

APPROVED for Release for
 Unlimited (Release to Public)
 6/23/2005

Calculation Cover Sheet

Project Saltstone Vault Performance Assessment		Calculation Number T-CLC-Z-00006	Project Number N/A
Title Saltstone Vault Structural Degradation Prediction		Functional Classification PS	Sheet 1 of 615
Discipline Structural Mechanics			
<input type="checkbox"/> Preliminary <input checked="" type="checkbox"/> Confirmed			
Computer Program: ANSYS NA <input type="checkbox"/>		Version/Release: 7.0	
Purpose and Objective This calculation predicts the performance of the Saltstone Vault Number 4 over time, considering static settlement and the effects of earthquakes. A statistical approach combined with non-linear structural analysis is used. The objective is to estimate structural cracking and associated statistical uncertainty during the next 10,000 years.			
Summary of Conclusion See page 21			
Revisions		UNCLASSIFIED	
Rev. No.	Revision Description	DOES NOT CONTAIN UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION	
0	Original Issue	ADC & Reviewing Official <u>J. R. Joshi</u> (Name and Title) Date: <u>6/21/03</u>	
Rev. No.	Originator (Print) Sign/Date	Verification/Checking Method	Verifier/Checker (Print) Sign/Date Manager (Print) Sign/Date
0	W. L. Peregoy <i>W. Peregoy 7/9/03</i>	Document Review of FE Analysis	Roger Farish <i>[Signature] 7/10/03</i> Greg Mertz <i>[Signature] 7.10.03</i>
0		Independent Review of Statistical Analysis	Greg Mertz <i>[Signature] 7/10/03</i> FRED LAEFF <i>[Signature] 7.10.2003</i>
Design Authority - (Print) <u>NA</u>		Signature _____ Date _____	
Release to Outside Agency - (Print) <u>NA</u>		Signature _____ Date _____	
Security Classification of the Calculation <u>Unclassified</u>			

ENGINEERING DOC. CONTROL - SRS



00575702

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 2	Rev. 0
----------------------------------	----------------	-----------

Table of Contents

Section	Description	Page
	Open Items	3
1.0	Introduction and Scope	4
2.0	Input	5
3.0	Methodology	6
4.0	Assumptions	15
5.0	Results	17
6.0	Conclusion	21
7.0	References	21
8.0	Body of Calculation	22
8.1	2-D Axisymmetric Model	22
8.2	Structural Model	52
8.3	Statistical Model	165
Appendix A	Saltstone Properties	287
Appendix B	Soil Layer Properties and DWPF Settlement Data	291
Appendix C	Closure Cap Configuration	336
Appendix D	SGS Geotechnical Data for Differential Settlement	342
Appendix E	Structural Analysis Results	347
Appendix F	ANSYS Model Data	491
Appendix G	2-D/3-D Preliminary Model Study	572
Appendix H	Independent Verification of Statistical Approach	589

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 3	Rev. 0
----------------------------------	----------------	-----------

Open Items

None.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 4	Rev. 0
----------------------------------	----------------	-----------

1 INTRODUCTION AND SCOPE

Saltstone Vault Number 4 is a rectangular monolith 200-ft. wide by 600-ft. long by 27-ft. high. It is constructed of reinforced concrete with a 2-ft. base slab and 1 ½-ft. thick walls. The roof is nominally 6-in. thick, but is not considered as a structural element. Its purpose is for weather protection only.

The vault is filled with a saltstone grout mix that solidifies to form a weak concrete.

Prediction of structural cracking with time in this calculation is used in conjunction with groundwater flow modeling (by others) to estimate the potential leaching of radiological and chemical contaminants over time. The calculation is intended to cover times up to 10,000 years from the present. Since the time frame is so long, there are significant probabilities of large earthquakes that exceed those normally considered for production support facilities.

In its final configuration, the vault is completely filled with saltstone covered by clean grout and surrounded with soil backfill. Inertial loading of the vault itself does not induce significant structural stress since it is a monolithic structure. The only structural mechanism that causes cracking is settlement of the foundation soil.

This calculation covers cracks induced by settlement of the ground beneath the vault. There are two types of settlement: first, static settlement over time caused by the initial response of the soil to the loading imposed by the vaults and the consolidation of the soil layers, and second, differential settlement of local areas under the vault caused by earthquakes. The cracking caused by the static settlement is induced by a dishing effect that produces a curvature at the base of the vault. The differential settlement also causes a curvature, but over a small area. Geotechnical investigations did not find liquefaction potential and soft zones that could cause larger and more extensive settlements during a seismic event.

This calculation is based on the vault geometry as of January 1, 2003. Changes in configuration after that date are not considered. The cracks observed during and after filling the cells in the vault are assumed to be 100% repaired. Cracks caused by degradation of materials, weathering, chemical reactions, etc. are addressed elsewhere.

A typical cross section of the vault is shown in Figure 1. The locations of construction joints and the locations assumed for earthquake induced differential settlements are shown on this figure. Note that this cross section represents half of the overall vault. The vault is symmetrical at its center and the two halves are separated by a 3in expansion joint.

The analysis is performed in three parts:

Static Settlement Model. An axisymmetric model is run with appropriate soil properties to determine the static settlement pattern over time. Soil properties are based on actual settlement recorded for the Defense Waste Processing Facility (DWPF).

Structural Model. A structural model of the vault, including the structural concrete and saltstone, determines the extent of cracking for both static and earthquake induced settlements. Location, extent, and magnitude of differential settlement are considered as parameters.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 5	Rev. 0
----------------------------------	----------------	-----------

Statistical Model. The relationships of extent of cracking to the input parameters is determined from the results of multiple structural analyses. A Monte Carlo analysis utilizing these relationships is performed to determine the behavior of the vault over time.

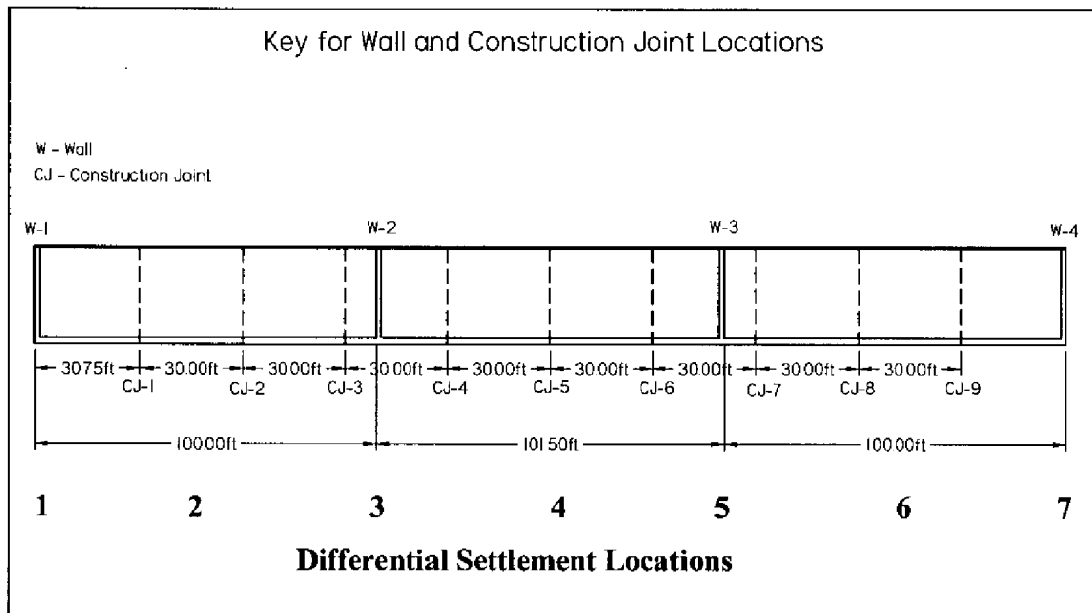


Figure 1. Typical Vault No. 4 Cross Section

2 INPUT

2.1 Drawings

The following drawings are used for the structural data in this calculation:

C-CC-Z-0011, through 14.	Saltstone Vault #4 Roof
W828992, 993, and 999	Saltstone Vault #4 Concrete and Steel

2.2 Materials

Concrete: Concrete strength is taken as 4000 pounds per square inch (psi) and steel reinforcement is assumed to be Grade 60 (yield strength = 60,000psi).

Saltstone: Structural properties are taken from WSRC-TR-2003-00082. Relevant pages are included in Appendix A.

Soil: Appendix B contains the soil data and DWPF settlement data used in the analysis.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 6	Rev. 0
----------------------------------	----------------	-----------

Vault Cover: The soil cover for Vault No. 4 is taken from The Revision 2 Closure Cap Configuration Report issued on 04/02/2003 by Mark Phifer. This report is included as Appendix C.

3 METHODOLOGY

The calculation is performed in three parts as noted in Section 1. A description of each of these parts follows.

3.1 Axisymmetric Analysis

3.1.1 Purpose of Analysis

A 2-D axisymmetric non-linear analysis is performed on the soil beneath Vault No. 4. The intent of this analysis is to train the properties of the soil with the DWPF data to obtain representative settlement displacements for Vault No. 4. The displacements are used in the structural model of the vault.

3.1.2 Model Details

The model is prepared with initial soil properties based on the shear wave velocities from Site Geotechnical Services (SGS) reports (References 7.3, 7.4, and 7.5). Relevant sections of these reports are included in Appendix B.

Settlement is the result of short-term elastic response of the soil layers beneath the structure and long-term secondary soil consolidation. Non-linear elements using elastic properties and kinematic hardening creep behavior are used to model the initial elastic response and the secondary consolidation, respectively.

The lateral extent of the model is sufficient to obtain horizontal boundary conditions that do not affect the area beneath the load application. The overall depth of the model is controlled by bedrock location at elevation -700-ft. The finite element mesh size is increased as a function of distance from the load application. A fine mesh is not needed in areas where the stress gradients are small.

Initial properties for the soil layers are calculated from the shear wave velocity data as discussed above. The initial properties are used as a starting point to verify that the model is working correctly and converging properly.

3.1.3 DWPF Load Analysis

SGS has calculated the DWPF construction load sequence for correlation with settlement monument data. The load application data and monument settlement readings are taken from Reference 7.3 and included in Appendix B.

Following the analysis with the calculated initial properties, the elastic and creep properties are varied until a displacement pattern is obtained that matches actual settlements. The relative relationships of properties from layer to layer are maintained.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 7	Rev. 0
----------------------------------	----------------	-----------

Figure 2 shows the actual settlements measured for the DWPF and the settlement of the axisymmetric model at node 9 (120 ft. from centerline) for the DWPF load application. Node 9 was chosen because it is about midway between the model center and the edge of the DWPF. Three cases were run, representing a high, low and mean settlement. These three cases are shown as the dashed lines in Figure 2.

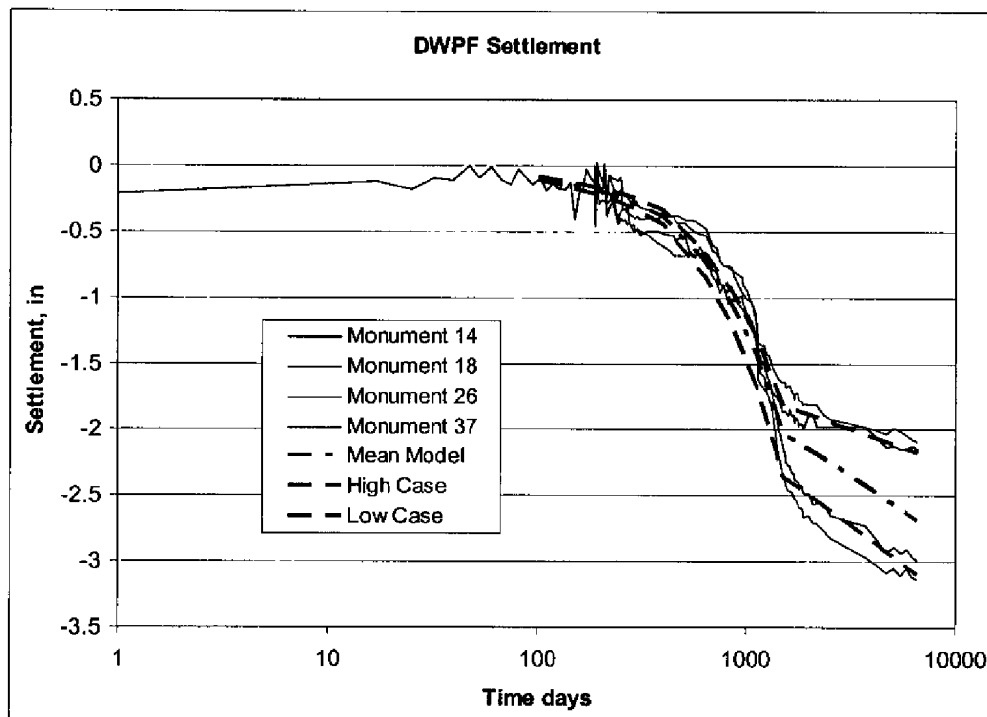


Figure 2. Comparison of DWPF Settlement with Axisymmetric Model Results

A stress contour plot for vertical normal stress and the deformed shape is shown in Figure 3. Note that the vertical scale is greatly exaggerated. The maximum displacement occurs at the model centerline (DMX) and is 0.24-ft. or 2.9-in. at a time of 6500 days.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 8	Rev. 0
----------------------------------	----------------	-----------

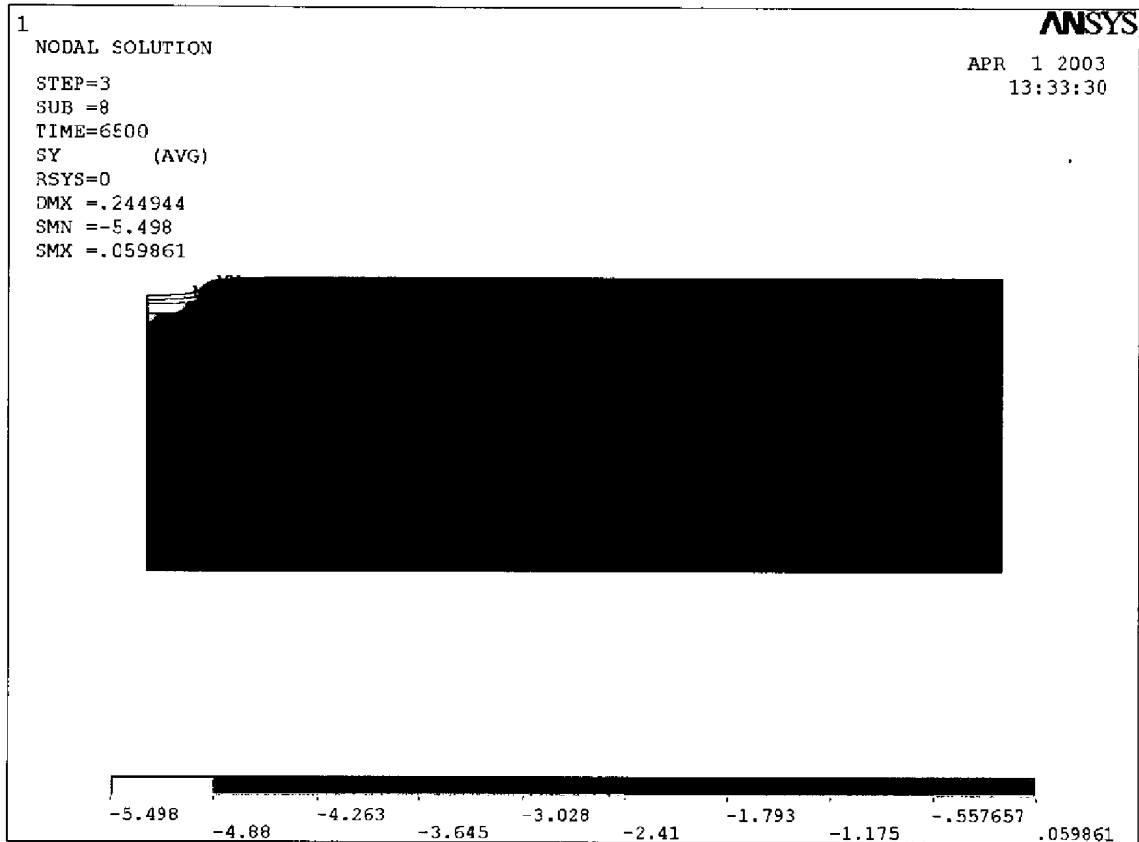


Figure 3. DWPF Non-linear Soil Model Results. This plot shows vertical stress plotted as contours on an exaggerated deformed shape.

3.1.4 Vault No. 4 Load Analysis

The result of the analysis for DWPF loads is a soil model that is representative of elastic and non-linear consolidation behavior of the underlying strata. To use this model to predict long-term static settlement of Vault No. 4, loads are calculated from the proposed closure cap cover plan detailed in Appendix C and applied as surface pressures. The calculated surface pressures vary from 0 to 7.3 kips per square foot (ksf).

Figure 4 shows the response of the model to the vault loads at a time of 10,000 years. The maximum soil pressure is 6.6 ksf. For Vault No. 4 the maximum displacement (DMX) is 0.61-ft., or 7.3-in. A comparison of Figure 4 and Figure 3 shows that the stress at bedrock for vault loads is significantly higher than the stress caused by DWPF loads. This difference does

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 9	Rev. 0
----------------------------------	----------------	-----------

not affect the results since the bedrock is stiffer than the overlying strata and its long term consolidation is judged to be negligible.

The calculated displacements are in agreement with geotechnical predictions of initial and long-term settlement. (reference 7.7, attached in Appendix D)

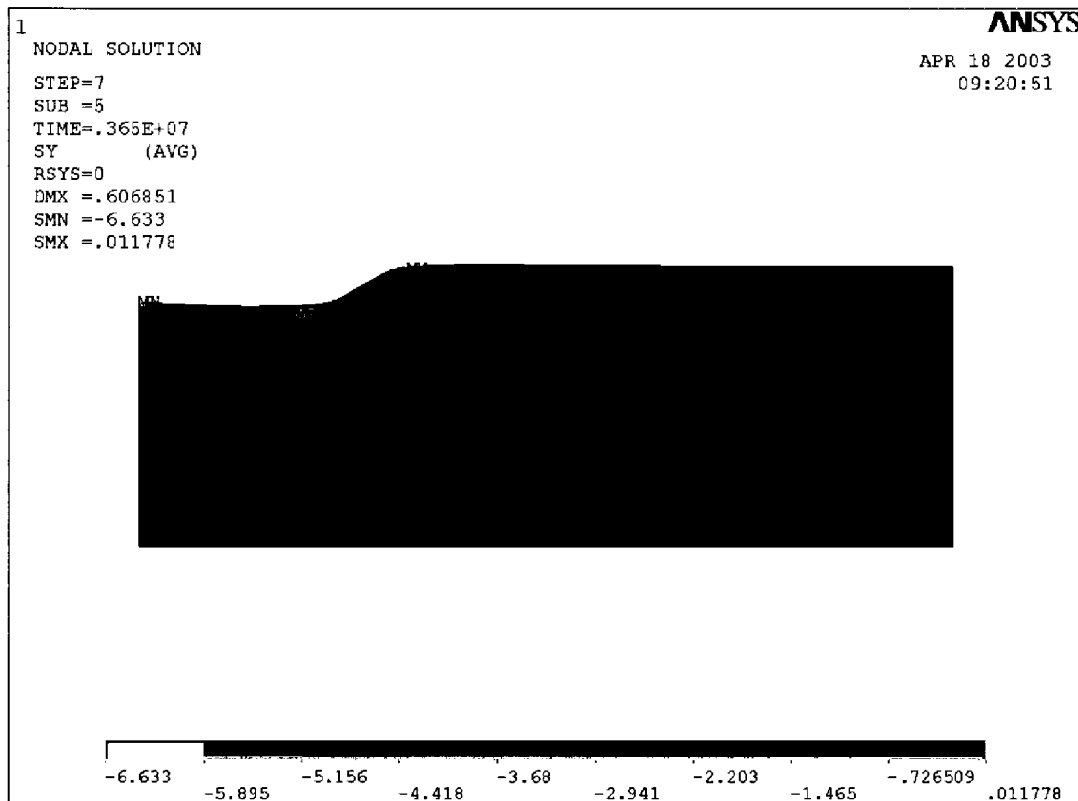


Figure 4. Non-linear Soil Model Results for Vault No. 4.

3.2 Structural Analysis

3.2.1 Purpose of Analysis

Once the settlement displacements over time are obtained from the axisymmetric model, the next step is to determine the effects of both static settlement and earthquake induced differential settlement. The intent is to relate cracking in the vault to settlement and to determine the influence of variations in parameters, such as material properties, settlement

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 10	Rev. 0
----------------------------------	-----------------	-----------

rate, magnitude and extent of differential settlement, etc. These parameters are discussed in detail later.

3.2.2 Model Description

The structural analysis is performed with a 2-D plane strain model. The choice of a 2-D model is based on a preliminary comparison between 2-D and 3-D models presented in Appendix G. The study showed that stress and strains in the 2-D model are slightly higher than the 3-D model, but only by 5% or less.

An important aspect of the vault construction is that there are construction joints on 30-ft. centers in the base slab and walls. These joints are considered as discontinuities that are locations for crack initiation. The saltstone grout mix is almost an order of magnitude weaker than the structural concrete. It is therefore assumed that the cracks in the grout would tend to follow the pattern initiated by cracking in the structural concrete slab and walls.

The construction joints effectively subdivide the structure into blocks. Because of their aspect ratios (30-ft. wide and 27-ft. tall), the blocks have low bending stress between the joints for the static and differential displacements. If the blocks were larger, say 100-ft., there would be a potential for cracking between joints. There are also joints between the saltstone and the concrete walls. There is no bond assumed between at these joints.

The structural model uses non-linear contact elements for the joints between the walls and the saltstone and at the construction joint locations in the base slab. Crack propagation in the saltstone is modeled with non-linear elements that are elastic under compressive load and have a small elastic tensile strength. When the tensile strength is exceeded, the capacity of the element is zero.

The interface between the soil and the vault is represented by soil spring elements whose properties are based on the soil bulk modulus. These elements are simple unidirectional springs. The displacement boundary conditions are imposed on the structure through these springs to simulate the actual soil behavior in distributing the settlement to the structure. Since displacements are applied to nodal points, applying the displacements directly to the structure would give artificially high results, unless an extremely fine mesh is used.

Figure 5 shows a plot of the model used for the structural analysis. The non-linear interface elements do not appear in graphical representations since they have zero length.

Some of the structural model properties were considered parametrically as shown in Table 1. These properties are bulk modulus for the soil and Young's modulus and cracking strain for saltstone.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 11	Rev. 0
---	------------------------	------------------

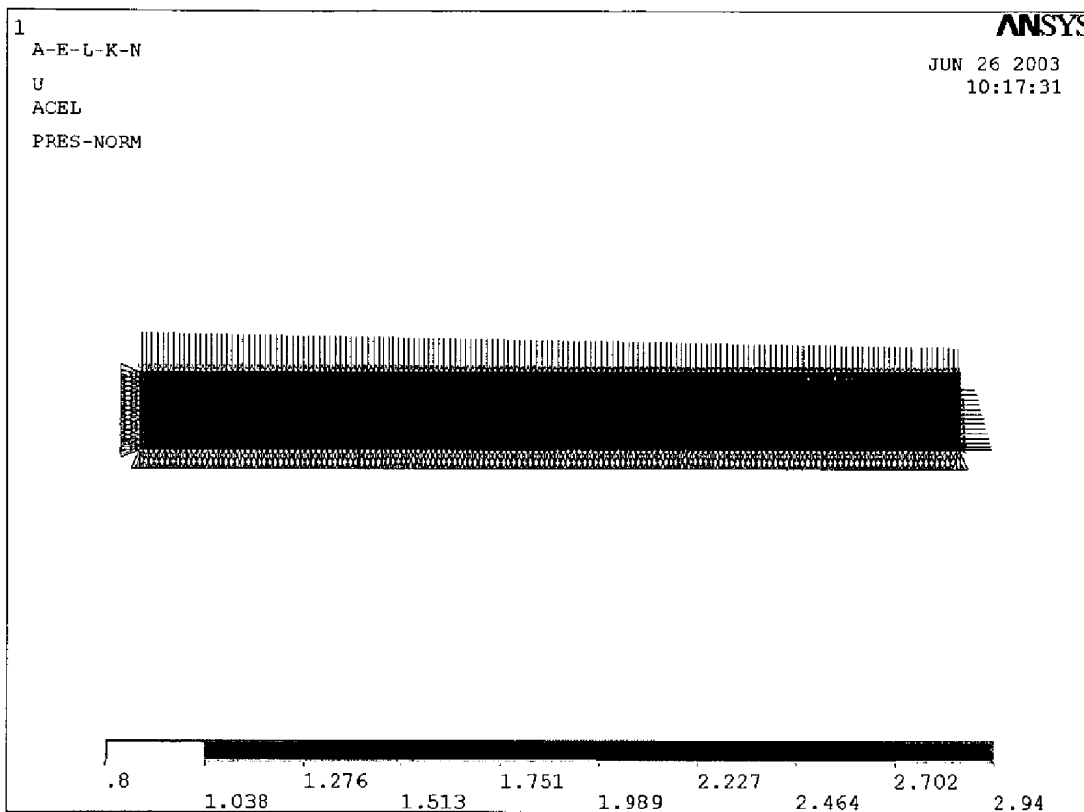


Figure 5. Structural Model. Applied pressures and boundary conditions are shown. The self weight of the structure is applied as a gravity load.

3.2.3 Static Settlement Analysis

The static settlement displacements from the axisymmetric model are applied to the structural model. The model is run by stepping through time with the displacements changed at discrete points in time corresponding to the axisymmetric model results. Since the mesh size is different for the structural model, displacements are linearly interpolated between nodal points of the axisymmetric model. The displacements from the axisymmetric model and the interpolations are shown graphically in Figure 8.

The static settlement rate is varied between the mean, high, and low cases discussed in Section 3.1.3. The settlement rate is used as a variable parameter in the statistical analysis and is given in Table 1.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 12	Rev. 0
----------------------------------	-----------------	-----------

Table 1. Parameters used in the Structural Analyses

Parameter	Units	Mean	1 sigma	Coefficient of variation
Basic Parameters				
Soil Bulk Modulus	kcf	30	15	0.5
Grout Compressive Strength	psi	524	196.8	0.38
Grout Modulus	ksf	2.05E+05	dependent on sqrt(Comp. Strength)	
Grout Cracking Strain	in/in	1.21E-04	dependent on sqrt(Comp. Strength)	
Static Settlement	ft	1.0607	0.53	0.5
Earthquake Parameters				
Differential Settlement				
Magnitude, PC-3	in	0.75	N/A	N/A
Magnitude, PC-4	in	2.75	N/A	N/A
Surface Extent	ft	62	31	0.5
Location	N/A	1 of 7	N/A	Uniform Distribution

3.2.4 Differential Settlement Analysis

The major effect of an earthquake on a monolithic structure of this type is to cause settlement beneath the structure. Differential settlement causes structural deformations that can lead to cracking. In the time span being analyzed, there is a likelihood of the occurrence of significant earthquakes.

To quantify the effects of differential settlement, there are three parameters of interest. First, the magnitude of settlement is related to the size of the event. The settlement magnitude for PC-3 and PC-4 events have been calculated by SGS (Reference 7.7 and Appendix D). These values are 0.75 inches for PC-3 and 2.75 inches for PC-4.

The second parameter is the extent of settlement. In reference 7.1, SGS shows the depth to the major earthquake induced settlement to be about 62-ft. for boring ZCP-27. This is the only boring that shows a fairly significant settlement of the six borings listed. Because of this observation, the settlement is treated as a point source with a 2:1 vertical cone of influence. The result of this assumption is a settlement diameter of 62-ft. at the surface. The settlement shape is a standard normal curve per Reference 7.2.

The third parameter is the location of the settlement with respect to the structure. Seven locations for potential differential settlement during earthquakes are chosen for the analysis. These locations are evenly spaced at 50-ft. intervals as shown on Figure 1.

The differential settlements are superimposed on the static settlements at specific times. The times chosen for the differential settlements are 100, 1000, and 5000 years.

The parameters for the differential settlement analysis are also shown in Table 1.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 13	Rev. 0
----------------------------------	-----------------	-----------

3.2.5 Structural Analysis Results Format

The results of multiple finite element analyses are summarized on spreadsheets by graphing nodal displacements at the construction joints and at the saltstone-concrete interface. The displacement patterns at the cracks are noted to be predominately linear. The cross sectional area for each crack is calculated by the length times the width divided by 2.

A typical plot of the finite element model deformed shape is shown on Figure 6. Note that the deformed shape plot is highly exaggerated. A corresponding plot showing the crack size vs. height is shown as Figure 7. Figure 7 is produced by plotting

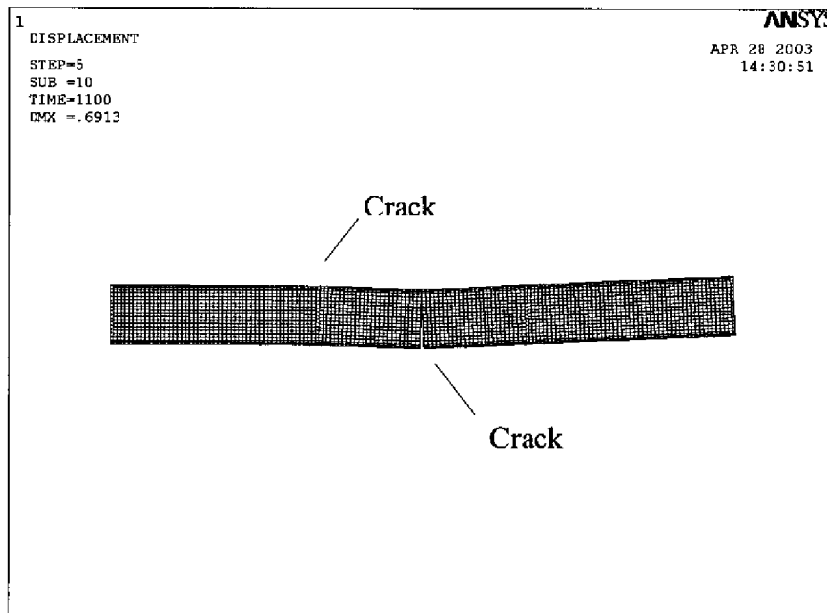


Figure 6. Typical Deformed Shape Plot. Differential settlement is at location 4 with PC-4 magnitude. All parameters are mean values.

For example, for the crack at construction joint 5 shown in Figure 7, the width is about 1.15 inches and the length is about 27 ft. The calculated area is $1.15 \times 27 \times 12 / 2 = 186 \text{ in}^2$.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 14	Rev. 0
----------------------------------	-----------------	-----------

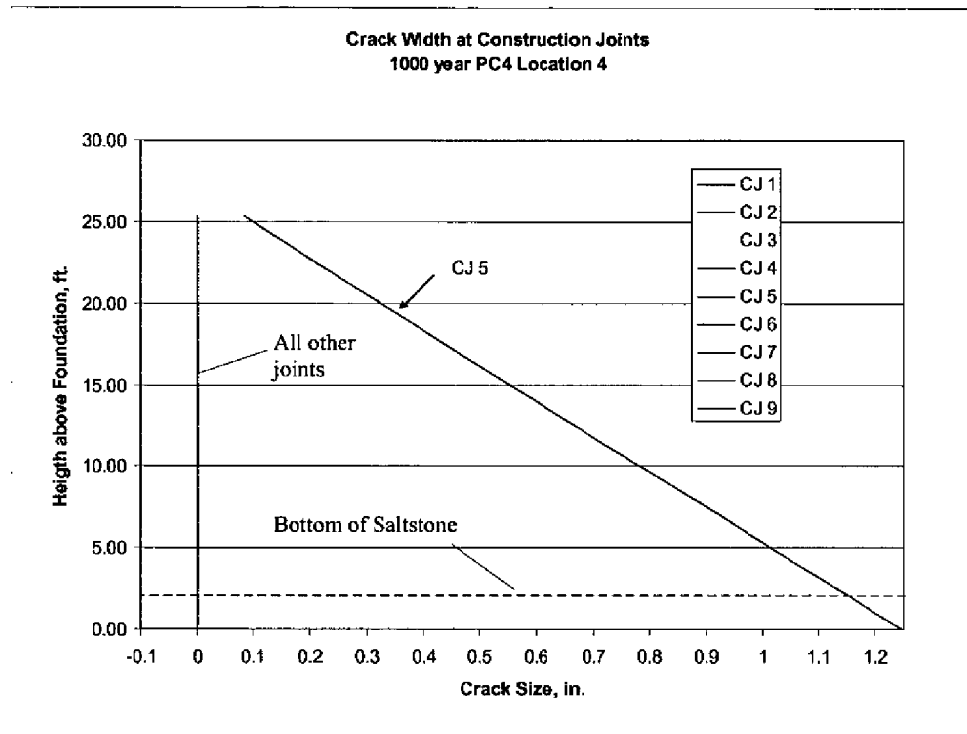


Figure 7. Typical Plot of Crack Size at CJ 5.

3.3 Statistical Analysis

3.3.1 Purpose

The structural analysis generates multiple results for the various parameters discussed above. The results are generated by varying each parameter independently while holding the others at their mean values. To arrive at a statistical result that reflects crack sizes with respect to time, a Monte Carlo analysis is performed.

3.3.2 Reduction of Structural Data

The first step in this process is to reduce the structural data to a form usable for the iterative analysis. Spreadsheet compilations of the structural data relate observed cracks to the parameters. Observed cracks were expressed in terms of cross sectional area for the two types observed: Cracks open at the top at the joint between the walls and the grout, and cracks open at the bottom at the construction joint locations.

There were some cases noted where there were multiple cracks. In these cases the data was simplified by adding the crack areas. The two basic premises in calculating crack areas are

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 15	Rev. 0
----------------------------------	-----------------	-----------

that static and differential settlement cracks were considered as independent and once a crack opens it remains open. The latter premise is discussed further in Section 4.

The results of the data reduction is a series of mathematical relationships that relate crack size to each of the parameters in Table 1.

3.3.3 Monte Carlo Analysis

Once the relationships between the parameters and the resulting crack areas are established, the next step is to apply statistical distributions to the data. In general, normal, or truncated normal distributions were used. The data was mapped onto these distributions.

The analysis is an iterative process where random numbers are used to set parameters for each iteration in accordance with the mapped distributions. Each iteration establishes values for saltstone modulus and cracking strain, soil bulk modulus, and static settlement rate. Once these parameters are set, the analysis is stepped through 10,000 years in 10 year increments.

As the analysis proceeds through the time steps, a random number generator is used to determine if a seismic event occurs, and if so, the magnitude of differential settlement associated with the event.

If an event occurs, random number generators are used to establish the location and extent of settlement.

The results of the Monte Carlo are a relationship between crack area and time with a statistical distribution. The model is iterated until a low convergence criterion in terms of percentage variation of mean and standard deviation of the results is met. The results are calculated at times of 100, 500, 1000, 2500, 5000, and 10000 years.

3.3.4 Calculation of Crack Size

The output of most interest for flow modeling is the crack width. To determine representative crack widths from the crack areas, a comparison is made between the statistical analysis results and the plots of the structural analysis cracks (see Figure 7). Empirical relationships are established that relate the areas and dimensions of the cracks.

4 ASSUMPTIONS

- 4.1 The starting point for this calculation is that the vault is in an as designed condition with all repairs complete.
- 4.2 Since the soil profiles for the Saltstone Vault area and the DWPF are similar, and the facilities are in close proximity on the site, the settlement data for the DWPF are considered applicable to the Saltstone Vault.
- 4.3 The static settlement for the DWPF is modeled by adjusting non-linear creep and linear elastic response in the axisymmetric model until a representative settlement curve is obtained as shown in Figure 2. This curve is considered the mean. The high and low settlement measurements of the DWPF are assumed to be a one sigma variation each way.

Calculation Continuation Sheet

Calculation No.	Sheet No.	Rev.
T-CLC-Z-00006	16	0
<p>4.4 The loading used for soil cover considers the current information for the entire vault area. The vault area is projected to contain 15 vaults. Appendix G presents the results of various trial load combinations. The loading configuration that caused the greatest static displacement curvature is the inclusion of Vaults No. 1 through 12, but the exclusion of 13 through 15.</p> <p>4.5 Since the vault is symmetric about its centerline in the long direction, only one half of the vault is used in the structural analysis. However, the loads are not entirely axisymmetric about the Vault No. 4 centerline when considering the effects of the other proposed vaults. The static load case is slightly conservative since the half of the vault with the greatest static settlement curvature is used as shown in Appendix G.</p> <p>4.6 Assumptions regarding the coefficients of variation of the input to the analysis are explained in the body of the calculation.</p> <p>4.7 As discussed in Section 3.2, the structural behavior of the model is controlled by preexisting construction joints spaced on 30-ft. centers. Since these joints represent discontinuities in the structure, they provide locations for crack initiation. Because of the length of time considered in this analysis, the waterstop and reinforcing dowels are considered to be ineffective in reducing the cracking or leakage through the joints. These joints are also assumed to control the saltstone cracking in that cracks in the much weaker saltstone will tend to follow the joints in the concrete floor and walls.</p> <p>4.8 The reinforcing dowels in the structure tying the construction joints would initially provide some resistance to crack propagation. However, the displacements of the underlying soil are permanent, so the reinforcing bars are not credited since corrosion is likely given the long time spans in this analysis.</p> <p>4.9 The 2-D model does not consider the effects of cracking initiated by longitudinal construction joints. However, the assumption of 2-D behavior is conservative in that the joint is considered to extend through the width of the structure. If one assumes that a mean differential settlement with radius of 31 ft. occurs at the conjunction of a longitudinal and a transverse construction joint, the result could be a crack in each joint of approximately 62-ft. for a total of 124-ft. The model is conservative in that a transverse crack would be 200-ft. in length across the transverse section.</p> <p>4.10 The loads applied to the structural model are the same loads that are applied to the axisymmetric model. This is done to ensure that there is a consistent load application for the differential settlement case. The static results are checked and the absolute displacements at the base of the structure are found to be about 16% conservative with vault loads included. The actual conservatism is somewhat less, since static settlement cracking is induced by curvature rather than absolute displacement.</p> <p>4.11 There are certain conditions where a differential displacement tends to close a previously opened crack. Credit is not taken for closing cracks since, in the time frame under consideration, they would eventually fill in with solids and not be capable of closing.</p>		

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 17	Rev. 0
----------------------------------	-----------------	-----------

4.12 There is no credit taken for increase in concrete or saltstone compressive strength with time. This is a known effect in concrete, but there is not enough data for saltstone. Since the time span of this calculation is so long, there is no basis for either an increase or decrease of strength with time, so the initial strength is used.

5 RESULTS

5.1 Axisymmetric Analysis

The results from the axisymmetric analysis for DWPF loading are shown on Figure 2. This shows the comparison between actual settlements measured over 10 years and the settlement calculated from the model.

The results from the same model for the vault loads are shown on Figure 8. The mean settlement rate is shown. The symbols represent the discrete settlement points calculated in the axisymmetric model at the various times noted on the legend. The lines connecting the symbols represent displacements interpolated for the finer mesh in the structural model.

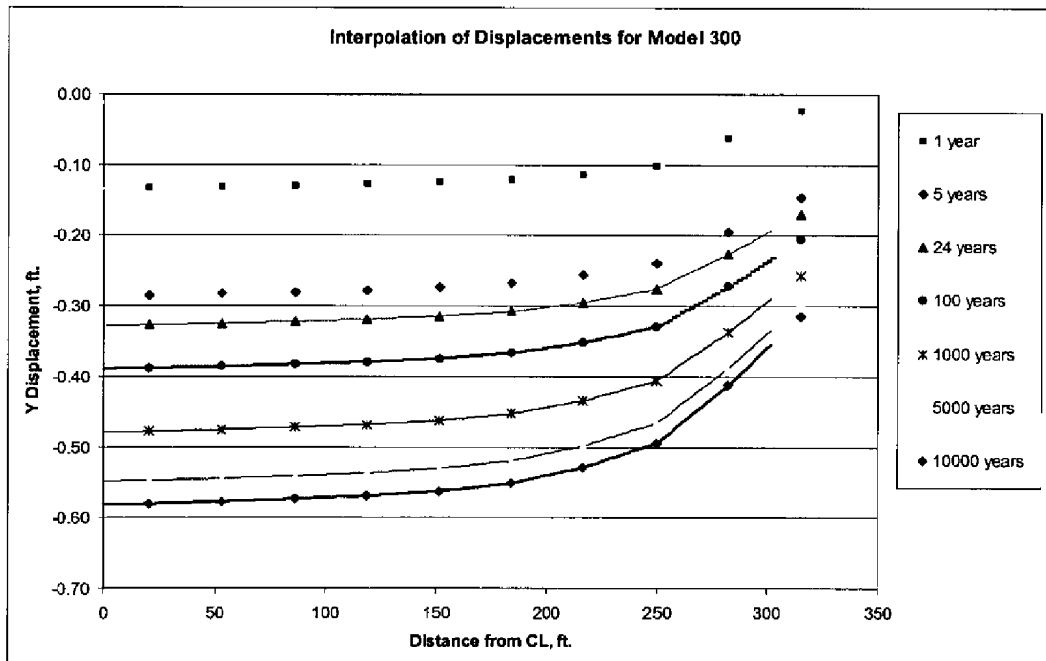


Figure 8. Settlements for Vault 4 from Axisymmetric Model. Symbols show model results and the connecting lines are interpolations for application to the structural model.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 18	Rev. 0
----------------------------------	-----------------	-----------

5.2 Structural Analysis

The results of the structural analysis are given in Appendix E. The plots shown indicate the formation of a cracks by the relative displacements between pairs of nodes on each end or surface of the non-linear elements.

A typical plot is shown in Figure 7. The plots are produced by exporting the ANSYS displacement results into EXCEL and plotting the relative displacements between the pairs of nodes associated with the construction joint locations and the saltstone-concrete interfaces. Appendix E shows results for the parameters listed in Table 1. Each parameter is varied independently while the others are held at their mean values.

5.3 Statistical Analysis

The results of the statistical analysis are shown in Figures 9 and 10. These figures represent the two types of cracks observed. The relationship of crack area and width and length is given Table 2.

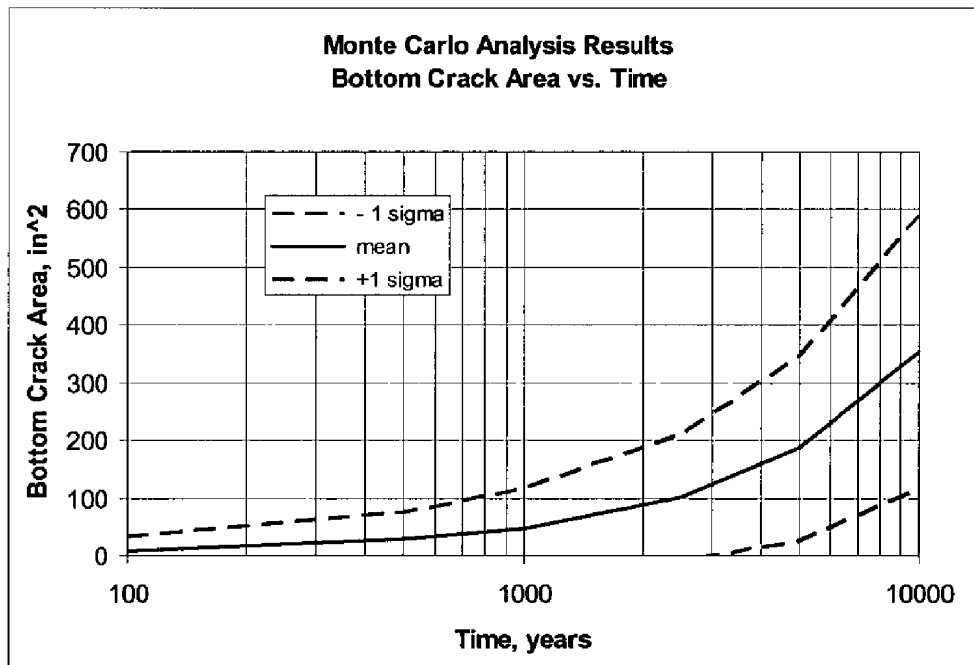


Figure 9. Cracks Open at Bottom

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 19	Rev. 0
----------------------------------	-----------------	-----------

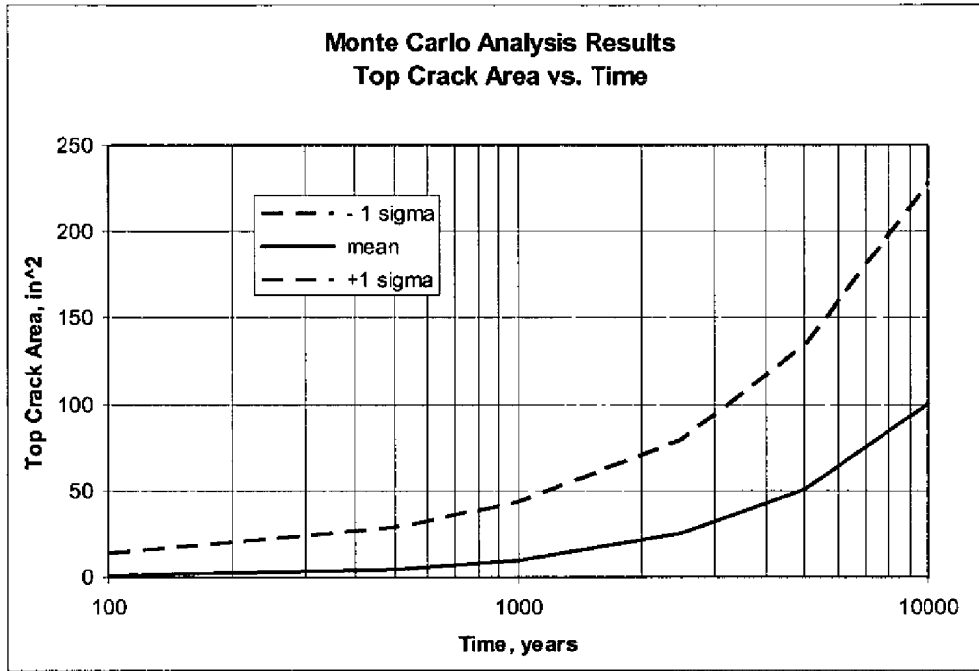


Figure 10. Cracks Open at Top

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 20	Rev. 0
----------------------------------	-----------------	-----------

Table 2. Summary of crack areas and sizes for specific time intervals.

Cracks Open at Bottom

Time			Mean Crack Size		+1 sigma Crack Size	
	Mean	+1 sigma	Length ft.	Width in.	Length ft.	Width in.
100	8.48	33.02	24.30	0.06	25.74	0.21
500	27.39	75.60	25.42	0.18	27.00	0.47
1000	47.87	116.88	26.54	0.30	27.00	0.72
2500	101.50	211.98	27.00	0.63	27.00	1.31
5000	186.53	347.05	27.00	1.15	27.00	2.14
10000	353.26	588.72	27.00	2.18	27.00	3.63

Cracks Open at Top

Time			Mean Crack Size		+1 sigma Crack Size	
	Mean	+1 sigma	Length ft.	Width in.	Length ft.	Width in.
100	1.14	14.02	27	0.01	27	0.09
500	4.70	28.80	27	0.03	27	0.18
1000	10.00	43.86	27	0.06	27	0.27
2500	25.21	79.94	27	0.16	27	0.49
5000	50.78	133.98	27	0.31	27	0.83
10000	100.55	227.80	27	0.62	27	1.41

Calculation Continuation Sheet

Calculation No.	Sheet No.	Rev.
T-CLC-Z-00006	21	0

6 CONCLUSIONS

The results of the analysis predict the vault cracking over time as required by the calculation objective. The statistics provide the standard deviation and 95% confidence level for use in the flow net analysis and overall probabilistic evaluation of vault performance. The results are slightly biased towards a conservative estimate of crack size.

7 REFERENCES

- 7.1 K-CLC-Z-00001, "Liquefaction Potential for Saltstone Disposal Facility Vault No. 4", 8/22/2002.
- 7.2 K-CLC-H-00154, "Differential Settlement for CLWR-TEF Product Transfer Trench", Feb. 2000.
- 7.3 WSRC-TR-00072, Rev. 0, "Geotechnical Assessment Report for Defense Waste Processing Facility", February, 1995.
- 7.4 K-CLC-G-00060, Rev. 0, "General SRS Strain Compatible Soil Properties for 1886 Charleston Earthquake", October 1998.
- 7.5 K-CLC-H-00134, "Application of SRS Site-wide PC-3 Spectra to the Tritium Extraction Facility", June, 1998.
- 7.6 K-ESR-S-00002, Rev. 0, "Settlement of Defense Waste Processing Facility Vitrification Building", September 1998.
- 7.7 Memorandum FSS-GED-2003-00005, "Geotechnical Input for Saltstone Vault No. 4 Structural Analysis", May 1, 2003.

