDUCTOR HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART---				
ACTUAL NEEDED CONDUCTOR HORIZONTAL TENSION-----		0.00	answer	RULING SPAN LENGTH-----
				1387.60
				SAG CHART NUMBER-----
				3 of 27
SHIELD WIRE HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART--				PROPOSED AMBIENT TEMPERATURE TO
SHIELD WIRE HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART--				ALLOW YOU TO PRINT UP TO A 30 DEGREE
ACTUAL NEEDED SHIELD WIRE HORIZONTAL TENSION-----		0.00	answer	TENSION SPREAD FOR USE IN THE FIELD-----
OPGW HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART-----				
OPGW HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART-----				
ACTUAL NEEDED OPGW HORIZONTAL TENSION-----		0.00	answer	

example is smaller than actual sheet

2. From the engineers sag chart you need enter the tension for the high and low temperature issued on the the chart. As long as the tension follows a linear progression. If it doesn't you will have to reduce the temperature and tension range until you meet the desired conditions. More on that later in these directions.

SAMPLE SAG CHARTS

sample conductor sag chart from project engineer

sag chart 3 of 27
ruling span 1387.6

Structure Number	Span Length Ahead (ft)	Temperature						
		LOW TEMPERATURE			HIGH TEMPERATURE			
		40 F	50 F	60 F	70 F	80 F	90 F	100 F
		Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)
2	1477.5	54.29	55.03	55.76	56.49	57.22	57.94	58.67
3	1333.8	44.23	44.83	45.42	46.02	46.61	47.20	47.79
4	1252.7	39.01	39.54	40.06	40.59	41.11	41.63	42.15
5	1442.1	51.72	52.42	53.11	53.81	54.50	55.19	55.88
6	1146.2	32.65	33.09	33.53	33.97	34.40	34.84	35.28
7	1413.9	49.71	50.39	51.05	51.73	52.39	53.05	53.72
Tension	(lbs)	5504	5430	5359	5290	5223	5158	5095

figure 2---
dead end
tangent
dead end

LOW TEMPERATURE TENSION

HIGH TEMPERATURE TENSION

sample shield wire sag chart from project engineer

sag chart 3 of 27
ruling span 1387.6

Structure Number	Span Length Ahead (ft)	Temperature						
		LOW TEMPERATURE			HIGH TEMPERATURE			
		40 F	50 F	60 F	70 F	80 F	90 F	100 F
		Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)
2	1477.5	42.98	43.58	44.15	44.72	45.29	45.87	46.43
3	1333.8	35.02	35.50	35.97	36.44	36.90	37.37	37.83
4	1252.7	30.89	31.31	31.72	32.14	32.55	32.96	33.36
5	1442.1	40.94	41.51	42.05	42.60	43.14	43.69	44.23
6	1146.2	25.83	26.19	26.54	26.88	27.22	27.57	27.91
7	1413.9	39.33	39.88	40.40	40.93	41.45	41.97	42.49
Tension	(lbs)	1735	1712	1689	1668	1647	1626	1607

figure 3---
dead end
tangent
dead end

LOW TEMPERATURE TENSION

HIGH TEMPERATURE TENSION

SHEET 1

figure 1 DATA INPUT & SAG TENSION SHEET WITH TENSION ENTERED FOR HIGH AND LOW TEMPERATURE
&
HIGH & LOW TEMPERATURE FROM SAG CHART AND PROPOSED AMBIENT TEMPERATURE

