## **Tutorial for Soil Modeling for Buried Piping using CAEPIPE**

Ground level for soil in CAEPIPE is the height of the soil surface from the global origin (height could be positive or negative). It is NOT a measure of the depth of the pipe's centerline.

In the figure below, the height of the soil surface is 3 feet above the global origin. Pipe node 10 [model origin] is defined at (0,-5,0). So, the pipe is buried 8' (3' - [-5']) deep into the soil. The pipe centerline is calculated by CAEPIPE from the given data



This tutorial shows different cases of Soil modelling for Buried Piping Analysis.

## Case 1: Piping layout buried under same type of soil



In the Figure shown above, 12" Schedule STD piping is assumed to be buried in same type of soil throughout. To represent the case shown above, you need to define in CAEPIPE, a section card "SC1" and a soil "S1" with its properties and Ground Level as +3'0". After defining the property of soil, tie soil "S1" defined with the section "SC1" for the stress layout defined using Nodes 10 through 50. When done, CAEPIPE will automatically compute the depth of soil above Nodes 10 and 20 as 23'0" [= +3'0" - (-20'0")]. Similarly, for Nodes 30, 40 and 50, the depth of soil will be internally computed as 13'0" [= +3'0" - (-10'0")]. See the model SampleBuriedPiping\_OneSoil.mod for details.

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#	Name	Туре	Density (Ib/ft3)	Strength (psi)	Delta (deg)	Ks	Ground Level (ft'in'')	Include Ins. Thk	Depth of Soi (ft'in'')	
1	C1	Cohesive	150	100			3'0''	Yes		
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#	Name	Nom Dia	Sch OD (inc	Thk h) (inch)	Cor.Al M. (inch) (%)	Tol Ins (Ib	:Dens /ft3)	Ins.TI (inch)	nk Lin.D (Ib/ft:	iens 3)	Lin.Thk (inch)	Soil	
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Eik # 1 2 3 4 5 6	Caepi <u>E</u> dit Node Title = 10 20 30 40 50	ipe : La t <u>V</u> ie Type Buried From Bend Bend	ayout (6) w <u>O</u> pti DX (ft'in'' Piping Sa 200'0'' 150'0'' 150'' 15'0''	- [Samp ons Load DY (ft'in'') DY (ft'in'') mple -20'0'' 10'0''	ds <u>Misc</u> DZ (ft'in'	Win           Win           Matl           C6           C6           C6           C6           C6           C6	dow Sect SC1 SC1 SC1 SC1	Help	Data Anchor				

## Case 2: Piping Layout buried under different type of soils



In the Figure shown above, 12" Schedule STD piping is assumed to be buried under two type of soils "S1" and "S2" with Ground level as +3'0".

To represent this case, you need to define two section cards say "SC1" and "SC2" with their Nominal size as 12" and Schedule as "STD". Following this, define two soils "S1" and "S2" with their required properties and Ground level as +3'0". After defining the soils, tie the soil "S1" with "SC1" and "S2" with "SC2". Then in the layout define the Section as "SC1" for Elements from Node 10 through Node 40 and define the Section as "SC2" for Element between Node 40 and 50. When done, CAEPIPE will automatically compute the depth of soil above Nodes 10 through 50 as explained in Case 1.

See the model SampleBuriedPiping\_TwoSoils.mod for details.

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#	Name	Туре	Density (Ib/ft3)	Strength (psi)	Delta (deg)	Ks	Ground Level (ft'in'')	Include Ins. Thk	Depth of So (ft'in'')	^	
1	S1	Cohesive	150	100			3'0''	No		_	
2	S2	Cohesive	180	120			3'0''	No		~	