Calculation Continuation Sheet

Calculation No.	Sheet No.	Rev.
T-CLC-Z-00006	22	0

8 BODY OF CALCULATION

8.1 **8.1 2-D Axisymmetric Soil Model**

The first model uses information from SGS to determine static settlements of the soil beneath the vault. The SGS data in Appendix B forms the basis for the model properties. An ANSYS 2-d axisymmetric model is used.

Initial Elastic Properties for Soil Column

$$v(h) := \begin{cases} 0.31 & \text{if } h \leq 25\text{ft} \\ \left[-\left(\frac{0.07}{550}\right) \cdot \frac{h}{\text{ft}} + 0.49 \right] & \text{if } 25\text{ft} < h \leq 550\text{ft} \\ \left[-\left(\frac{0.02}{550}\right) \cdot \frac{h}{\text{ft}} + 0.44 \right] & \text{if } h > 550\text{ft} \end{cases}$$

$$\gamma(h) := (0.0131 \cdot h + 120 \cdot \text{ft}) \text{lb} \cdot \text{ft}^{-4} \quad \rho(h) := \frac{\gamma(h)}{g}$$

$$G(v_s, h) := \frac{v_s^2 \cdot \gamma(h)}{g} \quad R := 0.10 \quad \text{Static modulus reduction factor (Massarach, 2002)}$$

$$E(v_s, h) := R \cdot G(v_s, h) \cdot 2 \cdot (1 + v(h))$$

pcf := lb·ft⁻³

kip := 1000lb

ksi := kip·in⁻²

ksf := kip·ft⁻²

kcf := kip·ft⁻³

fps := ft·sec⁻¹

tsf := ton·ft⁻²

psi := lb·in⁻²

h₀ := 270ft

year := 365.25·day

γ_c := 0.15kcf

γ_s := 0.12kcf

γ_g := 0.1061kcf

Layer 1 250 ft msl to 270 ft.

h₁ := 270ft v_s := 1200 $\frac{\text{ft}}{\text{sec}}$

h₂ := 250ft

h := h₀ - $\frac{h_1 + h_2}{2}$ h = 10ft

G(v_s, h) = 5.377 × 10³ ksf

v(h) = 0.31

E(v_s, h) = 1.409 × 10³ ksf

γ(h) = 120.131 pcf

ρ(h) = 3.734 × 10⁻³ $\frac{\text{kip} \cdot \text{sec}^2}{\text{ft}^4}$

Layer 2 230 ft msl to 250 ft.

h₁ := 250ft v_s := 1100 $\frac{\text{ft}}{\text{sec}}$

h₂ := 230ft

h := h₀ - $\frac{h_1 + h_2}{2}$ h = 30ft

G(v_s, h) = 4.528 × 10³ ksf

v(h) = 0.486

E(v_s, h) = 1.346 × 10³ ksf

γ(h) = 120.393 pcf

ρ(h) = 3.742 × 10⁻³ $\frac{\text{kip} \cdot \text{sec}^2}{\text{ft}^4}$

Layer 3 190 ft msl to 230 ft.

$$h_1 := 230\text{ft} \quad v_s := 900 \frac{\text{ft}}{\text{sec}}$$

$$h_2 := 190\text{ft}$$

$$h := h_0 - \frac{h_1 + h_2}{2} \quad h = 60\text{ft}$$

$$G(v_s, h) = 3.041 \times 10^3 \text{ksf}$$

$$v(h) = 0.482$$

$$E(v_s, h) = 901.532 \text{ksf}$$

$$\gamma(h) = 120.786 \text{pcf} \quad \rho(h) = 3.754 \times 10^{-3} \frac{\text{kip}\cdot\text{sec}^2}{\text{ft}^4}$$

Layer 4 140 ft msl to 190 ft.

$$h_1 := 190\text{ft} \quad v_s := 1400 \frac{\text{ft}}{\text{sec}}$$

$$h_2 := 140\text{ft}$$

$$h := h_0 - \frac{h_1 + h_2}{2} \quad h = 105\text{ft}$$

$$G(v_s, h) = 7.394 \times 10^3 \text{ksf}$$

$$v(h) = 0.477$$

$$E(v_s, h) = 2.184 \times 10^3 \text{ksf}$$

$$\gamma(h) = 121.376 \text{pcf} \quad \rho(h) = 3.772 \times 10^{-3} \frac{\text{kip}\cdot\text{sec}^2}{\text{ft}^4}$$

Layer 5 20ft msl to 140 ft.

$$h_1 := 140\text{ft} \quad h_2 := 20\text{ft} \quad h := h_0 - \frac{h_1 + h_2}{2} \quad h = 190\text{ft}$$

$$h_{\text{top}} := h_0 - h_1 \quad h_{\text{bot}} := h_0 + 100\text{ft} \quad h_{\text{top}} = 130\text{ft} \quad h_{\text{bot}} = 370\text{ft}$$

$$v_s := \frac{h - h_{\text{top}}}{h_{\text{bot}} - h_{\text{top}}} \cdot (2000\text{fps} - 1600\text{fps}) + 1600\text{fps} \quad v_s = 1.7 \times 10^3 \text{fps}$$

$$G(v_s, h) = 1.1 \times 10^4 \text{ksf}$$

$$v(h) = 0.466$$

$$E(v_s, h) = 3.226 \times 10^3 \text{ksf}$$

$$\gamma(h) = 122.489 \text{pcf} \quad \rho(h) = 3.807 \times 10^{-3} \frac{\text{kip}\cdot\text{sec}^2}{\text{ft}^4}$$

Layer 6 -100 ft msl to 20 ft.

$$h_1 := 20\text{ft} \quad v_s := 2000 \frac{\text{ft}}{\text{sec}}$$

$$h_2 := -100\text{ft}$$

$$h := h_0 - \frac{h_1 + h_2}{2} \quad h = 310\text{ft}$$

$$G(v_s, h) = 1.542 \times 10^4 \text{ksf}$$

$$v(h) = 0.451$$

$$E(v_s, h) = 4.475 \times 10^3 \text{ksf}$$

$$\gamma(h) = 124.061 \text{pcf} \quad \rho(h) = 3.856 \times 10^{-3} \frac{\text{kip}\cdot\text{sec}^2}{\text{ft}^4}$$

Layer 7 -300 ft msl to -100 ft.

$$h_1 := -100\text{ft} \quad v_s := 0.25(2700\text{fps} - 2000\text{fps}) + 2000\text{fps} \quad v_s = 2.175 \times 10^3 \text{ fps}$$

$$h_2 := -300\text{ft}$$

$$h := h_0 - \frac{h_1 + h_2}{2} \quad h = 470 \text{ ft}$$

$$G(v_s, h) = 1.855 \times 10^4 \text{ ksf}$$

$$v(h) = 0.43$$

$$E(v_s, h) = 5.306 \times 10^3 \text{ ksf}$$

$$\gamma(h) = 126.157 \text{ pcf}$$

$$\rho(h) = 3.921 \times 10^{-3} \frac{\text{kip}\cdot\text{sec}^2}{\text{ft}^4}$$

Layer 8 -500 ft msl to -300 ft.

$$h_1 := -300\text{ft}$$

$$h_2 := -500\text{ft}$$

$$v_s := 0.75(2700\text{fps} - 2000\text{fps}) + 2000\text{fps} \quad v_s = 2.525 \times 10^3 \text{ fps}$$

$$h := h_0 - \frac{h_1 + h_2}{2} \quad h = 670 \text{ ft}$$

$$G(v_s, h) = 2.552 \times 10^4 \text{ ksf}$$

$$v(h) = 0.416$$

$$E(v_s, h) = 7.225 \times 10^3 \text{ ksf}$$

$$\gamma(h) = 128.777 \text{ pcf}$$

$$\rho(h) = 4.003 \times 10^{-3} \frac{\text{kip}\cdot\text{sec}^2}{\text{ft}^4}$$

Layer 9 -500 ft msl to -700 ft.

$$h_1 := -500\text{ft}$$

$$h_2 := -700\text{ft}$$

$$v_s := 2700 \frac{\text{ft}}{\text{sec}}$$

$$h := h_0 - \frac{h_1 + h_2}{2} \quad h = 870 \text{ ft}$$

$$G(v_s, h) = 2.977 \times 10^4 \text{ ksf}$$

$$v(h) = 0.408$$

$$E(v_s, h) = 8.386 \times 10^3 \text{ ksf}$$

$$\gamma(h) = 131.397 \text{ pcf}$$

$$\rho(h) = 4.084 \times 10^{-3} \frac{\text{kip}\cdot\text{sec}^2}{\text{ft}^4}$$

Equivalent Load for Axisymmetric Model

DWPF Load per WSRC-TR-00072

$$w_0 := 2.7 \text{ tsf}$$

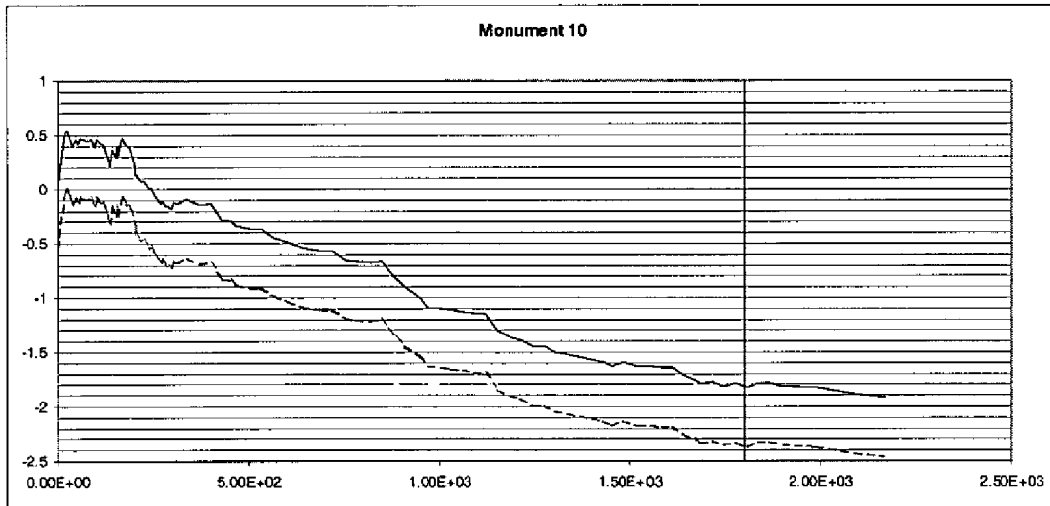
$$w_0 = 5.4 \text{ ksf}$$

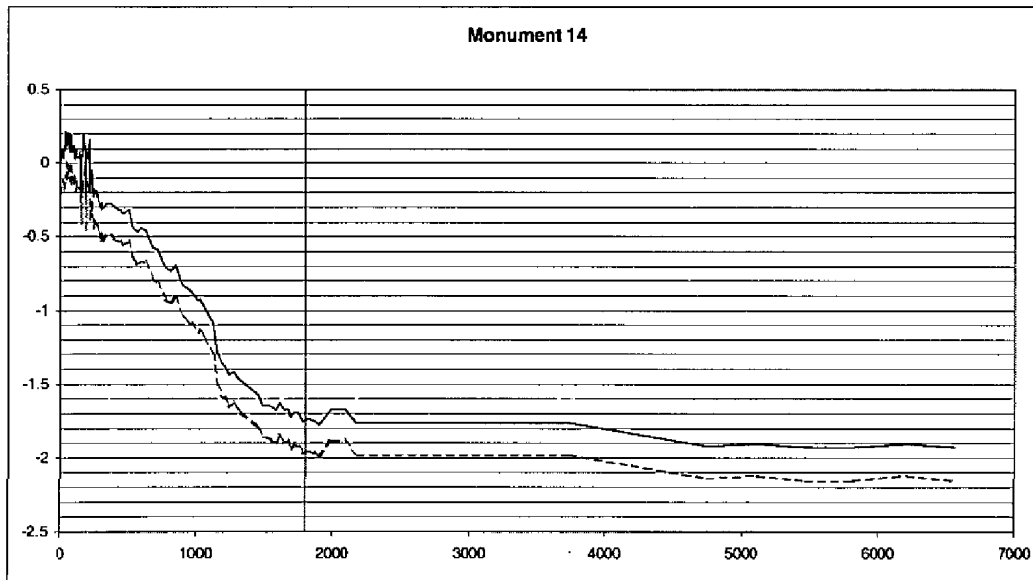
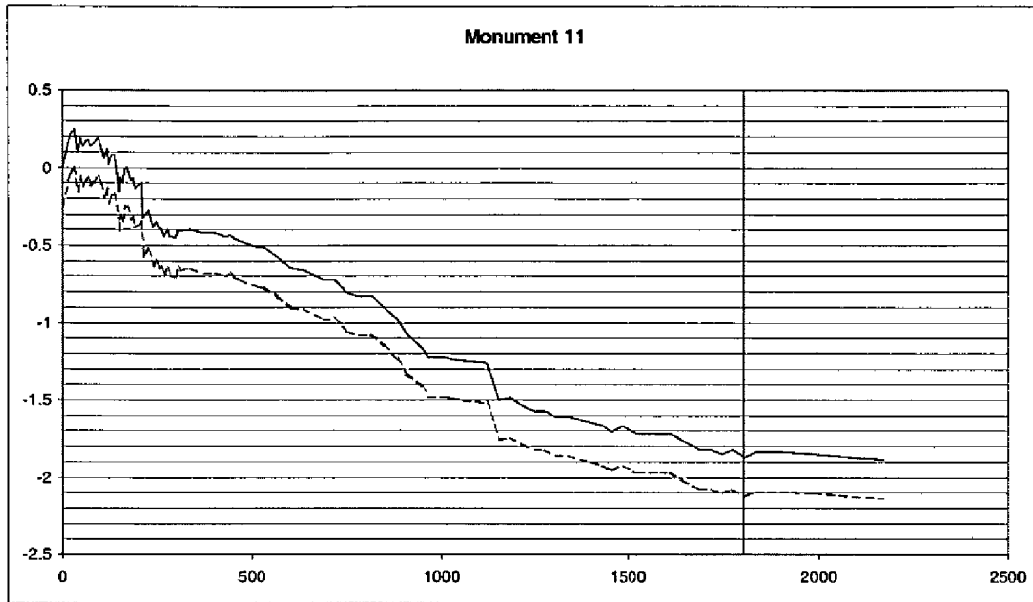
Settlement Data

Estimate of Load

Date	Days	Load, tsf
5/2/1984	0	0
1/1/1985	346	0.5
1/1/1988	1341	2.7

Use 1800 days to estimate elastic response. Monument records for 10,11, and 14 are relevant for this period. Correct readings for initial heave.



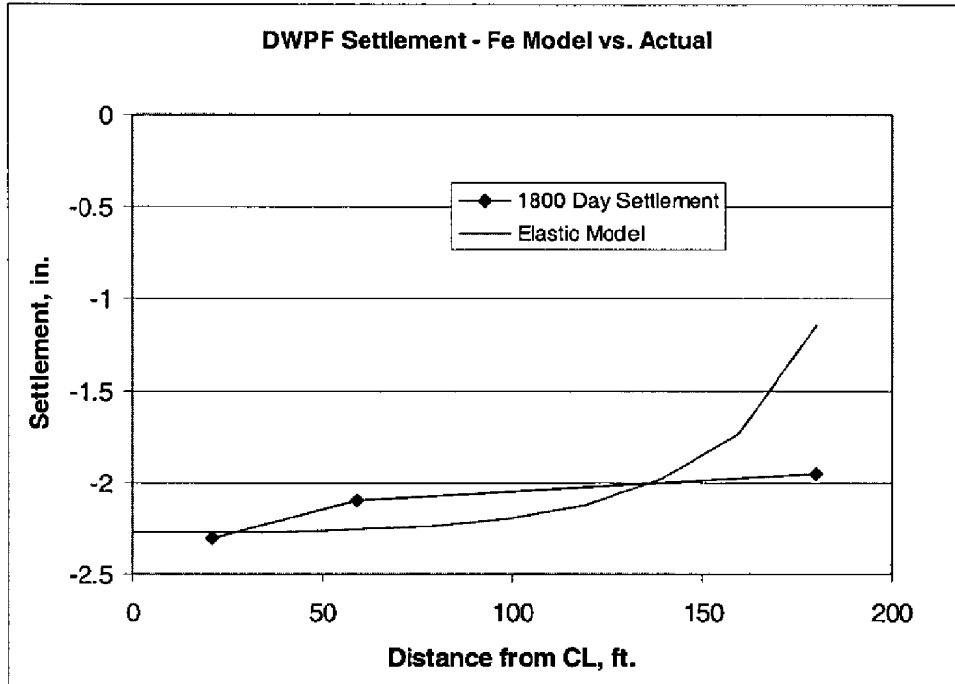


Elastic Settlement at 1800 days			
Monument	Distance	Net Settlement	
	ft	in	
10	21	-2.3	
11	59	-2.1	
14	180	-1.95	

Elastic Model

First run ANSYS model in linear elastic static mode to find best properties for initial (1800 day) settlement. Use $E=C1/k$ and Poisson's ratio from geotech report.

Results from elastic model with $k=4$:



Model name "ssv7.db"

Inelastic (Creep) Model

Long Term Settlement - from EXCEL

Average 14 and 26	a := -0.2959·in
Intercept 2.214565	b := 2.2146in
Slope -0.2959	

Calculate initial creep coefficients:

$$\delta_y(t) := a \cdot \ln(t) + b$$

$$t_1 := 10\text{year} \quad t := \frac{t_1}{\text{day}} \quad t = 3.652 \times 10^3$$

$$\delta_y(t) = -0.213 \text{ in}$$

$$t_1 := 1000\text{year} \quad t := \frac{t_1}{\text{day}} \quad t = 3.652 \times 10^5$$

$$\delta_y(t) = -1.575 \text{ in}$$

$$t_1 := 10000\text{year} \quad t := \frac{t_1}{\text{day}} \quad t = 3.652 \times 10^6$$

$$\delta_y(t) = -2.257 \text{ in}$$

Average Stress

$$\sigma := 2\text{ksf}$$

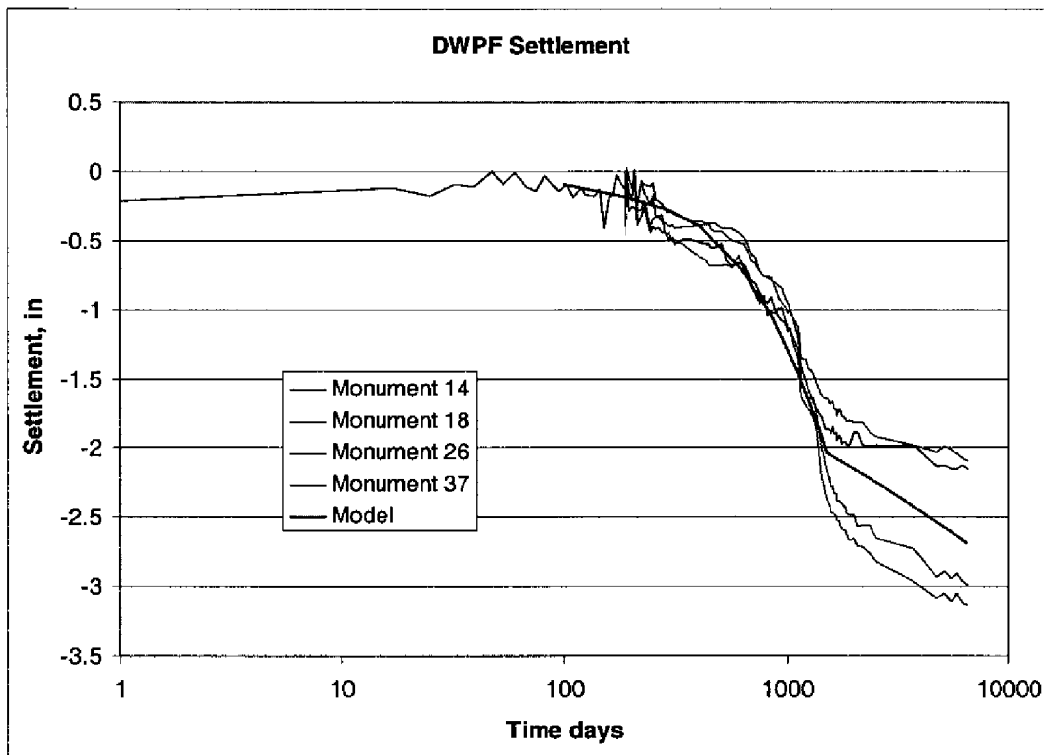
$$C_1 := \frac{a}{L \cdot \sigma}$$

$$C_1 = \begin{pmatrix} -6.165 \times 10^{-4} \\ -6.165 \times 10^{-4} \\ -6.165 \times 10^{-4} \\ -4.932 \times 10^{-4} \\ -3.082 \times 10^{-4} \\ -2.055 \times 10^{-4} \\ -1.233 \times 10^{-4} \\ -6.165 \times 10^{-5} \\ -6.165 \times 10^{-5} \end{pmatrix} \frac{\text{ft}^2}{\text{kip}} \quad L := \begin{pmatrix} 20 \\ 20 \\ 20 \\ 25 \\ 40 \\ 60 \\ 100 \\ 200 \\ 200 \end{pmatrix} \text{ft}$$

ANSYS Kinematic time hardening model 2: $d\epsilon_{cr}/dt = C_1\sigma^{C_2}t^{C_3}e^{-C_4/T}$

Try combinations of C1, C2 and C3 to fit data. C4 = 0 since temperature is not a variable.
Also modify k for elastic modulus. C3 = -1.0 per Site Geotechnical Services.

Results for Node 9



ANSYS File "ssv7pprop"

Calculation Sheet

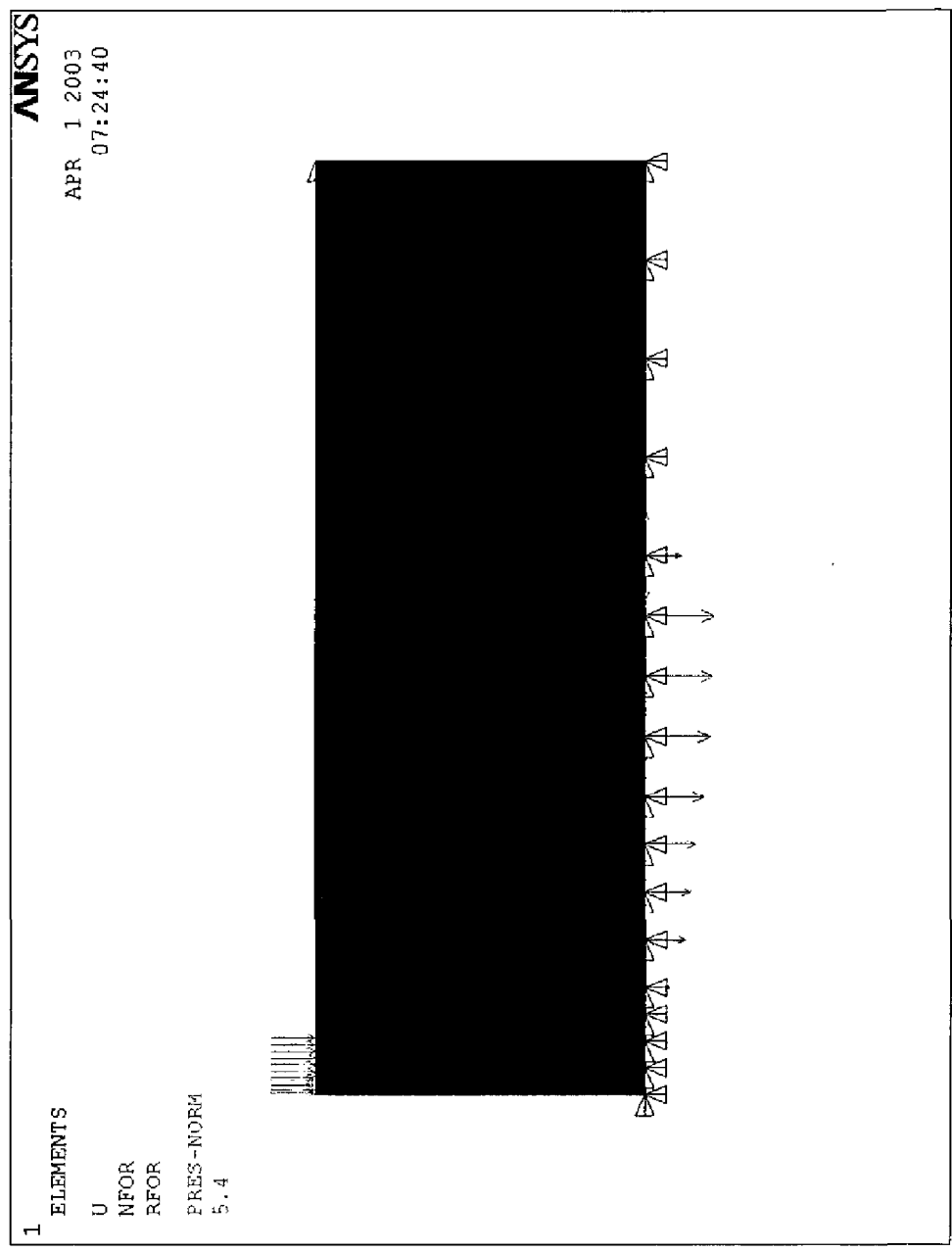
SRS	Project <i>See Cover</i>					Calculation No. <i>T-CLL-2-0006</i>				
	Subject " "					Sheet No. <i>31</i>				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
<i>0</i>	<i>WLP</i>	<i>7/9/03</i>	<i>[Signature]</i>	<i>7/10/03</i>						

CASE E0 - DWPF Elastic

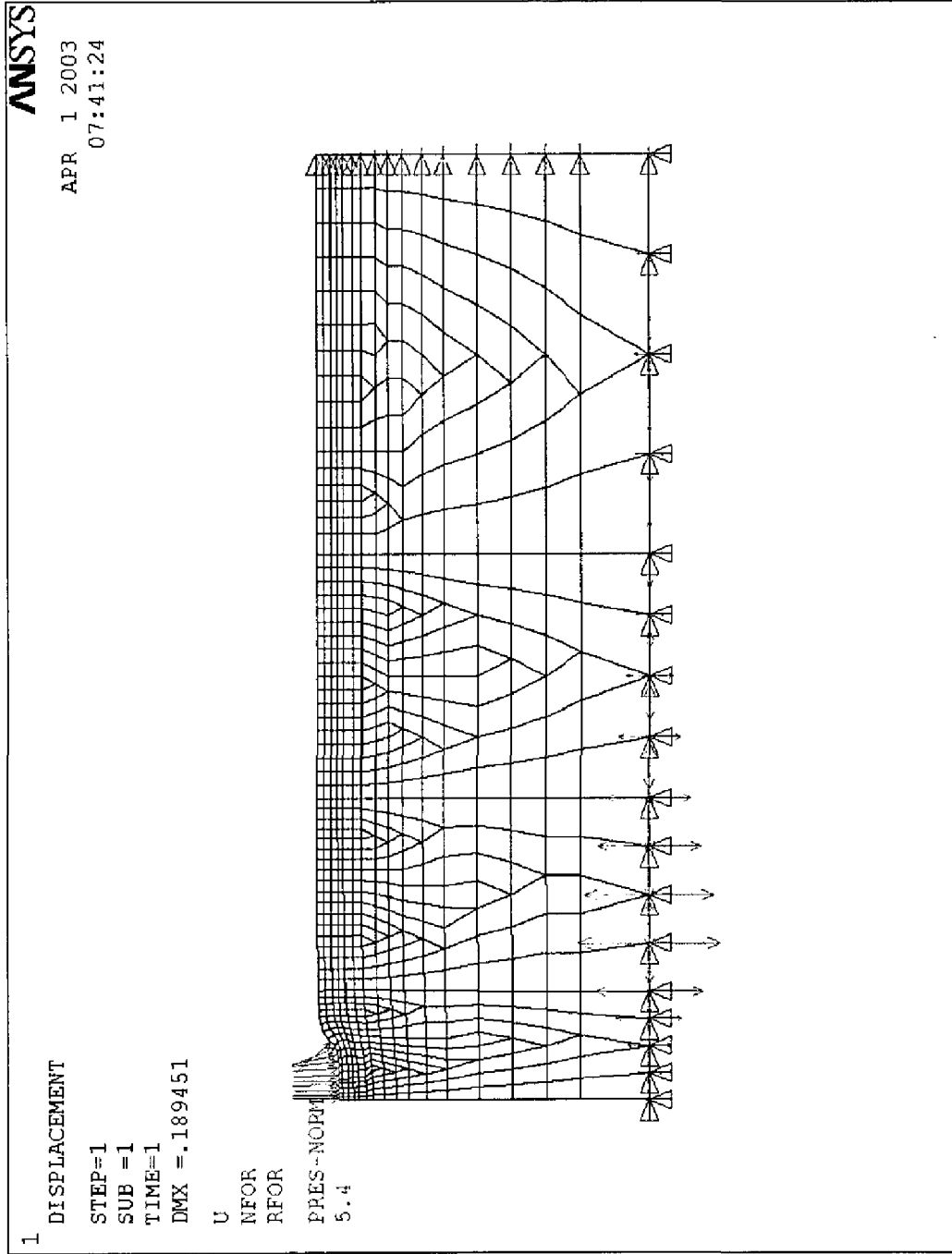
File SSV 70

2D - Axisymmetric

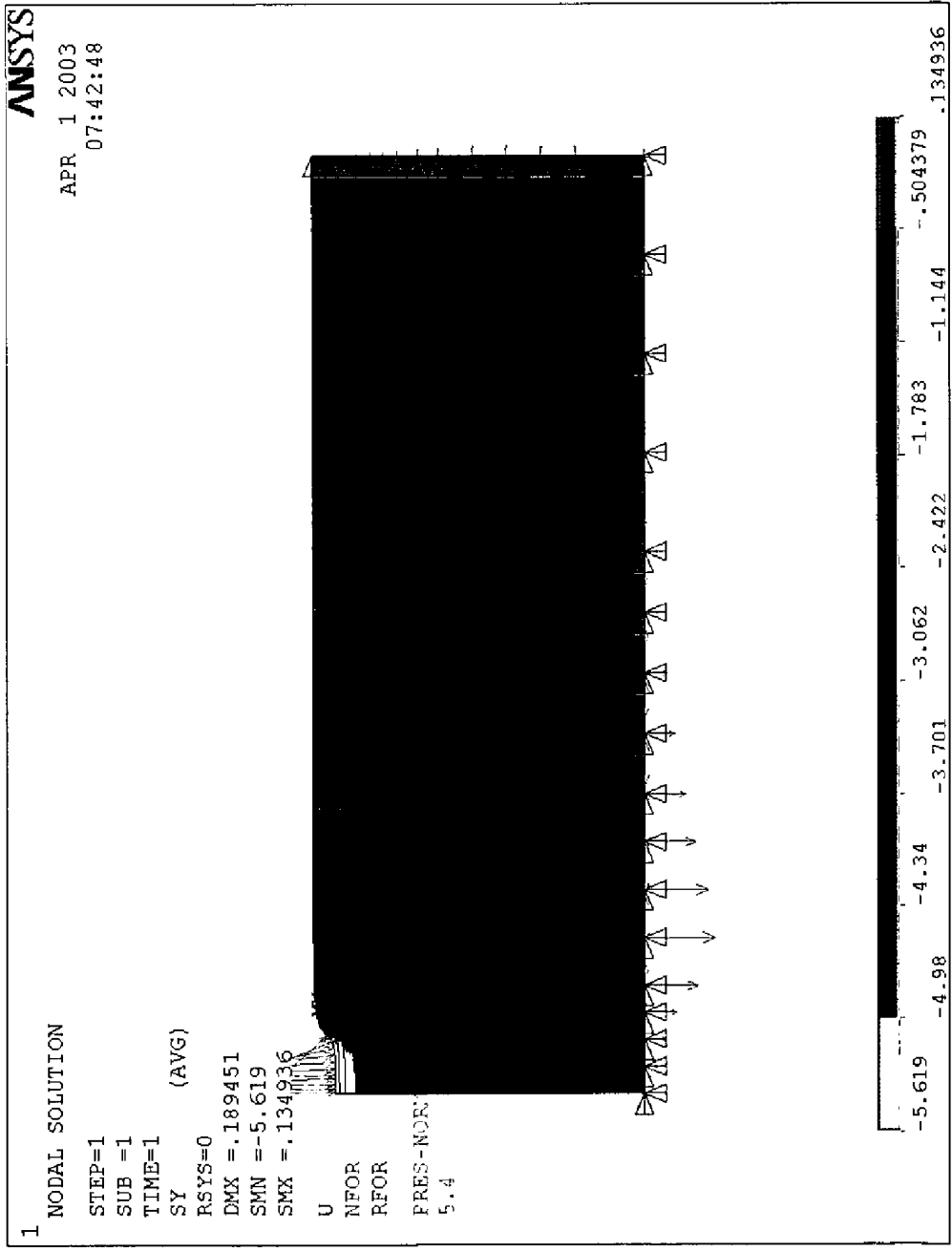
Model 1 - 2d Axisymmetric - DWPF Loads Case E0 - Applied Loads



Model 1 - 2d Axisymmetric - DWPF Loads
Case E0 - Elastic Deformation



Model 1 - 2D Axisymmetric - DWPF Loads
 Case E0 - Vertical Stress σ_y



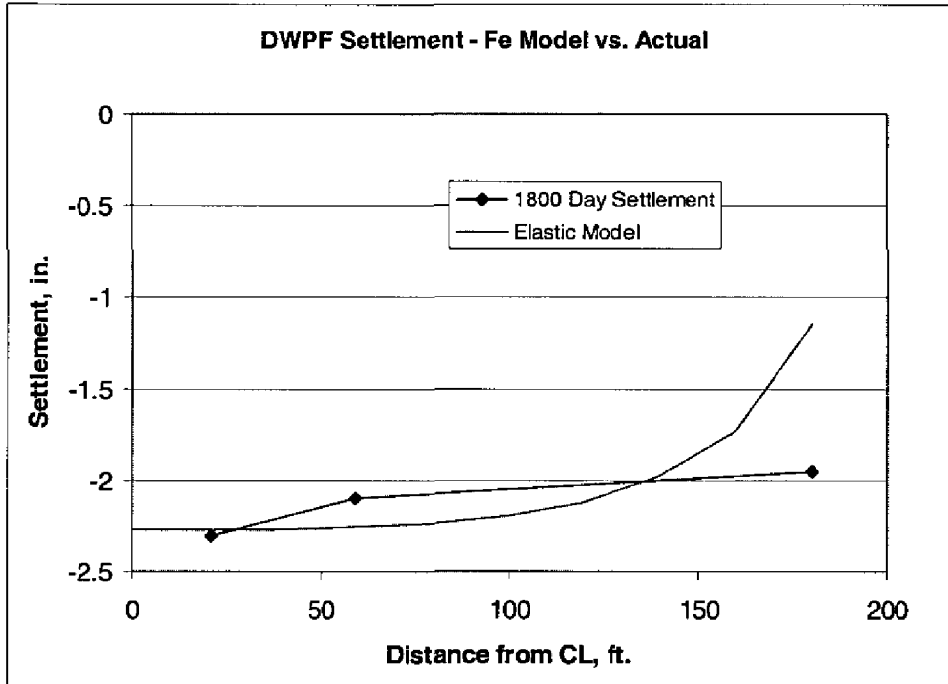
Units - kips, feet

T-CK-2-00006, Rev. 0

Elastic Model

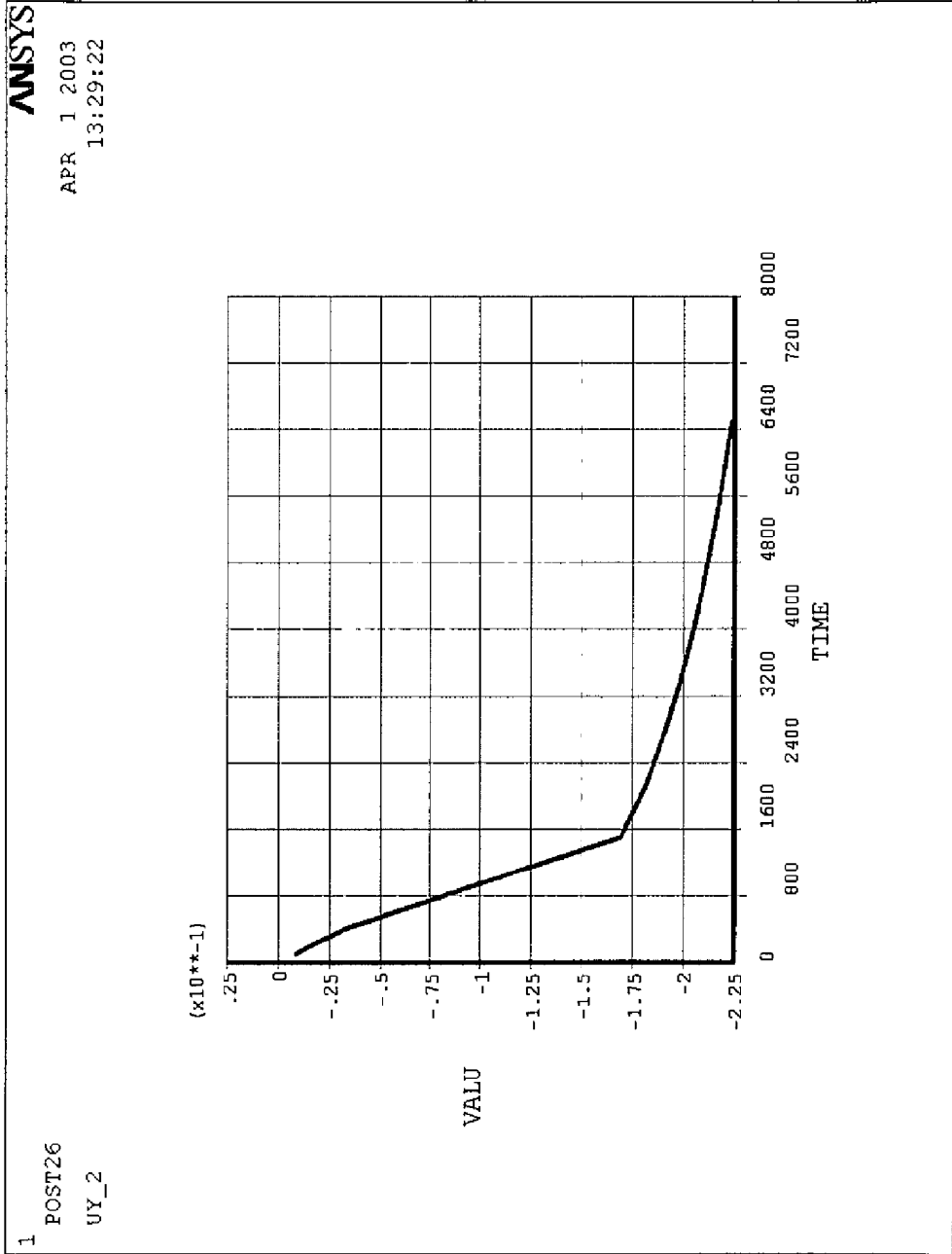
First run ANSYS model in linear elastic static mode to find best properties for initial (1800 day) settlement. Use $E=C1/k$ and Poisson's ratio from geotech report.

Results from elastic model with $k=4$:

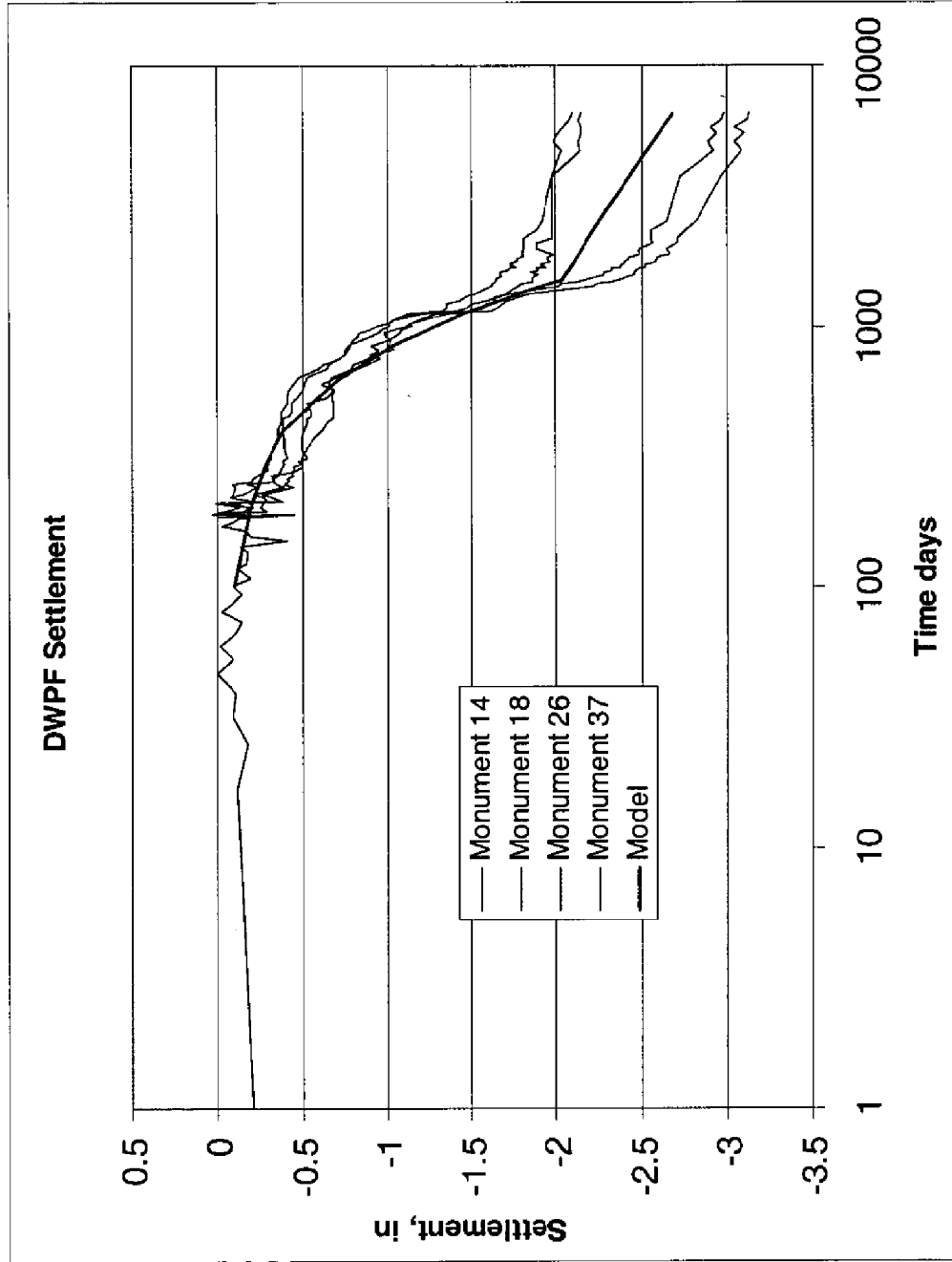


Model name "ssv7.db"

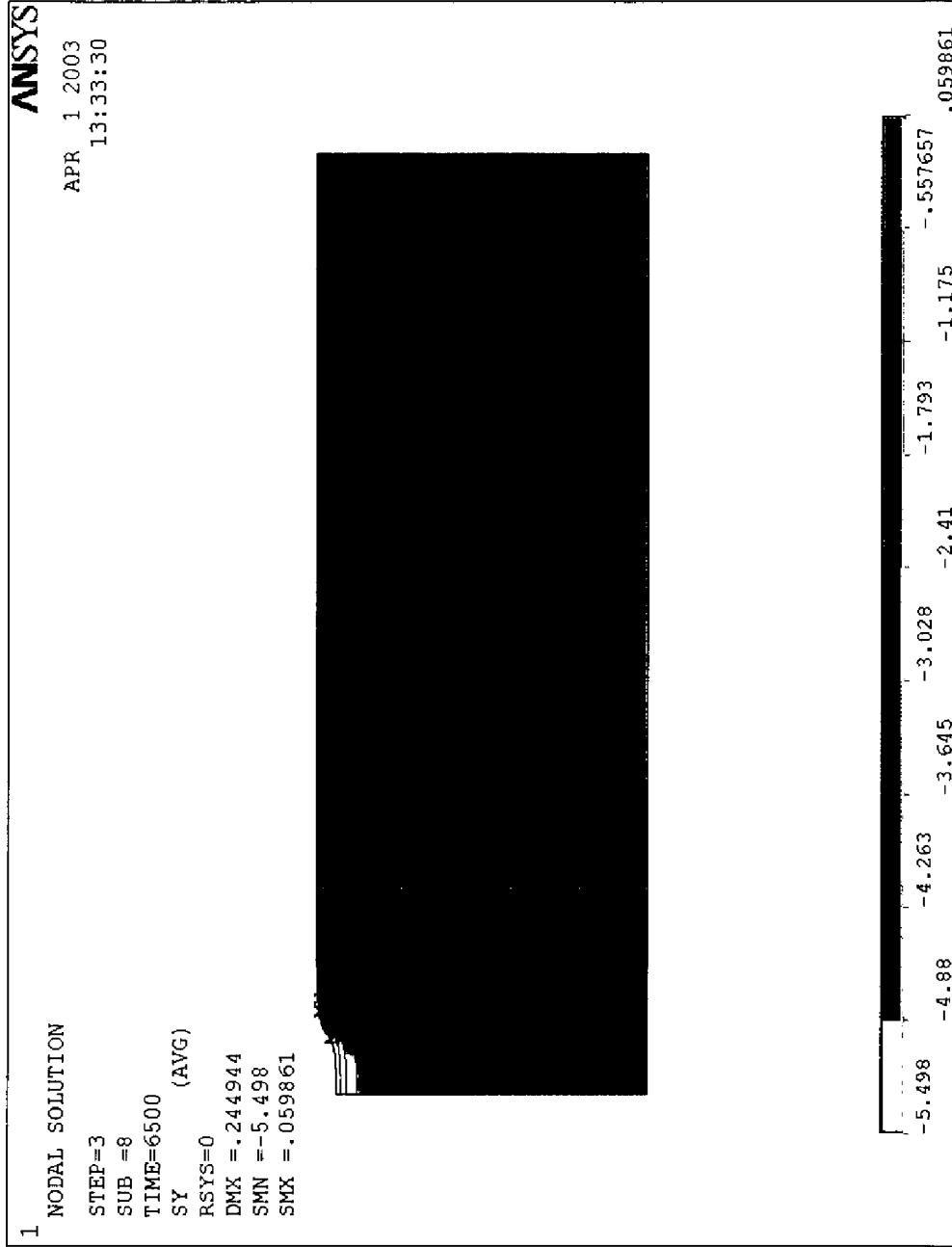
Model 1 - 2D Axisymmetric Creep
Case P0 - DWPF Loads
Settlement at Node 9



Model 1 - 2D Axisymmetric Creep
Case P0 - DWPF Loads
Settlement at Node 9



Model 1 - 2D Axisymmetric Creep - DWPF Loads Stress σ_y at 6500 Days



Calculation Sheet



Project <i>See Cover</i>					Calculation No. <i>T-CLL-2+00006</i>				
Subject <i>v v</i>					Sheet No. <i>39</i>				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
<i>0</i>	<i>wzp</i>	<i>7/9/03</i>	<i>[Signature]</i>	<i>7/10/03</i>					

Case P1 2D AXISYMMETRIC
 Loading - All vaults exc. 13, 14, 15
 Tapered Load
 file ssv70

Calculation Sheet

SRS	Project <i>See Cover</i>		Calculation No. <i>T-CLL-E-00006</i>						
	Subject <i>" "</i>		Sheet No. <i>40</i>						
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
<i>0</i>	<i>wrp</i>	<i>7/9/03</i>	<i>[Signature]</i>	<i>7/10/03</i>					

Load application to model

Step 1 apply a small load to start convergence

*Step 2 apply the vault & load over one
year - weight only
 $w = 3.19$ ksf uniform*

Step 3 apply final load over 5 years.