WHO'S LINE-----	GEORGIA POWER COMPANY	JOB NAME-----	McGRAW FORD TO CRESTVIEW 500 KV LINE	AMBIENT TEMPERATURE-----		
DATE-----	10/17/2007					
CONTRACTOR-----	WILSON CONSTRUCTION					
WHO'S SAGGING--	NORMAN JAYJOHN	JOB # or P.O. #-----	P7881			
LINE SECTION TO BE SAGGED:-----	STRUCTURE-----	5	TO STRUCTURE---	7	WEATHER	SUNNY/CALM
1. SAG SPAN-----	5 to 6	SPAN LENGTH-----	1442.10	HIGH TEMPERATURE USED FROM SAG CHART-----	100	
CONDUCTOR HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART---			5095.00	LOW TEMPERATURE USED FROM SAG CHART-----	40	
CONDUCTOR HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART---			5504.00	RULING SPAN LENGTH-----	1387.60	
ACTUAL NEEDED CONDUCTOR HORIZONTAL TENSION -----			0.00	answer	SAG CHART NUMBER-----	3 of 27
SHIELD WIRE HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART---			1607.00	PROPOSED AMBIENT TEMPERATURE TO		
SHIELD WIRE HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART---			1735.00	ALLOW YOU TO PRINT UP TO A 30 DEGREE		
ACTUAL NEEDED SHIELD WIRE HORIZONTAL TENSION-----			0.00	answer	TENSION SPREAD FOR USE IN THE FIELD-----	80
OPGW HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART-----						
OPGW HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART-----						
ACTUAL NEEDED OPGW HORIZONTAL TENSION-----			0.00	answer		

examples are smaller than actual sheets

3. Now enter the actual ambient temperature in its proper dialogue box. Then click on any cell and your sag tension is calculated, the printable tension sheet, and your sag report are now ready to print.

AMBIENT TEMPERATURE-----	86
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SHEET 1

DATA INPUT & SAG TENSION SHEET WITH ALL INFORMATION ENTERED

WHO'S LINE-----	GEORGIA POWER COMPANY	JOB NAME-----	McGRAW FORD TO CRESTVIEW 500 KV LINE
DATE-----	10/17/2007		
CONTRACTOR-----	WILSON CONSTRUCTION		
WHO'S SAGGING--	NORMAN JAY JOHN	JOB # or P.O. #-----	P7891
		AMBIENT TEMPERATURE-----	86
LINE SECTION TO BE SAGGED:-----	STRUCTURE-----	5	TO STRUCTURE---
		7	WEATHER
			SUNNY/CALM
1. SAG SPAN-----	5 to 6	SPAN LENGTH-----	1442.10
CONDUCTOR HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART----			5095.00
CONDUCTOR HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART----			5504.00
ACTUAL NEEDED CONDUCTOR HORIZONTAL TENSION-----			5190.43 answer
SHIELD WIRE HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART---			1607.00
SHIELD WIRE HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART---			1735.00
ACTUAL NEEDED SHIELD WIRE HORIZONTAL TENSION-----			1636.87 answer
OPGW HORIZONTAL TENSION FOR THE HIGH TEMPERATURE FROM SAG CHART-----			
OPGW HORIZONTAL TENSION FOR THE LOW TEMPERATURE FROM SAG CHART-----			
ACTUAL NEEDED OPGW HORIZONTAL TENSION-----			0.00 answer
		HIGH TEMPERATURE USED FROM SAG CHART-----	100
		LOW TEMPERATURE USED FROM SAG CHART-----	40
		RULING SPAN LENGTH-----	1387.60
		SAG CHART NUMBER-----	3 of 27
		PROPOSED AMBIENT TEMPERATURE TO ALLOW YOU TO PRINT A 30 DEGREE TENSION SPREAD FOR USE IN THE FIELD-----	80

examples are smaller than actual sheets

There is no need to print this page. All the figures you should need from this program are on the printable tension or sag report sheet.

If the engineer has you adding or subtracting sag corrections you need to add or subtract from the sag in feet from your sag chart before you enter them in the DATA INPUT & SAG TENSION sheet.