-0-	Саер	ipe : P	ipe Secti	ons (2) -	[Sample	eBurie	dPiping	_TwoS	Soils				$\times$
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1	SC1	12"	STD 12	.75 0.375								S1	18
2	SC2	12"	STD 12	.75 0.375								S2	~
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Eile # 1 2 3 4	<ul> <li>Edit</li> <li>Node</li> <li>Title =</li> <li>10</li> <li>20</li> <li>80</li> </ul>	t <u>V</u> ie Type Buried From Bend Bend	w <u>O</u> pti	ons Load	ds <u>M</u> isu DZ (tt'in 50'0''	c <u>W</u> ii )	I Sect	Help	A Data Anch	or			
Eile # 1 2 3 4 5	Edit Node Title = 10 20 80 40	t <u>V</u> ie Type Buried From Bend Bend	w Opti	ons Load	ds <u>M</u> is: DZ (tt'ir	c <u>W</u> in ) Ma C6 C6 C6	I Sect	Help Load R R R	Data Anch	or			
Eile # 1 2 3 4 5 6	E Edit Node Title = 10 20 80 40 50	t <u>V</u> ie Type Buried From Bend	w Opti	ons Load	ds <u>M</u> is:	c <u>W</u> in n'') Mai C6 C6 C6 C6	I Sect SC1 SC1 SC1 SC2	Help Load R R R R R	Anch	or			

Case 3: Depth of soil above pipe centre lines are varying for the stress layout



In the Figure shown above, 12" Schedule STD piping is assumed to be buried under same type of soil with depth of soil above centre line is varying for the stress layout as given above.

To represent this scenario in CAEPIPE follow the steps given below.

- 1. Define three (3) section cards "SC1", "SC2" and "SC3" with same Nominal Size as 12" and Schedule as STD.
- 2. Generate the layout as shown in the attached model "SampleBuriedPiping\_StepSoils.mod".
- From the Coordinate list of CAEPIPE (can be seen through Layout Window > View > List > Coordinate), calculate the Ground Level for Nodes 10 and 15. For this example, Ground Level is 18'0" (= Y Coordinate for Node 10 + Soil Depth = -20'0" + 2'0").
- 4. Follow Step 3 and calculate the Ground Levels above Nodes 20 and 40. For this example, it is -17'0" and -9'0" respectively.
- 5. Define three (3) soils "S1", "S2" and "S3" with Ground Levels as -18'0", 17'0" and -9'0" respectively and associate "S1" with "SC1", "S2" with "SC2" and "S3" with "SC3" as shown in the attached model "SampleBuriedPiping\_StepSoils.mod".
- 6. Save the model and perform the analysis.

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1	<mark>.</mark> S1	C	ohesive	150	100			-	18'0''		No											
2	S2	C	ohesive	150	100			· ·	17'0''		No	_			_							
3	53		ohesive	150	100				9'0''	_	No	_										
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4																~						
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#	Node	X (ft'in'	) Y (ft'in'')	Z (ft'in'')				-										•	_	_	_	
2	10	335'0"	-20'0''	50'0"	-	#	Node	Type	DX (ft'in'	םן(יי	Y (ft'i	n'')	DZ (ft	'in'')	Mati	Sect	Load	Data	^			
3	20A	348'6''	-20'0''	50'0''	-	2	l itle =	Buried	Piping S	ampi	e NO'O''	_	50'0''				1	A				
4	20 20B	350'0"	-18'6''	50'0''	-	2	10	PIOM	135'0"		00		500		6	SC1	в	Anchor				
6	25	350'0"	-14'0''	50'0''	-	4	20	Bend	15'0''						C6	SC2	B					
8	30A 30	350'0"	-10'0''	50'0''	·	5	25			6	'0''				C6	SC2	R					
9	30B	351'6"	-10'0''	50'0''	-	6	30	Bend		4	'0''				C6	SC2	B					
11	40 50	355'0"	-10'0''	50'0"		7	40		5'0''						C6	SC3	В		~			

## Case 4: Sloped line with uniform depth of Soil above Pipe Centre line

In the Figure below, 12" Schedule STD sloped line is assumed to be buried under same type of soil with depth of soil above centre line as 2' throughout the stress layout. Being a sloped line, we need to define a number of soils by changing its ground level to best simulate the field condition. In the example shown below, the stress layout is covered with six ground levels.



To represent the scenario shown above in CAEPIPE follow the steps given below.