Step 4 allow to creep over 10,000 years

Model 55V7

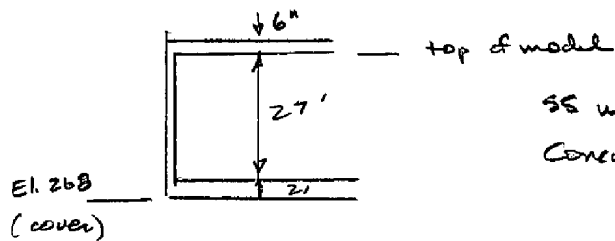
file load 55V7.pl

Calculation Sheet

SRS	Project <i>See Cover</i>						Calculation No. <i>T-LLC-Z-00006</i>		
	Subject <i>u u</i>						Sheet No. <i>41</i>		
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
<i>0</i>	<i>WLP</i>	<i>7/9/03</i>	<i>[Signature]</i>	<i>7/10/03</i>					

cover weight calculation

Top of model - El. 298' for cover calc.



SS weight = 106 pcf

Concrete = 150 pcf

W concrete (200 x 300')

$$w = 0.15 \left[(2)(301.5)(201.5) + 3(301.5)(1.5)(27) + 6(98.5)(27)(1.5) \right]$$

$$w = 27310 \text{ lb}$$

$$p_c = 0.450 \text{ lb/ft}^2$$

saltstone

$$w = 0.106(27)(6)(98.5)^2 = 166,607 \text{ lb}$$

$$p_{ss} = 2.74 \text{ lb/ft}^2$$

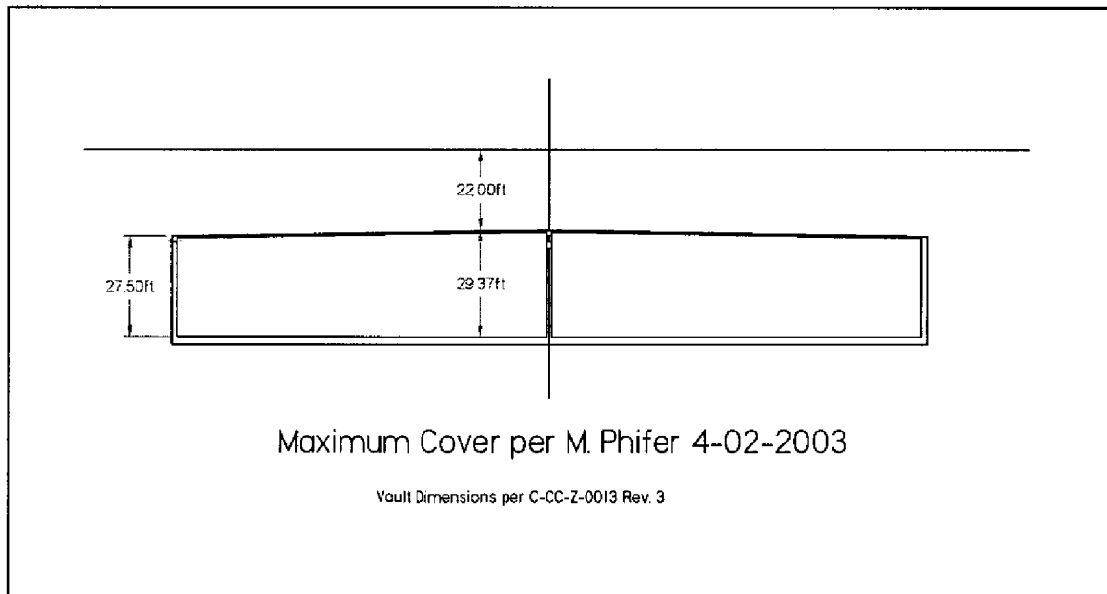
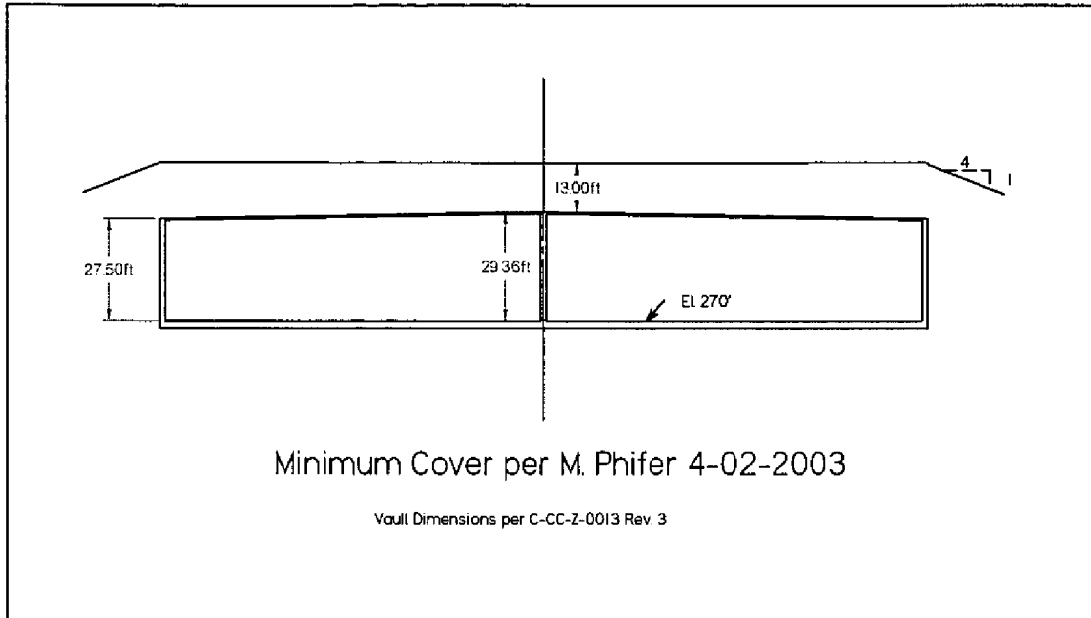
Assume wt of roof and sloped concrete fill is covered in soil weight of 120 pcf.

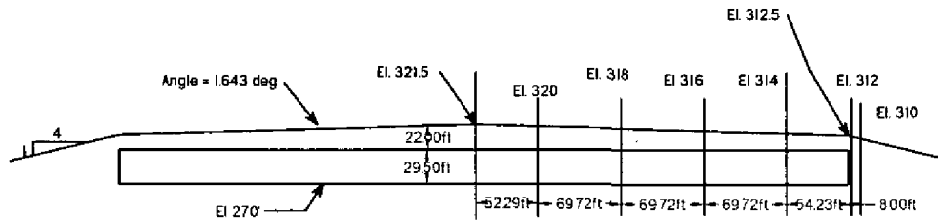
calculate cover weight based on top elev. of 295'

$$p = (\text{Surface el} - 295)(0.12 \text{ pcf})$$

Cover weight shown on contour plot

Effect of Sloping Cover - Axisymmetric Load Case





Cover - Longitudinal Section at CL

Similar to Case 3 (All vaults except 13, 14, and 15)

Apply Loads to 2D Axisymmetric Model and resulting displacements to Model 3 - 3D Structural Model.

Crack Criteria

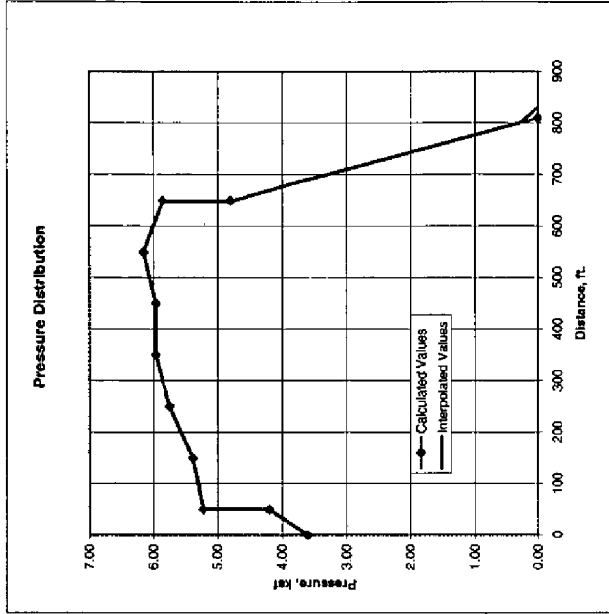
$$f_{tc} = 45.537 \text{ ksf} \quad \epsilon_{tc} := \frac{f_{tc}}{E_c} \quad \epsilon_{tc} = 8.696 \times 10^{-5}$$

$$f_{tg} = 16.1 \text{ ksf} \quad \epsilon_{tg} := \frac{f_{tg}}{E_g} \quad \epsilon_{tg} = 7.861 \times 10^{-5}$$

Pressure from Weight of Vault Model
prw 3.19

Results	Distance	Pressure	Pressure	Node
		Wt. Inc.	Wt. Inc.	
	0	3.6	3.60	
	50	4.2	4.20	
	50	2.04	5.23	
	150	2.20	5.39	
	250	2.66	5.75	
	350	2.78	5.97	
	450	2.78	5.97	
	550	2.96	6.15	
	650	2.67	5.86	
	810	4.80	4.80	
		0.00	0.00	

Element	Nodes	Distance	Pressure
1	1	1	0
2	2	10	3.72
3	3	21	3.85
4	4	35.5	4.03
5	5	50	4.20
6	6	50	5.23
7	7	59	5.24
8	8	79.1666667	5.28
9	9	89.3333333	5.31
10	10	119.5	5.34
11	11	138.666667	5.37
12	12	159.833333	5.42
13	13	180	5.49
14	14	200	5.57
15	15	220	5.64
16	16	240	5.71
17	17	260	5.77
18	18	280	5.81
19	19	300	5.86
20	20	320	5.90
21	21	352.7273	5.97
22	22	395.4545	5.97
23	23	418.1818	5.97
24	24	450.9091	5.97
25	25	483.6364	6.03
26	26	516.3636	6.08
27	27	549.0909	6.15
28	28	581.8182	6.06
29	29	614.5455	5.96
30	30	647.2727	5.87
31	31	680	4.80
32	32	710	3.00
33	33	740	2.10
34	34	770	1.20
35	35	800	0.30
		830	0.00



Element	Nodes
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42

Element	Nodes
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97

ssv7p1loads.txt

```

ANTYPE,0
OUTRES,ALL,ALL
RATE,1
SFEDELE,ALL,ALL,ALL
NSUBST,1,1,1
TIME,10
FLST,2,24,2,ORDE,4
FITEM,2,5
FITEM,2,-24
FITEM,2,26
FITEM,2,-29
/GO
!*
SFE,P51X,1,PRES, ,0.1, , ,
/STATUS,SOLU
SOLVE
NSUBST,12,24,12
TIME,364
FLST,2,24,2,ORDE,4
FITEM,2,5
FITEM,2,-24
FITEM,2,26
FITEM,2,-29
/GO
!*
SFE,P51X,1,PRES, ,3.19, , ,
/STATUS,SOLU
SOLVE
NSUBST,12,24,12
TIME,1825
SFE,1,1,PRES, ,7.3,6.68, ,
SFE,2,1,PRES, ,6.68,6.0, ,
SFE,3,1,PRES, ,6.0,5.1, ,
SFE,4,1,PRES, ,5.1,4.2, ,
SFE,5,1,PRES, ,5.23,5.24, ,
SFE,6,1,PRES, ,5.24,5.28, ,
SFE,7,1,PRES, ,5.28,5.31, ,
SFE,8,1,PRES, ,5.31,5.34, ,
SFE,9,1,PRES, ,5.34,5.37, ,
SFE,10,1,PRES, ,5.37,5.42, ,
SFE,11,1,PRES, ,5.42,5.49, ,
SFE,12,1,PRES, ,5.49,5.57, ,
SFE,13,1,PRES, ,5.57,5.64, ,
SFE,14,1,PRES, ,5.64,5.71, ,
SFE,15,1,PRES, ,5.71,5.77, ,
SFE,16,1,PRES, ,5.77,5.81, ,
SFE,17,1,PRES, ,5.81,5.86, ,
SFE,18,1,PRES, ,5.86,5.90, ,
SFE,19,1,PRES, ,5.90,5.97, ,
SFE,20,1,PRES, ,5.97, , ,
SFE,21,1,PRES, ,5.97, , ,
SFE,22,1,PRES, ,5.97, , ,
SFE,23,1,PRES, ,5.97,6.03, ,
SFE,24,1,PRES, ,6.03,6.09, ,
SFE,26,1,PRES, ,6.09,6.15, ,
SFE,27,1,PRES, ,6.15,6.06, ,
SFE,28,1,PRES, ,6.06,5.96, ,
SFE,29,1,PRES, ,5.96,5.87, ,
SFE,30,1,PRES, ,4.80,3.90, ,
SFE,31,1,PRES, ,3.90,3.00, ,
SFE,32,1,PRES, ,3.00,2.10, ,
SFE,33,1,PRES, ,2.10,1.20, ,
SFE,34,1,PRES, ,1.20,0.30, ,

```

Load application file for
Vault Loading

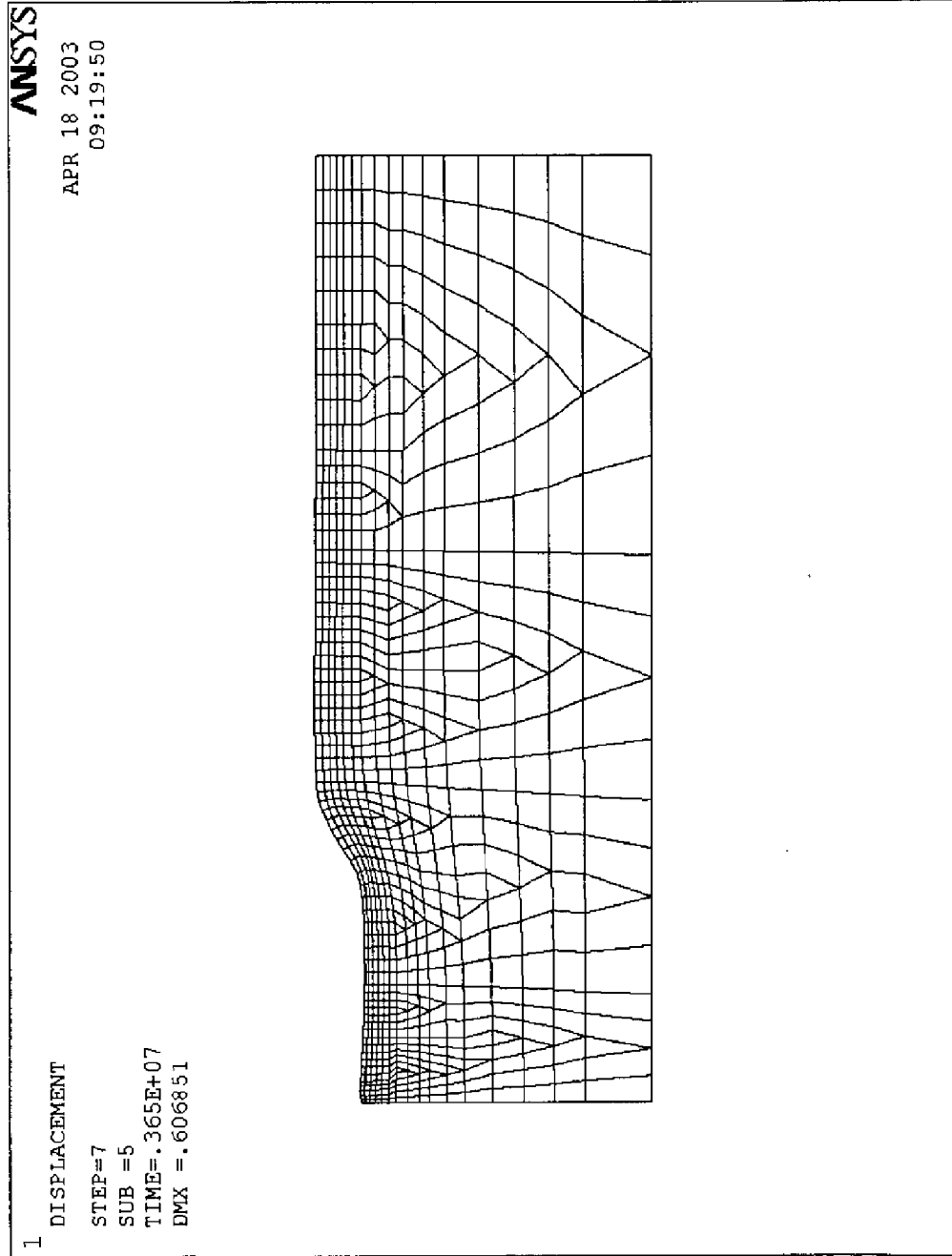
T-CLC-Z-00006, Rev. 0

49

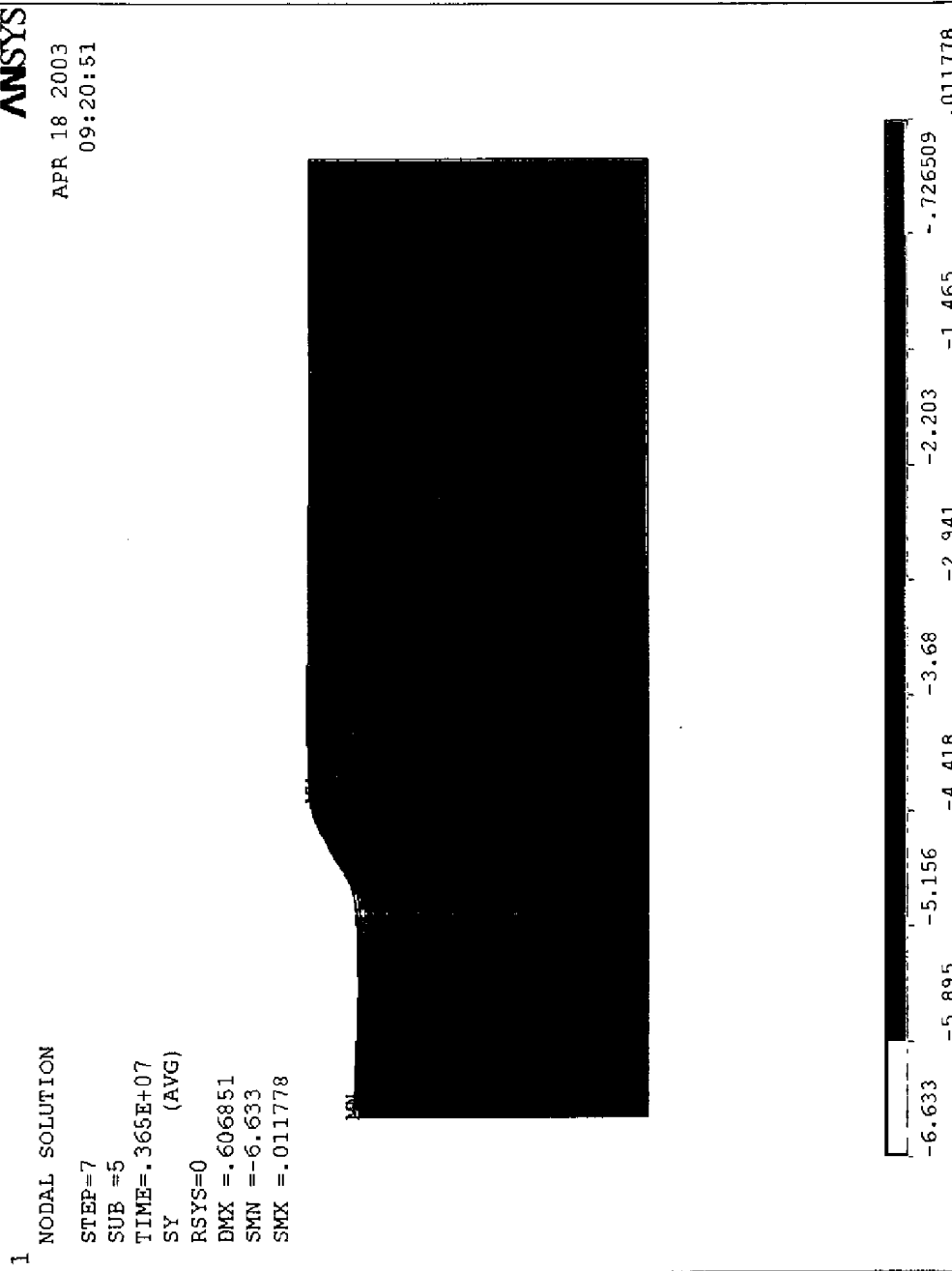
ssv7p1loads.txt

```
SFE,35,1,PRES, ,0.30,0.00, ,  
/STATUS,SOLU  
SOLVE  
NSUBST,5,20,5  
TIME,36525  
/STATUS,SOLU  
SOLVE  
NSUBST,5,20,5  
TIME,365250  
/STATUS,SOLU  
SOLVE  
NSUBST,5,20,5  
TIME,1.8263e6  
/STATUS,SOLU  
SOLVE  
NSUBST,5,20,5  
TIME,3.653e6  
/STATUS,SOLU  
SOLVE
```

Model 70 - 2D Axisymmetric Creep
Case P1 - Loads from all Vaults
Deformed Shape at 10,000 years



Model 70 - 2D Axisymmetric Creep
Case P1 - Loads from all Vaults
Stress σ_y at 10,000 years



T-CLC-2-00006, Rev. 0

Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. <i>T-LLC-2-00006</i>			
	Subject <i>u u</i>					Sheet No. <i>52</i>			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
0	<i>wrp</i>	<i>7/10/03</i>	<i>[Signature]</i>	<i>7/10/03</i>					

~~8/8/03~~ *7/10/03* Structural Model
 8.2 ~~2-D Plane Strain Model (model 300)~~

2D - plane strain

Contact surfaces at construction joints
 and concrete - saltstone interface

COMBIN 37 elements used to simulate grout
 cracking

COMBIN 14 elements used for soil springs.

A single model was used for all parametric
 analyses. Properties and boundary conditions
 were varied for each run.

Pressure and self weight were fixed for all
 runs. The following parameters were varied:

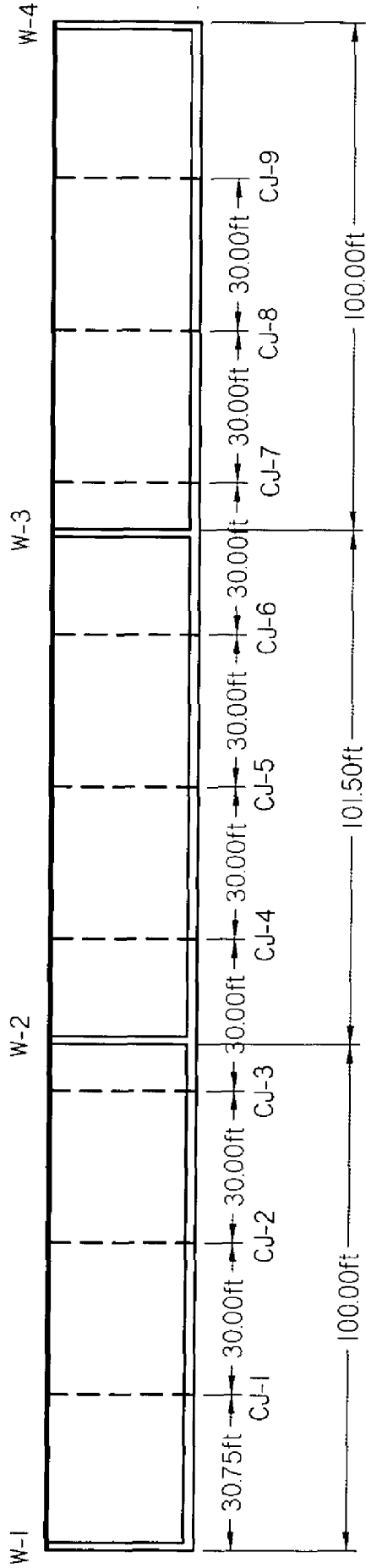
1. Displacement boundary condition - changed
 with time and differential settlement.
2. Soil springs - bulk modulus varied
3. Grout modulus
4. Grout cracking strain

T-CLC-2-00006, Rev. 0

Key for Wall and Construction Joint Locations

W - Wall

CJ - Construction Joint



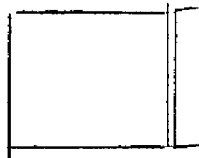
of
W

Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. T-CLC-E-00006				
	Subject <i>" "</i>					Sheet No. 54				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
0	WVP	7/9/03	<i>[Signature]</i>	7/10/03						

CONSTRUCTION JOINTS - walls & slabs 30' c-c

Shrinkage effect



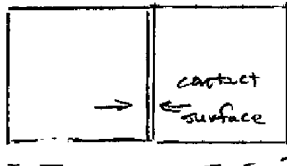
Estimate crack size

$$E_{sh} = -4.7 \times 10^{-4} \%$$

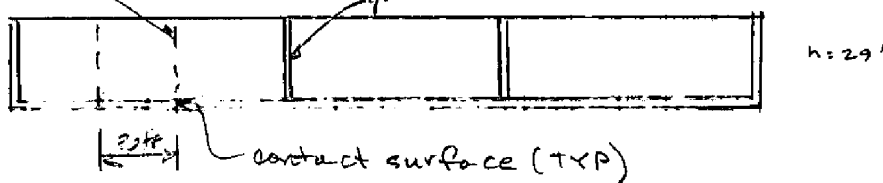
$$\Delta = -4.7 \times 10^{-4} \times 12 \times 30 = 0.13 \text{ in}$$

Assume waterstop horizontal w/age and is not effective over entire span being considered. Shrinkage will aid in initiation of cracking.

Apply static displacement to precracked 2-D plane strain model.



MODEL 100 SSU 100
substrate probable crack location



* Assume 500# / cy, w/c = 0.5 - no air

$$E_{sh} \approx 3.5 \times 10^{-4}$$

Bullec Concrete Manual, 3rd Ed, 1975

Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. T-CLC-Z-00006			
	Subject <i>u u</i>					Sheet No. 55			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
0	WVP	7/9/03	<i>[Signature]</i>	7/10/03					

MODEL DATA for Contact Surfaces

GRAOUT - CONCRETE CONTACT

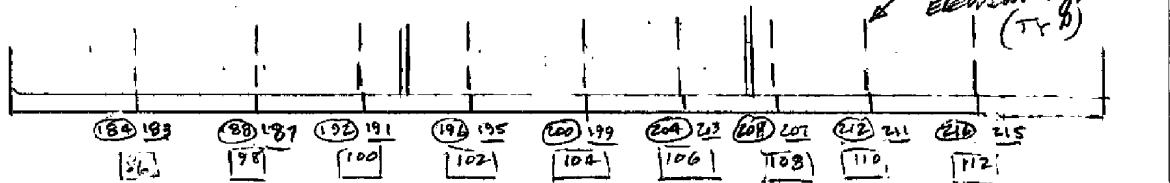
113 <u>255</u> 254	114 <u>257</u> 256	115 <u>259</u> 258	116 <u>261</u> 260	117 <u>263</u> 262	118 <u>265</u> 264
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

Boxed numbers are real constant pairs
 Circled numbers are CONTACT element type
 Underlined numbers are TABLE 169 element type

Grout cracking - 30 ft. contacts

$$\text{OFFSET} = 1.49 \times 10^{-4} \times 30 \text{ ft.} = 4.47 \times 10^{-3} \text{ ft.}$$

BASE SLAB & GRAOUT
 Symmetric contact, no offset



Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. T-CLC-2-00006				
	Subject -					Sheet No. 56				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
0	WVP	7/9/03	<i>[Signature]</i>	7/10/03						

use of COMBIN 37 element



$$CPAR = UX_K - UX_L$$

KEYOPT (1) = 0 Control on UK-UL

KEYOPT (2) = 0

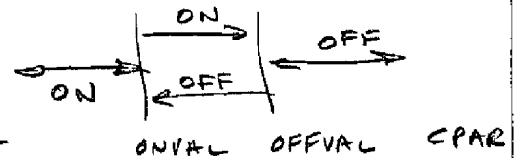
KEYOPT (3) = 0 UX Displ.

KEYOPT (4) = 0 } overlapping OFFVAL > ONVAL

KEYOPT (5) = 1 } on either off

KEYOPT (6) = 0 USE STIF

KEYOPT (7) = 0 use RV MOD



Real Constants

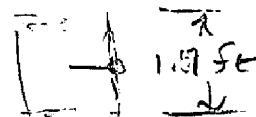
ONVAL = 0.0

OFFVAL = 0.000206

STIF = 3.42E5

FSLIDE = 0.001

START = 0



$E = 2.048E5 \text{ ksf.}$

$K = 2.048 \times 10^5 \times 1.67 = 3.42E5 \text{ k/ft.}$

Max tensile force

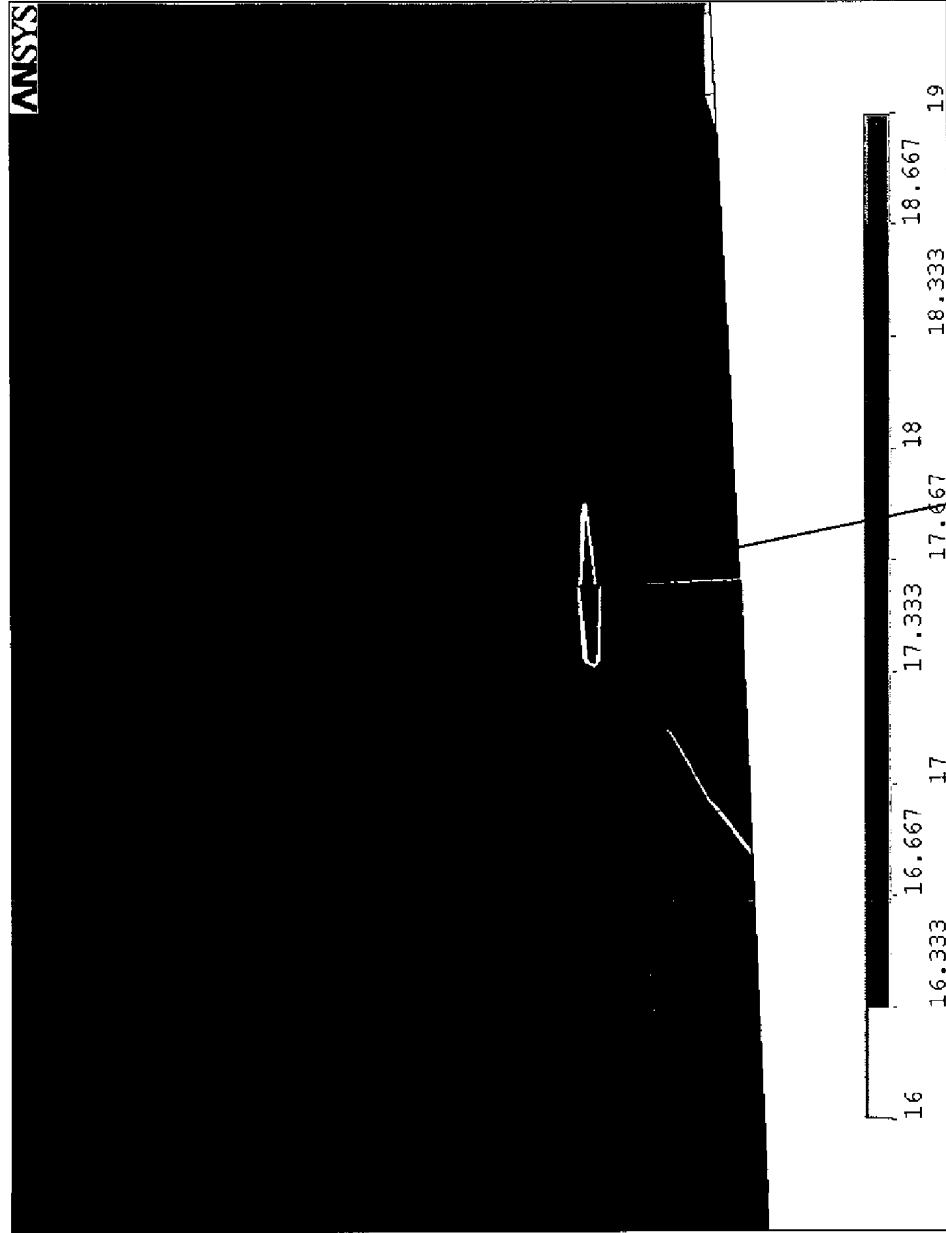
$$\tau_c = 7.5 \sqrt{f'_c} = 7.5 \sqrt{524} = 172 \text{ psi} = 24.7 \text{ ksf}$$

for 1.67 ft $F = 24.7 \times 1.67 = 41.2 \text{ kips/ft.}$


$$\epsilon_{cr} = \frac{41.2 \text{ k/ft}}{3.42E5} = 1.206 \times 10^{-4} \text{ ft.}$$

Assume tensile stress is concentrated in 1 ft length - observation of contour plots (see next page)

Model 300 - Non-Linear Plane Strain [File ssv300]
Horizontal Stress



Calculation Sheet

		Project <i>See Cover</i>					Calculation No. <i>T-CLC-2-00006</i>			
		Subject <i>u u</i>					Sheet No. <i>58</i>			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
0	<i>WVP</i>	<i>7/9/03</i>	<i>[Signature]</i>	<i>7/10/03</i>						

Results from model show max tensile stress is about 18-19 ksf when cracking occurs. This is in line with the ACI 318 code reduction for lightweight concrete in Section 22.5.6.

$$f_t = 0.75 \times 24.7 \text{ ksf} = 18.5 \text{ ksf}$$

Therefore use 1.2×10^{-4} ft. as the mean parameter for the COMBIN 37 element.

Variability - $f'_g = 524$ psi mean.

Ref. WSEC-7B-2003-00082 1/28/2003

Have 5 values of 28 day strength

$$f'_g = 488, 388, 471, 642, 638$$


$$\bar{x} = 524.4 \text{ psi}$$

$$s_x = 98.4 \text{ psi}$$

$$E = 2.048 \times 10^5 \text{ ksf mean}$$

Independently vary tensile strength and Young's modulus by $\sqrt{f'_g}$ - ACI-318 code provides these values for concrete as functions of $\sqrt{f'_c}$.

Calculation Sheet

 SRS <small>SAYANMAN RIVER SITE</small>	Project <i>See Cover</i>						Calculation No. <i>T-CLC-Z-00006</i>			
	Subject <i>u u</i>						Sheet No. <i>59</i>			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
<i>0</i>	<i>WVP</i>	<i>7/9/03</i>	<i>[Signature]</i>	<i>7/10/03</i>						

Since grout is known subjectively to vary considerably in properties, and only 5 recent data points are available, use 20 for variance

$$\text{high ratio} = \left[\frac{524.4 + 2(98.4)}{524.4} \right]^{1/2} = 1.17 \quad CV = \frac{2(98.4)}{524.4}$$

$$\text{low ratio} = \left[\frac{524.4 - 2(98.4)}{524.4} \right]^{1/2} = 0.790 \quad CV = 0.38$$

Vary two parameters -

1.) Tensile strength

COMBIN 37	OFF VAL =	9.52×10^{-5}	low
		1.206×10^{-4}	mean
		1.411×10^{-4}	high

2.) Grout stiffness

MATERIAL 2	E =	1.619×10^5	low
		2.098×10^5	mean
		2.396×10^5	high
COMBIN 37	ESTEF =	2.70 E5	low
		3.42 E5	mean
		4.00 E5	high

Calculation Sheet

SRS	Project <i>See Cover</i>						Calculation No. <i>T-CLC-Z-00006</i>			
	Subject <i>" "</i>						Sheet No. <i>60</i>			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
<i>0</i>	<i>WUP</i>	<i>7/9/03</i>	<i>[Signature]</i>	<i>7/10/03</i>						

TOP LOAD

varies from 24.5 to 15.5 ft.

$$p_1 = 24.5 \times 0.120 = 2.94 \text{ ksf}$$

$$p_2 = 15.5 \times 0.120 = 1.86 \text{ ksf}$$

decrease linearly from center to edge

Model height above base slab = 27'

Displacement interpolation Model 70 → Model 300
 File: model 300.x15

Node	Y displacement, ft.											Node	X Displacement										
	Distance	1 year	5 years	24 years	100 years	1000 years	5000 years	10000 year	Distance	1 year	5 years		24 years	100 years	1000 years	5000 years	10000 year						
1	0	-365	-0.07452	-0.26014	-0.30003	-0.35941	-0.44481	-0.51092	-0.54272	1	0	-365	-0.07452	-0.26014	-0.30003	-0.35941	-0.44481	-0.51092	-0.54272				
2	10	-355	-0.07566	-0.25824	-0.29798	-0.35640	-0.44085	-0.50623	-0.53767	2	10	-355	-0.07566	-0.25824	-0.29798	-0.35640	-0.44085	-0.50623	-0.53767				
3	21	-344	-0.07915	-0.25544	-0.29441	-0.35171	-0.43454	-0.49867	-0.52982	3	21	-344	-0.07915	-0.25544	-0.29441	-0.35171	-0.43454	-0.49867	-0.52982				
4	35.5	-329.5	-0.08741	-0.25267	-0.29052	-0.34618	-0.42667	-0.48900	-0.51897	4	35.5	-329.5	-0.08741	-0.25267	-0.29052	-0.34618	-0.42667	-0.48900	-0.51897				
5	50	-315	-0.10682	-0.25065	-0.29375	-0.35279	-0.43301	-0.49514	-0.52502	5	50	-315	-0.10682	-0.25065	-0.29375	-0.35279	-0.43301	-0.49514	-0.52502				
6	59	-306	-0.11843	-0.25551	-0.30034	-0.35699	-0.43853	-0.50192	-0.53194	6	59	-306	-0.11843	-0.25551	-0.30034	-0.35699	-0.43853	-0.50192	-0.53194				
7	79.16667	-285.833	-0.13121	-0.27071	-0.30868	-0.36465	-0.44544	-0.50811	-0.53628	7	79.16667	-285.833	-0.13121	-0.27071	-0.30868	-0.36465	-0.44544	-0.50811	-0.53628				
8	99.33333	-265.667	-0.13602	-0.27347	-0.31163	-0.36778	-0.44908	-0.51208	-0.54239	8	99.33333	-265.667	-0.13602	-0.27347	-0.31163	-0.36778	-0.44908	-0.51208	-0.54239				
9	119.5	-245.5	-0.13810	-0.27537	-0.31373	-0.37021	-0.45197	-0.51533	-0.54582	9	119.5	-245.5	-0.13810	-0.27537	-0.31373	-0.37021	-0.45197	-0.51533	-0.54582				
10	139.6667	-225.333	-0.13992	-0.27697	-0.31580	-0.37246	-0.45480	-0.51861	-0.54931	10	139.6667	-225.333	-0.13992	-0.27697	-0.31580	-0.37246	-0.45480	-0.51861	-0.54931				
11	159.8333	-205.167	-0.13911	-0.27852	-0.31748	-0.37481	-0.45783	-0.52117	-0.55313	11	159.8333	-205.167	-0.13911	-0.27852	-0.31748	-0.37481	-0.45783	-0.52117	-0.55313				
12	180	-185	-0.13911	-0.28015	-0.31947	-0.37736	-0.46118	-0.52614	-0.55740	12	180	-185	-0.13911	-0.28015	-0.31947	-0.37736	-0.46118	-0.52614	-0.55740				
13	200	-165	-0.13893	-0.28175	-0.32147	-0.37994	-0.46461	-0.53023	-0.56181	13	200	-165	-0.13893	-0.28175	-0.32147	-0.37994	-0.46461	-0.53023	-0.56181				
14	220	-145	-0.13857	-0.28325	-0.32303	-0.38242	-0.46783	-0.53274	-0.56610	14	220	-145	-0.13857	-0.28325	-0.32303	-0.38242	-0.46783	-0.53274	-0.56610				
15	240	-125	-0.13834	-0.28454	-0.32453	-0.38463	-0.47095	-0.53784	-0.57003	15	240	-125	-0.13834	-0.28454	-0.32453	-0.38463	-0.47095	-0.53784	-0.57003				
16	260	-105	-0.13794	-0.28556	-0.32538	-0.38646	-0.47348	-0.54082	-0.57337	16	260	-105	-0.13794	-0.28556	-0.32538	-0.38646	-0.47348	-0.54082	-0.57337				
17	280	-85	-0.13746	-0.28632	-0.32574	-0.38786	-0.47561	-0.54354	-0.57623	17	280	-85	-0.13746	-0.28632	-0.32574	-0.38786	-0.47561	-0.54354	-0.57623				
18	300	-65	-0.13691	-0.28680	-0.32581	-0.38904	-0.47721	-0.54555	-0.57844	18	300	-65	-0.13691	-0.28680	-0.32581	-0.38904	-0.47721	-0.54555	-0.57844				
19	320	-45	-0.13627	-0.28711	-0.32589	-0.38992	-0.47858	-0.54731	-0.58038	19	320	-45	-0.13627	-0.28711	-0.32589	-0.38992	-0.47858	-0.54731	-0.58038				
20	352.7273	-12.2727	-0.13503	-0.28653	-0.32580	-0.38979	-0.47884	-0.54787	-0.58109	20	352.7273	-12.2727	-0.13503	-0.28653	-0.32580	-0.38979	-0.47884	-0.54787	-0.58109				
21	385.4545	20.4545	-0.13352	-0.28509	-0.32561	-0.38847	-0.47763	-0.54675	-0.58001	21	385.4545	20.4545	-0.13352	-0.28509	-0.32561	-0.38847	-0.47763	-0.54675	-0.58001				
22	418.1818	53.1818	-0.13173	-0.28275	-0.32445	-0.38585	-0.47479	-0.54373	-0.57691	22	418.1818	53.1818	-0.13173	-0.28275	-0.32445	-0.38585	-0.47479	-0.54373	-0.57691				
23	450.9091	86.9091	-0.12960	-0.28012	-0.32169	-0.38288	-0.47152	-0.54023	-0.57330	23	450.9091	86.9091	-0.12960	-0.28012	-0.32169	-0.38288	-0.47152	-0.54023	-0.57330				
24	483.6364	118.6364	-0.12716	-0.27716	-0.31853	-0.37943	-0.46783	-0.53599	-0.56888	24	483.6364	118.6364	-0.12716	-0.27716	-0.31853	-0.37943	-0.46783	-0.53599	-0.56888				
25	516.3636	151.3636	-0.12424	-0.27329	-0.31429	-0.37465	-0.46204	-0.52977	-0.56236	25	516.3636	151.3636	-0.12424	-0.27329	-0.31429	-0.37465	-0.46204	-0.52977	-0.56236				
26	549.0909	184.0909	-0.12080	-0.26726	-0.30747	-0.36666	-0.45233	-0.51872	-0.55086	26	549.0909	184.0909	-0.12080	-0.26726	-0.30747	-0.36666	-0.45233	-0.51872	-0.55086				
27	581.8182	216.8182	-0.11406	-0.25942	-0.29942	-0.35166	-0.43960	-0.49445	-0.52282	27	581.8182	216.8182	-0.11406	-0.25942	-0.29942	-0.35166	-0.43960	-0.49445	-0.52282				
28	614.5455	249.5455	-0.10238	-0.25066	-0.28566	-0.32695	-0.40604	-0.46574	-0.49445	28	614.5455	249.5455	-0.10238	-0.25066	-0.28566	-0.32695	-0.40604	-0.46574	-0.49445				
29	647.2727	282.2727	-0.06274	-0.19550	-0.22633	-0.27163	-0.33706	-0.39769	-0.41203	29	647.2727	282.2727	-0.06274	-0.19550	-0.22633	-0.27163	-0.33706	-0.39769	-0.41203				
30	680	315	-0.02418	-0.14556	-0.16971	-0.20515	-0.25627	-0.29577	-0.31475	30	680	315	-0.02418	-0.14556	-0.16971	-0.20515	-0.25627	-0.29577	-0.31475				

Calculation at axis of symmetry

Node	Height	Y Displacement											X Displacement										
		Distance	1 year	5 years	24 years	100 years	1000 years	5000 years	10000 year	Distance	1 year	5 years	24 years	100 years	1000 years	5000 years	10000 year						
10708	28.00	-12.273	-0.13503	-0.28653	-0.32830	-0.38979	-0.47884	-0.54787	-0.58109	10708	28.00	-0.00134	-0.00128	-0.00123	-0.00117	-0.00107	-0.00099	-0.00096					
10722	27.20	20.455	-0.13352	-0.28509	-0.32830	-0.38847	-0.47763	-0.54675	-0.58001	10722	27.20	-0.00125	-0.00120	-0.00116	-0.00110	-0.00101	-0.00093	-0.00090					
10721	25.40									10721	25.40	-0.00117	-0.00112	-0.00108	-0.00102	-0.00094	-0.00087	-0.00084					
10720	23.60									10720	23.60	-0.00109	-0.00104	-0.00100	-0.00095	-0.00087	-0.00081	-0.00078					
10719	21.80									10719	21.80	-0.00101	-0.00096	-0.00093	-0.00088	-0.00081	-0.00075	-0.00072					
10718	20.00									10718	20.00	-0.00092	-0.00088	-0.00085	-0.00081	-0.00074	-0.00068	-0.00066					
10717	18.20									10717	18.20	-0.00084	-0.00080	-0.00077	-0.00073	-0.00067	-0.00062	-0.00060					
10716	16.40									10716	16.40	-0.00076	-0.00072	-0.00070	-0.00066	-0.00061	-0.00056	-0.00054					
10715	14.60									10715	14.60	-0.00067	-0.00064	-0.00062	-0.00059	-0.00054	-0.00050	-0.00048					
10714	12.80									10714	12.80	-0.00059	-0.00056	-0.00054	-0.00052	-0.00047	-0.00044	-0.00042					
10713	11.00									10713	11.00	-0.00051	-0.00048	-0.00047	-0.00044	-0.00041	-0.00038	-0.00036					
10712	9.20									10712	9.20	-0.00042	-0.00040	-0.00039	-0.00037	-0.00034	-0.00031	-0.00029					
10711	7.40									10711	7.40	-0.00034	-0.00033	-0.00031	-0.00030	-0.00027	-0.00025	-0.00024					
10710	5.60									10710	5.60	-0.00026	-0.00025	-0.00024	-0.00023	-0.00021	-0.00019	-0.00018					
10709	3.80									10709	3.80	-0.00018	-0.00017	-0.00016	-0.00015	-0.00014	-0.00013	-0.00013					
5	2.00									5	2.00	-0.00009	-0.00009	-0.00008	-0.00008	-0.00007	-0.00007	-0.00007					
6	1.00									6	1.00	-0.00005	-0.00004	-0.00004	-0.00004	-0.00004	-0.00003	-0.00003					