A. YOU HAVE TO CLICK OUTSIDE THE LAST CELL DATA WAS ENTERED IN FOR IT TO TAKE AFFECT AND WORK.

B. You have to stay within the sag charts temperature range or your answers will zero their selves as a safety factor. This forces you the user to stay within the engineers issued charts and alleviates any errors in what is wanted by the engineer. Try it by using values used here, 100 for high and 40 for low then enter 39 degrees or 101 degrees in the ambient temperature and all sag values turn to zero. This program will work on any temperature range. What ever temperatures in Fahrenheit the issued sag chart is using.

INFORMATION ON LINEAR PROGRESSION OF SAG WE DISCUSSED ABOVE

In example 1 below sag in feet follows a linear progression for each ten degrees difference in temperature or in simple terms stays the same. So the difference in sag in feet for each ten degrees is the same but the tension difference in pounds is different for each ten degrees. To achieve the exact tension you will be able to calculate sag for just ten degrees. But as you will see in examples 2 through 6 the amount of difference will not put you outside your given tolerance on most projects. To make sure there is not a problem I would talk with the project engineer. That way you will know if you can use the entire chart temperature range or if like in this case a ten degree difference. Different sag charts could also give you different temperature ranges to work with. Some charts use twenty degrees, or five degree increments. Its all up to the way the engineer set up the sag program.

from figure 1

Structure Number	Span Length Ahead (ft)	Temperature						
		40 F	50 F	60 F	70 F	80 F	90 F	100 F
		Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)	Sag in (ft)
5	1442.1	51.72	52.42	53.11	53.81	54.50	55.19	55.88
Tension	(lbs)	5504	5430	5359	5290	5223	5158	5095

example 1

total chart range

TEMPERATURE	TENSION	Sag in (ft)
40	5504	51.72
100	5095	55.88
DIFFERENCE PER DEGREE F		6.8166
		0.0693

example 2

10 degree range

TEMPERATURE	TENSION	Sag in (ft)
80	5223	54.50
90	5158	55.19
DIFFERENCE PER DEGREE F IN LBS		6.5000
		0.0693

example 3

10 degree range

TEMPERATURE	TENSION	Sag in (ft)
60	5359	53.11
70	5290	53.81
DIFFERENCE PER DEGREE F IN LBS		6.9000
		53.81

example 4

10 degree range

TEMPERATURE	TENSION	Sag in (ft)
50	5430	52.42
60	5359	53.11
DIFFERENCE PER DEGREE F IN LBS		7.1000
		0.0693

example 5

10 degree range

TEMPERATURE	TENSION	Sag in (ft)
40	5504	51.72
50	5430	52.42
DIFFERENCE PER DEGREE F IN LBS		7.4000
		52.42

example 6

SHEET 2

PRINTABLE TENSION SHEET

1. The Printable Tension Sheet calculated when you entered the proposed ambient temperature and the other information on the Data Input & Sag Tension sheet. This sheet will give you tension for fifteen degrees above and fifteen degrees below your proposed ambient temperature in one degree increments.

PRINTABLE TENSION SHEET

TENSION FROM PROPOSED AMBIENT TEMPERATURE RESULTING IN 30 DEGREES OF TENSION SPREAD

SAG SECTION	TEMPERATURE DEGREE'S F	CONDUCTOR TENSION	SHIELD WIRE TENSION	OPGW FIBER TENSION
5 TO 7	65	5333.58	1681.67	0.00
	66	5326.77	1679.53	0.00
SAG SPAN	67	5319.95	1677.40	0.00
5 to 6	68	5313.13	1675.27	0.00
	69	5306.32	1673.13	0.00
RULING SPAN LENGTH 1387.60	70	5299.50	1671.00	0.00
	71	5292.68	1668.87	0.00
SAG CHART NUMBER 3 of 27	72	5285.87	1666.73	0.00
	73	5279.05	1664.60	0.00
	74	5272.23	1662.47	0.00
SPAN LENGTH 1442.10	75	5265.42	1660.33	0.00
	76	5258.60	1658.20	0.00
	77	5251.78	1656.07	0.00
	78	5244.97	1653.93	0.00
	79	5238.15	1651.80	0.00
PROPOSED AMBIENT TEMPERATURE	80	5231.33	1649.67	0.00
	81	5224.52	1647.53	0.00
	82	5217.70	1645.40	0.00
	83	5210.88	1643.27	0.00
	84	5204.07	1641.13	0.00
	85	5197.25	1639.00	0.00
	86	5190.43	1636.87	0.00
	87	5183.62	1634.73	0.00
	88	5176.80	1632.60	0.00
	89	5169.98	1630.47	0.00
	90	5163.17	1628.33	0.00
	91	5156.35	1626.20	0.00
	92	5149.53	1624.07	0.00
	93	5142.72	1621.93	0.00
	94	5135.90	1619.80	0.00
	95	5129.08	1617.67	0.00