- 1. Define six (6) section cards "SC1" through "SC6" with same Nominal Size as 12" and Schedule as STD.
- 2. Create the stress layout by defining DX, DY and DZ of each Node from Node 10 through Node 260.
- 3. From the Coordinate list of CAEPIPE (can be seen through Layout Window > View > List > Coordinate), calculate the Ground Level for Nodes 30, 50, 80, 130, 200 and 260. For example, add 2' to the Y coordinate of Node 30 to find its Ground Level.
- 4. Follow Step 3 and calculate the Ground Levels at Nodes 50, 80, 130, 200 and 260.
- 5. Define six (6) soils "S1" through "S6" corresponding to Nodes 30, 50, 80, 130, 200 and 260 with their Ground Levels entered as computed.
- 6. Associate Soils "S1" through "S6" to "SC1" through "SC6". Save the model and perform the analysis. See the attached model "SampleBuriedPiping\_SlopedSoils.mod" for details.

For complex stress layout that runs on sloped terrain with uniform Depth of soil above pipe centre line, the procedure given above may become laborious at this time.

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#	Name	Туре	Density (Ib/ft3)	Strength (psi)	Delta (deg)	Ks	Ground Level (ft'in'')	Include Ins. Thk	Depth of Soil (ft'in'')	
1	S1	Cohesionless	150		30	0.30	-16.8500	No		
2	S2	Cohesionless	150		30	0.30	-15.7000	No		
3	S3	Cohesionless	150		30	0.30	-13.9500	No		
4	S4	Cohesionless	150		30	0.30	-13'0''	No		
5	S5	Cohesionless	150		30	0.30	-10.1600	No		
6	S6	Cohesionless	150		30	0.30	-9'0''	No		
7										