50606	107.275	-0.128	-0.278	-0.320	-0.381	-0.469	-0.537	-0.570
50607	109.200	-0.128	-0.278	-0.319	-0.380	-0.469	-0.537	-0.570
50608	111.125	-0.128	-0.278	-0.319	-0.380	-0.469	-0.537	-0.570
50609	113.05	-0.128	-0.278	-0.319	-0.380	-0.468	-0.537	-0.570
50610	114.975	-0.127	-0.277	-0.319	-0.380	-0.468	-0.536	-0.569
50611	116.900	-0.127	-0.277	-0.319	-0.380	-0.468	-0.536	-0.569
50612	118.825	-0.127	-0.277	-0.319	-0.379	-0.468	-0.536	-0.568
50603	120.750	-0.127	-0.277	-0.318	-0.379	-0.467	-0.536	-0.568
50744	120.750	-0.127	-0.277	-0.318	-0.379	-0.467	-0.536	-0.568
50746	122.750	-0.127	-0.277	-0.318	-0.379	-0.467	-0.535	-0.568
50747	124.750	-0.127	-0.276	-0.318	-0.379	-0.467	-0.535	-0.568
50748	126.75	-0.126	-0.276	-0.317	-0.378	-0.466	-0.534	-0.567
50749	128.750	-0.126	-0.276	-0.317	-0.378	-0.466	-0.534	-0.567
50750	130.750	-0.126	-0.276	-0.317	-0.378	-0.466	-0.534	-0.566
50751	132.750	-0.126	-0.275	-0.317	-0.377	-0.465	-0.533	-0.566
50752	134.750	-0.126	-0.275	-0.316	-0.377	-0.465	-0.533	-0.566
50753	136.750	-0.126	-0.275	-0.316	-0.377	-0.465	-0.533	-0.565
50754	138.750	-0.125	-0.275	-0.316	-0.376	-0.464	-0.532	-0.565
50755	140.750	-0.125	-0.275	-0.316	-0.376	-0.464	-0.532	-0.564
50756	142.750	-0.125	-0.274	-0.315	-0.376	-0.464	-0.531	-0.564
50757	144.750	-0.125	-0.274	-0.315	-0.376	-0.463	-0.531	-0.564
50758	146.75	-0.125	-0.274	-0.316	-0.375	-0.463	-0.531	-0.563
50759	148.750	-0.124	-0.274	-0.315	-0.375	-0.462	-0.530	-0.563
50745	150.750	-0.124	-0.273	-0.314	-0.375	-0.462	-0.530	-0.562
50782	150.750	-0.124	-0.273	-0.314	-0.375	-0.462	-0.530	-0.562
50794	152.750	-0.124	-0.273	-0.314	-0.374	-0.462	-0.529	-0.561
50795	154.75	-0.124	-0.273	-0.314	-0.374	-0.461	-0.529	-0.561
50796	156.750	-0.124	-0.272	-0.313	-0.373	-0.460	-0.528	-0.560
50797	158.75	-0.123	-0.272	-0.313	-0.373	-0.460	-0.527	-0.560
50798	160.750	-0.123	-0.272	-0.312	-0.372	-0.459	-0.527	-0.559
50799	162.750	-0.123	-0.271	-0.312	-0.372	-0.459	-0.526	-0.558
50800	164.75	-0.123	-0.271	-0.312	-0.371	-0.458	-0.525	-0.558
50801	166.750	-0.123	-0.270	-0.311	-0.371	-0.457	-0.525	-0.557
50802	168.750	-0.122	-0.270	-0.311	-0.370	-0.457	-0.524	-0.556
50803	170.75	-0.122	-0.270	-0.310	-0.370	-0.456	-0.523	-0.555
50804	172.750	-0.122	-0.269	-0.310	-0.369	-0.456	-0.523	-0.555
50805	174.750	-0.122	-0.268	-0.309	-0.368	-0.455	-0.522	-0.554
50806	176.75	-0.122	-0.268	-0.309	-0.368	-0.455	-0.521	-0.553
50807	178.750	-0.121	-0.268	-0.309	-0.368	-0.454	-0.521	-0.553
50793	180.750	-0.121	-0.268	-0.308	-0.367	-0.453	-0.520	-0.552
50840	180.750	-0.121	-0.268	-0.308	-0.367	-0.453	-0.520	-0.552
50841	182.675	-0.121	-0.268	-0.308	-0.367	-0.453	-0.519	-0.551
50842	184.600	-0.121	-0.267	-0.307	-0.366	-0.452	-0.518	-0.550
50843	186.525	-0.120	-0.266	-0.307	-0.366	-0.451	-0.517	-0.549
50844	188.45	-0.120	-0.266	-0.306	-0.365	-0.450	-0.516	-0.548
50845	190.375	-0.120	-0.265	-0.305	-0.364	-0.449	-0.515	-0.546
50846	192.300	-0.119	-0.264	-0.304	-0.363	-0.448	-0.513	-0.545
50847	194.225	-0.119	-0.264	-0.304	-0.362	-0.447	-0.512	-0.544
50848	196.150	-0.118	-0.263	-0.303	-0.361	-0.446	-0.511	-0.542
50849	198.075	-0.118	-0.263	-0.302	-0.360	-0.444	-0.510	-0.541
30214	200	-0.118	-0.262	-0.301	-0.359	-0.443	-0.508	-0.540
30215	201.500	-0.117	-0.261	-0.301	-0.359	-0.443	-0.507	-0.539
50730	203.500	-0.117	-0.261	-0.300	-0.358	-0.441	-0.506	-0.537
50731	205.200	-0.116	-0.260	-0.299	-0.357	-0.440	-0.505	-0.536
50732	207.050	-0.116	-0.260	-0.299	-0.356	-0.439	-0.504	-0.535
50733	208.9	-0.116	-0.259	-0.298	-0.355	-0.438	-0.503	-0.534
50729	210.750	-0.115	-0.258	-0.297	-0.354	-0.437	-0.502	-0.532
50870	210.750	-0.115	-0.258	-0.297	-0.354	-0.437	-0.502	-0.532
50872	212.750	-0.115	-0.258	-0.296	-0.354	-0.436	-0.500	-0.531
50873	214.75	-0.115	-0.257	-0.296	-0.353	-0.435	-0.499	-0.530
50874	216.75	-0.114	-0.256	-0.295	-0.352	-0.434	-0.498	-0.528

1 0.00 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000

50875	216.750	-0.113	-0.255	-0.284	-0.350	-0.432	-0.496	-0.526
50876	220.750	-0.113	-0.254	-0.293	-0.349	-0.431	-0.494	-0.524
50877	222.750	-0.112	-0.253	-0.291	-0.348	-0.429	-0.492	-0.522
50878	224.750	-0.111	-0.252	-0.290	-0.346	-0.427	-0.490	-0.520
50879	226.75	-0.111	-0.251	-0.289	-0.345	-0.425	-0.488	-0.518
50880	228.750	-0.110	-0.250	-0.288	-0.343	-0.424	-0.486	-0.516
50881	230.75	-0.109	-0.249	-0.287	-0.342	-0.422	-0.484	-0.514
50882	232.750	-0.108	-0.248	-0.285	-0.341	-0.420	-0.482	-0.512
50883	234.750	-0.108	-0.247	-0.284	-0.339	-0.419	-0.480	-0.510
50884	236.750	-0.107	-0.246	-0.283	-0.338	-0.417	-0.478	-0.508
50885	238.750	-0.106	-0.245	-0.282	-0.336	-0.415	-0.476	-0.506
50871	240.750	-0.106	-0.244	-0.281	-0.335	-0.414	-0.474	-0.504
50818	240.75	-0.106	-0.244	-0.281	-0.334	-0.412	-0.472	-0.501
50920	242.750	-0.105	-0.243	-0.280	-0.334	-0.412	-0.472	-0.501
50921	244.750	-0.104	-0.242	-0.278	-0.332	-0.410	-0.470	-0.499
50922	246.750	-0.103	-0.241	-0.277	-0.331	-0.408	-0.468	-0.497
50923	248.75	-0.103	-0.240	-0.276	-0.330	-0.407	-0.467	-0.495
50924	250.750	-0.101	-0.238	-0.274	-0.327	-0.404	-0.463	-0.491
50925	252.750	-0.098	-0.235	-0.271	-0.323	-0.399	-0.458	-0.486
50926	254.75	-0.096	-0.232	-0.268	-0.320	-0.395	-0.453	-0.481
50927	256.750	-0.094	-0.230	-0.265	-0.316	-0.391	-0.449	-0.476
50928	258.750	-0.091	-0.227	-0.262	-0.313	-0.387	-0.444	-0.471
50929	260.750	-0.089	-0.224	-0.259	-0.309	-0.382	-0.439	-0.466
50930	262.750	-0.086	-0.222	-0.256	-0.306	-0.378	-0.434	-0.461
50931	264.750	-0.084	-0.219	-0.253	-0.302	-0.374	-0.429	-0.456
50932	266.750	-0.082	-0.216	-0.250	-0.299	-0.370	-0.425	-0.451
50933	268.750	-0.079	-0.214	-0.247	-0.295	-0.365	-0.420	-0.446
50919	270.750	-0.077	-0.211	-0.244	-0.292	-0.361	-0.415	-0.441
50966	270.75	-0.077	-0.211	-0.244	-0.292	-0.361	-0.415	-0.441
50967	272.700	-0.074	-0.208	-0.241	-0.288	-0.357	-0.411	-0.436
50968	274.650	-0.072	-0.206	-0.238	-0.285	-0.353	-0.406	-0.431
50969	276.600	-0.070	-0.203	-0.235	-0.282	-0.349	-0.401	-0.426
50970	278.550	-0.067	-0.200	-0.232	-0.278	-0.345	-0.397	-0.421
50971	280.5	-0.065	-0.198	-0.229	-0.275	-0.341	-0.392	-0.416
50972	282.450	-0.063	-0.195	-0.226	-0.271	-0.337	-0.387	-0.412
50973	284.400	-0.060	-0.192	-0.223	-0.267	-0.332	-0.382	-0.406
50974	286.350	-0.058	-0.189	-0.219	-0.263	-0.327	-0.376	-0.400
50975	288.300	-0.056	-0.186	-0.216	-0.259	-0.322	-0.371	-0.394
50976	290.250	-0.053	-0.183	-0.213	-0.255	-0.317	-0.365	-0.388
50977	292.200	-0.051	-0.180	-0.209	-0.251	-0.313	-0.360	-0.383
50978	294.150	-0.049	-0.177	-0.206	-0.248	-0.308	-0.354	-0.377
50979	296.100	-0.046	-0.174	-0.202	-0.244	-0.303	-0.349	-0.371
50980	298.05	-0.044	-0.171	-0.199	-0.240	-0.298	-0.343	-0.365
30361	300.000	-0.042	-0.168	-0.196	-0.236	-0.293	-0.338	-0.359
30362	301.500	-0.040	-0.166	-0.193	-0.233	-0.290	-0.334	-0.355

T-CLC-2-00006, Rev. 0

1	51122	51393	52336	53561	53082	51633	52008	52126	9	52575	52842
	51121	51392	52335	53560	53081	51632	52007	52125		52574	52841
	51120	51391	52334	53559	53080	51631	52006	52124		52573	52840
	51119	51390	52333	53558	53079	51630	52005	52123		52572	52839
	51118	51389	52332	53557	53078	51629	52004	52122		52571	52838
	51117	51388	52331	53556	53077	51628	52003	52121		52570	52837
	51116	51387	52330	53555	53076	51627	52002	52120		52569	52836
	51115	51386	52329	53554	53075	51626	52001	52119		52568	52835
	51114	51385	52328	53553	53074	51625	52000	52118		52567	52834
	51113	51384	52327	53552	53073	51624	51999	52117		52566	52833
	51112	51383	52326	53551	53072	51623	51998	52116		52565	52832
	51111	51382	52325	53550	53071	51622	51997	52115		52564	52831
	51110	51381	52324	53549	53070	51621	51996	52114		52563	52830
	51109	51380	52323	53548	53069	51620	51995	52113		52562	52829
	21026	20651	20697	21061	20760	20810	20734	20888		20934	20981
2	51365	52364	53321	53111	51604	51867	52098	52603	8		
	51364	52363	53320	53110	51603	51866	52097	52602			
	51363	52362	53319	53109	51602	51865	52096	52601			
	51362	52361	53318	53108	51601		52095	52600			
	51361	52360	53317	53107	51600	51863	52094	52599			
	51360	52359	53316	53106	51599	51862	52093	52598			
	51359	52358	53315	53105	51598	51861	52092	52597			
	51358	52357	53314	53104	51597	51860	52091	52596			
	51357	52356	53313	53103	51596	51859	52090	52595			
	51356	52355	53312	53102	51595	51858	52089	52594			
	51355	52354	53311	53101	51594	51857	52088	52593			
	51354	52353	53310	53100	51593	51856	52087	52592			
	51353	52352	53309	53099	51592	51855	52086	52591			
	51352	52351	53308	53098	51591	51854	52085	52590			
	20649	20699	20613	20762	20808	20850	20886	20936			

Nodes @ construction joints

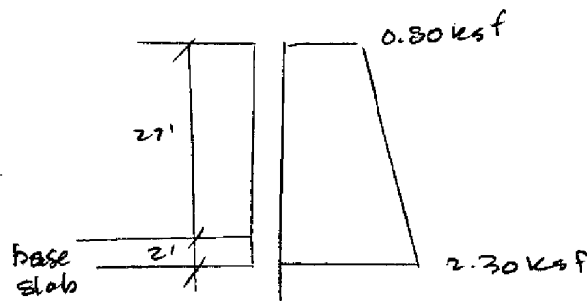
T-CLL-Z-00006, Rev. 0

66


Pressure on End Wall

Ko 0.43
dens 0.12 kcf

Distance from Surface ft	Pressure ksf
15.50	0.80
17.30	0.89
19.10	0.99
20.90	1.08
22.70	1.17
24.50	1.26
26.30	1.36
28.10	1.45
29.90	1.54
31.70	1.64
33.50	1.73
35.30	1.82
37.10	1.91
38.90	2.01
40.70	2.10
42.50	2.19
43.50	2.24
44.50	2.30



Calculation Sheet

		Project See Cover				Calculation No. T-LLC-2-00006			
		Subject - -				Sheet No. 67			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
0	wrp	7/9/03	JF	7/10/03					

With the soil nodes displaced to the long term displacements, apply the top loading. The soil displacement pattern will provide a constraint on total base slab deformation, while top load will cause representative internal stress in the model, particularly for differential displacements.

Two cases are provided:

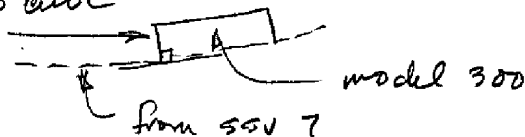
- Case 1 soil displacements only.
- Case 2 top load only.
- Case 3 top load and soil displacements

Notes:

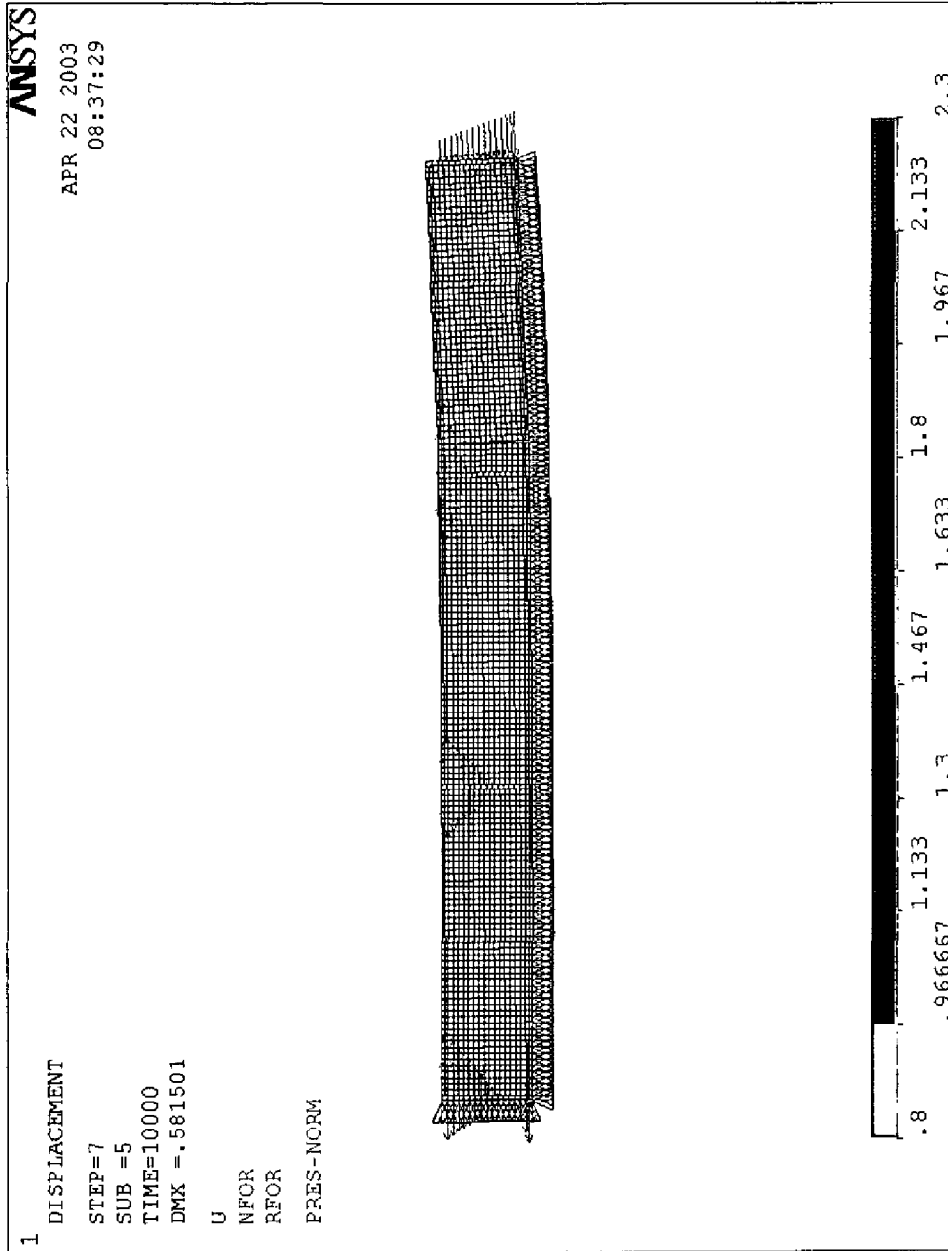
- 1.) The model cracks at construction joint 7 when the displacements increase from the 1000 yr. pattern to the 5000 year pattern. The crack size is the same for cases 1 and 3.
- 2.) The max ϵ increased by only 0.10 ft. (16%) between Case 1 and 3. This is not significant in terms of the nature of the overall analysis. The max. displacement is 8.1 in. which is in the range predicted by SAS. (7 to 9 in, verbal per meeting of 03/31/03).

Assumption - the use of a vertical plane as the symmetric boundary condition introduces an artificially high rigidity for the displacements. use a plane perpendicular to the soil curvature instead

set 1 to curve



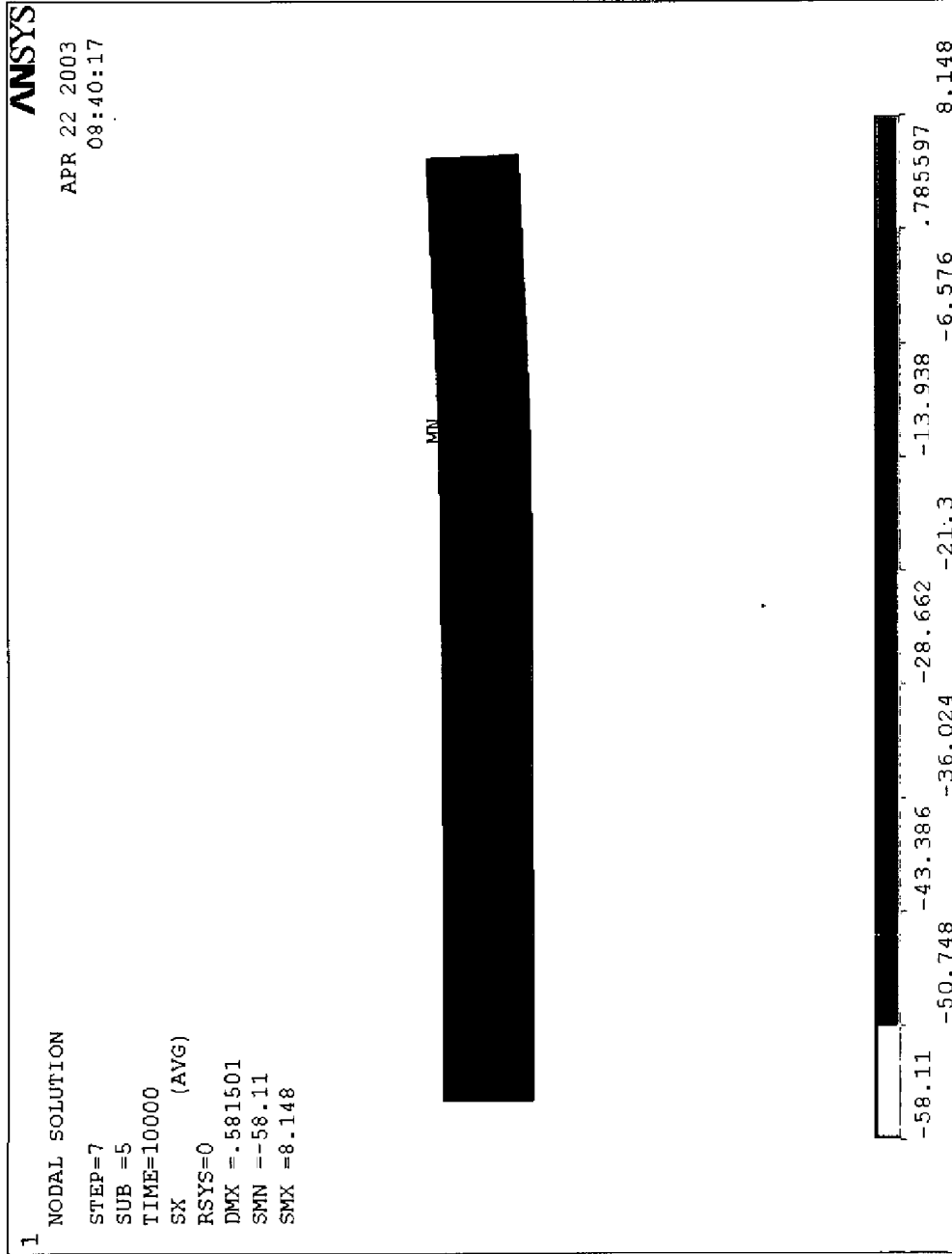
Model 300 – Non-linear Plane Strain
Case 1 – No Top Pressure



Deformed Shape

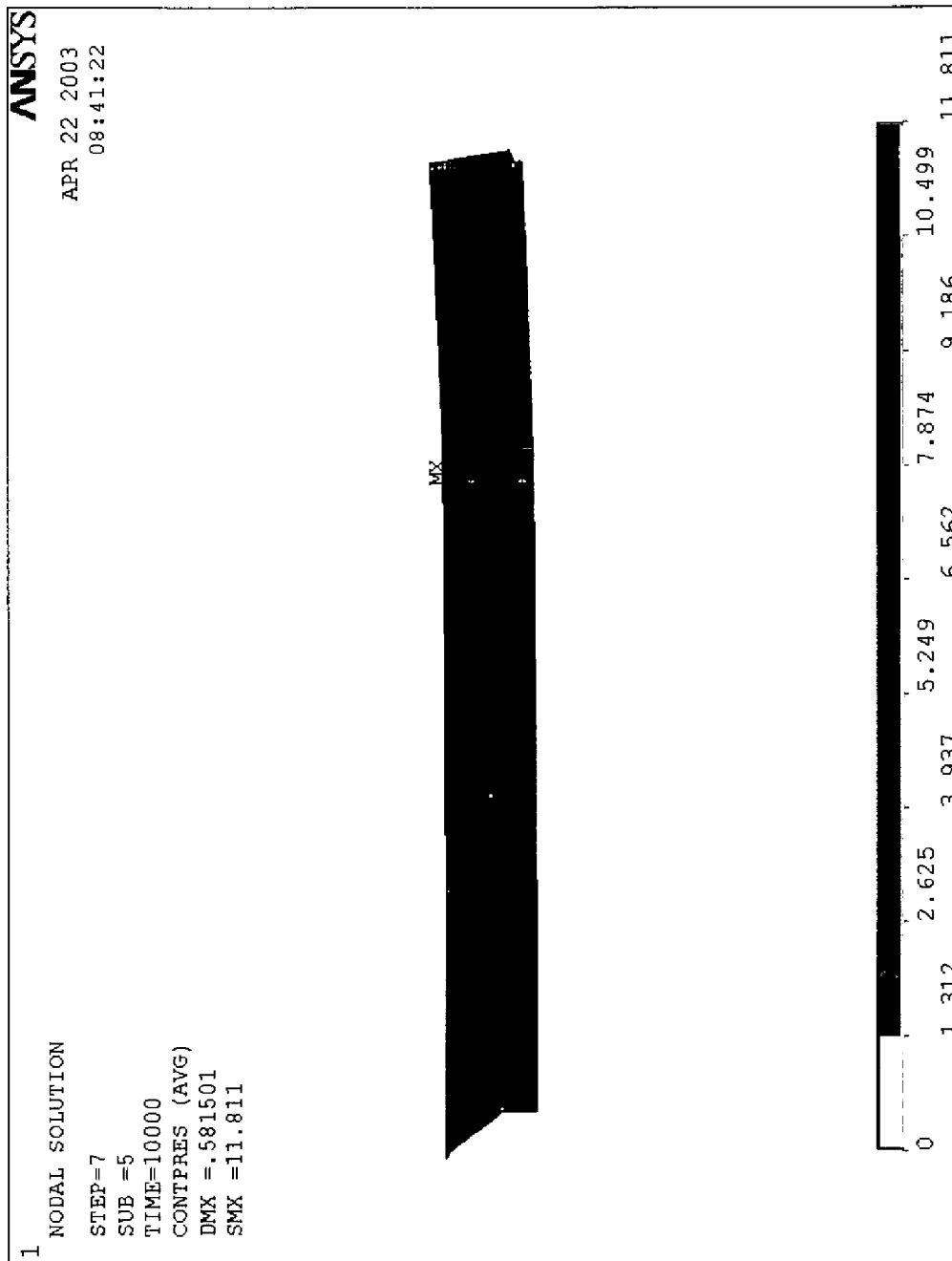
T-CLC-2-00006, Rev. 0

Model 300 – Non-linear Plane Strain
Case 1 – No Top Pressure



Horizontal Stress σ_x

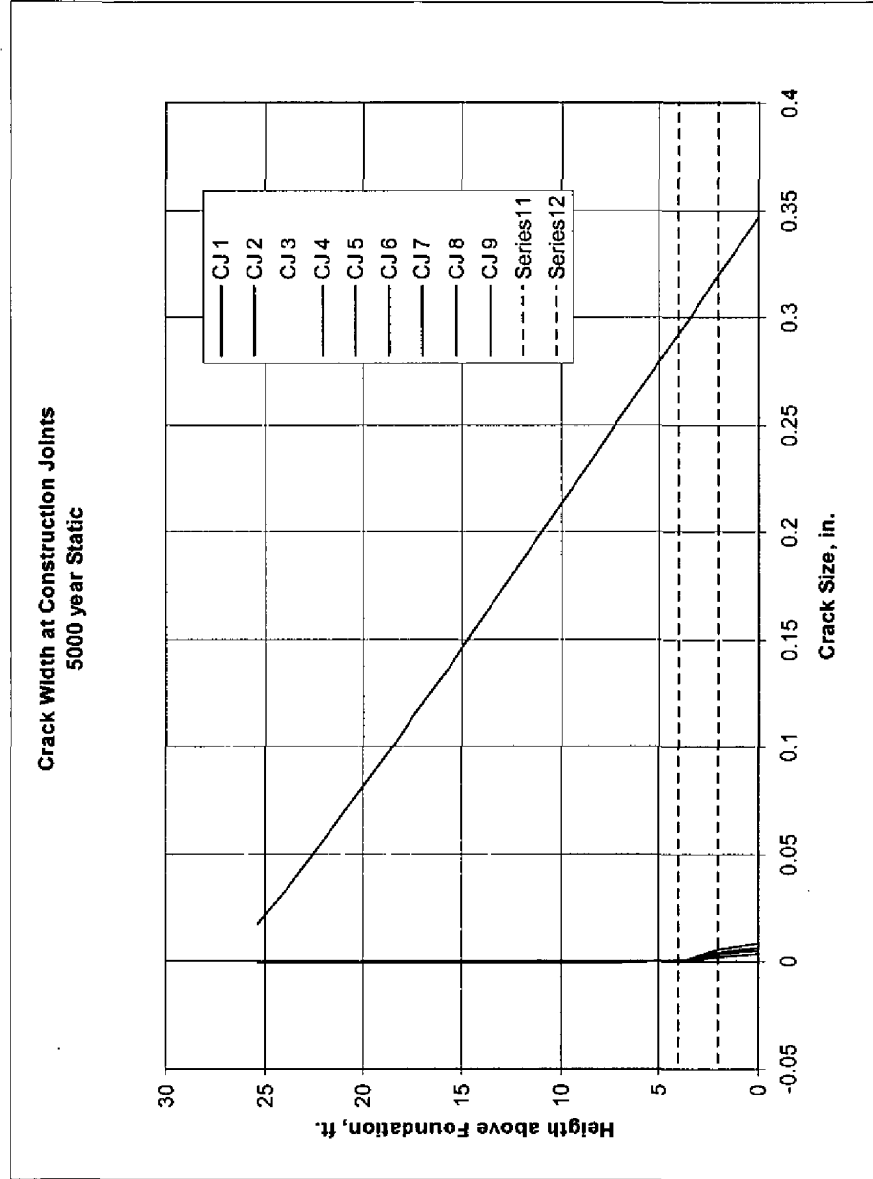
Model 300 – Non-linear Plane Strain
Case 1 – No Top Pressure



Contact Pressure

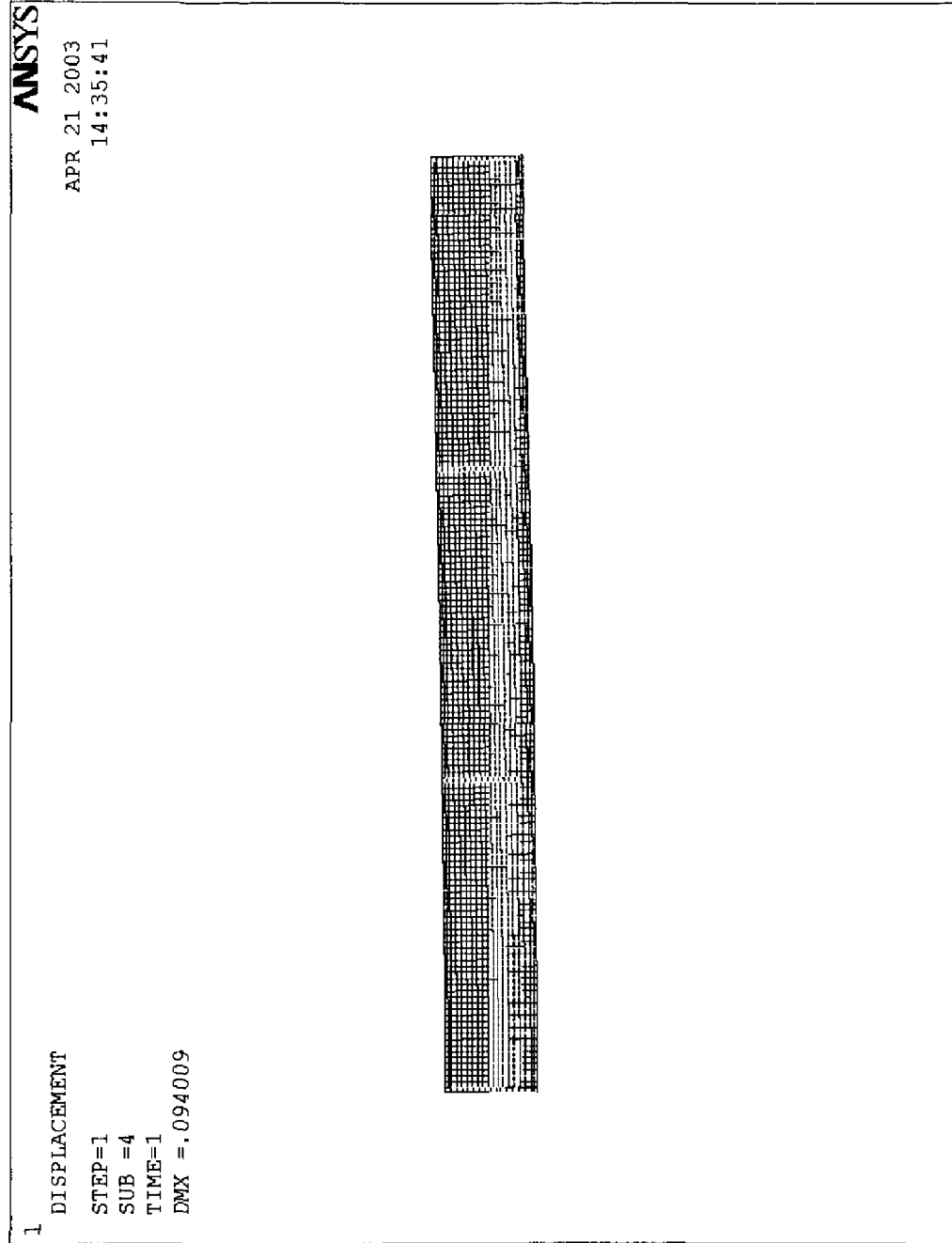
Model 300 – Non-linear Plane Strain
Case 1 – No Top Pressure

T-CLC-Z-00006, Rev. 0



T-CLC-Z-00001, Rev. 0

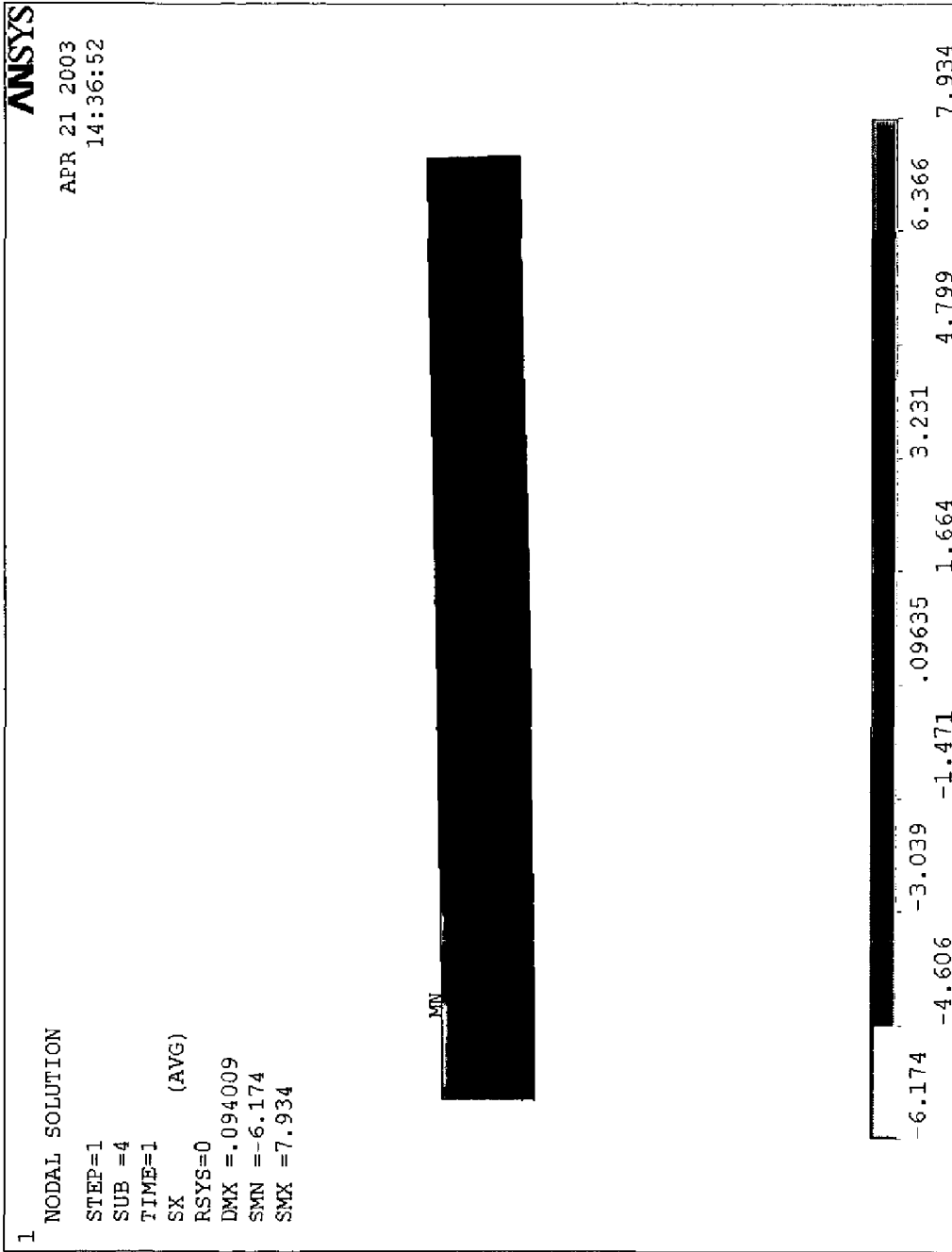
Model 300 - Non-linear Plane Strain
Case 2 - Top Pressure, No Soil Displacements



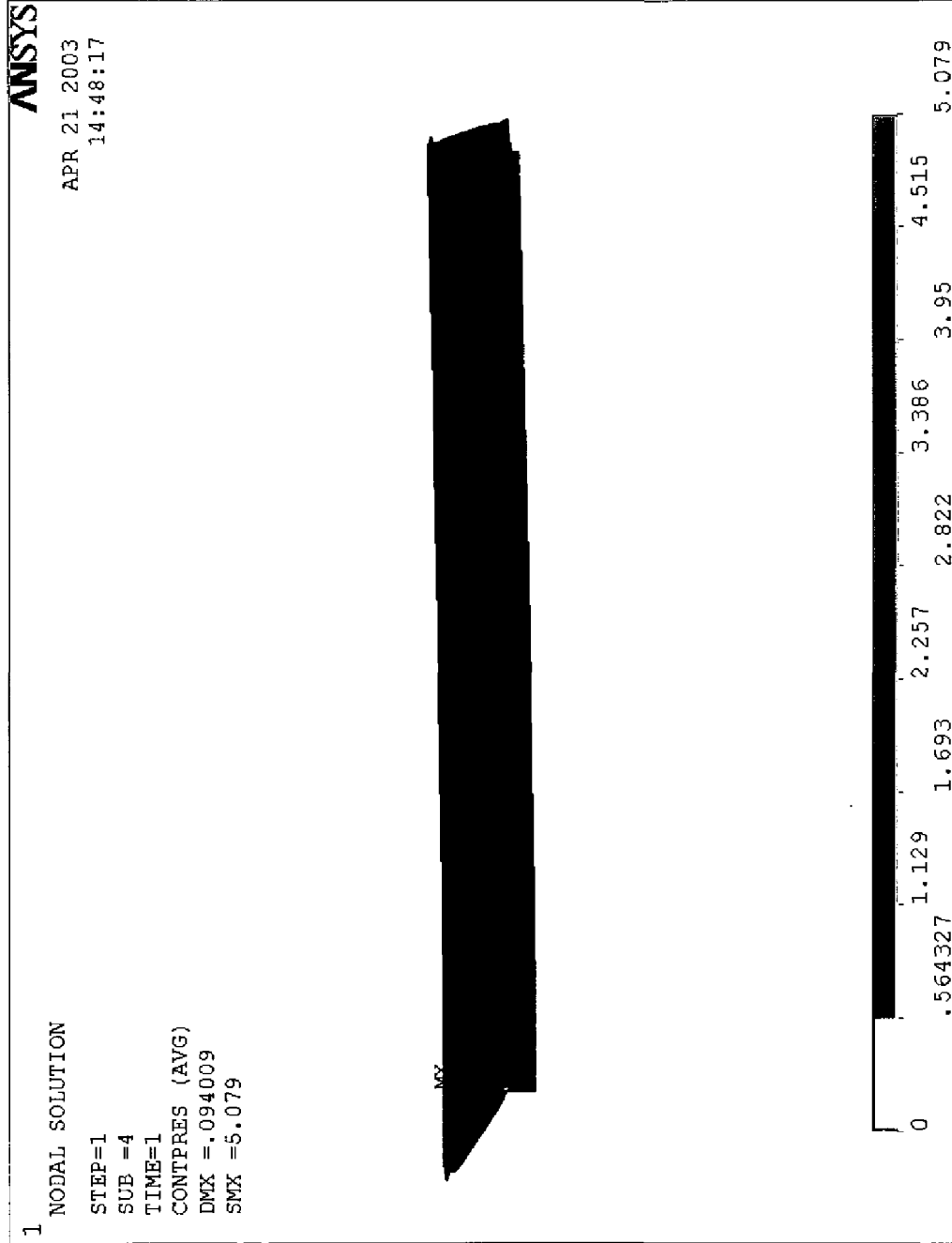
Deformed Shape

T-CLC-Z-00006, Rev. 0

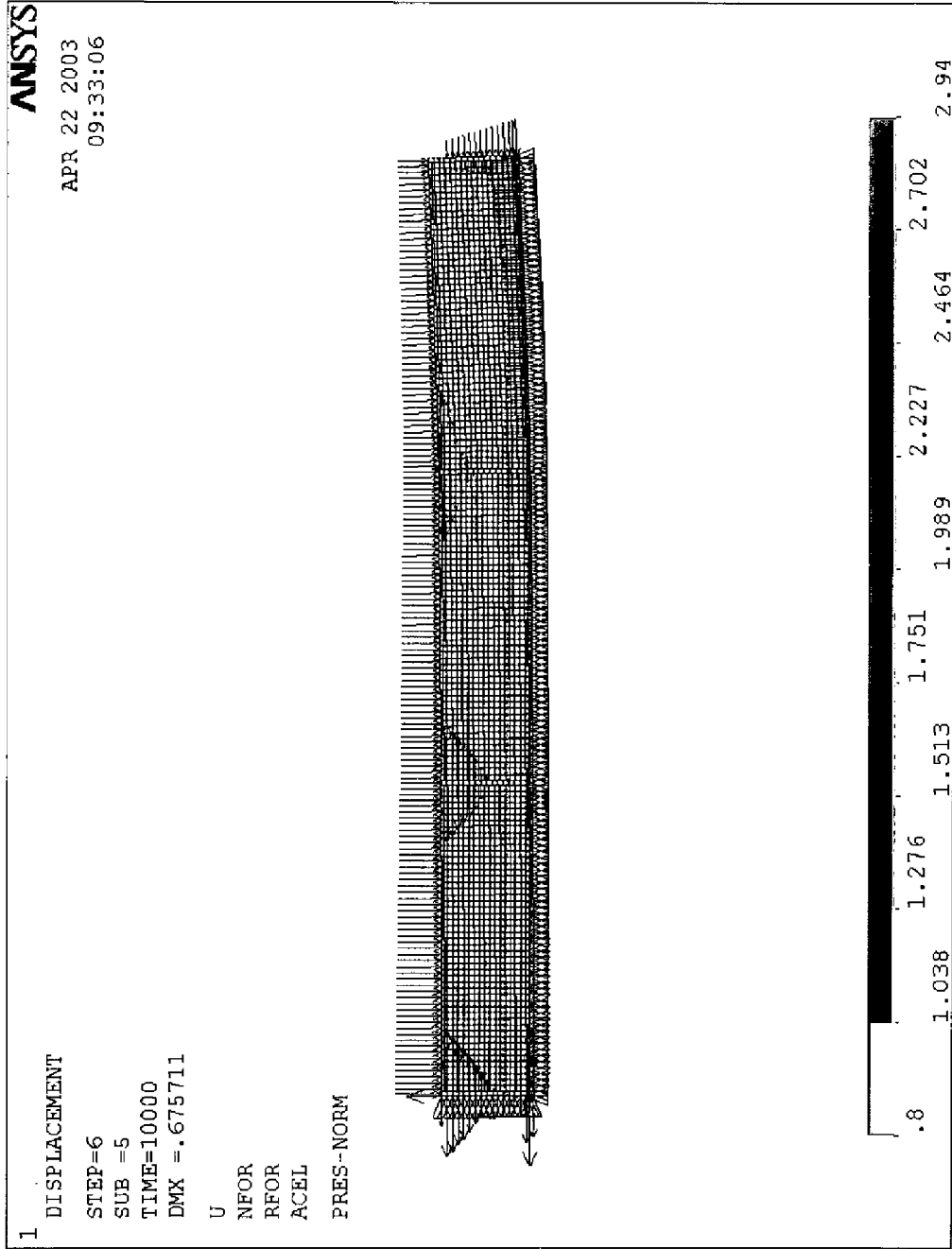
Model 300 – Non-linear Plane Strain
Case 2 – Top Pressure, No Soil Displacements



Model 300 – Non-linear Plane Strain
Case 2 – Top Pressure, No Soil Displacements

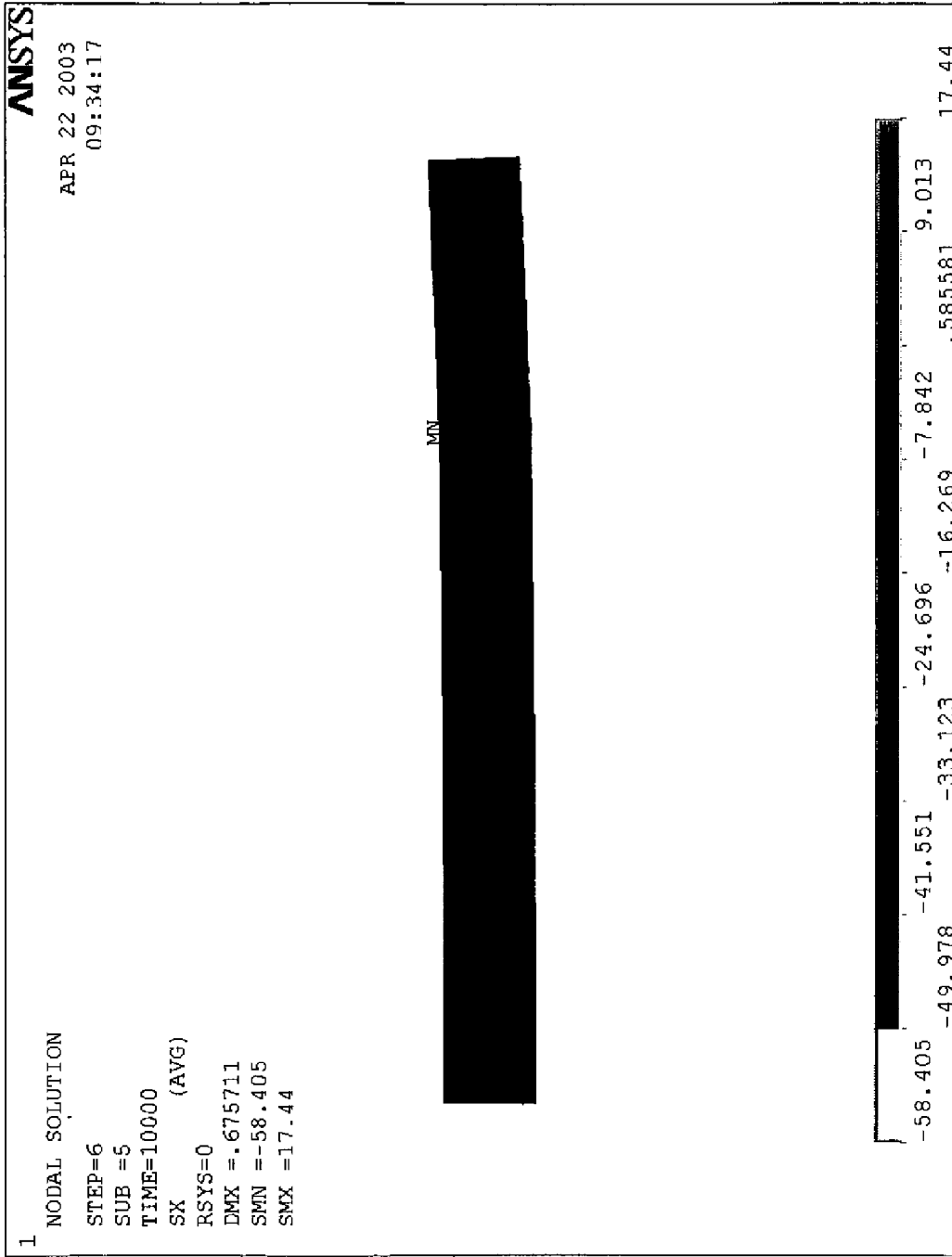


Model 300 – Non-linear Plane Strain
Case 3 – Top Pressure and Soil Static Displacements



Deformed Shape

Model 300 – Non-linear Plane Strain
Case 3 – Top Pressure and Soil Static Displacements