examples are smaller than actual sheets

SHEET 2

PRINTABLE TENSION SHEET WITH TO HIGH OF A PROPOSED AMBIENT TEMPERATURE

1, You must stay at least fifteen degrees below the high temperature entered from the sag chart and fifteen degrees above the low temperature entered from the sag chart in the Data Input & Sag Tension sheet or any temperature above or below these temperatures will be zero on this sheet. Look at the examples below. This forces you to stay within values given to you on your sag charts.

TENSION FROM PROPOSED AMBIENT TEMPERATURE RESULTING IN 30 DEGREES OF TENSION SPREAD				
SAG SECTION	TEMPERATURE DEGREE'S F	CONDUCTOR TENSION	SHIELD WIRE TENSION	OPGW FIBER TENSION
5 TO 7	75	5265.42	1660.33	0.00
	76	5258.60	1658.20	0.00
SAG SPAN 5 to 6	77	5251.78	1656.07	0.00
	78	5244.97	1653.93	0.00
RULING SPAN LENGTH 1387.60	79	5238.15	1651.80	0.00
	80	5231.33	1649.67	0.00
	81	5224.52	1647.53	0.00
SAG CHART NUMBER 3 of 27	82	5217.70	1645.40	0.00
	83	5210.88	1643.27	0.00
	84	5204.07	1641.13	0.00
SPAN LENGTH 1442.10	85	5197.25	1639.00	0.00
	86	5190.43	1636.87	0.00
	87	5183.62	1634.73	0.00
	88	5176.80	1632.60	0.00
	89	5169.98	1630.47	0.00
PROPOSED AMBIENT TEMPERATURE	90	5163.17	1628.33	0.00
	91	5156.35	1626.20	0.00
	92	5149.53	1624.07	0.00
	93	5142.72	1621.93	0.00
	94	5135.90	1619.80	0.00
	95	5129.08	1617.67	0.00
	96	5122.27	1615.53	0.00
	97	5115.45	1613.40	0.00
	98	5108.63	1611.27	0.00
	99	5101.82	1609.13	0.00
	100	5095.00	1607.00	0.00
	101	0.00	0.00	0.00
	102	0.00	0.00	0.00
	103	0.00	0.00	0.00
	104	0.00	0.00	0.00
	105	0.00	0.00	0.00