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#	Name	Nom Dia	Sch	OD (inch)	Thk (inch)	Cor.Al (inch)	M.To (%)	ol Ins (Ib.	:.Dens /ft3)	Ins.TI (inch)	hk Lin. I (Ib/	Dens ft3)	Lin.Thk (inch)	Soil	
1	SC1	12"	STD	12.75	0.375									S1	
2	SC2	12"	STD	12.75	0.375									S2	
3	SC3	12"	STD	12.75	0.375									S3	
4	SC4	12"	STD	12.75	0.375									S4	
5	SC5	12"	STD	12.75	0.375									S5	
6	SC6	12"	STD	12.75	0.375									S6	
7															
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		Type		<u>2</u> ptions () tin'') []	) <u>E</u> 0a	) DZ (f	[(sc	Matl	Sect		A Data	^			
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# 1 2	Node Title =	Type Buried From	DX (fi Piping 200'0	2ptions 2 t'in'') [D 3 Sampl )'' 2	) <u>c</u> oa ) (ft'in''  e 20'0''	) DZ (1	(t'in'')	Matl	Sect	Load	Data Ancho	r r			
# 1 3	Node Title = 10 20	Type Buried From	DX (fi Piping 200'0 15.55	t'in'') [] <b>3 Samp</b> ] 9'' -2 590 []	PY (ft'in'' e 20'0'' 1.5763	) DZ (f	(t'in'')	Matl C6	Sect	Load R	Data Ancho	ŕ			
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# 1 2 3 4 5	Node Title = 10 20 30 40	Type Buried From	DX (fi Piping 200'0 15.55 15.38 15.62	tin'') D <b>3 Samp</b> 590 0 396 0 210 0	YY (ft'in'' e 20'0'' .5763 .5700 .5786	) DZ (1	(t'in'')	Matl C6 C6 C6	Sect SC1 SC1 SC2	Load R R R	Data Ancho				
# 1 2 3 4 5 6	Node Title = 10 20 30 40 50	Type Buried From	DX (fi Piping 200'0 15.55 15.38 15.62 15.50	tin'') D 3 Samp 3 Samp	PY (ft'in'' e 20'0'' .5763 .5700 .5786 .5744	) DZ (1	(ťin'')	Matl C6 C6 C6 C6	Sect SC1 SC2 SC2	Load R R R R	Data Ancho	r r			
# 1 2 3 4 5 6 7	Node Title = 10 20 30 40 50 60	Type Buried From	DX (f) Piping 200'0 15.55 15.38 15.62 15.50 15.68	t'in'') D <b>3 Sampl</b> y'' -2 590 0 396 0 210 0 084 0 345 0	YY (ft'in'' e 20'0'' .5763 .5700 .5786 .5744 .5809	) DZ (f	(t'in'')	Matl C6 C6 C6 C6 C6 C6	Sect SC1 SC2 SC2 SC3	Load R R R R R R R	Data Ancho	ſ			
# 1 2 3 4 5 6 7 8	Node Title = 10 20 30 40 50 60 70	Type Buried From	DX (f) Piping 200'0 15.55 15.62 15.62 15.62 15.68 15.71	t'in'') D <b>3 Sampl</b> <b>3 Sampl</b>	YY (ft'in'' e 20'0'' 1.5763 1.5700 1.5786 1.5786 1.5809 1.5821	) DZ (1	(t'in'')	Matl C6 C6 C6 C6 C6 C6 C6	Sect SC1 SC2 SC2 SC2 SC3 SC3	Load R R R R R R R R	A Data Ancho	r			
# 1 2 3 4 5 6 7 8 9	Node Title = 10 20 30 40 50 60 70 80	Type Buried From	DX (f) Piping 200'0 15.55 15.62 15.62 15.62 15.71 15.71	tin'') C <b>3 Sampl</b> 590 0 396 0 210 0 345 0 169 0 496 0	YY (ft'in'' e 20'0'' .5763 .5700 .5786 .5744 .5809 .5821 .5833	) DZ (f	(t'in'')	Matl C6 C6 C6 C6 C6 C6 C6 C6 C6	Sect SC1 SC2 SC2 SC3 SC3 SC3	Load R R R R R R R R R R R R	Ancho				
# 1 2 3 4 5 6 7 8 9 10	Node Title = 10 20 30 40 50 60 70 80 90	Type Buried From	DX (f) Piping 2000 15.55 15.62 15.62 15.62 15.62 15.71 15.74 15.74	tin'') D <b>3 Sampl</b> 3'' - 2 590 0 396 0 210 0 084 0 345 0 169 0 496 0 328 0	YY (ft'in'' e 20'0'' .5763 .5760 .5786 .5744 .5809 .5821 .5833 .7''	) DZ (1	(t'in')	Matl C6	Sect SC1 SC2 SC2 SC3 SC3 SC3 SC3 SC3 SC4	Load R R R R R R R R R R R R R	Data Ancho				
# 1 2 3 4 5 6 7 8 9 10 11	Node Title = 10 20 30 40 50 60 70 80 90 100	Type Buried From	DX (fr Piping 20070 15.55 15.62 15.62 15.71 15.74 9.706	tin'') D Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl	xY (ft'in'' e 20'0'' 5763 5766 5786 5786 5786 5784 5809 5821 5833 (7'' 3595	) DZ (1	(tín'')	Matl C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6	Sect SC1 SC2 SC2 SC3 SC3 SC3 SC3 SC4 SC4	Load R R R R R R R R R R R R R R R	Data				
# 1 2 3 4 5 6 7 8 9 10 11 12	Node Title = 10 20 30 40 50 60 70 80 90 100 110	Type Buried From	DX (f) Piping 20070 15.55 15.62 15.62 15.62 15.71 15.74 15.74 9.706 2'1-1.	t'in'') C Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl Sampl	Ecos YY (ft'in'' Ecos Constraints Ecos Constraints Ecos <pecos< p<="" td=""><td>) DZ (1</td><td>(t'in')</td><td>Matl C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6</td><td>Sect SC1 SC2 SC2 SC3 SC3 SC3 SC3 SC4 SC4 SC4</td><td>Load Load R R R R R R R R R R R R R R R R R R R</td><td>Data Ancho</td><td></td><td></td><td></td><td></td></pecos<>	) DZ (1	(t'in')	Matl C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6 C6	Sect SC1 SC2 SC2 SC3 SC3 SC3 SC3 SC4 SC4 SC4	Load Load R R R R R R R R R R R R R R R R R R R	Data Ancho				
# 1 2 3 4 5 6 7 8 9 10 11 12 13	Node Title = 10 20 30 40 50 60 70 80 90 100 110 120	Type Buried From	DX (f) Piping 20000 15.55 15.62 15.62 15.62 15.71 15.74 15.76 9.706 21-1, 21-1,	tin'') D 3 Sampl 3	YY (R'in'' e 20'0'' .5763 .5700 .5786 .5744 .5809 .5821 .5833 (7'' .3595	) DZ (f	(t'in'')	Matl C6	Sect SC1 SC2 SC3 SC3 SC3 SC3 SC4 SC4 SC4 SC4	Load R R R R R R R R R R R R R R R R R R R	Ancho				