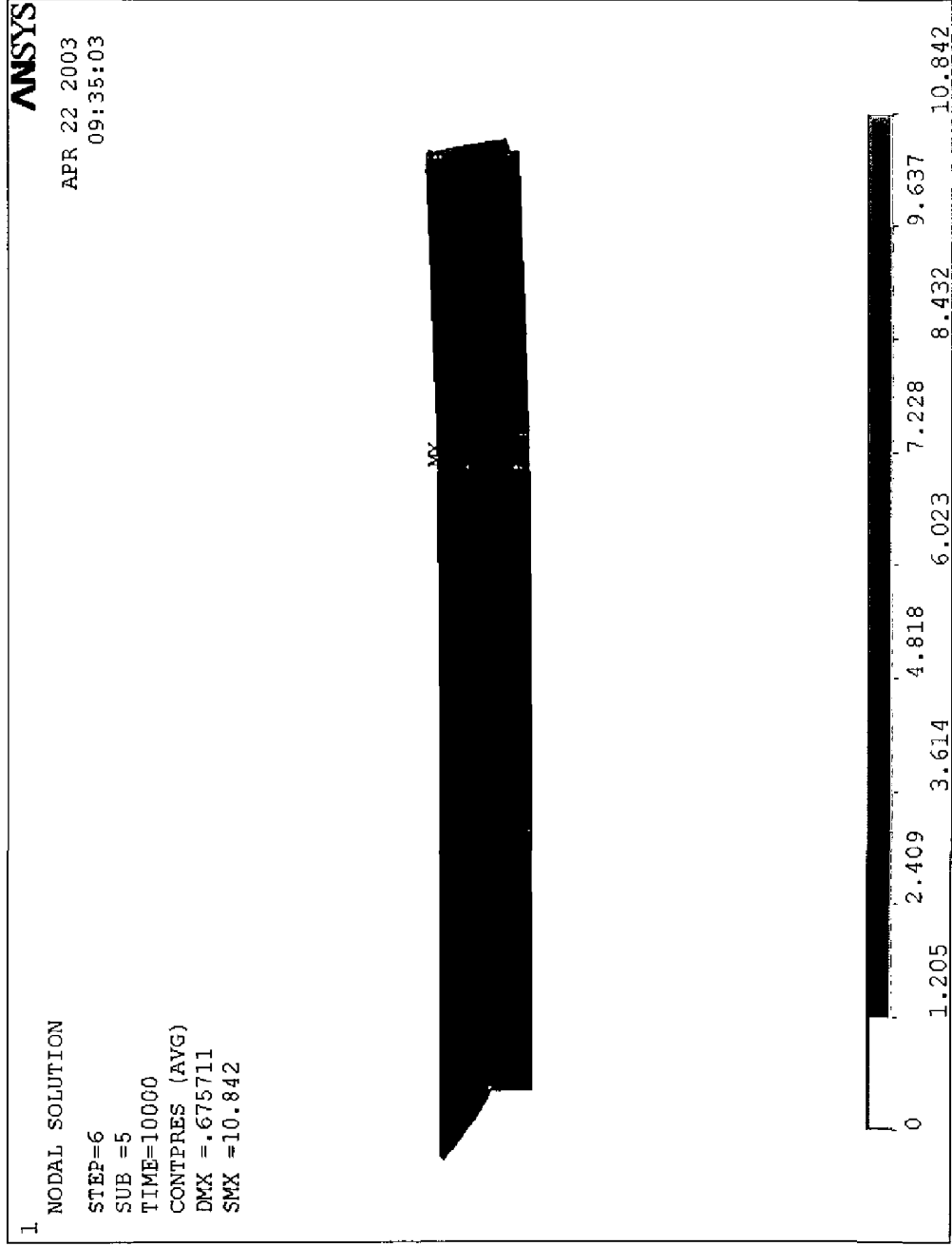
Horizontal Stress σ_x

T-CLC-Z-00001, Rev. 0

Model 300 – Non-linear Plane Strain
Case 3 – Top Pressure and Soil Static Displacements

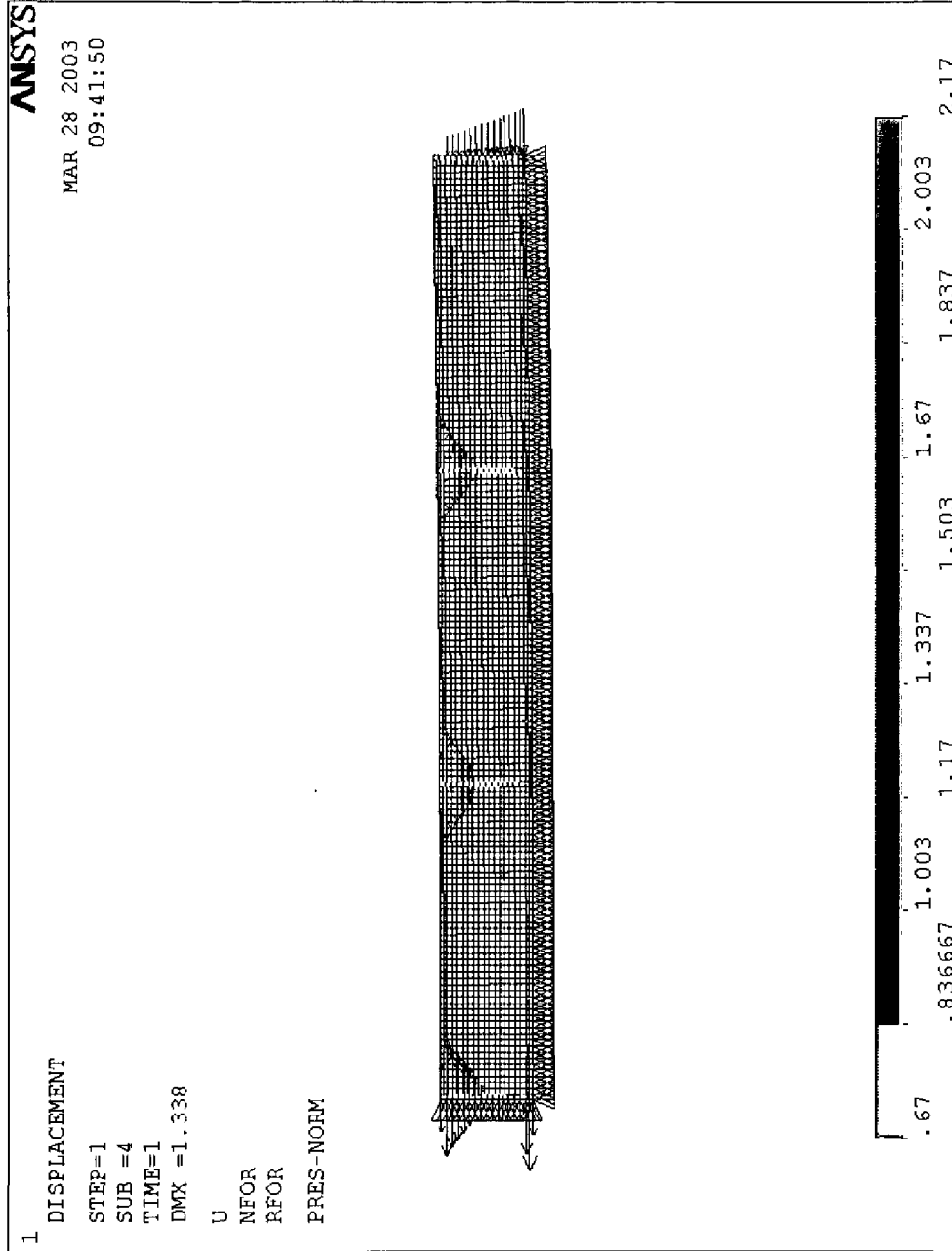
T-CLC-Z - 00006, Rev. 0

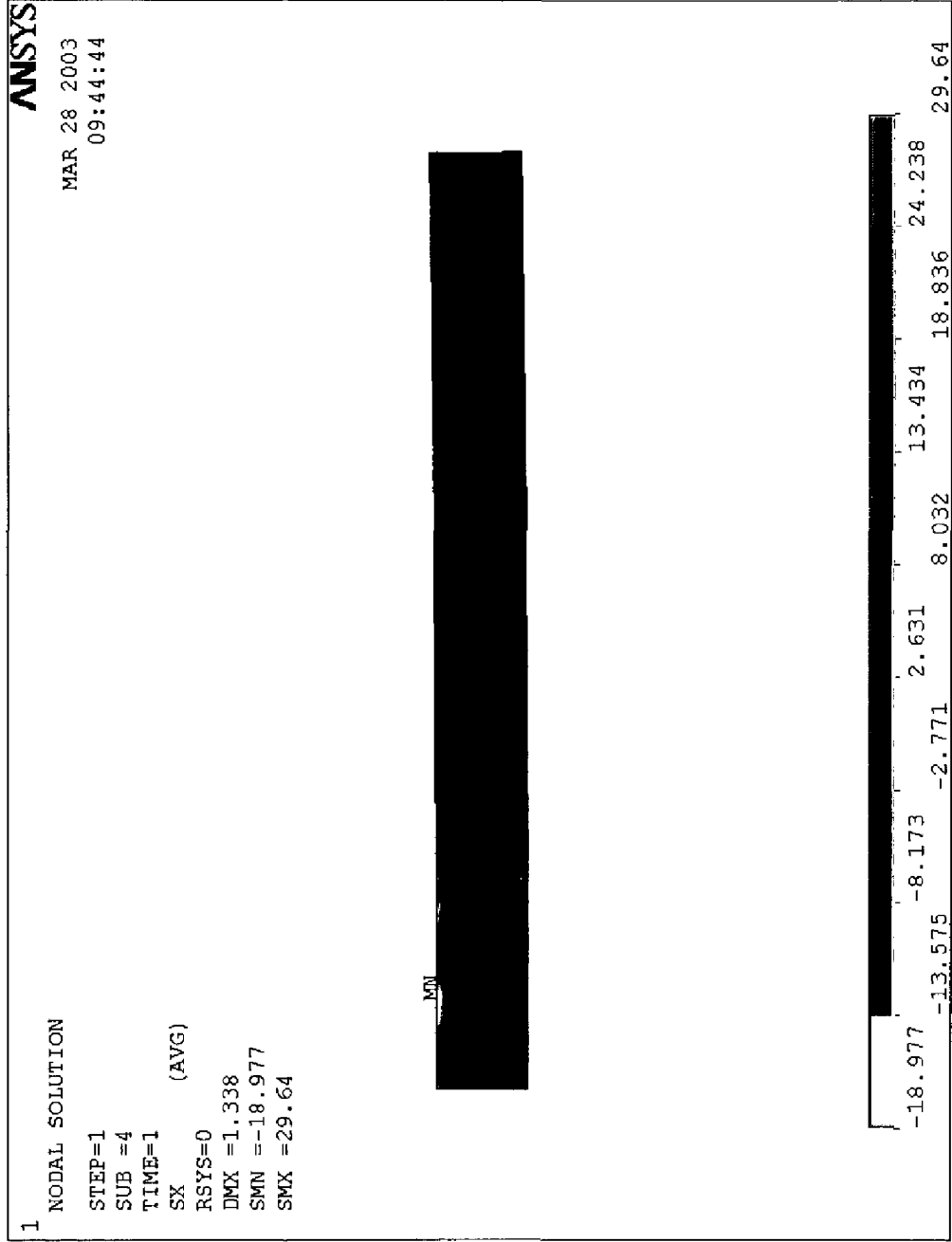
00



T-CLC-Z-00006, Rev. 0

Model 300 - Non-Linear Plane Strain [File ssv300]
10000 Year Static Settlement

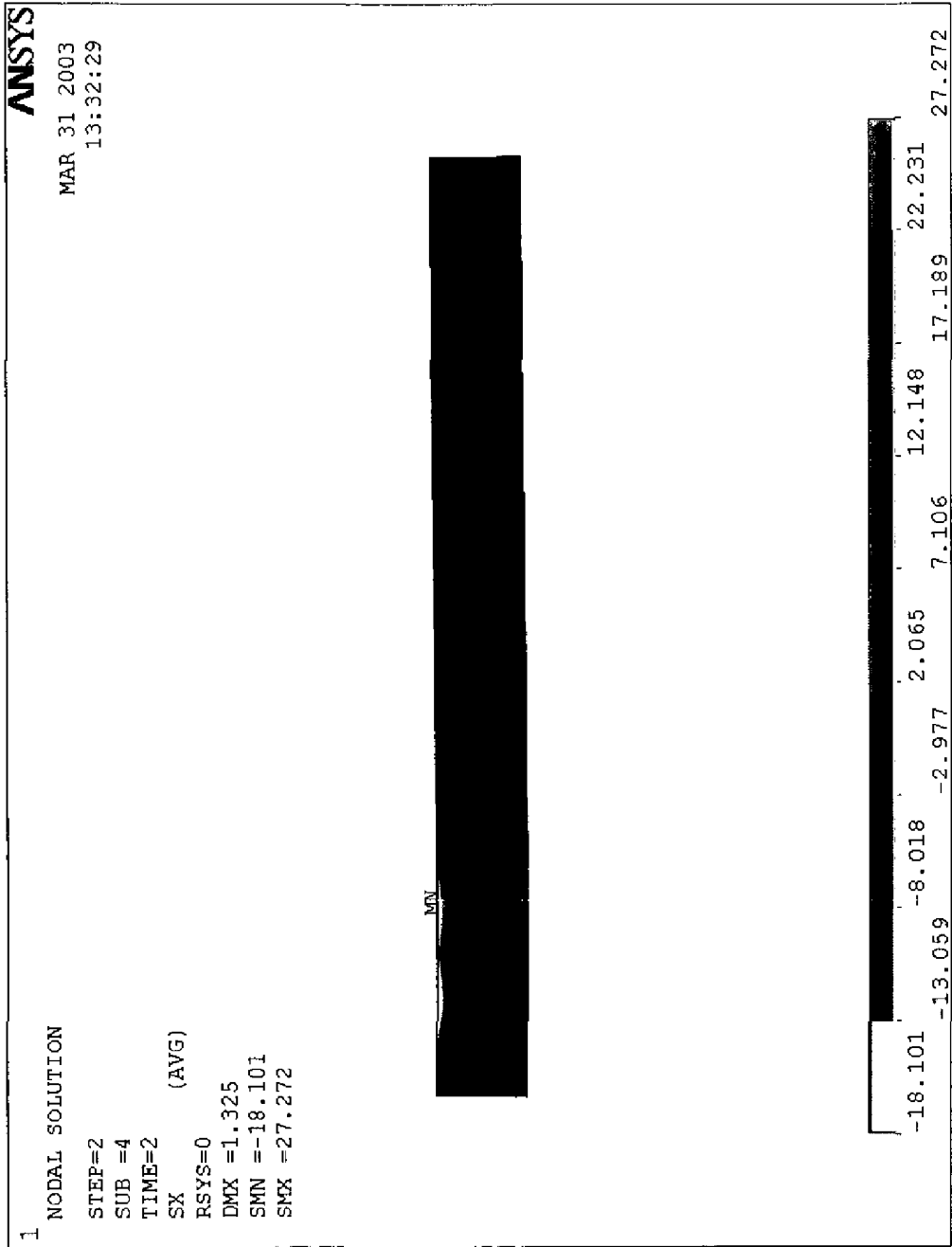




T-CLC-Z-00006, Rev. 0

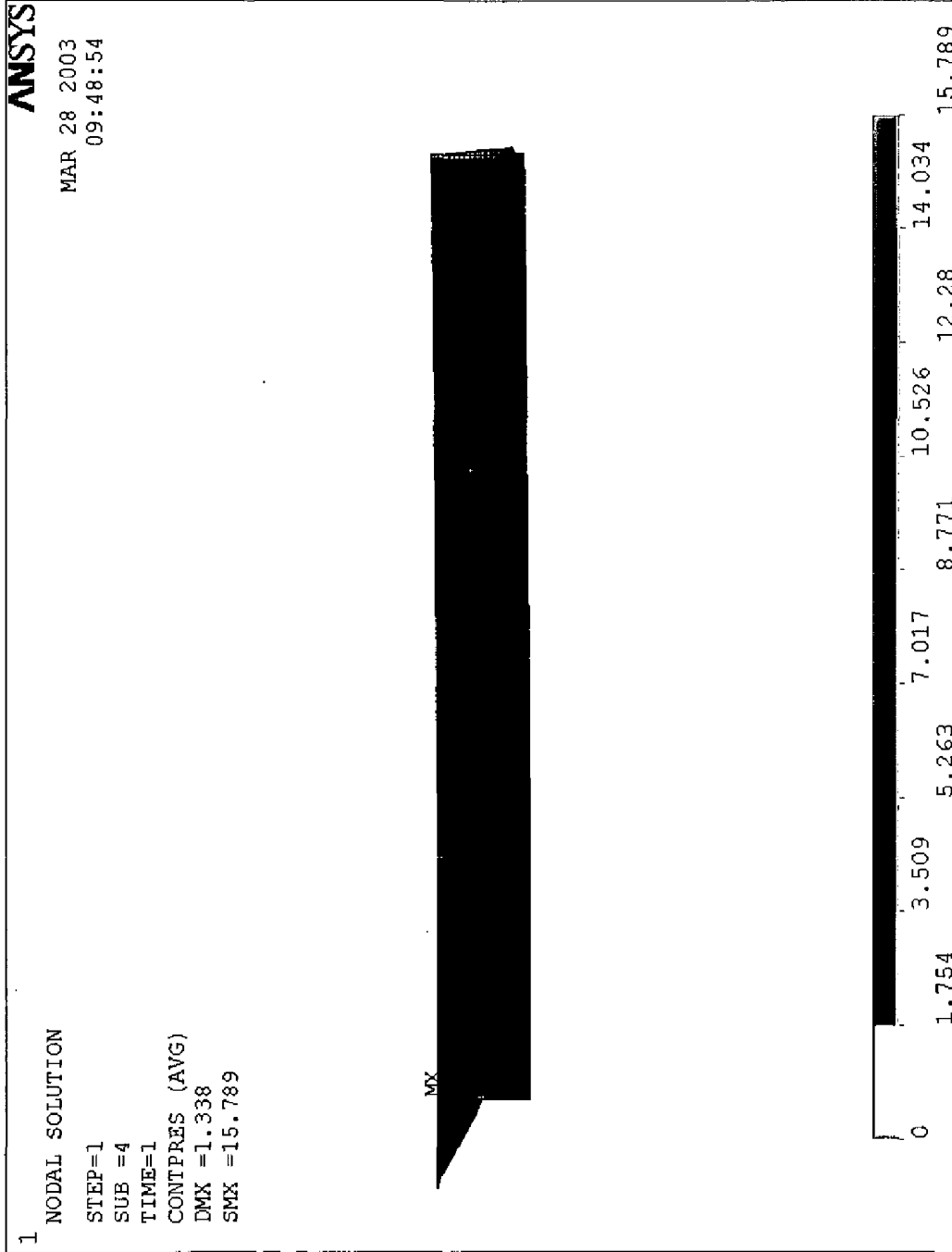
Model 300 - Non-Linear Plane Strain [File ssv300]
Case 3 - Top Load & Weight, then 10000 yr. Creep

T-CLC-Z-00006, Rev. 0



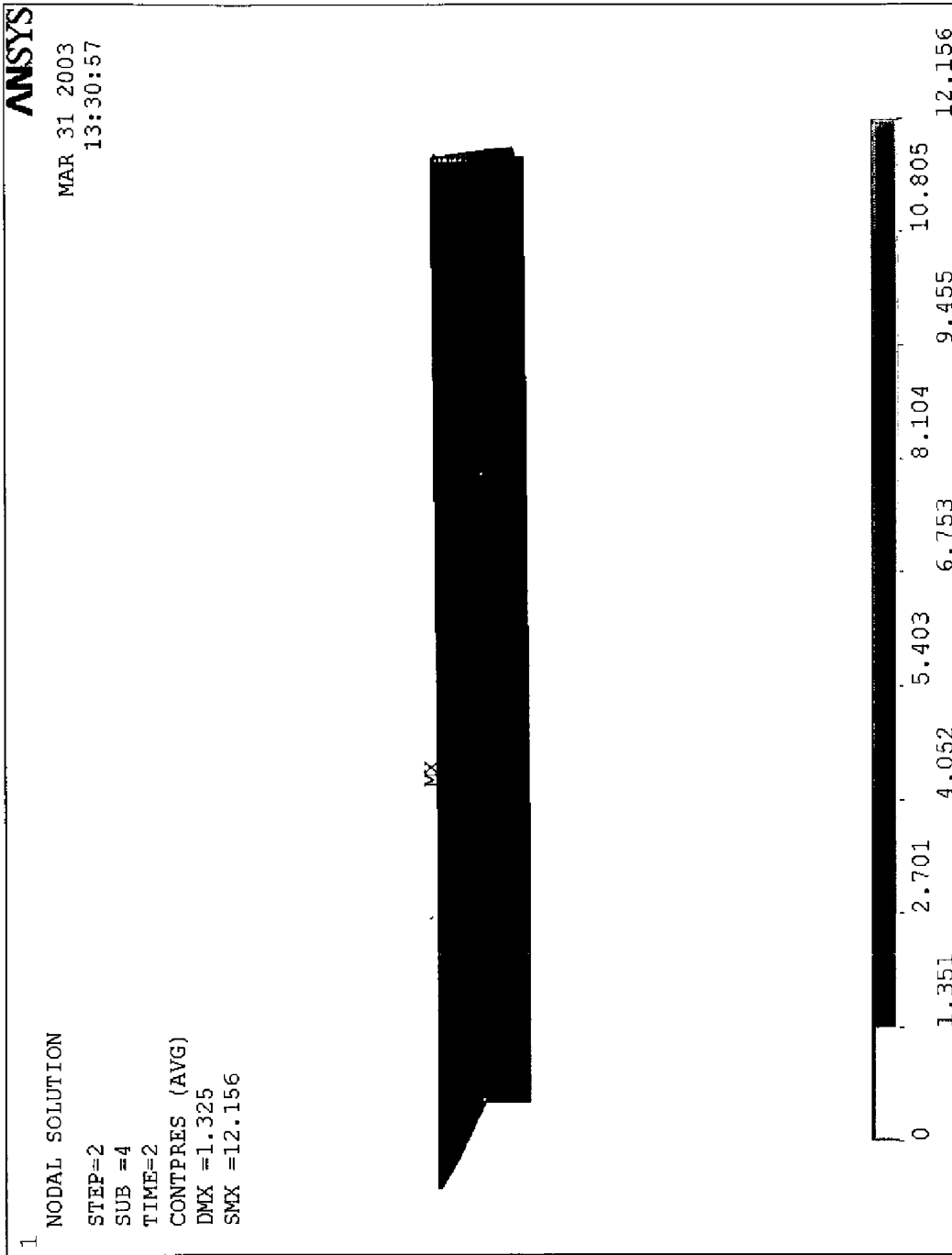
Horizontal Stress σ_x

Model 300 - Non-Linear Plane Strain [File ssv300]
10000 Year Static Settlement



Model 300 - Non-Linear Plane Strain [File ssv300]
Case 3 - Top Load & Weight, then 10000 yr. Creep

T-CLC-Z-00006, Rev. 0



Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. <i>T-CLC-Z-00006</i>				
	Subject <i>" "</i>					Sheet No. <i>87</i>				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
0	WLP	7/9/03	<i>[Signature]</i>	7/10/03						

DIFFERENTIAL SETTLEMENTS

ref. Coles. R-CLC-Z-00001, 00004

Depth to Settlement (boring ZCP-27)

Sheet 102

start elev. 230' } avg. 208 ft - depth = 62 ft.
 max elev 185'

No.

Max δ for PC-3

is 0.75 in

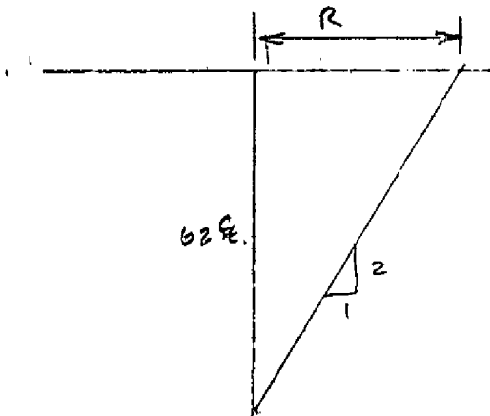
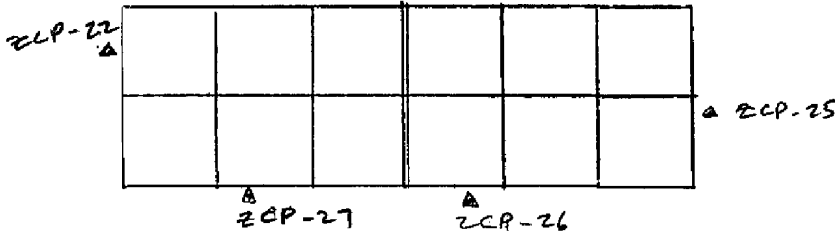
PC-4

2.75 in

limitations are approximate

Δ ZCP-23

Δ ZCP-24



$R = 31 \text{ ft. mean}$

$D = 62 \text{ ft. mean}$

Variation of D

min = 30' (const. st. spacing)

$CV = 1$

MEAN + 1 σ = 124'

Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. <i>T-CLC-2-00006</i>				
	Subject <i>" "</i>					Sheet No. <i>88</i>				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
<i>12</i>	<i>WVP</i>	<i>7/9/03</i>								

Settlement curve

ref: K-CLC-H-0015A, "Differential Settlement for CLWR-TEF Product Transfer Trench", Feb, 2000.
(Reference 7.2)

Settlement follows a Gaussian distribution with $R = 2.5\sigma$

$$\phi_N(t) = \frac{1}{\sqrt{2\pi}} e^{-t^2/2} \quad \text{where } t = \frac{x-\mu}{\sigma}$$

$r = x - \mu =$ distance from center of displacement field

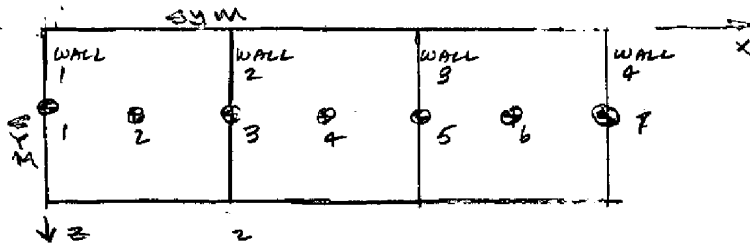
⊙ $r = 0 \cdot \phi_N(t) = 0.3989$

⊙ $r = 2.5\sigma = 31 \text{ ft. } t = 2.5 \quad \phi_N = 0.0175$

Write EXCEL spreadsheet to apply displacements on model - file: ssv-diff settlement.xls

Parameters S_{map} , depth to displacement, location of center of displacement field

LOCATION OF CHOSEN - equal probability



Add diff. displ to static case - apply at top of soil

Center of Displacement	Xc 50.75	ft
Depth to Displacement	D 82	ft
Maximum Diff Displ	delmax 0.75	in

Units are feet

NODE	sigma	X	t	Phi	Phi(norm)	Y diff	Static		Differential	
							100 years	5000 years	100 years	5000 years
30001	=VLOOKUP(A12,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B13-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C17^2)/2)	=D12*MAX(D\$12,D\$467)	=STATICG9	=E17*delmax/12	=STATICG9	=STATICG9	=G13-\$F12	5000 years
30002	=VLOOKUP(A13,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B14-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C18^2)/2)	=D13*MAX(D\$13,D\$467)	=STATICG7	=E18*delmax/12	=STATICG7	=STATICG7	=G13-\$F13	1000 years
51012	=VLOOKUP(A14,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B15-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C19^2)/2)	=D14*MAX(D\$14,D\$467)	=STATICG8	=E19*delmax/12	=STATICG8	=STATICG8	=G14-\$F14	5000 years
51013	=VLOOKUP(A15,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B16-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C20^2)/2)	=D15*MAX(D\$15,D\$467)	=STATICG6	=E20*delmax/12	=STATICG6	=STATICG6	=G14-\$F15	1000 years
51014	=VLOOKUP(A16,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B17-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C21^2)/2)	=D16*MAX(D\$16,D\$467)	=STATICG5	=E21*delmax/12	=STATICG5	=STATICG5	=G15-\$F16	5000 years
51015	=VLOOKUP(A17,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B18-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C22^2)/2)	=D17*MAX(D\$17,D\$467)	=STATICG3	=E22*delmax/12	=STATICG3	=STATICG3	=G15-\$F17	1000 years
51016	=VLOOKUP(A18,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B19-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C23^2)/2)	=D18*MAX(D\$18,D\$467)	=STATICG1	=E23*delmax/12	=STATICG1	=STATICG1	=G16-\$F18	5000 years
51017	=VLOOKUP(A19,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B20-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C24^2)/2)	=D19*MAX(D\$19,D\$467)	=STATICG2	=E24*delmax/12	=STATICG2	=STATICG2	=G16-\$F19	1000 years
51018	=VLOOKUP(A20,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B21-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C25^2)/2)	=D20*MAX(D\$20,D\$467)	=STATICG4	=E25*delmax/12	=STATICG4	=STATICG4	=G17-\$F20	5000 years
51019	=VLOOKUP(A21,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B22-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C26^2)/2)	=D21*MAX(D\$21,D\$467)	=STATICG15	=E26*delmax/12	=STATICG15	=STATICG15	=G17-\$F21	1000 years
51020	=VLOOKUP(A22,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B23-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C27^2)/2)	=D22*MAX(D\$22,D\$467)	=STATICG16	=E27*delmax/12	=STATICG16	=STATICG16	=G18-\$F22	5000 years
51021	=VLOOKUP(A23,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B24-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C28^2)/2)	=D23*MAX(D\$23,D\$467)	=STATICG17	=E28*delmax/12	=STATICG17	=STATICG17	=G18-\$F23	1000 years
51022	=VLOOKUP(A24,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B25-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C29^2)/2)	=D24*MAX(D\$24,D\$467)	=STATICG18	=E29*delmax/12	=STATICG18	=STATICG18	=G19-\$F24	5000 years
51023	=VLOOKUP(A25,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B26-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C30^2)/2)	=D25*MAX(D\$25,D\$467)	=STATICG19	=E30*delmax/12	=STATICG19	=STATICG19	=G19-\$F25	1000 years
51024	=VLOOKUP(A26,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B27-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C31^2)/2)	=D26*MAX(D\$26,D\$467)	=STATICG20	=E31*delmax/12	=STATICG20	=STATICG20	=G20-\$F26	5000 years
50833	=VLOOKUP(A27,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B28-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C32^2)/2)	=D27*MAX(D\$27,D\$467)	=STATICG21	=E32*delmax/12	=STATICG21	=STATICG21	=G20-\$F27	1000 years
50834	=VLOOKUP(A28,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B29-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C33^2)/2)	=D28*MAX(D\$28,D\$467)	=STATICG22	=E33*delmax/12	=STATICG22	=STATICG22	=G21-\$F28	5000 years
50835	=VLOOKUP(A29,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B30-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C34^2)/2)	=D29*MAX(D\$29,D\$467)	=STATICG23	=E34*delmax/12	=STATICG23	=STATICG23	=G21-\$F29	1000 years
50836	=VLOOKUP(A30,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B31-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C35^2)/2)	=D30*MAX(D\$30,D\$467)	=STATICG24	=E35*delmax/12	=STATICG24	=STATICG24	=G22-\$F30	5000 years
50837	=VLOOKUP(A31,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B32-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C36^2)/2)	=D31*MAX(D\$31,D\$467)	=STATICG25	=E36*delmax/12	=STATICG25	=STATICG25	=G22-\$F31	1000 years
50838	=VLOOKUP(A32,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B33-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C37^2)/2)	=D32*MAX(D\$32,D\$467)	=STATICG26	=E37*delmax/12	=STATICG26	=STATICG26	=G23-\$F32	5000 years
50839	=VLOOKUP(A33,\$AD\$2:\$AES\$165,2,FALSE)	=ABS(B34-Xc)/sigma	=1/(SQRT(2*PI()))*EXP(-(C38^2)/2)	=D33*MAX(D\$33,D\$467)	=STATICG27	=E38*delmax/12	=STATICG27	=STATICG27	=G23-\$F33	1000 years

EXCEL formulae for differential displacement calculations

Center of Displacement
 Xc 250.75ft
 Depth to Displacement
 D 62ft
 Maximum Diff Displ
 delmax: 2.75 in

DIFFERENTIAL DISPLACEMENT CALCULATION

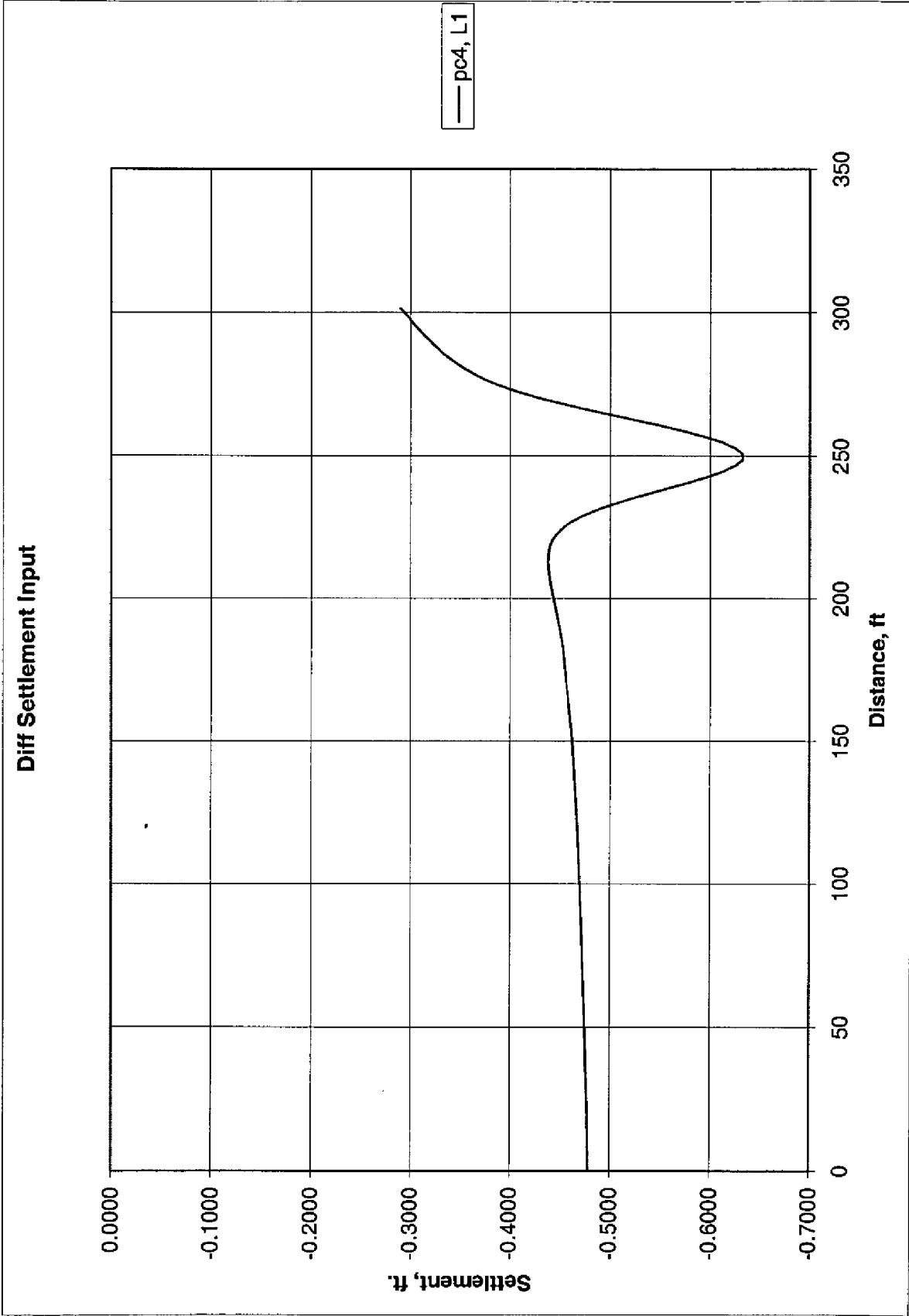
← INPUT

sigma 12.4

NODE	X	t	Phi	Phi(norm)	Y diff	Static			Differential			- Apply to Model 300 isu 300
						100 years	1000 years	5000 years	100 years	1000 years	5000 years	
30001	0	20.222	0.000	0.000	0.0000	-0.389	-0.47839	-0.54745	-0.3893	-0.4784	-0.5475	
30002	1.5	20.101	0.000	0.000	0.0000	-0.389	-0.47833	-0.5474	-0.3892	-0.4783	-0.5474	
51012	3.45	19.944	0.000	0.000	0.0000	-0.389	-0.47826	-0.54733	-0.3892	-0.4783	-0.5473	
51013	5.4	19.786	0.000	0.000	0.0000	-0.389	-0.47819	-0.54727	-0.3891	-0.4782	-0.5473	
51014	7.35	19.629	0.000	0.000	0.0000	-0.389	-0.47811	-0.5472	-0.3890	-0.4781	-0.5472	
51015	9.3	19.472	0.000	0.000	0.0000	-0.389	-0.47804	-0.54713	-0.3889	-0.4780	-0.5471	
51016	11.25	19.315	0.000	0.000	0.0000	-0.389	-0.47797	-0.54706	-0.3888	-0.4780	-0.5471	
51017	13.2	19.157	0.000	0.000	0.0000	-0.389	-0.4779	-0.547	-0.3888	-0.4779	-0.5470	
51018	15.15	19.000	0.000	0.000	0.0000	-0.389	-0.47783	-0.54693	-0.3887	-0.4778	-0.5469	
51019	17.1	18.843	0.000	0.000	0.0000	-0.389	-0.47775	-0.54686	-0.3886	-0.4778	-0.5469	
51020	19.05	18.685	0.000	0.000	0.0000	-0.389	-0.47768	-0.5468	-0.3885	-0.4777	-0.5468	
51021	21	18.528	0.000	0.000	0.0000	-0.388	-0.47758	-0.5467	-0.3884	-0.4776	-0.5467	
51022	22.95	18.371	0.000	0.000	0.0000	-0.388	-0.47741	-0.54652	-0.3883	-0.4774	-0.5465	
51023	24.9	18.214	0.000	0.000	0.0000	-0.388	-0.47724	-0.54634	-0.3881	-0.4772	-0.5463	
51024	26.85	18.056	0.000	0.000	0.0000	-0.388	-0.47708	-0.54616	-0.3880	-0.4771	-0.5462	
51025	28.8	17.899	0.000	0.000	0.0000	-0.388	-0.47691	-0.54598	-0.3878	-0.4769	-0.5460	
50633	30.75	17.742	0.000	0.000	0.0000	-0.388	-0.47674	-0.5458	-0.3876	-0.4767	-0.5458	
51011	30.75	17.742	0.000	0.000	0.0000	-0.388	-0.47674	-0.5458	-0.3876	-0.4767	-0.5458	
50635	32.75	17.581	0.000	0.000	0.0000	-0.387	-0.47656	-0.54562	-0.3875	-0.4766	-0.5456	
50636	34.75	17.419	0.000	0.000	0.0000	-0.387	-0.47639	-0.54543	-0.3873	-0.4764	-0.5454	
50637	36.75	17.258	0.000	0.000	0.0000	-0.387	-0.47622	-0.54525	-0.3872	-0.4762	-0.5452	
50638	38.75	17.097	0.000	0.000	0.0000	-0.387	-0.47604	-0.54506	-0.3870	-0.4760	-0.5451	
50639	40.75	16.935	0.000	0.000	0.0000	-0.387	-0.47587	-0.54488	-0.3868	-0.4759	-0.5449	
50640	42.75	16.774	0.000	0.000	0.0000	-0.387	-0.4757	-0.54469	-0.3867	-0.4757	-0.5447	
50641	44.75	16.613	0.000	0.000	0.0000	-0.387	-0.47552	-0.54451	-0.3865	-0.4755	-0.5445	
50642	46.75	16.452	0.000	0.000	0.0000	-0.386	-0.47535	-0.54432	-0.3864	-0.4753	-0.5443	
50643	48.75	16.290	0.000	0.000	0.0000	-0.386	-0.47517	-0.54414	-0.3862	-0.4752	-0.5441	
50644	50.75	16.129	0.000	0.000	0.0000	-0.386	-0.475	-0.54395	-0.3860	-0.4750	-0.5440	
50645	52.75	15.968	0.000	0.000	0.0000	-0.386	-0.47483	-0.54377	-0.3859	-0.4748	-0.5438	
50646	54.75	15.806	0.000	0.000	0.0000	-0.386	-0.47463	-0.54356	-0.3857	-0.4746	-0.5436	
50647	56.75	15.645	0.000	0.000	0.0000	-0.386	-0.47443	-0.54335	-0.3855	-0.4744	-0.5433	
50648	58.75	15.484	0.000	0.000	0.0000	-0.385	-0.47423	-0.54313	-0.3853	-0.4742	-0.5431	
50634	60.75	15.323	0.000	0.000	0.0000	-0.385	-0.47403	-0.54292	-0.3852	-0.4740	-0.5429	
50681	60.75	15.323	0.000	0.000	0.0000	-0.385	-0.47403	-0.54292	-0.3852	-0.4740	-0.5429	
50683	62.75	15.161	0.000	0.000	0.0000	-0.385	-0.47383	-0.54271	-0.3850	-0.4738	-0.5427	
50684	64.75	15.000	0.000	0.000	0.0000	-0.385	-0.47363	-0.54249	-0.3848	-0.4736	-0.5425	
50685	66.75	14.839	0.000	0.000	0.0000	-0.385	-0.47343	-0.54228	-0.3846	-0.4734	-0.5423	
50686	68.75	14.677	0.000	0.000	0.0000	-0.384	-0.47323	-0.54207	-0.3844	-0.4732	-0.5421	
50687	70.75	14.516	0.000	0.000	0.0000	-0.384	-0.47303	-0.54185	-0.3843	-0.4730	-0.5419	
50688	72.75	14.355	0.000	0.000	0.0000	-0.384	-0.47283	-0.54164	-0.3841	-0.4728	-0.5418	
50689	74.75	14.194	0.000	0.000	0.0000	-0.384	-0.47263	-0.54142	-0.3839	-0.4726	-0.5414	
50690	76.75	14.032	0.000	0.000	0.0000	-0.384	-0.47244	-0.54121	-0.3837	-0.4724	-0.5412	
50691	78.75	13.871	0.000	0.000	0.0000	-0.384	-0.47224	-0.541	-0.3835	-0.4722	-0.5410	
50692	80.75	13.710	0.000	0.000	0.0000	-0.383	-0.47204	-0.54078	-0.3833	-0.4720	-0.5408	
50693	82.75	13.548	0.000	0.000	0.0000	-0.383	-0.47184	-0.54057	-0.3832	-0.4718	-0.5406	
50694	84.75	13.387	0.000	0.000	0.0000	-0.383	-0.47164	-0.54035	-0.3830	-0.4716	-0.5404	
50695	86.75	13.226	0.000	0.000	0.0000	-0.383	-0.47142	-0.54012	-0.3828	-0.4714	-0.5401	
50696	88.75	13.065	0.000	0.000	0.0000	-0.383	-0.47118	-0.53986	-0.3826	-0.4712	-0.5399	
50682	90.75	12.903	0.000	0.000	0.0000	-0.382	-0.47094	-0.5396	-0.3824	-0.4709	-0.5396	
51056	90.75	12.903	0.000	0.000	0.0000	-0.382	-0.47094	-0.5396	-0.3824	-0.4709	-0.5396	
51060	92.6	12.754	0.000	0.000	0.0000	-0.382	-0.47072	-0.53936	-0.3822	-0.4707	-0.5394	
51059	94.45	12.605	0.000	0.000	0.0000	-0.382	-0.4705	-0.53912	-0.3820	-0.4705	-0.5391	
51058	96.3	12.456	0.000	0.000	0.0000	-0.382	-0.47028	-0.53888	-0.3818	-0.4703	-0.5389	
51057	98.15	12.306	0.000	0.000	0.0000	-0.382	-0.47007	-0.53864	-0.3816	-0.4701	-0.5386	
30211	100	12.157	0.000	0.000	0.0000	-0.381	-0.46985	-0.5384	-0.3814	-0.4698	-0.5384	
30178	101.5	12.036	0.000	0.000	0.0000	-0.381	-0.46967	-0.53821	-0.3812	-0.4697	-0.5382	
50604	103.425	11.881	0.000	0.000	0.0000	-0.381	-0.46944	-0.53796	-0.3810	-0.4694	-0.5380	

50805	105.35	11.726	0.000	0.000	0.0000	-0.381	-0.46921	-0.53771	-0.3808	-0.4692	-0.5377
50806	107.275	11.571	0.000	0.000	0.0000	-0.381	-0.46898	-0.53746	-0.3806	-0.4690	-0.5375
50807	109.2	11.415	0.000	0.000	0.0000	-0.380	-0.46875	-0.53721	-0.3804	-0.4688	-0.5372
50808	111.125	11.260	0.000	0.000	0.0000	-0.380	-0.46852	-0.53696	-0.3802	-0.4685	-0.5370
50809	113.05	11.105	0.000	0.000	0.0000	-0.380	-0.46829	-0.53671	-0.3800	-0.4683	-0.5367
50810	114.975	10.950	0.000	0.000	0.0000	-0.380	-0.46807	-0.53646	-0.3798	-0.4681	-0.5365
50811	116.9	10.794	0.000	0.000	0.0000	-0.380	-0.46784	-0.53621	-0.3796	-0.4678	-0.5362
50812	118.825	10.639	0.000	0.000	0.0000	-0.379	-0.4676	-0.53595	-0.3794	-0.4676	-0.5360
50803	120.75	10.484	0.000	0.000	0.0000	-0.379	-0.46727	-0.53559	-0.3791	-0.4673	-0.5356
50744	120.75	10.484	0.000	0.000	0.0000	-0.379	-0.46727	-0.53559	-0.3791	-0.4673	-0.5356
50746	122.75	10.323	0.000	0.000	0.0000	-0.379	-0.46693	-0.53521	-0.3788	-0.4669	-0.5352
50747	124.75	10.161	0.000	0.000	0.0000	-0.379	-0.46659	-0.53483	-0.3785	-0.4666	-0.5348
50748	126.75	10.000	0.000	0.000	0.0000	-0.378	-0.46624	-0.53445	-0.3782	-0.4662	-0.5344
50749	128.75	9.839	0.000	0.000	0.0000	-0.378	-0.4659	-0.53407	-0.3780	-0.4659	-0.5341
50750	130.75	9.677	0.000	0.000	0.0000	-0.378	-0.46556	-0.53369	-0.3777	-0.4656	-0.5337
50751	132.75	9.516	0.000	0.000	0.0000	-0.377	-0.46522	-0.53331	-0.3774	-0.4652	-0.5333
50752	134.75	9.355	0.000	0.000	0.0000	-0.377	-0.46488	-0.53293	-0.3771	-0.4649	-0.5329
50753	136.75	9.194	0.000	0.000	0.0000	-0.377	-0.46454	-0.53255	-0.3768	-0.4645	-0.5325
50754	138.75	9.032	0.000	0.000	0.0000	-0.376	-0.46419	-0.53217	-0.3765	-0.4642	-0.5322
50755	140.75	8.871	0.000	0.000	0.0000	-0.376	-0.46385	-0.53179	-0.3762	-0.4639	-0.5318
50756	142.75	8.710	0.000	0.000	0.0000	-0.376	-0.46351	-0.53141	-0.3759	-0.4635	-0.5314
50757	144.75	8.548	0.000	0.000	0.0000	-0.376	-0.46317	-0.53103	-0.3756	-0.4632	-0.5310
50758	146.75	8.387	0.000	0.000	0.0000	-0.375	-0.46283	-0.53065	-0.3753	-0.4628	-0.5306
50759	148.75	8.226	0.000	0.000	0.0000	-0.375	-0.46249	-0.53027	-0.3750	-0.4625	-0.5303
50745	150.75	8.065	0.000	0.000	0.0000	-0.375	-0.46214	-0.52989	-0.3747	-0.4621	-0.5299
50792	150.75	8.065	0.000	0.000	0.0000	-0.375	-0.46214	-0.52989	-0.3747	-0.4621	-0.5299
50794	152.75	7.903	0.000	0.000	0.0000	-0.374	-0.46163	-0.5293	-0.3743	-0.4616	-0.5293
50795	154.75	7.742	0.000	0.000	0.0000	-0.374	-0.46104	-0.52863	-0.3738	-0.4610	-0.5286
50796	156.75	7.581	0.000	0.000	0.0000	-0.373	-0.46044	-0.52795	-0.3733	-0.4604	-0.5280
50797	158.75	7.419	0.000	0.000	0.0000	-0.373	-0.45985	-0.52728	-0.3728	-0.4598	-0.5273
50798	160.75	7.258	0.000	0.000	0.0000	-0.372	-0.45926	-0.5266	-0.3724	-0.4593	-0.5266
50799	162.75	7.097	0.000	0.000	0.0000	-0.372	-0.45866	-0.52593	-0.3719	-0.4587	-0.5259
50800	164.75	6.935	0.000	0.000	0.0000	-0.371	-0.45807	-0.52525	-0.3714	-0.4581	-0.5253
50801	166.75	6.774	0.000	0.000	0.0000	-0.371	-0.45747	-0.52457	-0.3709	-0.4575	-0.5246
50802	168.75	6.613	0.000	0.000	0.0000	-0.370	-0.45688	-0.5239	-0.3704	-0.4569	-0.5239
50803	170.75	6.452	0.000	0.000	0.0000	-0.370	-0.45629	-0.52322	-0.3699	-0.4563	-0.5232
50804	172.75	6.290	0.000	0.000	0.0000	-0.369	-0.45569	-0.52255	-0.3694	-0.4557	-0.5225
50805	174.75	6.129	0.000	0.000	0.0000	-0.369	-0.4551	-0.52187	-0.3689	-0.4551	-0.5219
50806	176.75	5.968	0.000	0.000	0.0000	-0.368	-0.45451	-0.5212	-0.3685	-0.4545	-0.5212
50807	178.75	5.806	0.000	0.000	0.0000	-0.368	-0.45391	-0.52052	-0.3680	-0.4539	-0.5205
50793	180.75	5.645	0.000	0.000	0.0000	-0.367	-0.45332	-0.51985	-0.3675	-0.4533	-0.5198
50840	180.75	5.645	0.000	0.000	0.0000	-0.367	-0.45332	-0.51985	-0.3675	-0.4533	-0.5198
50841	182.675	5.490	0.000	0.000	0.0000	-0.367	-0.45275	-0.5192	-0.3670	-0.4528	-0.5192
50842	184.6	5.335	0.000	0.000	0.0000	-0.366	-0.45204	-0.51839	-0.3664	-0.4520	-0.5184
50843	186.525	5.179	0.000	0.000	0.0000	-0.366	-0.45096	-0.51715	-0.3655	-0.4510	-0.5171
50844	188.45	5.024	0.000	0.000	0.0000	-0.365	-0.44988	-0.51591	-0.3647	-0.4499	-0.5159
50845	190.375	4.869	0.000	0.000	0.0000	-0.364	-0.44879	-0.51466	-0.3638	-0.4488	-0.5147
50846	192.3	4.714	0.000	0.000	0.0000	-0.363	-0.44771	-0.51342	-0.3629	-0.4477	-0.5134
50847	194.225	4.558	0.000	0.000	0.0000	-0.362	-0.44662	-0.51218	-0.3620	-0.4466	-0.5122
50848	196.15	4.403	0.000	0.000	0.0000	-0.361	-0.44554	-0.51094	-0.3611	-0.4456	-0.5110
50849	198.075	4.248	0.000	0.000	0.0000	-0.360	-0.44446	-0.5097	-0.3603	-0.4445	-0.5097
30214	200	4.093	0.000	0.000	0.0001	-0.359	-0.44337	-0.50845	-0.3594	-0.4434	-0.5085
30215	201.5	3.972	0.000	0.000	0.0001	-0.359	-0.44253	-0.50749	-0.3588	-0.4426	-0.5076
50730	203.35	3.823	0.000	0.001	0.0002	-0.358	-0.44148	-0.50629	-0.3580	-0.4416	-0.5064
50731	205.2	3.673	0.000	0.001	0.0003	-0.357	-0.44044	-0.5051	-0.3573	-0.4407	-0.5054
50732	207.05	3.524	0.001	0.002	0.0005	-0.356	-0.4394	-0.5039	-0.3566	-0.4399	-0.5044
50733	208.9	3.375	0.001	0.003	0.0008	-0.355	-0.43836	-0.50271	-0.3561	-0.4391	-0.5035
50729	210.75	3.226	0.002	0.006	0.0013	-0.354	-0.43732	-0.50152	-0.3557	-0.4386	-0.5028
50870	210.75	3.226	0.002	0.006	0.0013	-0.354	-0.43732	-0.50152	-0.3557	-0.4386	-0.5028
50872	212.75	3.065	0.004	0.009	0.0021	-0.354	-0.43619	-0.50023	-0.3556	-0.4383	-0.5023
50873	214.75	2.903	0.006	0.015	0.0034	-0.353	-0.43506	-0.49893	-0.3560	-0.4385	-0.5023
50874	216.75	2.742	0.009	0.023	0.0053	-0.352	-0.43394	-0.49764	-0.3570	-0.4393	-0.5030
50875	218.75	2.581	0.014	0.036	0.0082	-0.350	-0.43226	-0.49572	-0.3585	-0.4405	-0.5039
50876	220.75	2.419	0.021	0.054	0.0123	-0.349	-0.43055	-0.49377	-0.3612	-0.4428	-0.5061
50877	222.75	2.258	0.031	0.078	0.0179	-0.348	-0.42885	-0.49183	-0.3654	-0.4468	-0.5097
50878	224.75	2.097	0.044	0.111	0.0254	-0.346	-0.42715	-0.48988	-0.3716	-0.4526	-0.5153
50879	226.75	1.935	0.061	0.154	0.0352	-0.345	-0.42545	-0.48793	-0.3800	-0.4607	-0.5231
50880	228.75	1.774	0.083	0.207	0.0475	-0.343	-0.42374	-0.48598	-0.3909	-0.4712	-0.5335