notice tension is zero above 100 degrees in the example above

SHEET 2

PRINTABLE TENSION SHEET WITH TO LOW OF A PROPOSED AMBIENT TEMPERATURE

TENSION FROM PROPOSED AMBIENT TEMPERATURE RESULTING IN 30 DEGREES OF TENSION SPREAD				
SAG SECTION	TEMPERATURE DEGREE'S F	CONDUCTOR TENSION	SHIELD WIRE TENSION	OPGW FIBER TENSION
5 TO 7	30	0.00	0.00	0.00
	31	0.00	0.00	0.00
SAG SPAN	32	0.00	0.00	0.00
5 to 6	33	0.00	0.00	0.00
	34	0.00	0.00	0.00
RULING SPAN LENGTH	35	0.00	0.00	0.00
1387.60	36	0.00	0.00	0.00
	37	0.00	0.00	0.00
SAG CHART NUMBER	38	0.00	0.00	0.00
3 of 27	39	0.00	0.00	0.00
	40	5504.00	1735.00	0.00
SPAN LENGTH	41	5497.18	1732.87	0.00
1442.10	42	5490.37	1730.73	0.00
	43	5483.55	1728.60	0.00
	44	5476.73	1726.47	0.00
PROPOSED AMBIENT TEMPERATURE	45	5469.92	1724.33	0.00
	46	5463.10	1722.20	0.00
	47	5456.28	1720.07	0.00
	48	5449.47	1717.93	0.00
	49	5442.65	1715.80	0.00
	50	5435.83	1713.67	0.00
	51	5429.02	1711.53	0.00
	52	5422.20	1709.40	0.00
	53	5415.38	1707.27	0.00
	54	5408.57	1705.13	0.00
	55	5401.75	1703.00	0.00
	56	5394.93	1700.87	0.00
	57	5388.12	1698.73	0.00
	58	5381.30	1696.60	0.00
	59	5374.48	1694.47	0.00
	60	5367.67	1692.33	0.00

notice tension is zero below 40 degrees in the example above

SHEET 3

SAG REPORT SHEET

1. After the data input, sag & tension sheet is complete and answered all you have to do is click on the SAG REPORT tab at the bottom of this program and click print. Your sag data, and numbers for your personnel use and other information are all on this sheet. This same sheet can be signed and turned in and a copy can be kept for your records if you would like. Any information that is zero on the DATA INPUT, SAG & TENSION sheet will not show up on the SAG REPORT sheet. Including, sagger, sag span, span length, and all the rest of the information for that sag location. Just like there is no OPGW Fiber or sag information on the example sag chart below.

Example SAG REPORT: This example is smaller than the actual sag report that you will print.

GEORGIA POWER COMPANY McGRAW FORD TO CRESTVIEW 500 KV LINE CONTRACTOR: WILSON CONSTRUCTION
RULING SPAN LENGTH : 1387.60 SAG CHART #: 3 of 27 JOB # OR P.O. P7891

CONDUCTOR SAG REPORT

<u>DATE:</u>	<u>SAG SECTION</u>	<u>SAGGER</u>	<u>SPAN SAGGED</u>	<u>SPAN LENGTH</u>	<u>TEMPERATURE</u>	<u>HORIZONTAL TENSION</u>	<u>WEATHER</u>
10/17/2007	5 TO 7	NORMAN JAYJOHN	5 to 6	1442.1	86	5190.43	SUNNY/CALM

SHIELD WIRE SAG REPORT

<u>DATE:</u>	<u>SAG SECTION</u>	<u>SAGGER</u>	<u>SPAN SAGGED</u>	<u>SPAN LENGTH</u>	<u>TEMPERATURE</u>	<u>HORIZONTAL TENSION</u>	<u>WEATHER</u>
10/17/2007	5 TO 7	NORMAN JAYJOHN	5 to 6	1442.1	86	1636.87	SUNNY/CALM

OPGW FIBER OPTIC WIRE SAG REPORT

<u>DATE:</u>	<u>SAG SECTION</u>	<u>SAGGER</u>	<u>SPAN SAGGED</u>	<u>SPAN LENGTH</u>	<u>TEMPERATURE</u>	<u>HORIZONTAL TENSION</u>	<u>WEATHER</u>
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FOREMAN: _____

REPRESENTATIVE: _____

examples are smaller than actual sheets

Directions for a complete Sag Report workbook

1. All you have to do is make a new Microsoft excel workbook file and name it after the project, job number or P.O. number or anything you would like. Next copy and paste a copy of the Sag Report sheet from this program each time you finish a sag set up in this program to this new excel file. Please do not use copies of this file to send data. This will violate your user agreement with Peanut Calculations.

Please remember we are here to support you, and keep checking our web site for updates and new programs. Check www.peanutcalculations.com support@peanutcalculations.com or norman@peanutcalculations.com any questions or problems you have will be answered.