For all the Cases given above, CAEPIPE will compute internally the Soil stiffnesses in three directions (axial, transverse and vertical) and apply them ONLY at node points defined in the stress layout. For further details, see the Section titled "Buried Piping" in CAEPIPE Technical Reference manual. This manual and other three (3) manuals of CAEPIPE can be downloaded from the link <u>www.sstusa.com/caepipe-docs.php</u>.

As an example, from the sorted stress results for model "SampleBuriedPiping\_StepSoils.mod", you will observe that the piping is overstressed in Sustained load case as CAEPIPE applies the soil stiffnesses in three directions only at nodes defined in the stress model.

-0-	Caep	ipe : B3	1.1 (202	20) Co	ode co	mpliand	e (Sort	ed str	ess			×
<u>F</u> ile	e <u>R</u> es	ults <u>\</u>	<u>/</u> iew (	<u>O</u> ptio	ns <u>W</u>	indow	<u>H</u> elp					
4	5	+ (			f.	ð 🛯			4		S	s⁄A
		Susta	ined			Expar	nsion		^			
#	Node	SL (psi)	SH (psi)	<u>SL</u> SH	Node	SE (psi)	SA (psi)	<u>SE</u> SA				
1	10	29416	19885	1.48	30A	27603	41833	0.66				
2	15	25914	19885	1.30	20B	22371	40041	0.56				
3	20A	10524	19885	0.53	30B	16758	41938	0.40				
4	20B	9961	19885	0.50	20A	11526	39478	0.29				
5	25	8321	19885	0.42	40	6939	41760	0.17	v			

So, it is important that you should discretize the long section of the straight pipe <u>manually</u> into smaller lengths to best simulate soil to pipe interaction by following the procedure given in Buried Piping Tutorial. Long straight pipe sections can be discretized automatically using the command "Layout Window > Edit > Refine Nodal Mesh.

By discretizing the long pipe sections into smaller lengths for model "SampleBuriedPiping\_StepSoils.mod" by following the procedure given in Buried Piping tutorial, you will observe that the over stresses for Sustained case is resolved. See the model "SampleBuriedPiping\_StepSoils\_refined.mod" for details.

-0-	Caep	ipe : B	31.1 (20	020) C	ode co	ompliar	nce (So	rted s	tres	s	Ľ	]	×
<u>F</u> ile	e <u>R</u> es	ults	<u>V</u> iew	<u>O</u> ptio	ons <u>\</u>	<u>V</u> indow	/ <u>H</u> elp	)					
4	3	╟				) <u>n</u> (	<b>ک</b>  [		<	<b> </b>		S	<sup>S</sup> ∕A
		Susta	ained			Expar	nsion		^				
#	Node	SL (psi)	SH (psi)	SL SH	Node	SE (psi)	SA (psi)	<u>SE</u> SA					
1	200	8034	19885	0.40	30A	26021	42341	0.61					
2	10	8012	19885	0.40	20B	23801	42269	0.56					
3	180	8009	19885	0.40	30B	18040	42328	0.43					
4	160	8008	19885	0.40	20A	15809	42268	0.37					
5	170	8007	19885	0.40	120	9163	42330	0.22					
6	150	8004	19885	0.40	40	5774	42231	0.14					
7	190	8000	19885	0.40	130	5239	42328	0.12					
8	50	7958	19885	0.40	25	4657	42347	0.11					
9	210	7905	19885	0.40	110	3981	42252	0.09					
10	40	7771	19885	0.39	140	3683	42254	0.09					
11	100	7765	19885	0.39	10	2721	41990	0.06					
12	110	7751	19885	0.39	150	2721	41998	0.06					
11	1.40	7740	10005	0.00	00	2000	40000	0.00	~				

Lastly, using the "Soil restraints" results of CAEPIPE (can be seen through "Results Window > Results > Results...") you can view the Stiffness and Loads of all the elements that are buried in soil(s).