50881	230.75	1.613	0.109	0.272	0.0624	-0.342	-0.42204	-0.48404	-0.4044	-0.4844	-0.5464
50882	232.75	1.452	0.139	0.349	0.0799	-0.341	-0.42034	-0.48209	-0.4205	-0.5002	-0.5620
50883	234.75	1.290	0.174	0.435	0.0997	-0.339	-0.41864	-0.48014	-0.4389	-0.5183	-0.5798
50884	236.75	1.129	0.211	0.529	0.1212	-0.338	-0.41693	-0.4782	-0.4590	-0.5381	-0.5994
50885	238.75	0.968	0.250	0.626	0.1435	-0.336	-0.41523	-0.47625	-0.4799	-0.5587	-0.6197
50871	240.75	0.806	0.288	0.722	0.1655	-0.335	-0.41353	-0.4743	-0.5006	-0.5791	-0.6399
50918	240.75	0.806	0.288	0.722	0.1655	-0.335	-0.41353	-0.4743	-0.5006	-0.5791	-0.6399
50920	242.75	0.645	0.324	0.812	0.1861	-0.334	-0.41182	-0.47236	-0.5198	-0.5979	-0.6585
50921	244.75	0.484	0.355	0.890	0.2038	-0.332	-0.41012	-0.47041	-0.5361	-0.6140	-0.6743
50922	246.75	0.323	0.379	0.949	0.2175	-0.331	-0.40842	-0.46846	-0.5484	-0.6260	-0.6860
50923	248.75	0.161	0.394	0.987	0.2262	-0.330	-0.40672	-0.46651	-0.5557	-0.6329	-0.6927
50924	250.75	0.000	0.399	1.000	0.2292	-0.327	-0.4035	-0.46287	-0.5560	-0.6327	-0.6920
50925	252.75	0.161	0.394	0.987	0.2262	-0.323	-0.39929	-0.4581	-0.5495	-0.6255	-0.6843
50926	254.75	0.323	0.379	0.949	0.2175	-0.320	-0.39507	-0.45333	-0.5374	-0.6126	-0.6709
50927	256.75	0.484	0.355	0.890	0.2038	-0.316	-0.39085	-0.44856	-0.5202	-0.5947	-0.6524
50928	258.75	0.645	0.324	0.812	0.1861	-0.313	-0.38664	-0.44379	-0.4989	-0.5727	-0.6299
50929	260.75	0.806	0.288	0.722	0.1655	-0.309	-0.38242	-0.43902	-0.4749	-0.5480	-0.6046
50930	262.75	0.968	0.250	0.626	0.1435	-0.306	-0.37821	-0.43425	-0.4493	-0.5217	-0.5777
50931	264.75	1.129	0.211	0.529	0.1212	-0.302	-0.37399	-0.42948	-0.4235	-0.4952	-0.5506
50932	266.75	1.290	0.174	0.435	0.0997	-0.299	-0.36978	-0.42471	-0.3985	-0.4695	-0.5244
50933	268.75	1.452	0.139	0.349	0.0799	-0.295	-0.36556	-0.41994	-0.3752	-0.4455	-0.4998
50919	270.75	1.613	0.109	0.272	0.0624	-0.292	-0.36135	-0.41517	-0.3542	-0.4238	-0.4776
50966	270.75	1.613	0.109	0.272	0.0624	-0.292	-0.36135	-0.41517	-0.3542	-0.4238	-0.4776
50967	272.7	1.770	0.083	0.209	0.0478	-0.288	-0.35724	-0.41052	-0.3362	-0.4051	-0.4584
50968	274.65	1.927	0.062	0.156	0.0358	-0.285	-0.35313	-0.40587	-0.3207	-0.3889	-0.4416
50969	276.6	2.085	0.045	0.114	0.0261	-0.282	-0.34902	-0.40122	-0.3077	-0.3751	-0.4273
50970	278.55	2.242	0.032	0.081	0.0186	-0.278	-0.34491	-0.39657	-0.2967	-0.3635	-0.4151
50971	280.5	2.399	0.022	0.056	0.0129	-0.275	-0.3408	-0.39192	-0.2876	-0.3537	-0.4048
50972	282.45	2.556	0.015	0.038	0.0087	-0.271	-0.33662	-0.38719	-0.2800	-0.3454	-0.3959
50973	284.4	2.714	0.010	0.025	0.0058	-0.267	-0.33181	-0.38172	-0.2731	-0.3376	-0.3875
50974	286.35	2.871	0.006	0.016	0.0037	-0.263	-0.32699	-0.37624	-0.2671	-0.3307	-0.3800
50975	288.3	3.028	0.004	0.010	0.0023	-0.259	-0.32218	-0.37076	-0.2617	-0.3245	-0.3731
50976	290.25	3.185	0.002	0.006	0.0014	-0.255	-0.31737	-0.36528	-0.2569	-0.3188	-0.3667
50977	292.2	3.343	0.001	0.004	0.0009	-0.251	-0.31255	-0.35981	-0.2523	-0.3134	-0.3607
50978	294.15	3.500	0.001	0.002	0.0005	-0.248	-0.30774	-0.35433	-0.2480	-0.3082	-0.3548
50979	296.1	3.657	0.000	0.001	0.0003	-0.244	-0.30293	-0.34885	-0.2438	-0.3032	-0.3491
50980	298.05	3.815	0.000	0.001	0.0002	-0.240	-0.29811	-0.34338	-0.2397	-0.2983	-0.3435
30361	300	3.972	0.000	0.000	0.0001	-0.236	-0.2933	-0.3379	-0.2357	-0.2934	-0.3380
30362	301.5	4.093	0.000	0.000	0.0001	-0.233	-0.2896	-0.33369	-0.2326	-0.2896	-0.3337



T-CLC-Z-00006, Rev. 0

adisp sequence.txt

```

ANTYPE,0
TIME,1
/INPUT,'d1','txt','D:\Ansys Files\Run Files\Model 300\',' , 0
/STATUS,SOLU
SOLVE
!*
TIME,24
/INPUT,'d24','txt','D:\Ansys Files\Run Files\Model 300\',' , 0
/STATUS,SOLU
SOLVE
!*
TIME,100
/INPUT,'d100','txt','D:\Ansys Files\Run Files\Model 300\',' , 0
/STATUS,SOLU
SOLVE
!*
TIME,1000
/INPUT,'d1000','txt','D:\Ansys Files\Run Files\Model 300\',' , 0
/STATUS,SOLU
SOLVE
!*
TIME,5000
/INPUT,'d5000','txt','D:\Ansys Files\Run Files\Model 300\',' , 0
/STATUS,SOLU
SOLVE
!*
!TIME,10000
!/INPUT,'d10000','txt','D:\Ansys Files\Run Files\Model 300\',' , 0
!/STATUS,SOLU
!SOLVE
!FINISH

```

STATIC LOAD APPLICATION (5000 gms.)

Input for file ssv 300.db

D5000a.txt

D, 30001, , -0.3893, , , , UY, , , ,
D, 30002, , -0.3892, , , , UY, , , ,
D, 51012, , -0.3892, , , , UY, , , ,
D, 51013, , -0.3891, , , , UY, , , ,
D, 51014, , -0.3890, , , , UY, , , ,
D, 51015, , -0.3889, , , , UY, , , ,
D, 51016, , -0.3888, , , , UY, , , ,
D, 51017, , -0.3888, , , , UY, , , ,
D, 51018, , -0.3887, , , , UY, , , ,
D, 51019, , -0.3886, , , , UY, , , ,
D, 51020, , -0.3885, , , , UY, , , ,
D, 51021, , -0.3884, , , , UY, , , ,
D, 51022, , -0.3883, , , , UY, , , ,
D, 51023, , -0.3881, , , , UY, , , ,
D, 51024, , -0.3880, , , , UY, , , ,
D, 51025, , -0.3878, , , , UY, , , ,
D, 50633, , -0.3876, , , , UY, , , ,
D, 51011, , -0.3876, , , , UY, , , ,
D, 50635, , -0.3875, , , , UY, , , ,
D, 50636, , -0.3873, , , , UY, , , ,
D, 50637, , -0.3872, , , , UY, , , ,
D, 50638, , -0.3870, , , , UY, , , ,
D, 50639, , -0.3868, , , , UY, , , ,
D, 50640, , -0.3867, , , , UY, , , ,
D, 50641, , -0.3865, , , , UY, , , ,
D, 50642, , -0.3864, , , , UY, , , ,
D, 50643, , -0.3862, , , , UY, , , ,
D, 50644, , -0.3860, , , , UY, , , ,
D, 50645, , -0.3859, , , , UY, , , ,
D, 50646, , -0.3857, , , , UY, , , ,
D, 50647, , -0.3855, , , , UY, , , ,
D, 50648, , -0.3853, , , , UY, , , ,
D, 50634, , -0.3852, , , , UY, , , ,
D, 50681, , -0.3852, , , , UY, , , ,
D, 50683, , -0.3850, , , , UY, , , ,
D, 50684, , -0.3848, , , , UY, , , ,
D, 50685, , -0.3846, , , , UY, , , ,
D, 50686, , -0.3844, , , , UY, , , ,
D, 50687, , -0.3843, , , , UY, , , ,
D, 50688, , -0.3841, , , , UY, , , ,
D, 50689, , -0.3839, , , , UY, , , ,
D, 50690, , -0.3837, , , , UY, , , ,
D, 50691, , -0.3835, , , , UY, , , ,
D, 50692, , -0.3833, , , , UY, , , ,
D, 50693, , -0.3832, , , , UY, , , ,
D, 50694, , -0.3830, , , , UY, , , ,
D, 50695, , -0.3828, , , , UY, , , ,
D, 50696, , -0.3826, , , , UY, , , ,
D, 50682, , -0.3824, , , , UY, , , ,
D, 51056, , -0.3824, , , , UY, , , ,
D, 51060, , -0.3822, , , , UY, , , ,
D, 51059, , -0.3820, , , , UY, , , ,
D, 51058, , -0.3818, , , , UY, , , ,
D, 51057, , -0.3816, , , , UY, , , ,
D, 30211, , -0.3814, , , , UY, , , ,
D, 30178, , -0.3812, , , , UY, , , ,
D, 50604, , -0.3810, , , , UY, , , ,
D, 50605, , -0.3808, , , , UY, , , ,
D, 50606, , -0.3806, , , , UY, , , ,
D, 50607, , -0.3804, , , , UY, , , ,
D, 50608, , -0.3802, , , , UY, , , ,
D, 50609, , -0.3800, , , , UY, , , ,
D, 50610, , -0.3798, , , , UY, , , ,

Differential Displacement File
applied as load step after
static load application

T-CC-Z-00006) Rev. 0

D5000a.txt

D,50611,, -0.3796,,,, UY,,,,,
D,50612,, -0.3794,,,, UY,,,,,
D,50603,, -0.3791,,,, UY,,,,,
D,50744,, -0.3791,,,, UY,,,,,
D,50746,, -0.3788,,,, UY,,,,,
D,50747,, -0.3785,,,, UY,,,,,
D,50748,, -0.3782,,,, UY,,,,,
D,50749,, -0.3780,,,, UY,,,,,
D,50750,, -0.3777,,,, UY,,,,,
D,50751,, -0.3774,,,, UY,,,,,
D,50752,, -0.3771,,,, UY,,,,,
D,50753,, -0.3768,,,, UY,,,,,
D,50754,, -0.3765,,,, UY,,,,,
D,50755,, -0.3762,,,, UY,,,,,
D,50756,, -0.3759,,,, UY,,,,,
D,50757,, -0.3756,,,, UY,,,,,
D,50758,, -0.3753,,,, UY,,,,,
D,50759,, -0.3750,,,, UY,,,,,
D,50745,, -0.3747,,,, UY,,,,,
D,50792,, -0.3747,,,, UY,,,,,
D,50794,, -0.3743,,,, UY,,,,,
D,50795,, -0.3738,,,, UY,,,,,
D,50796,, -0.3733,,,, UY,,,,,
D,50797,, -0.3728,,,, UY,,,,,
D,50798,, -0.3724,,,, UY,,,,,
D,50799,, -0.3719,,,, UY,,,,,
D,50800,, -0.3714,,,, UY,,,,,
D,50801,, -0.3709,,,, UY,,,,,
D,50802,, -0.3704,,,, UY,,,,,
D,50803,, -0.3699,,,, UY,,,,,
D,50804,, -0.3694,,,, UY,,,,,
D,50805,, -0.3689,,,, UY,,,,,
D,50806,, -0.3685,,,, UY,,,,,
D,50807,, -0.3680,,,, UY,,,,,
D,50793,, -0.3675,,,, UY,,,,,
D,50840,, -0.3675,,,, UY,,,,,
D,50841,, -0.3670,,,, UY,,,,,
D,50842,, -0.3664,,,, UY,,,,,
D,50843,, -0.3655,,,, UY,,,,,
D,50844,, -0.3647,,,, UY,,,,,
D,50845,, -0.3638,,,, UY,,,,,
D,50846,, -0.3629,,,, UY,,,,,
D,50847,, -0.3620,,,, UY,,,,,
D,50848,, -0.3611,,,, UY,,,,,
D,50849,, -0.3603,,,, UY,,,,,
D,30214,, -0.3594,,,, UY,,,,,
D,30215,, -0.3588,,,, UY,,,,,
D,50730,, -0.3580,,,, UY,,,,,
D,50731,, -0.3573,,,, UY,,,,,
D,50732,, -0.3566,,,, UY,,,,,
D,50733,, -0.3561,,,, UY,,,,,
D,50729,, -0.3557,,,, UY,,,,,
D,50870,, -0.3557,,,, UY,,,,,
D,50872,, -0.3556,,,, UY,,,,,
D,50873,, -0.3560,,,, UY,,,,,
D,50874,, -0.3570,,,, UY,,,,,
D,50875,, -0.3585,,,, UY,,,,,
D,50876,, -0.3612,,,, UY,,,,,
D,50877,, -0.3654,,,, UY,,,,,
D,50878,, -0.3716,,,, UY,,,,,
D,50879,, -0.3800,,,, UY,,,,,
D,50880,, -0.3909,,,, UY,,,,,
D,50881,, -0.4044,,,, UY,,,,,

D5000a.txt

D, 50882, , -0.4205, , , , UY, , , , ,
D, 50883, , -0.4389, , , , UY, , , , ,
D, 50884, , -0.4590, , , , UY, , , , ,
D, 50885, , -0.4799, , , , UY, , , , ,
D, 50871, , -0.5006, , , , UY, , , , ,
D, 50918, , -0.5006, , , , UY, , , , ,
D, 50920, , -0.5198, , , , UY, , , , ,
D, 50921, , -0.5361, , , , UY, , , , ,
D, 50922, , -0.5484, , , , UY, , , , ,
D, 50923, , -0.5557, , , , UY, , , , ,
D, 50924, , -0.5560, , , , UY, , , , ,
D, 50925, , -0.5495, , , , UY, , , , ,
D, 50926, , -0.5374, , , , UY, , , , ,
D, 50927, , -0.5202, , , , UY, , , , ,
D, 50928, , -0.4989, , , , UY, , , , ,
D, 50929, , -0.4749, , , , UY, , , , ,
D, 50930, , -0.4493, , , , UY, , , , ,
D, 50931, , -0.4235, , , , UY, , , , ,
D, 50932, , -0.3985, , , , UY, , , , ,
D, 50933, , -0.3752, , , , UY, , , , ,
D, 50919, , -0.3542, , , , UY, , , , ,
D, 50966, , -0.3542, , , , UY, , , , ,
D, 50967, , -0.3362, , , , UY, , , , ,
D, 50968, , -0.3207, , , , UY, , , , ,
D, 50969, , -0.3077, , , , UY, , , , ,
D, 50970, , -0.2967, , , , UY, , , , ,
D, 50971, , -0.2876, , , , UY, , , , ,
D, 50972, , -0.2800, , , , UY, , , , ,
D, 50973, , -0.2731, , , , UY, , , , ,
D, 50974, , -0.2671, , , , UY, , , , ,
D, 50975, , -0.2617, , , , UY, , , , ,
D, 50976, , -0.2569, , , , UY, , , , ,
D, 50977, , -0.2523, , , , UY, , , , ,
D, 50978, , -0.2480, , , , UY, , , , ,
D, 50979, , -0.2438, , , , UY, , , , ,
D, 50980, , -0.2397, , , , UY, , , , ,
D, 30361, , -0.2357, , , , UY, , , , ,
D, 30362, , -0.2326, , , , UY, , , , ,

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 98	Rev. 0
----------------------------------	-----------------	-----------

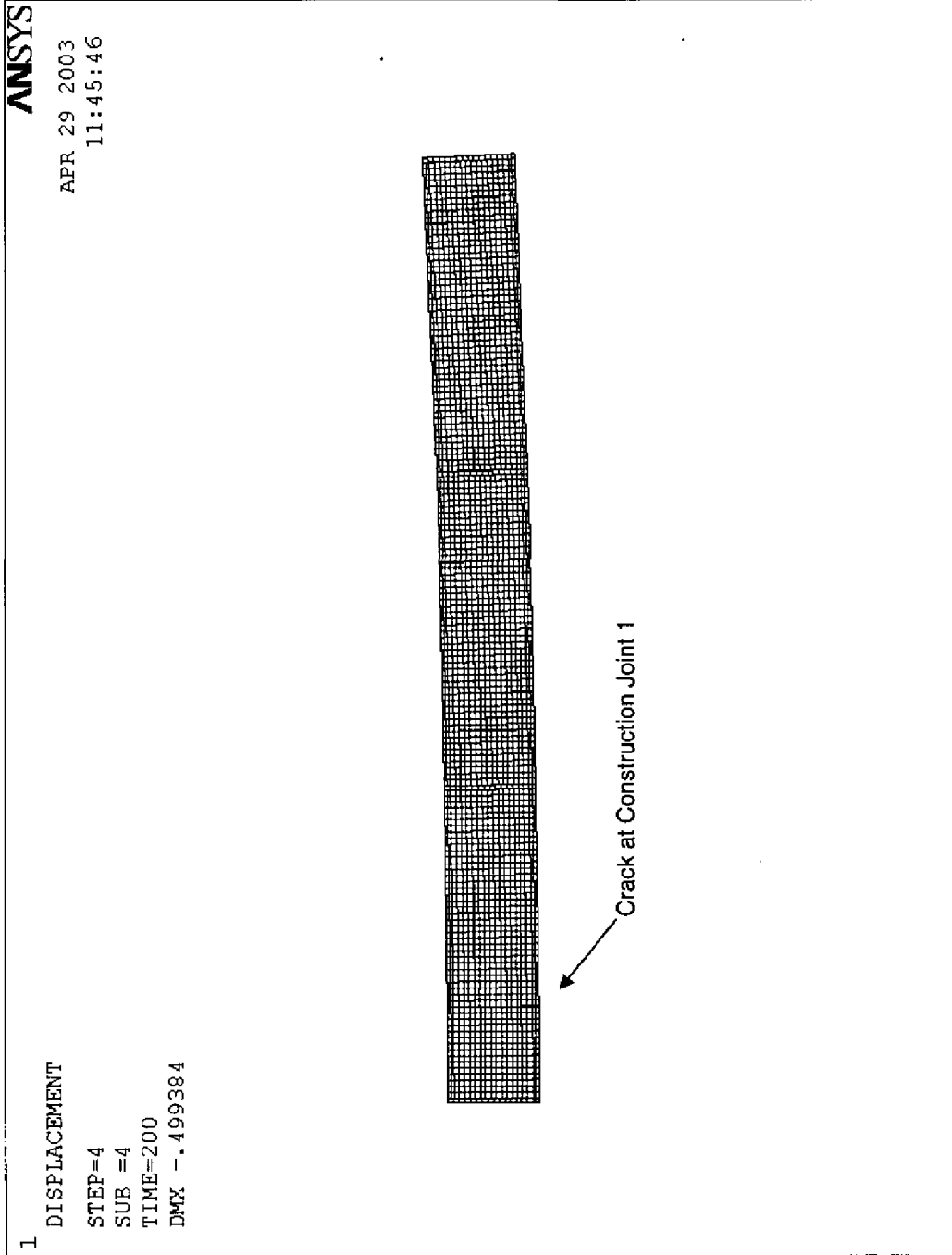
Differential Settlement Results:

The following plots show the differing crack patterns that result from the mean case for differential settlements. Seven locations were chosen for settlement. The plots show results for three different times, 100, 1000, and 10000 years and two levels of settlement, 0.75 in. (PC-3) and 2.75 in. (PC-4).

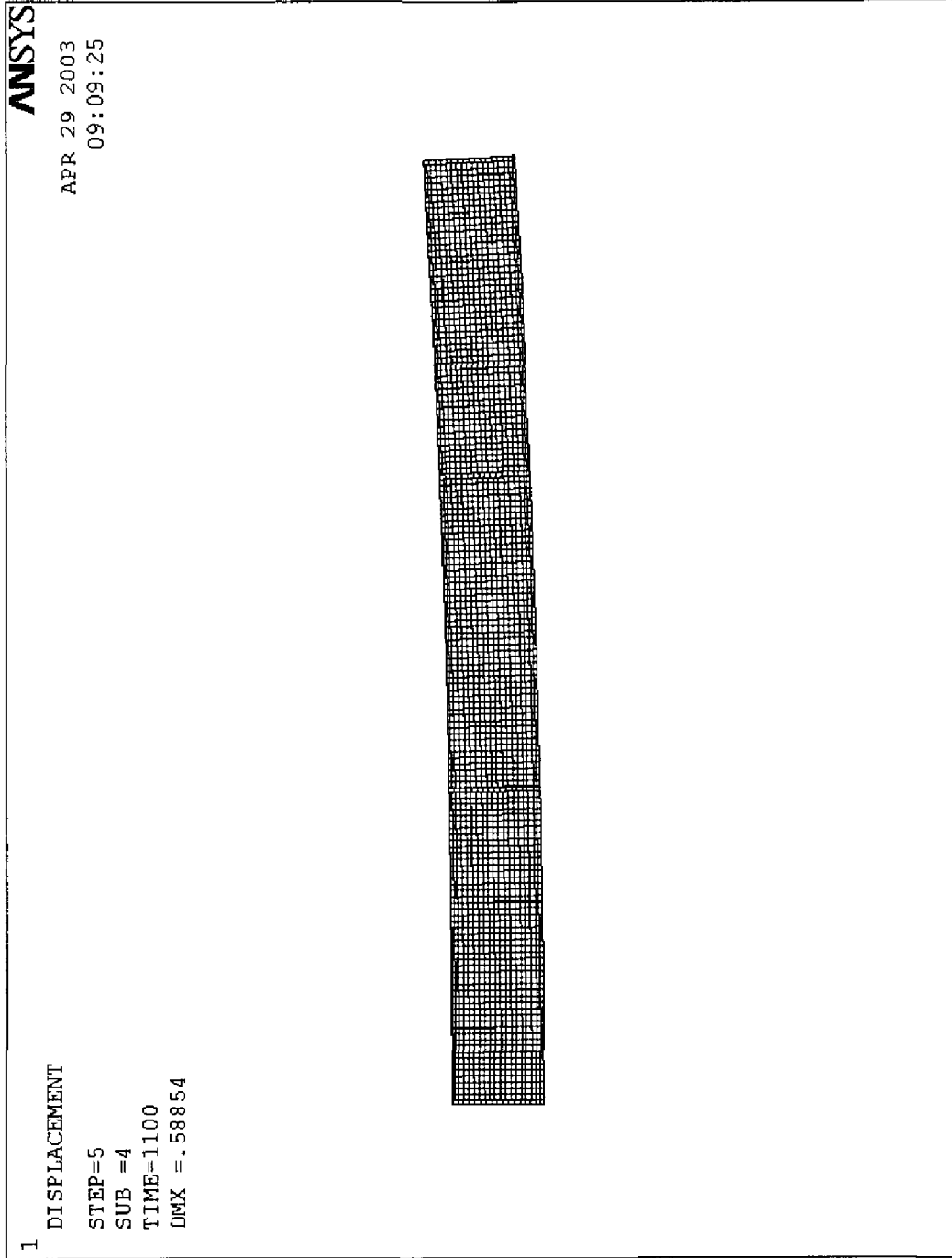
In addition, two cases were run where there were two concurrent settlement locations. The results from the double settlements, however, resulted in no additional cracking above that caused by a single settlement. Therefore, only single settlements will be considered in this analysis.

These deformed shape plots graphically show the behavior of the vault. The deformation scale has been greatly exaggerated in all cases. To plot the cracks in a form usable for further evaluation, EXCEL spreadsheets were used to calculate relative displacements on each side of control joints and saltstone/concrete contacts. Appendix E contains plots of these locations for all the basic parametric variations. There are a small number of plots that are not shown that were used to obtain data that was needed to provide additional data points for later use in the Monte Carlo analysis.

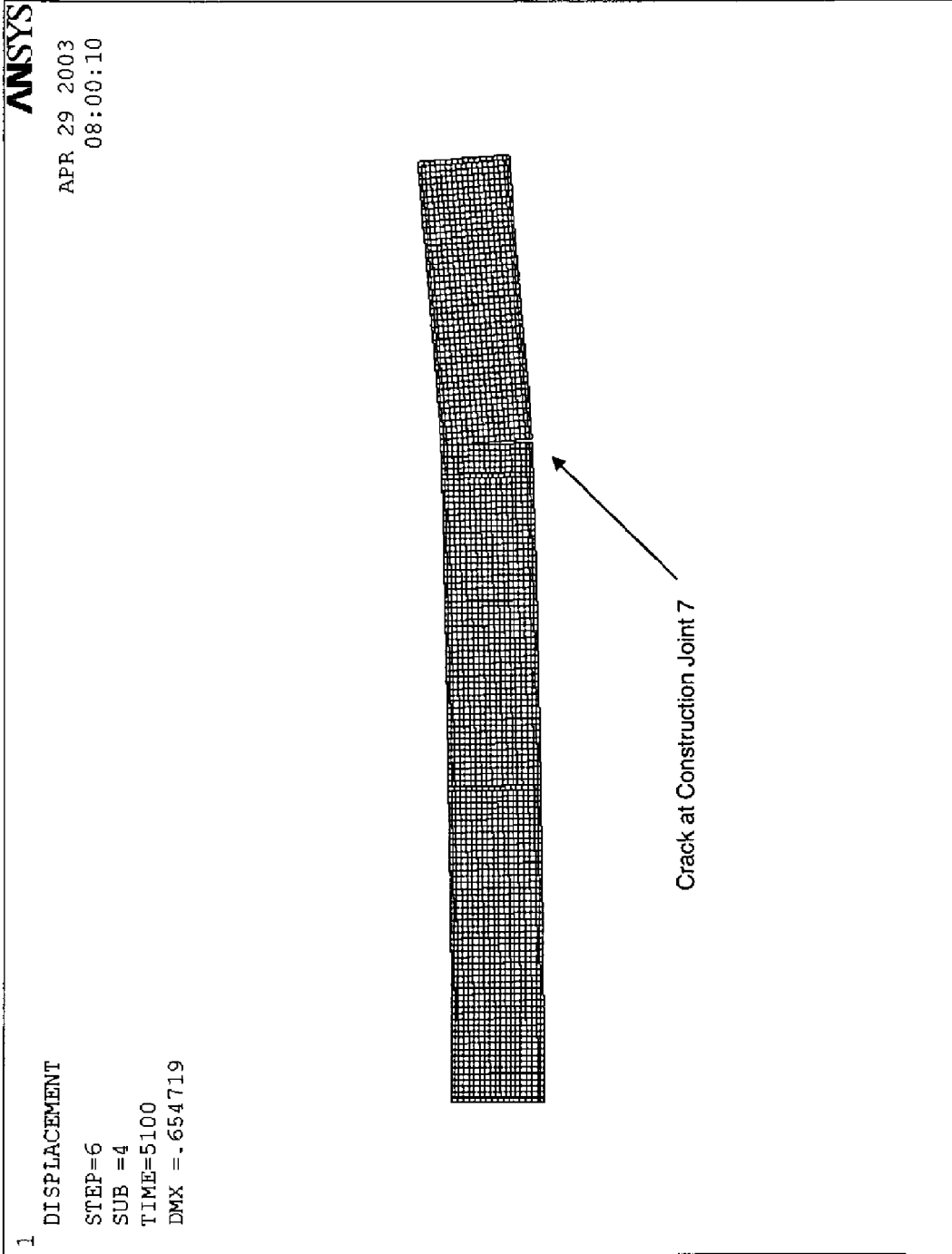
PC3 Location 1 - 100 years
(Displacements magnified by 50)



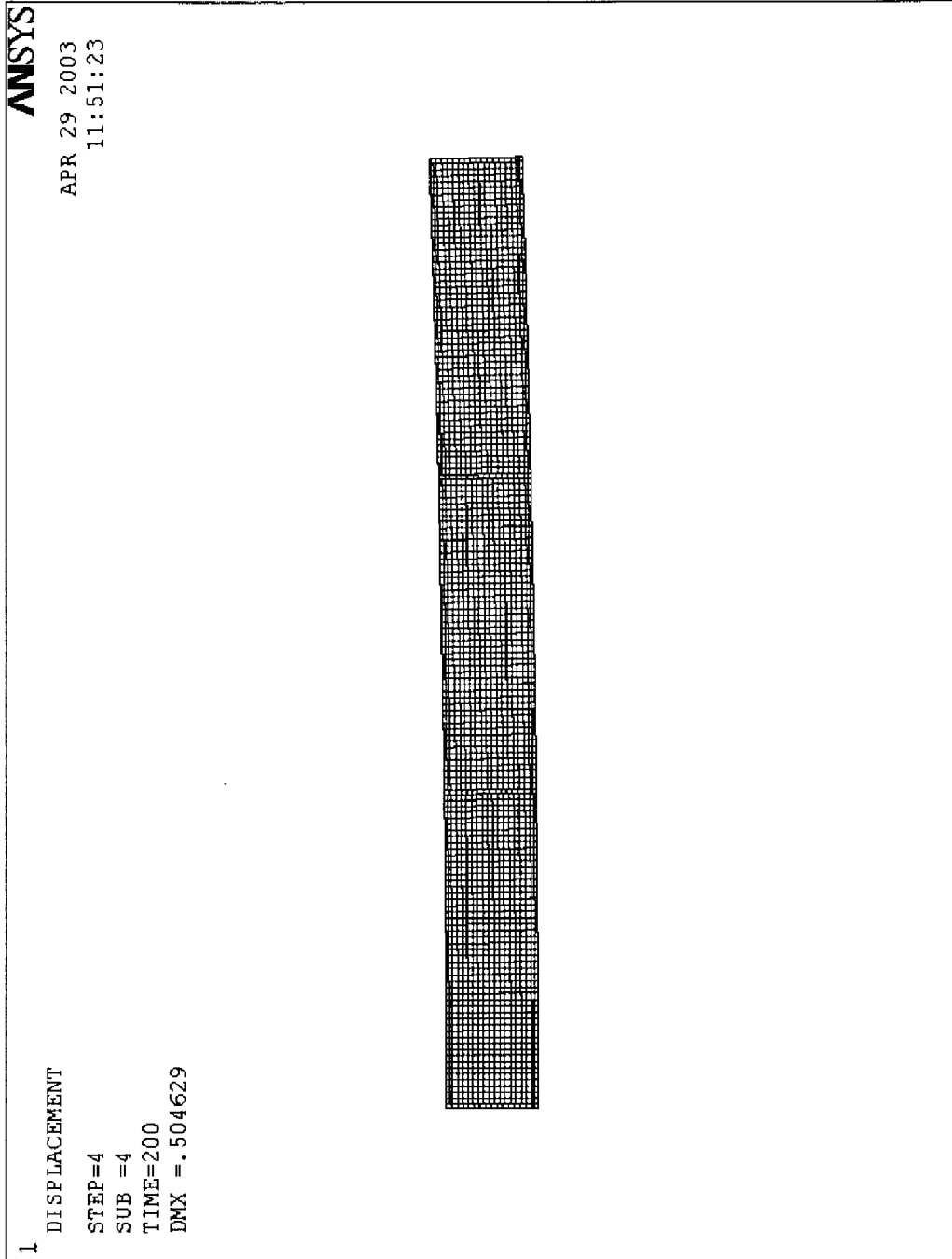
PC3 Location 1 - 1000 years
(Displacements magnified by 50)



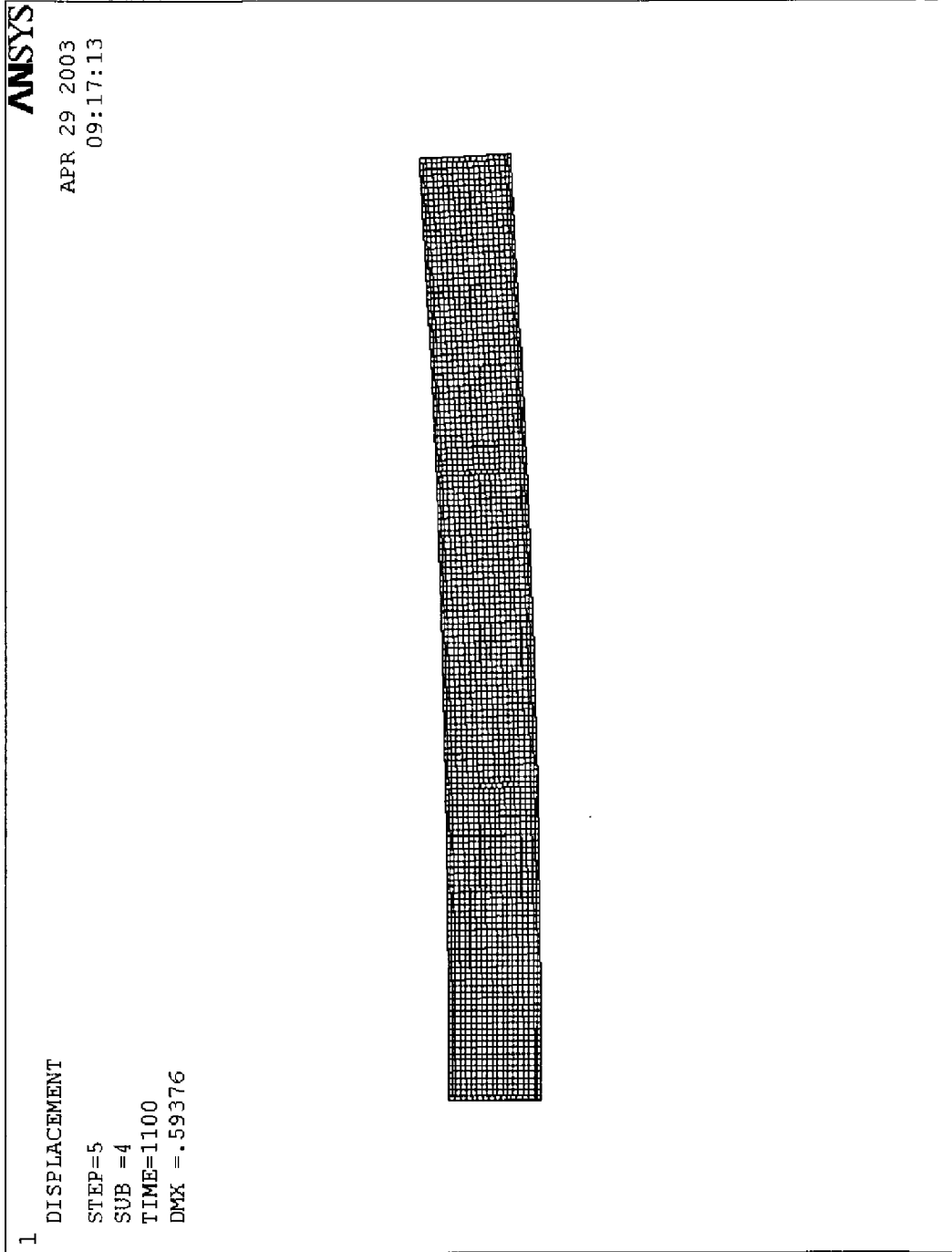
PC3 Location 1 - 5000 years
(Displacements magnified by 50)



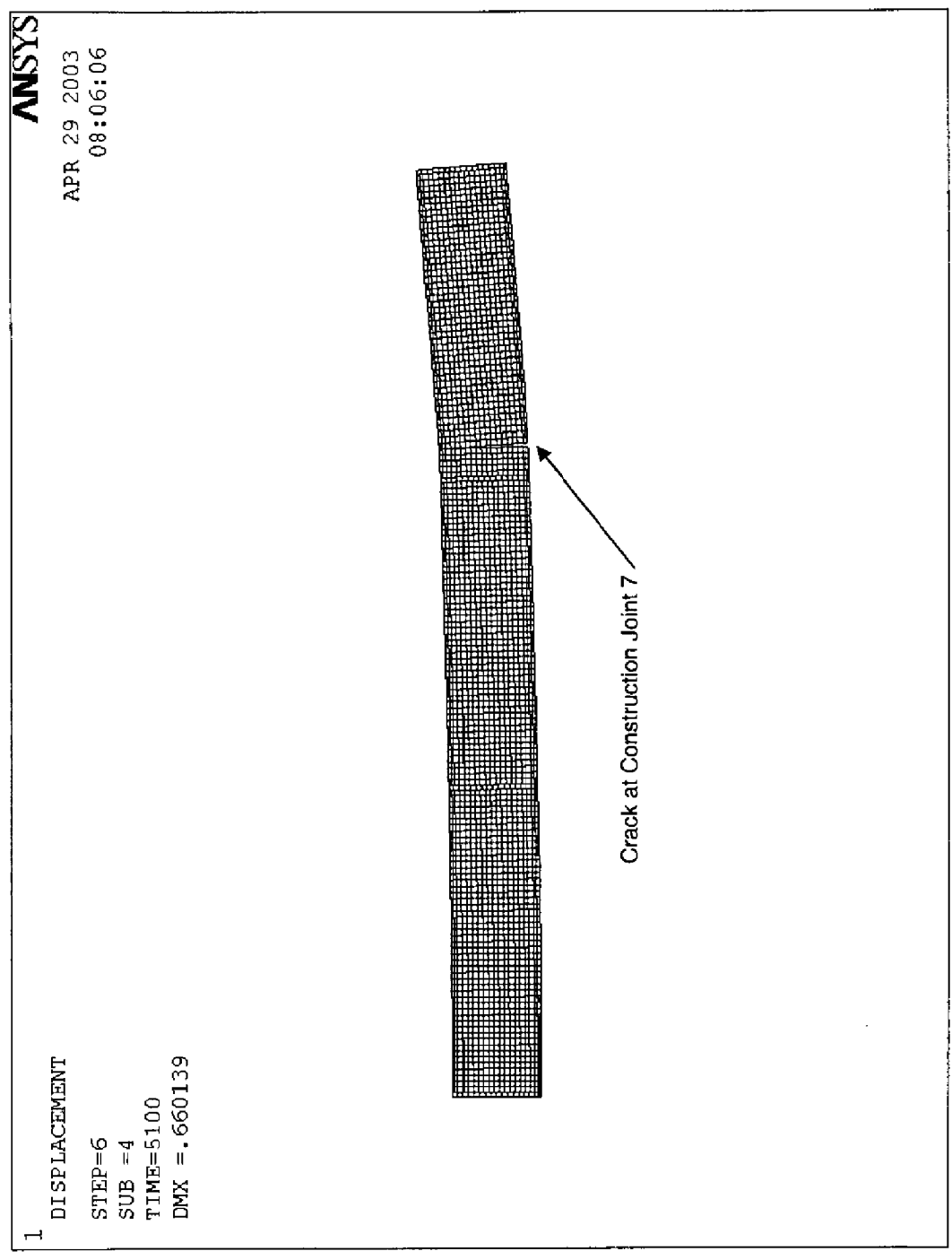
PC3 Location 2 - 100 years
(Displacements magnified by 50)



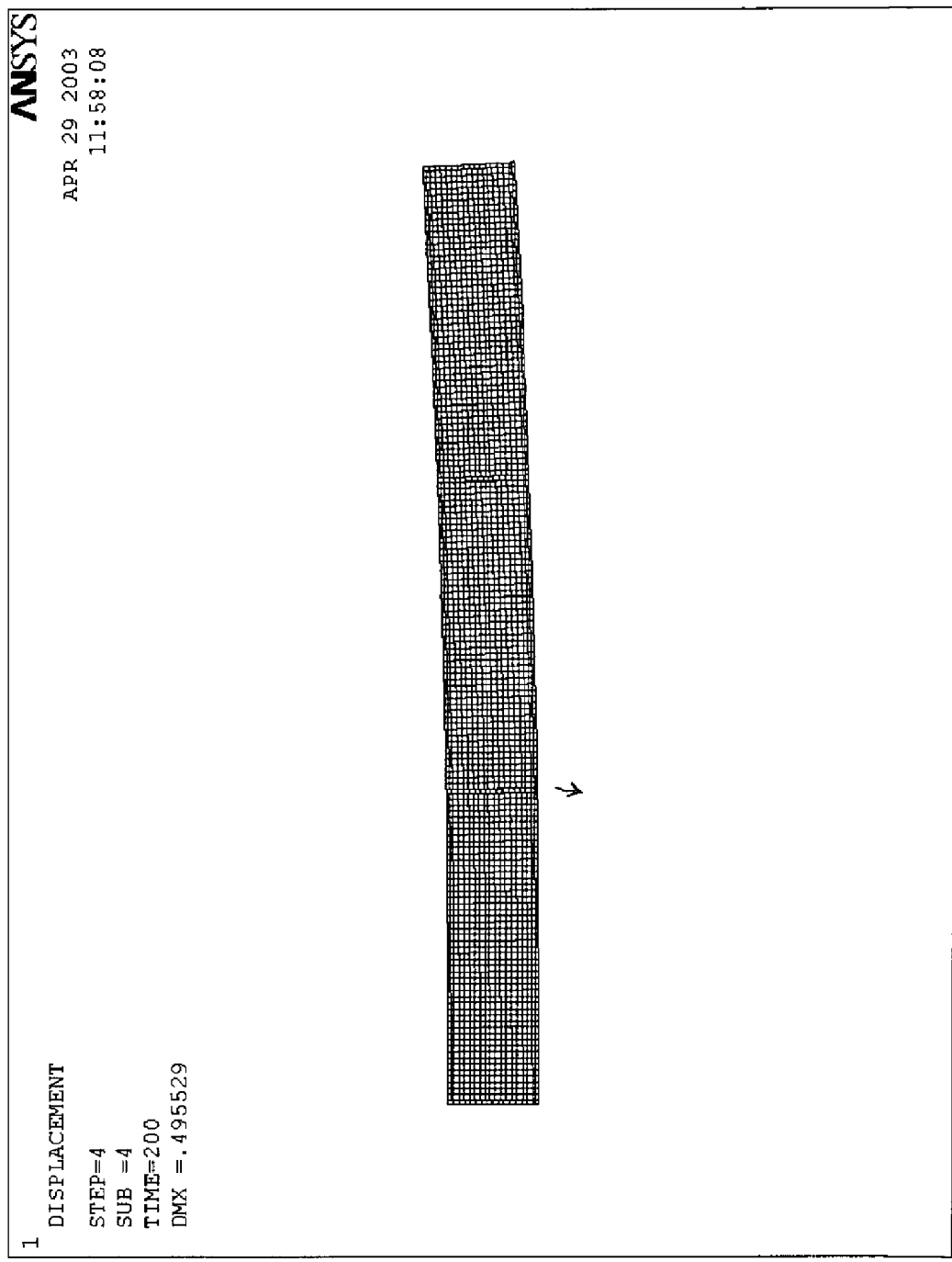
PC3 Location 2 - 1000 years
(Displacements magnified by 50)



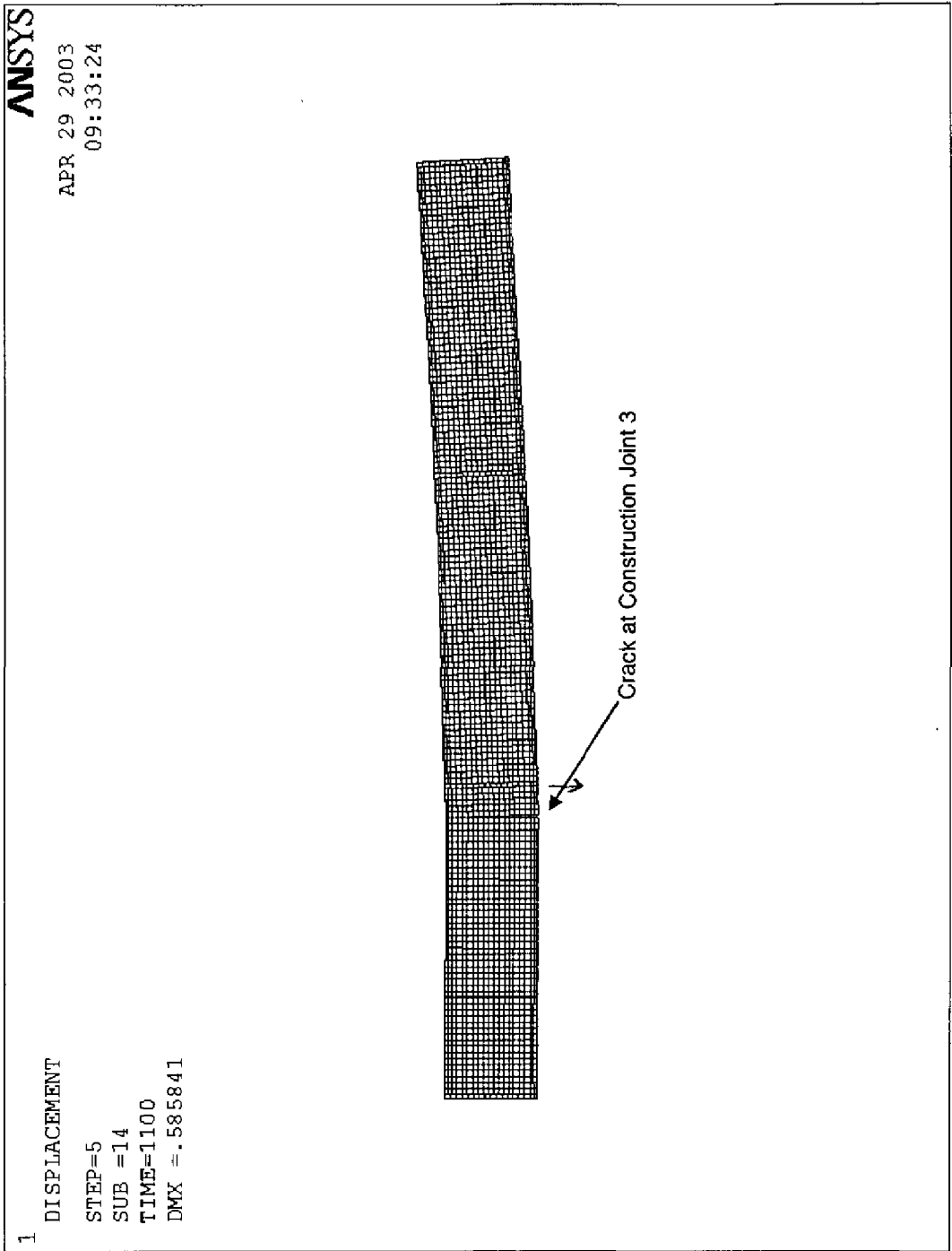
PC3 Location 2 - 5000 years
(Displacements magnified by 50)



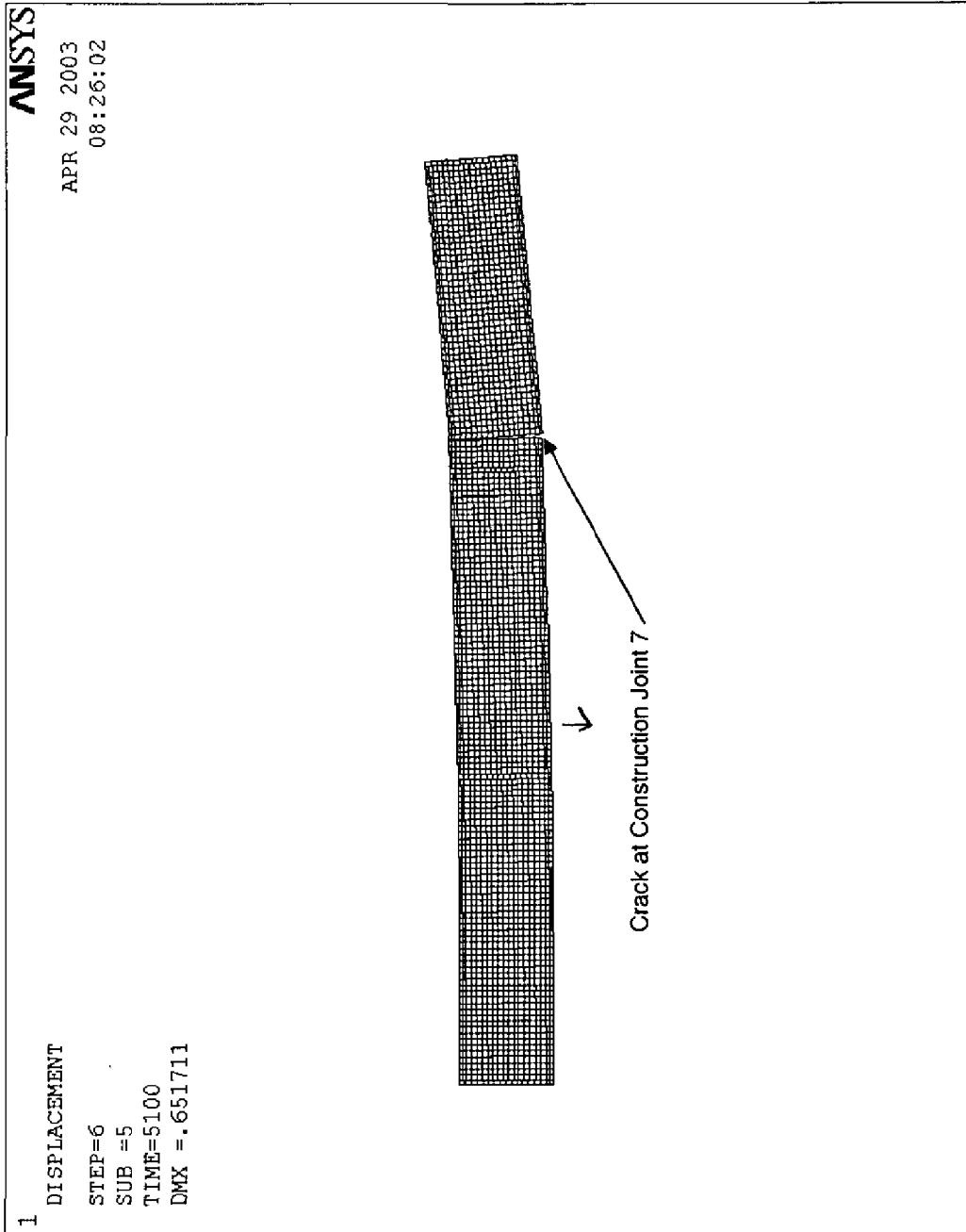
PC3 Location 3 - 100 years
(Displacements magnified by 50)



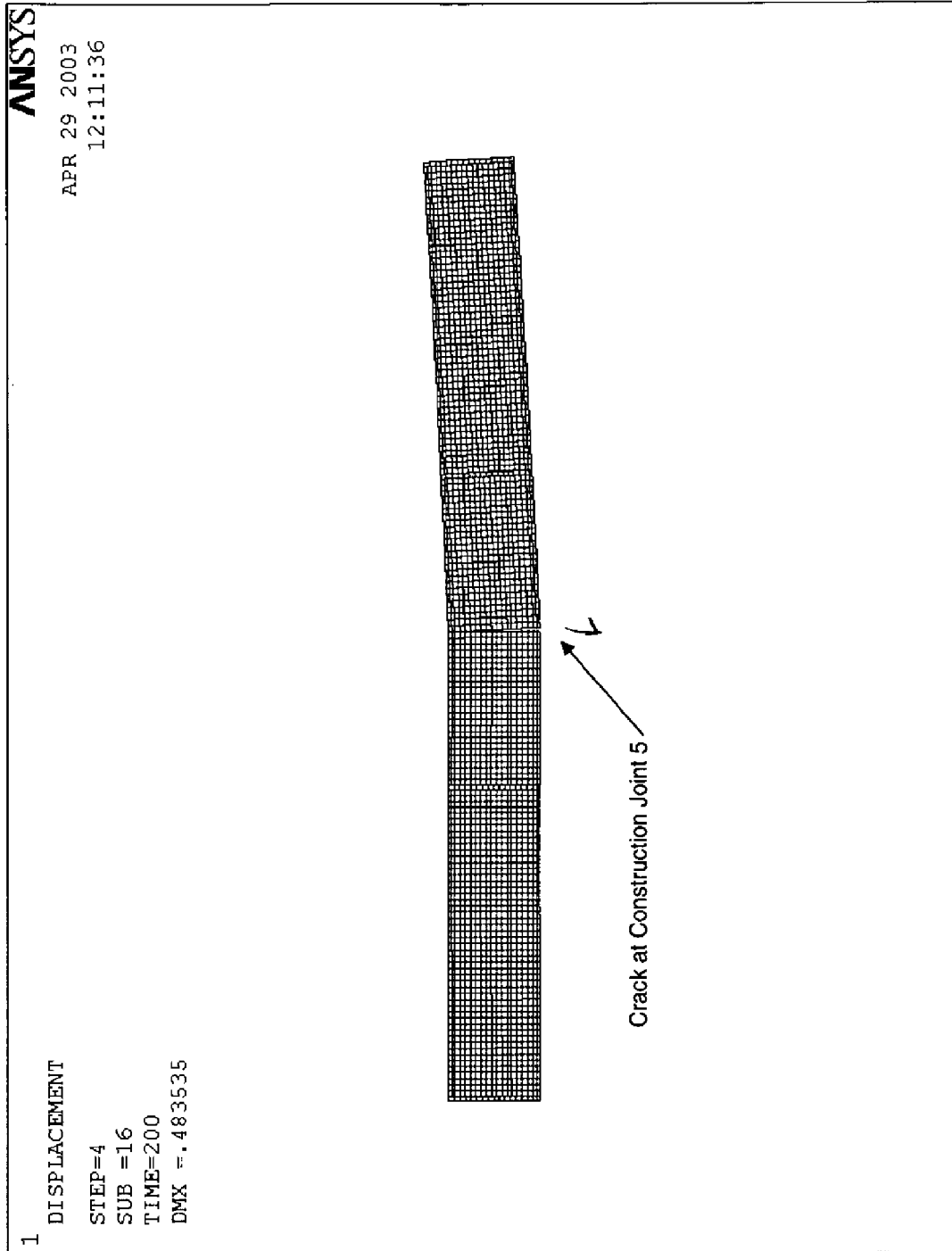
PC3 Location 3 - 1000 years
(Displacements magnified by 50)



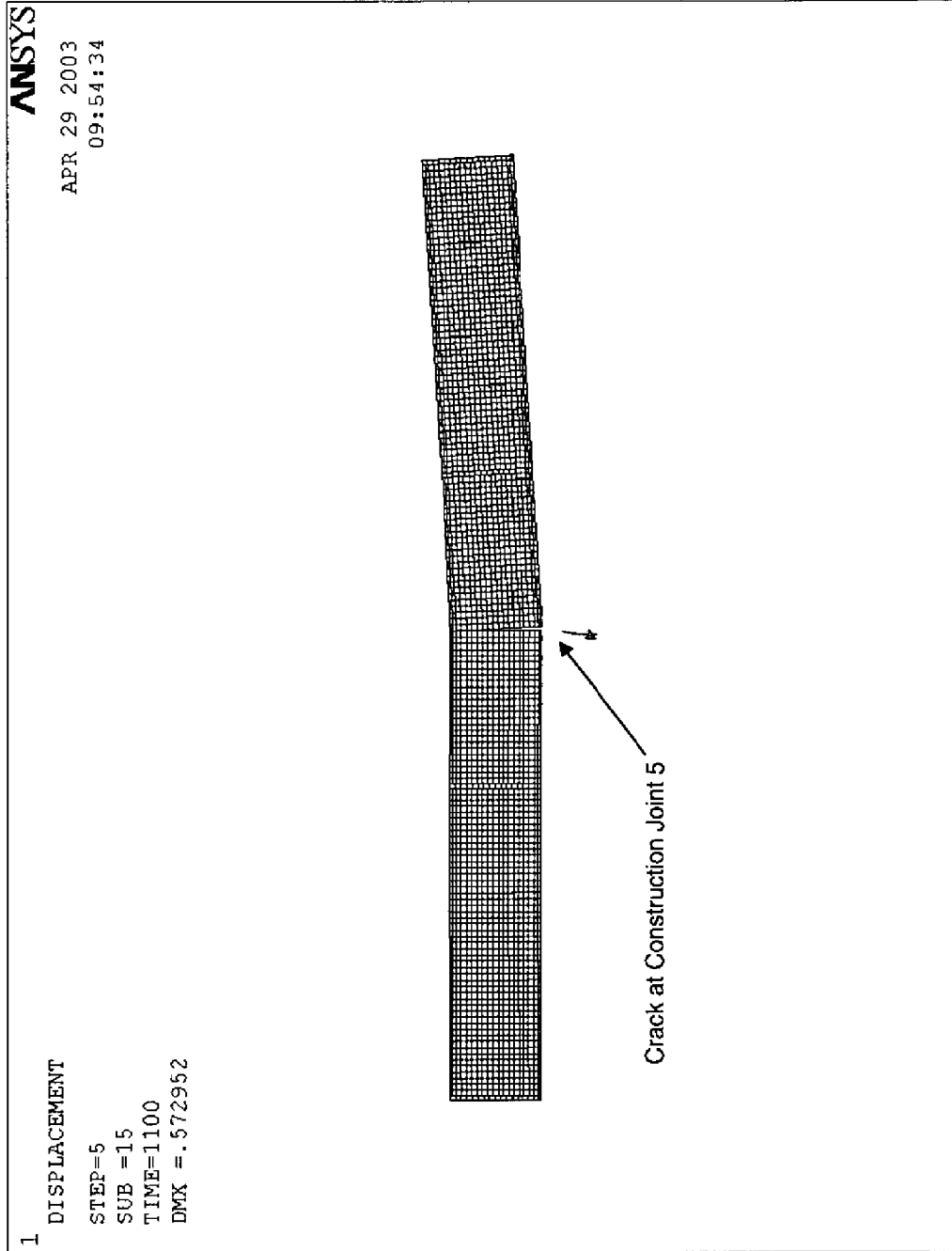
PC3 Location 3 - 5000 years
(Displacements magnified by 50)



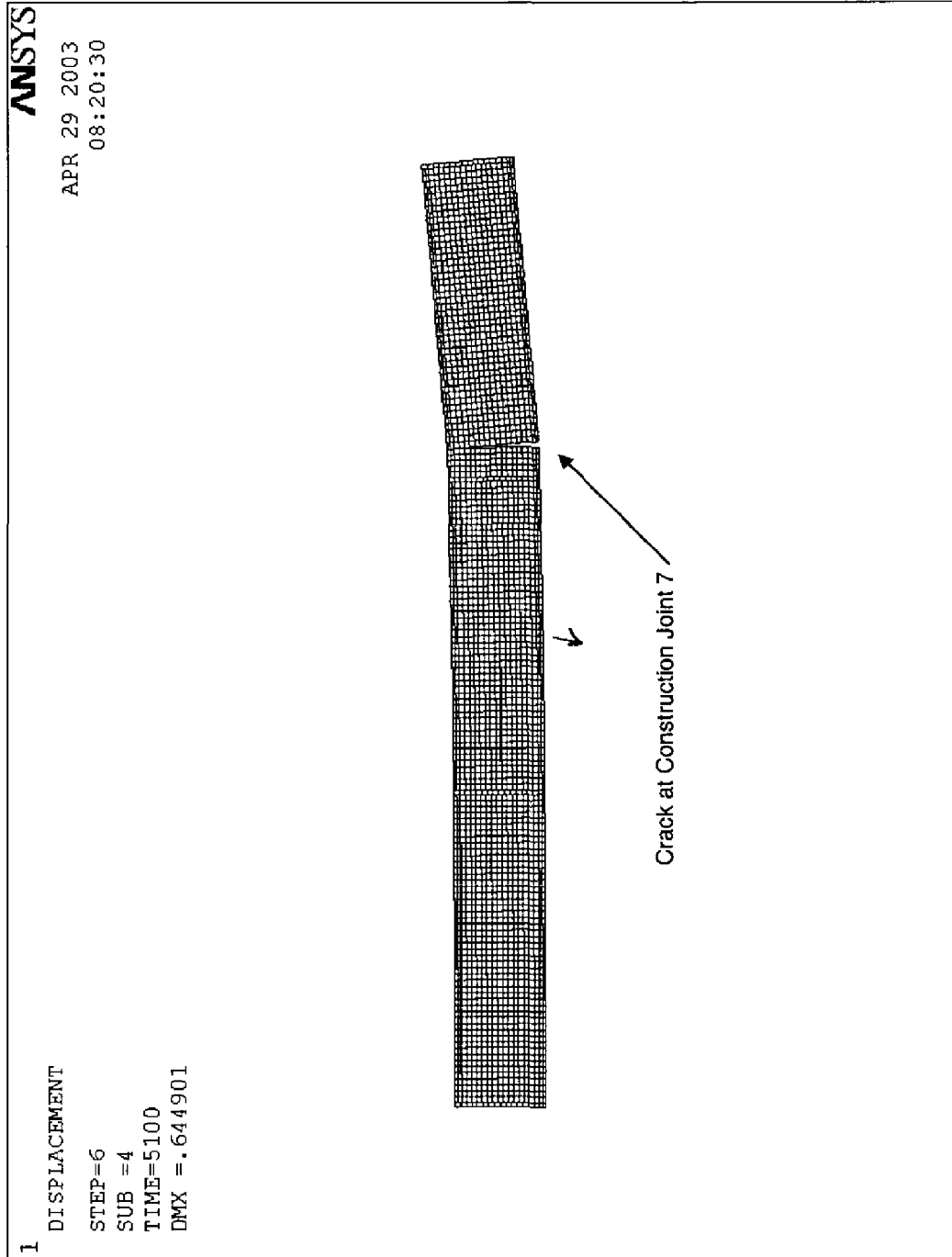
PC3 Location 4 - 100 years
(Displacements magnified by 50)



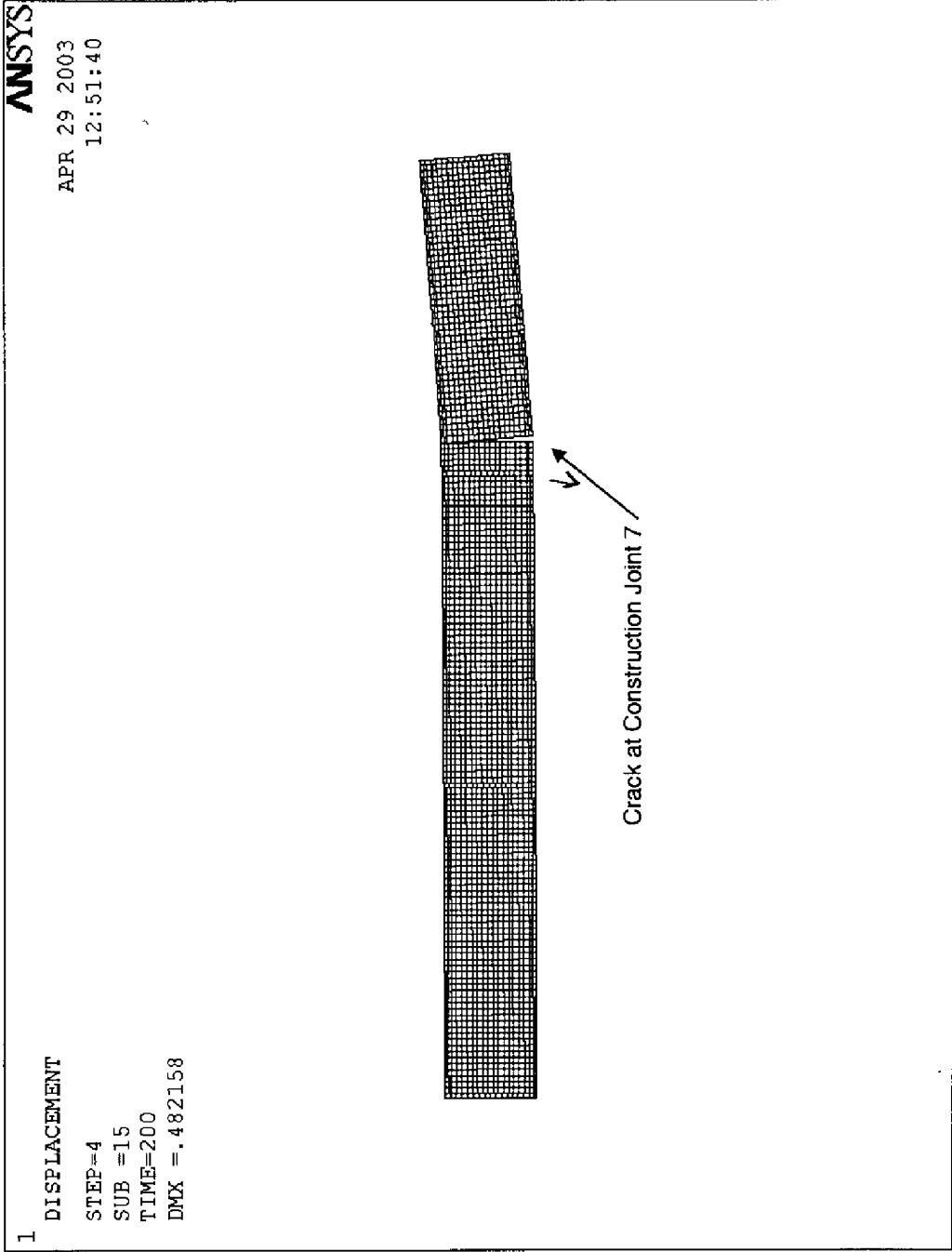
PC3 Location 4 - 1000 years
(Displacements magnified by 50)



PC3 Location 4 - 5000 years
(Displacements magnified by 50)



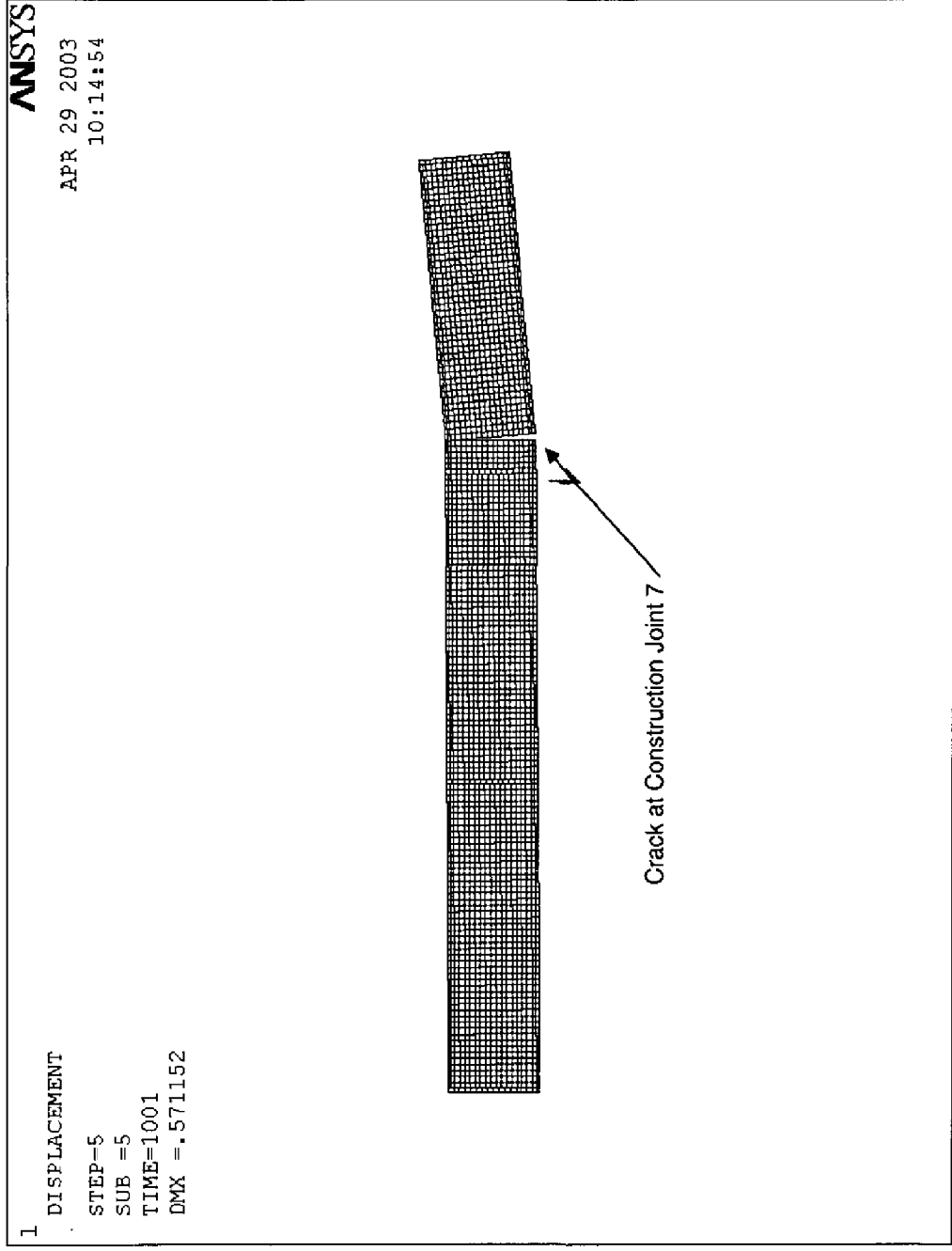
PC3 Location 5 - 100 years
(Displacements magnified by 50)



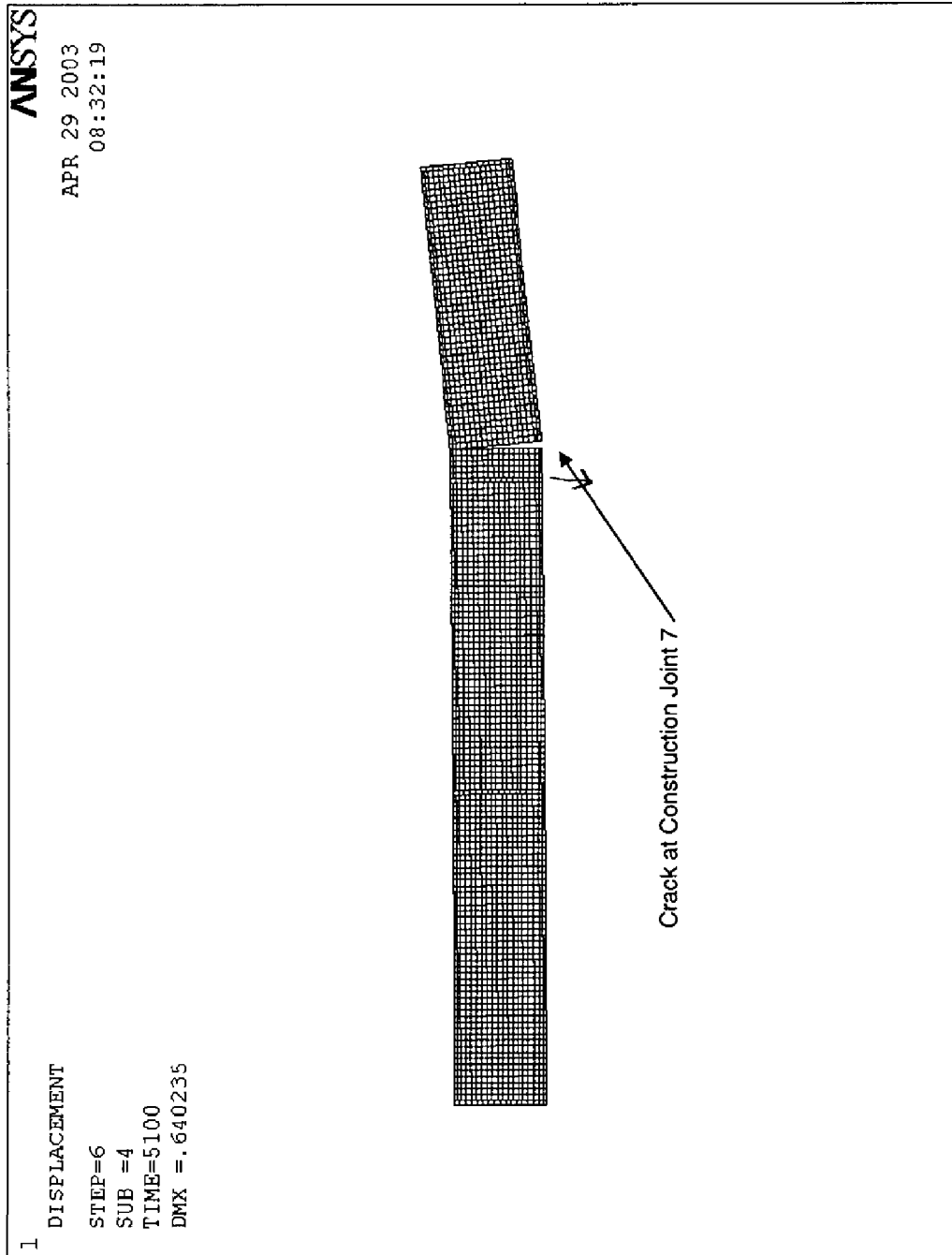
PC3 Location 5 - 1000 years
(Displacements magnified by 50)

T-CLL-Z-00006, Rev. 0

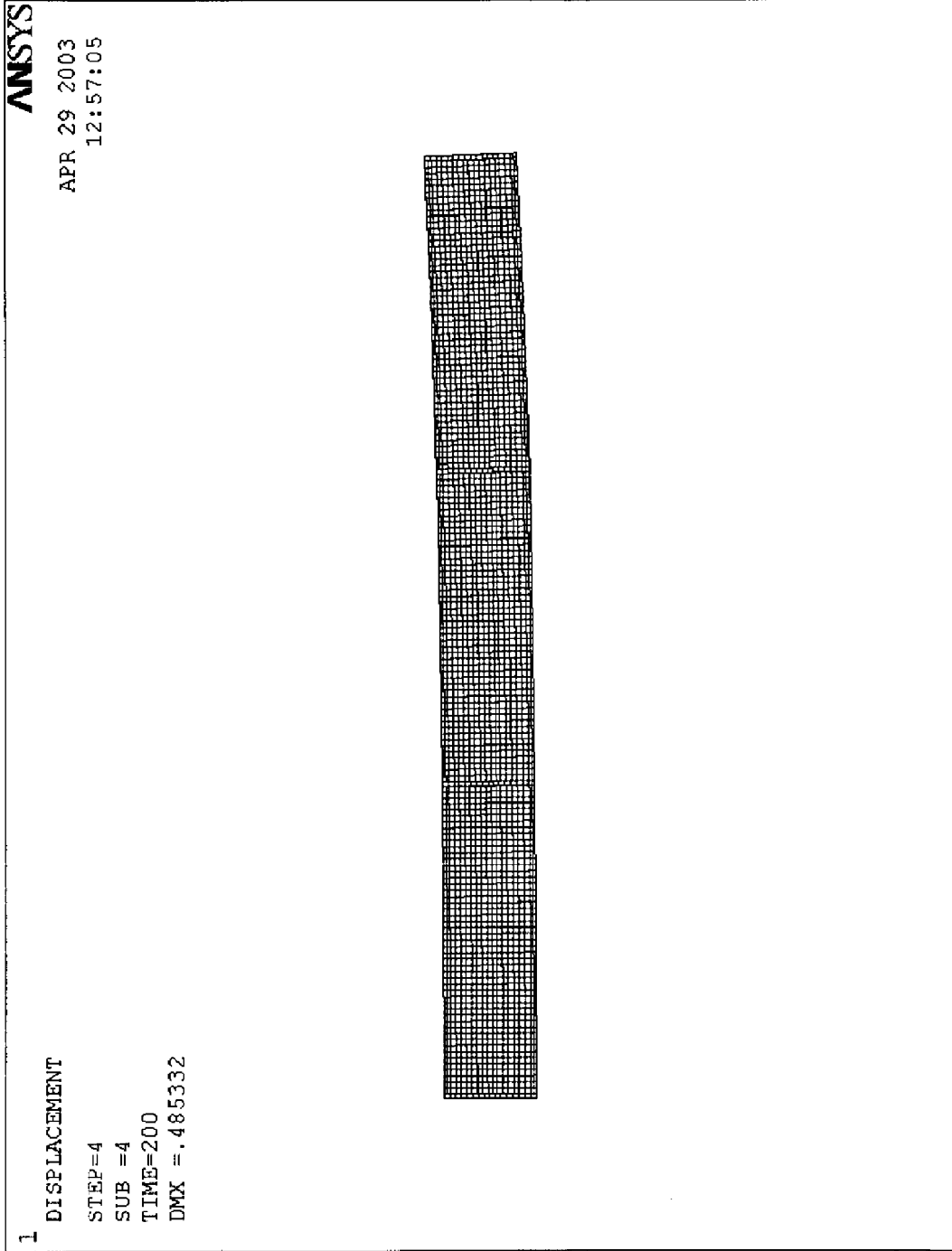
112



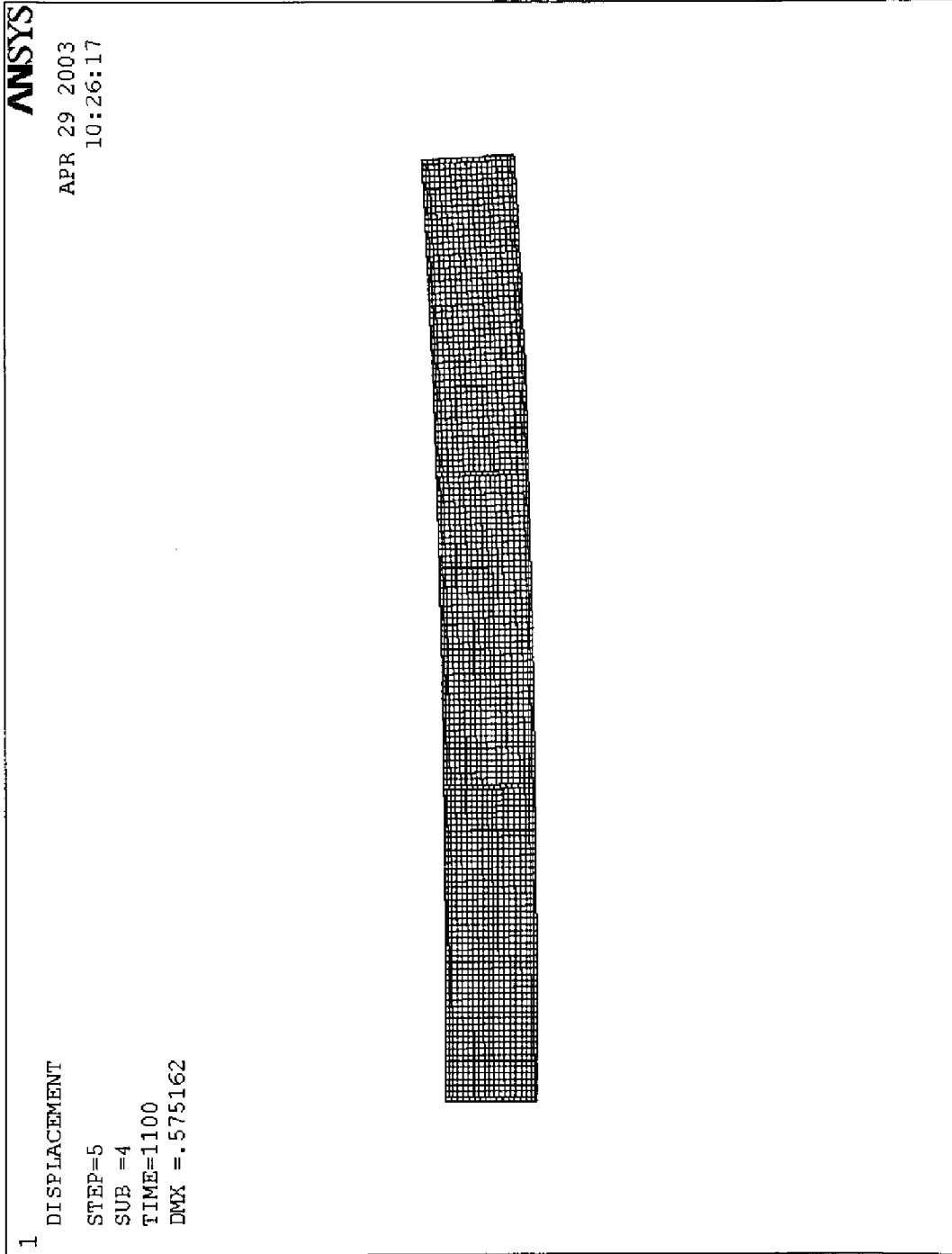
PC3 Location 5 - 5000 years
(Displacements magnified by 50)



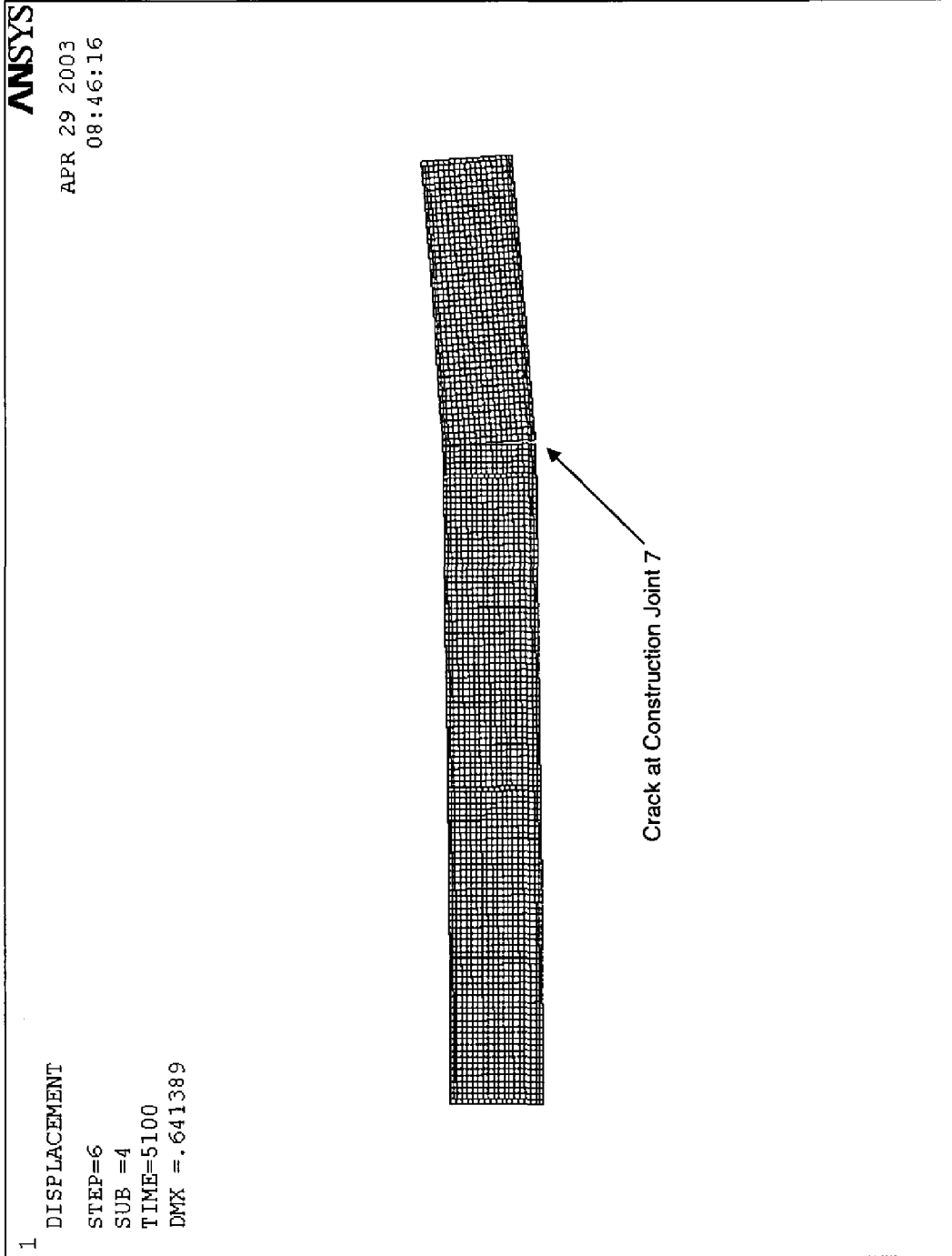
PC3 Location 6 - 100 years
(Displacements magnified by 50)



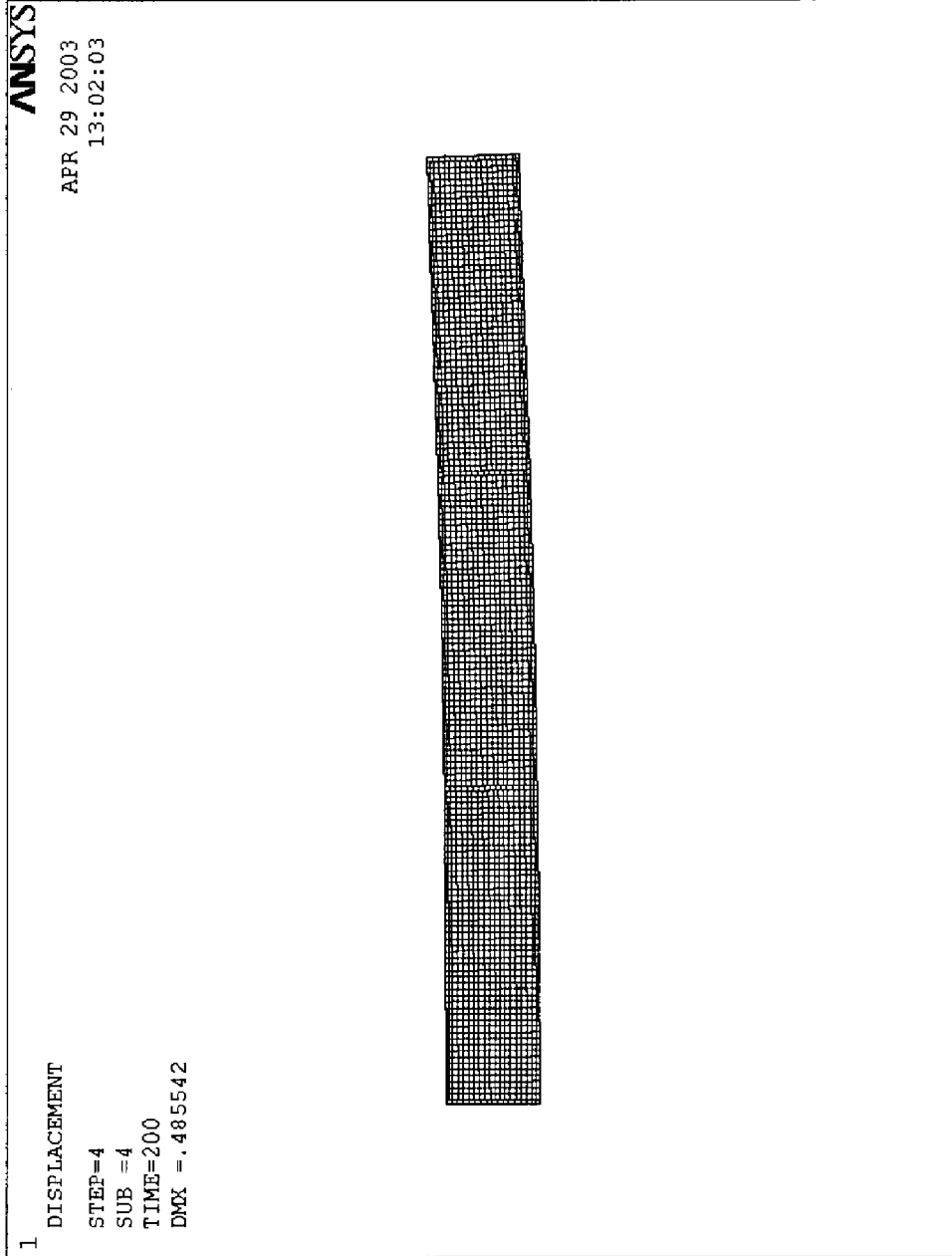
PC3 Location 6 - 1000 years
(Displacements magnified by 50)



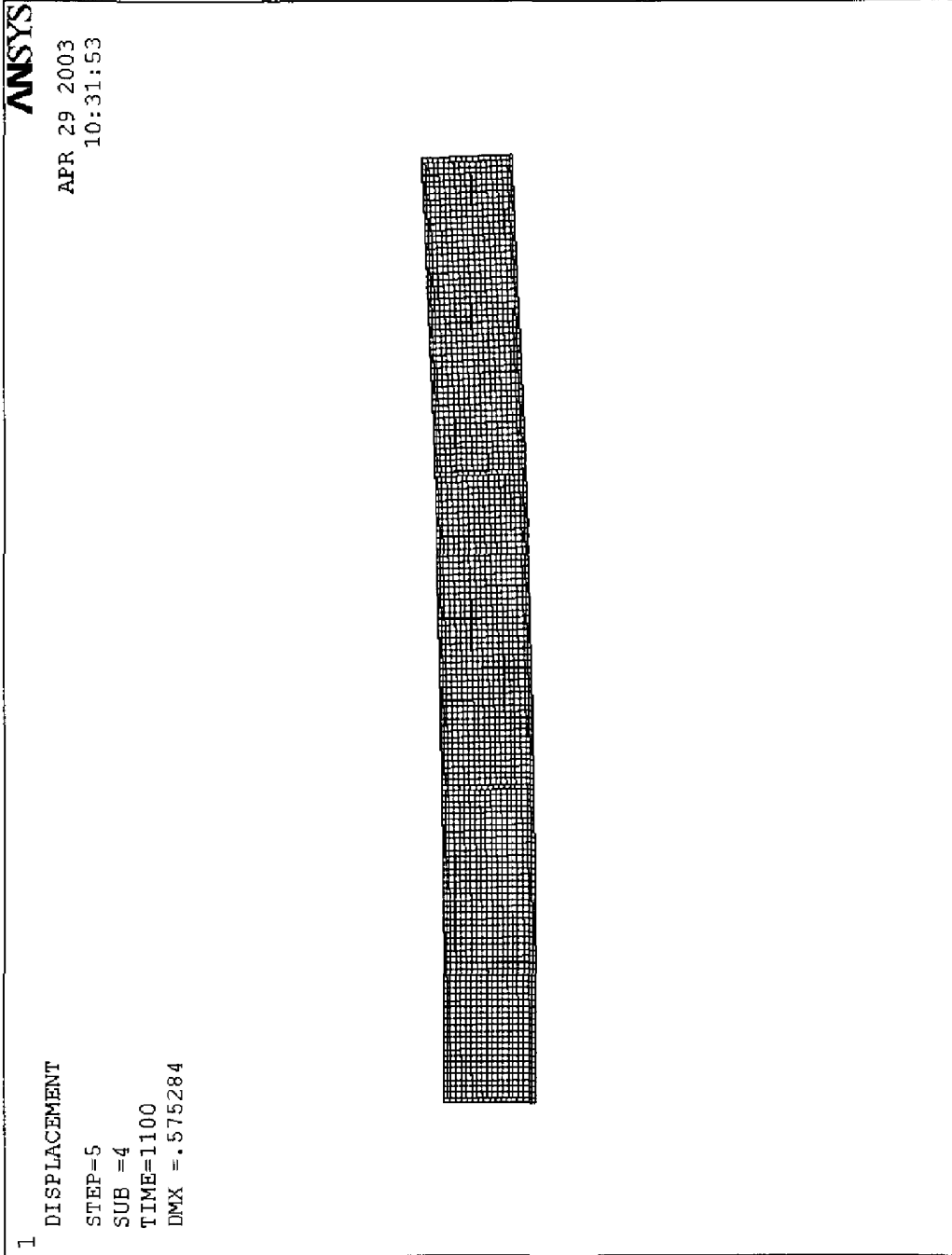
PC3 Location 6 - 5000 years
(Displacements magnified by 50)



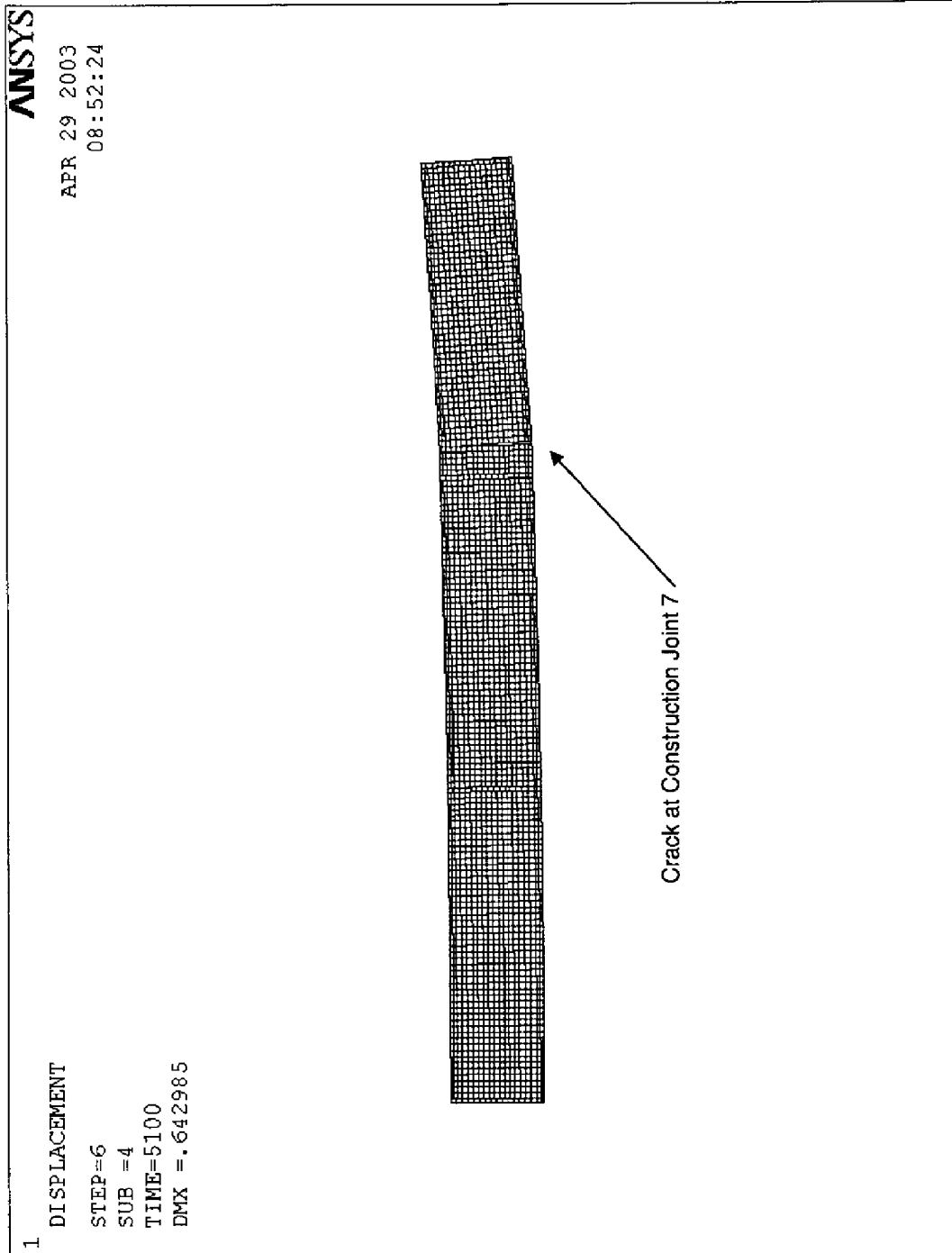
PC3 Location 7 - 100 years
(Displacements magnified by 50)



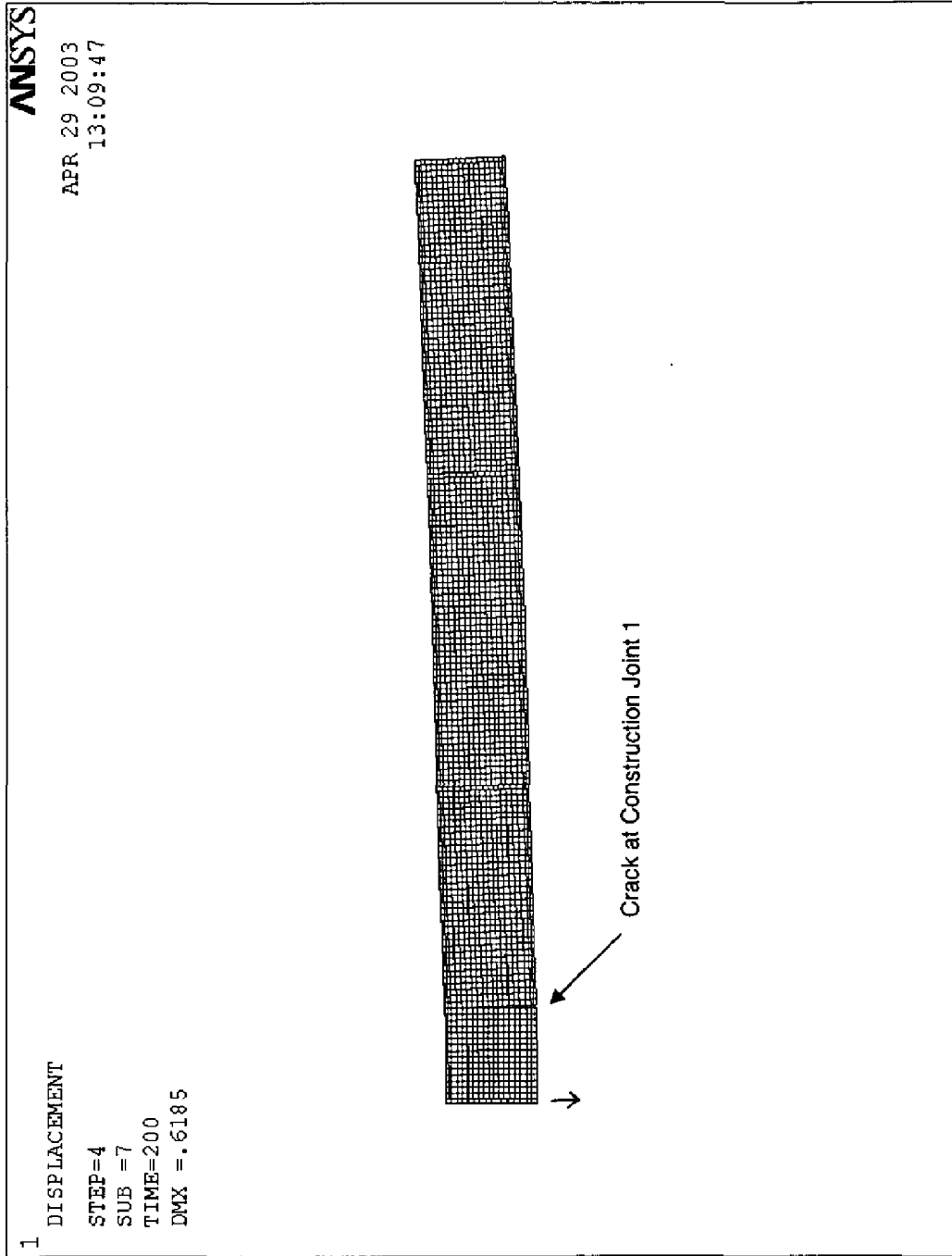
PC3 Location 7 - 1000 years
(Displacements magnified by 50)



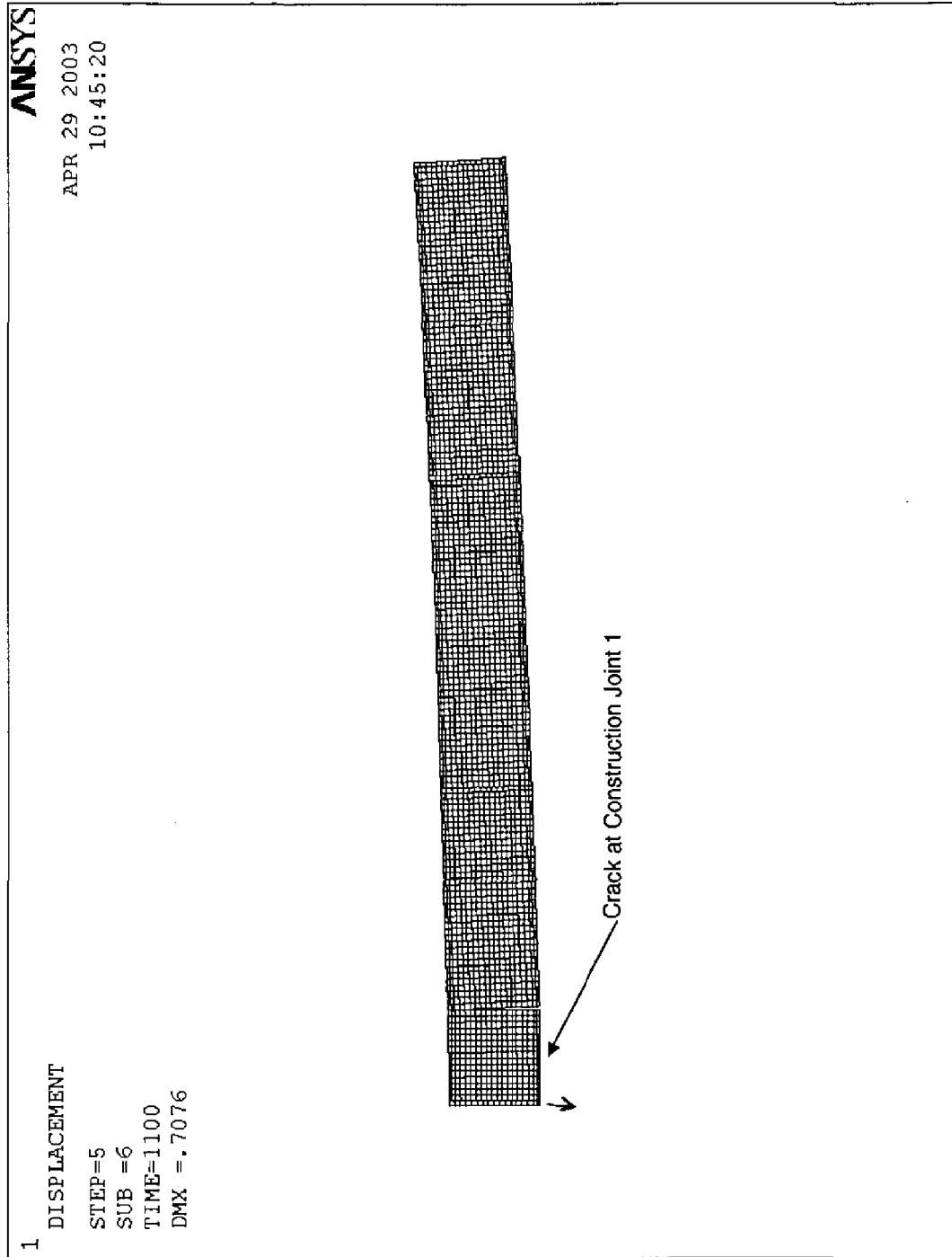
PC3 Location 7 - 5000 years
(Displacements magnified by 50)



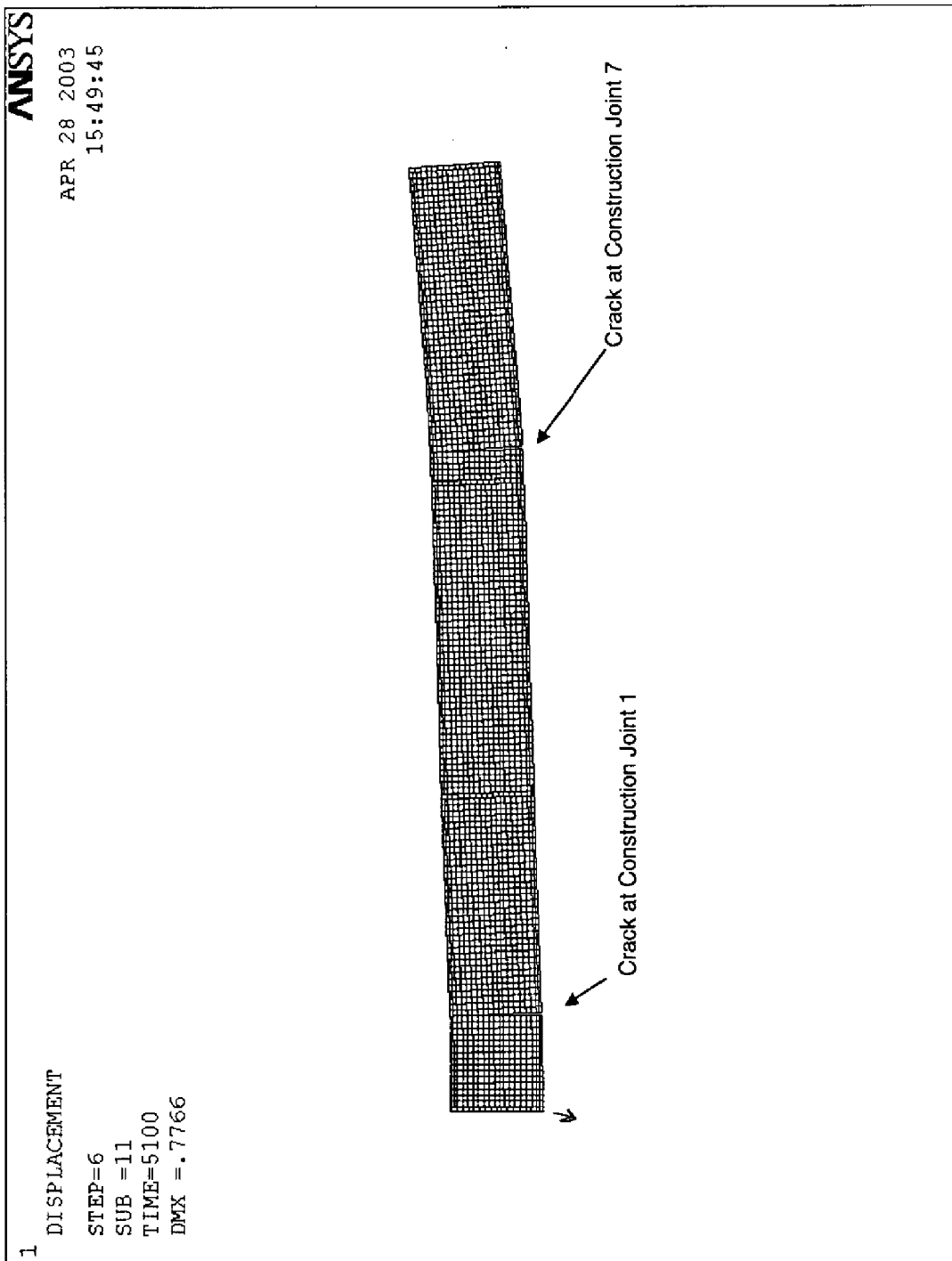
PC4 Location 1 - 100 years
(Displacements magnified by 50)



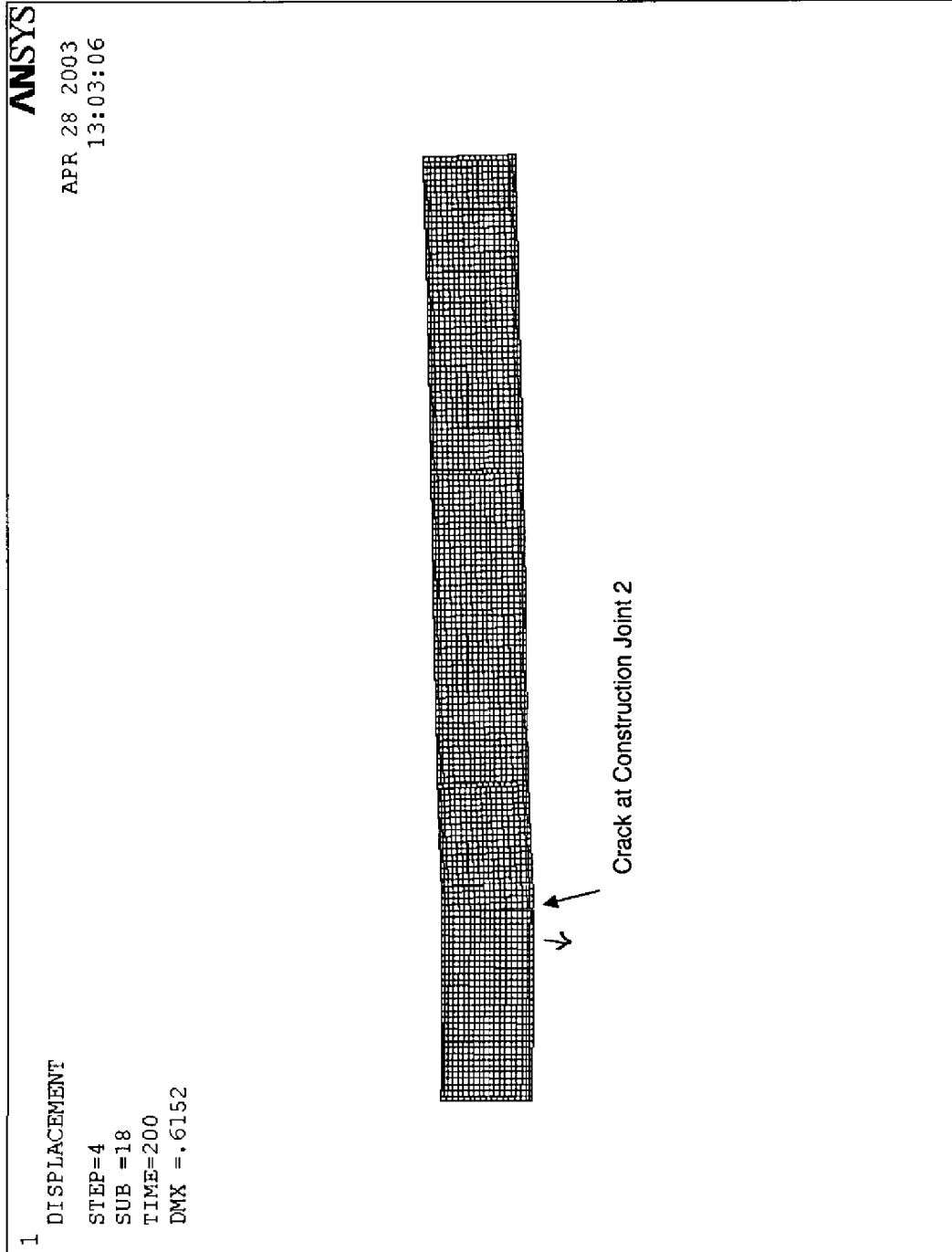
PC4 Location 1 - 1000 years
(Displacements magnified by 50)



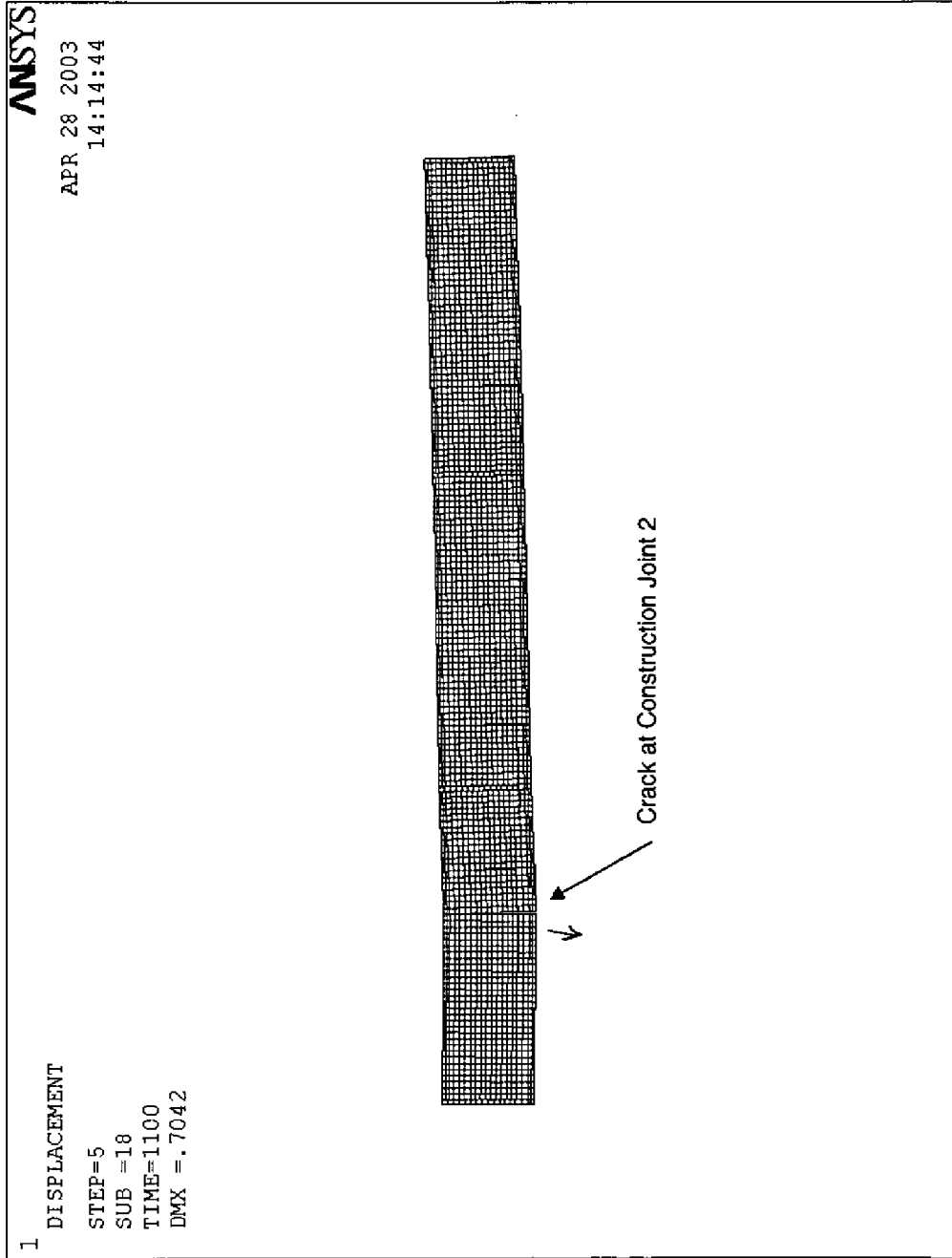
PC4 Location 1 - 5000 years
(Displacements magnified by 50)



PC4 Location 2 - 100 years
(Displacements magnified by 25)



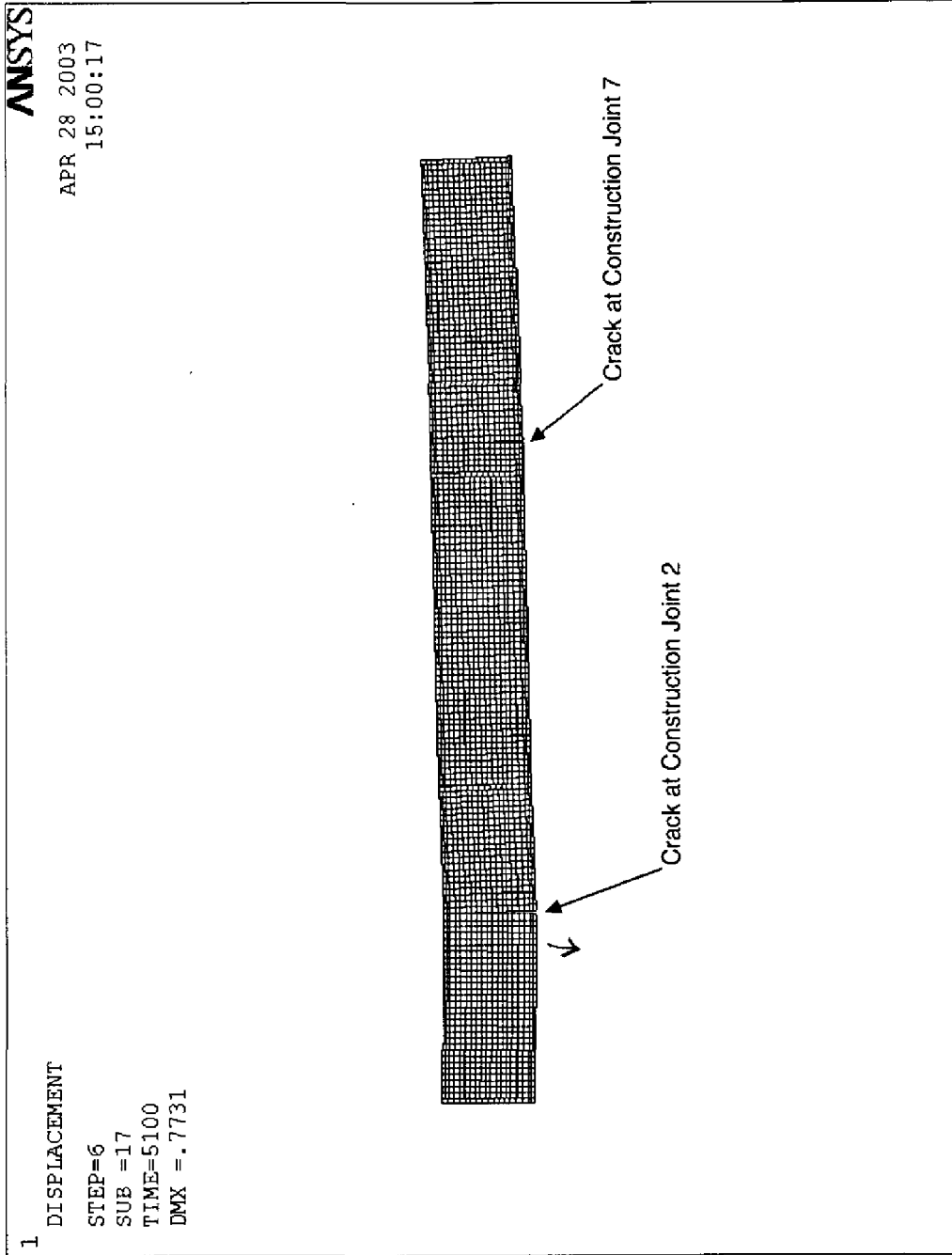
PC4 Location 2 - 1000 years
(Displacements magnified by 25)



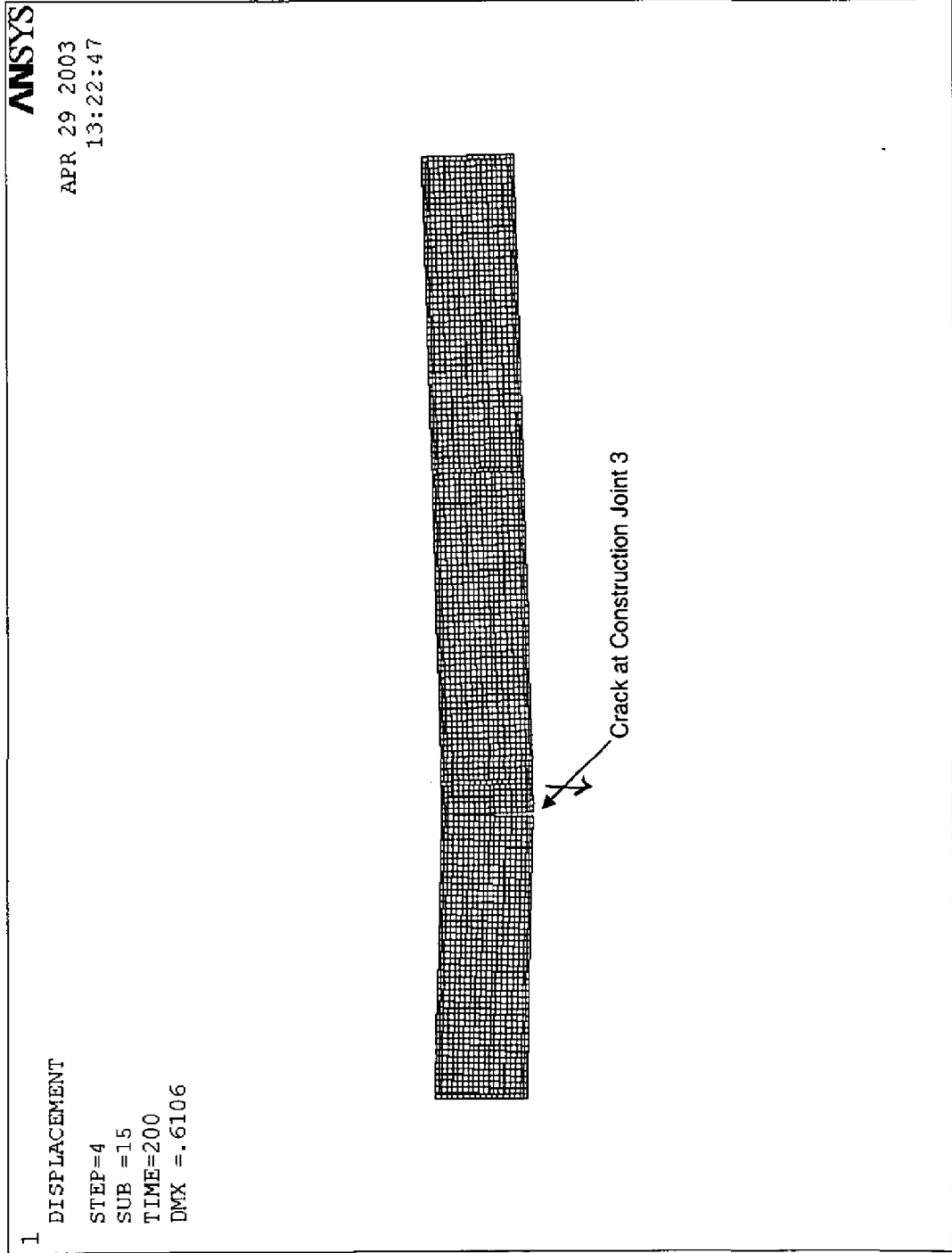
PC4 Location 2 - 5000 years
(Displacements magnified by 25)

T-CLL-3-00006, Rev.0

125

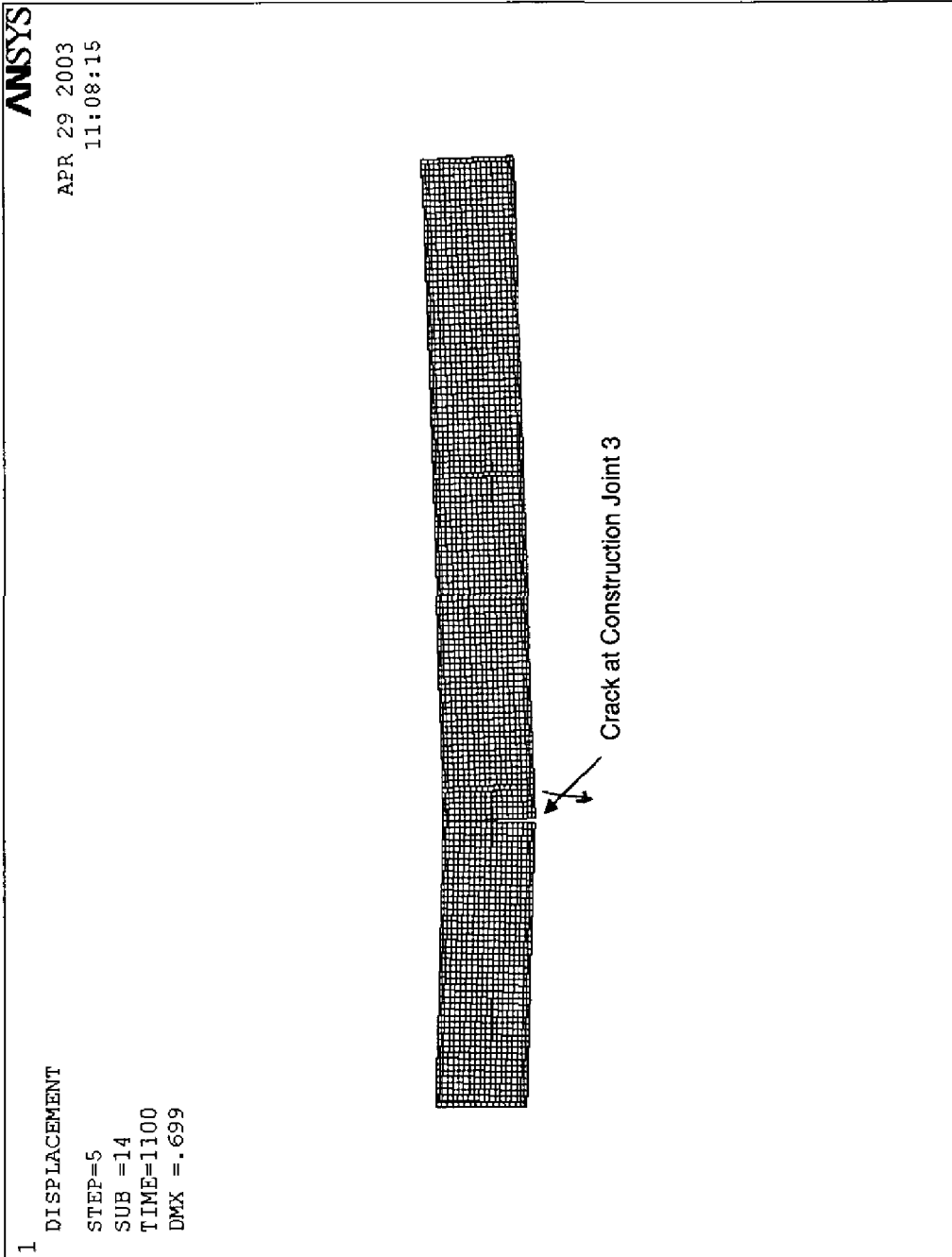


PC4 Location 3 - 100 years
(Displacements magnified by 25)

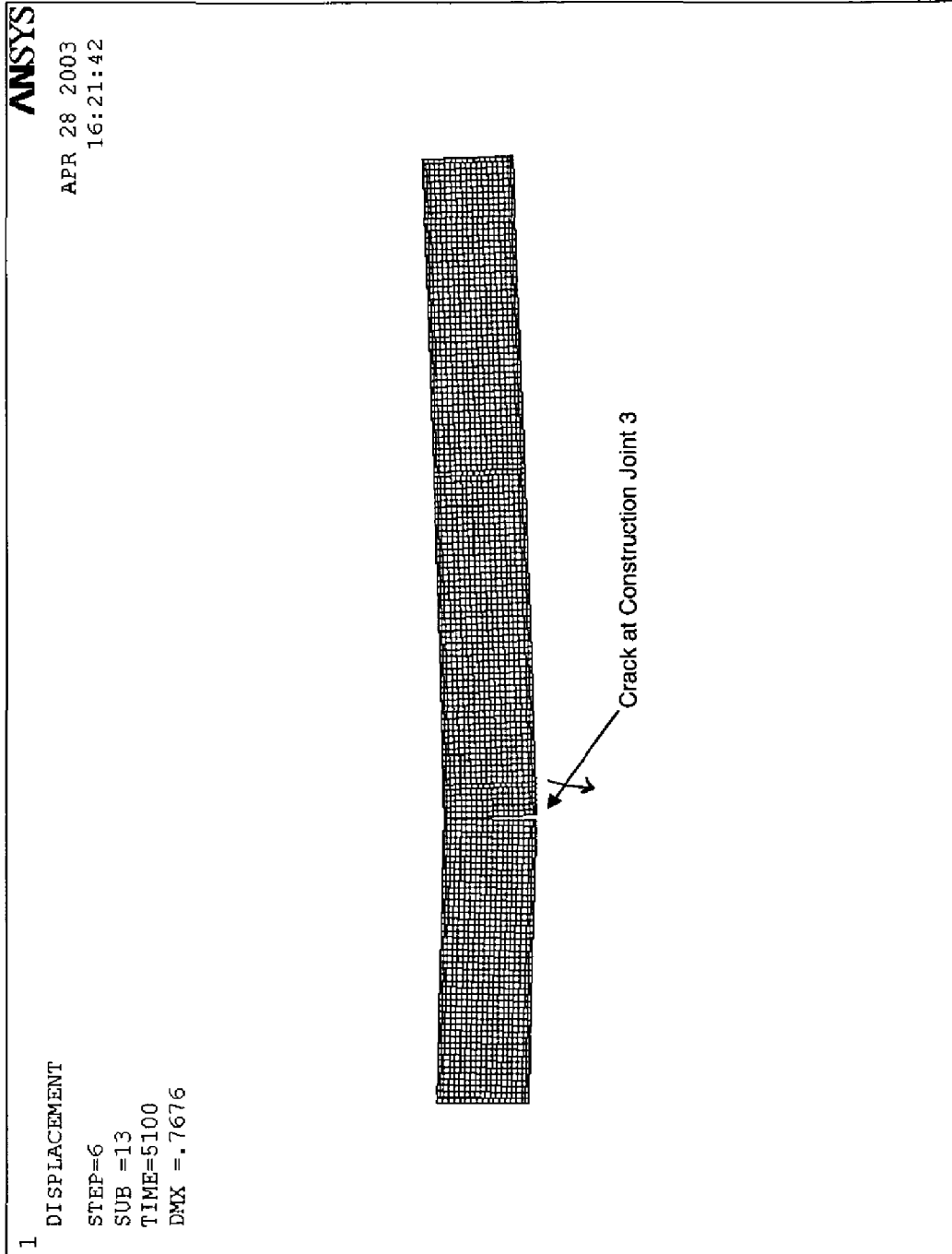


T-CLC-2-00006, Rev. 0

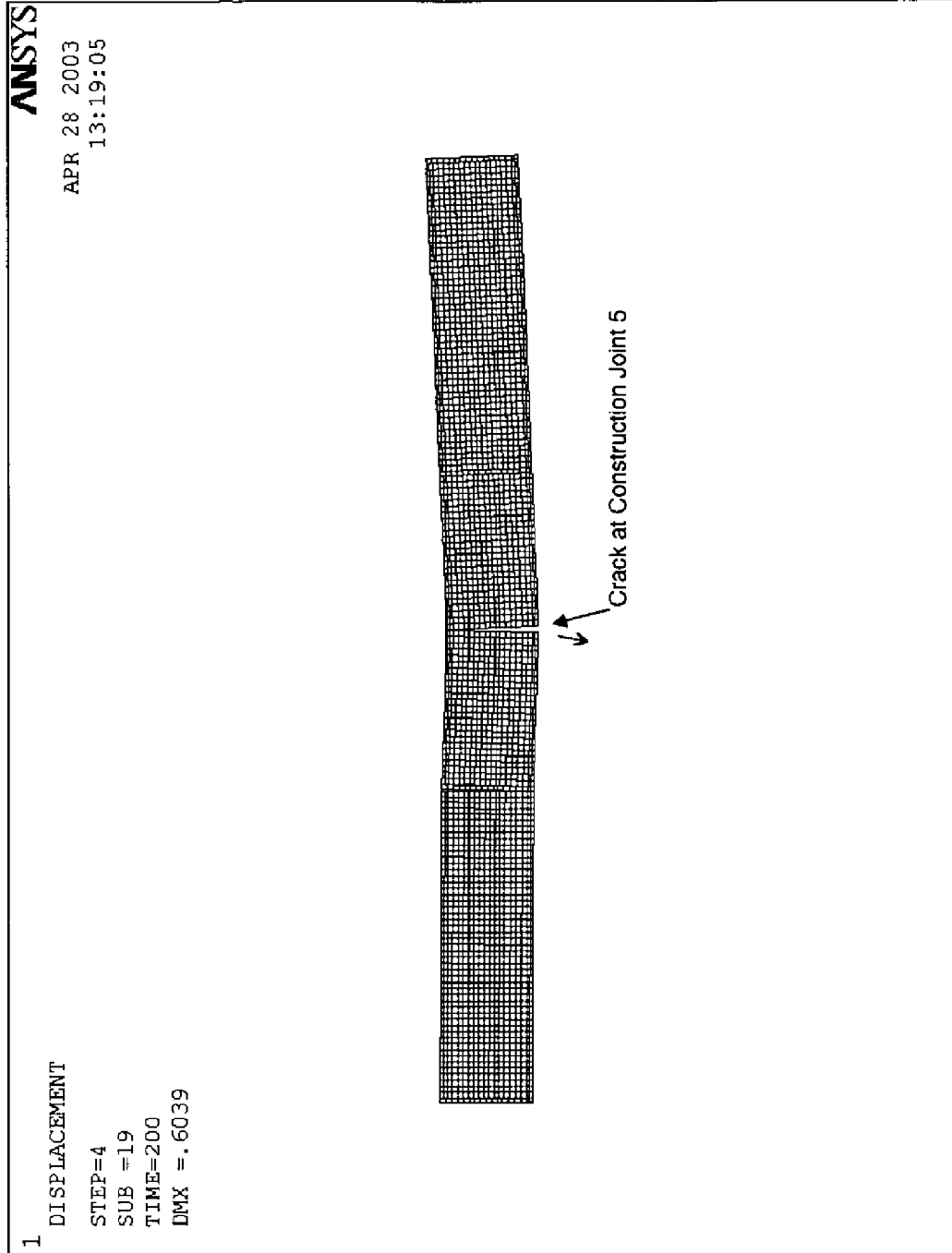
PC4 Location 3 - 1000 years
(Displacements magnified by 25)



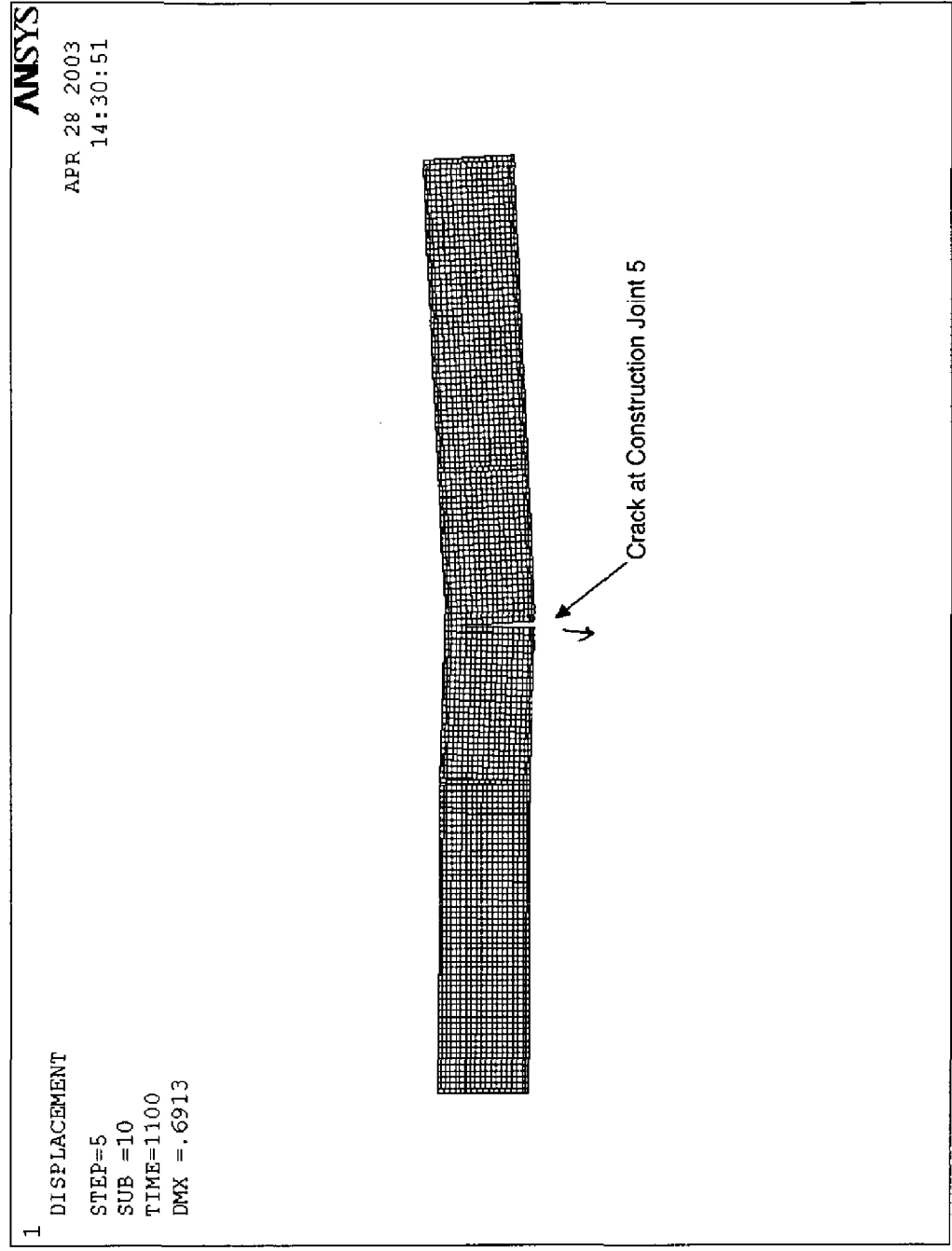
PC4 Location 3 - 5000 years
(Displacements magnified by 25)



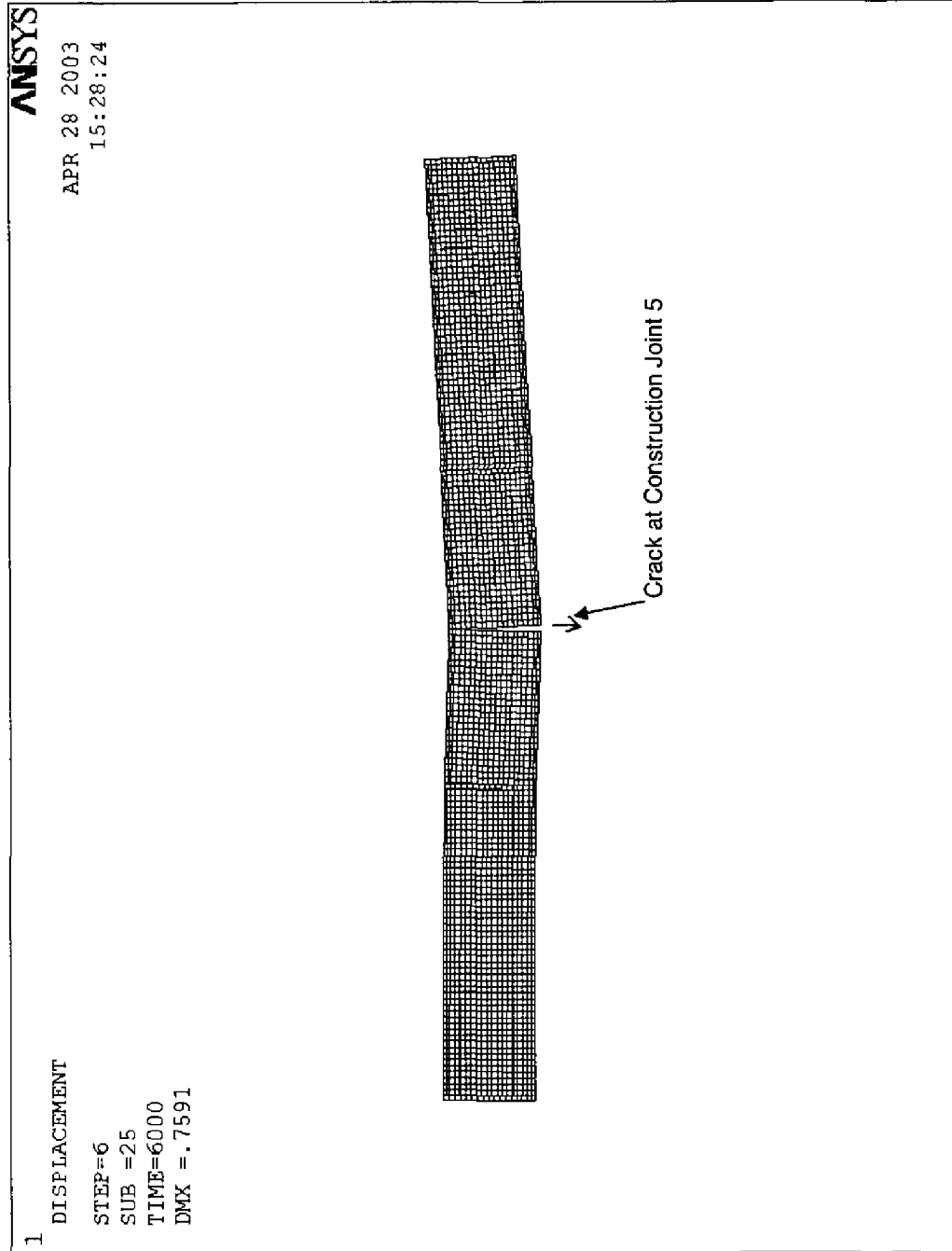
PC4 Location 4 - 100 years
(Displacements magnified by 25)



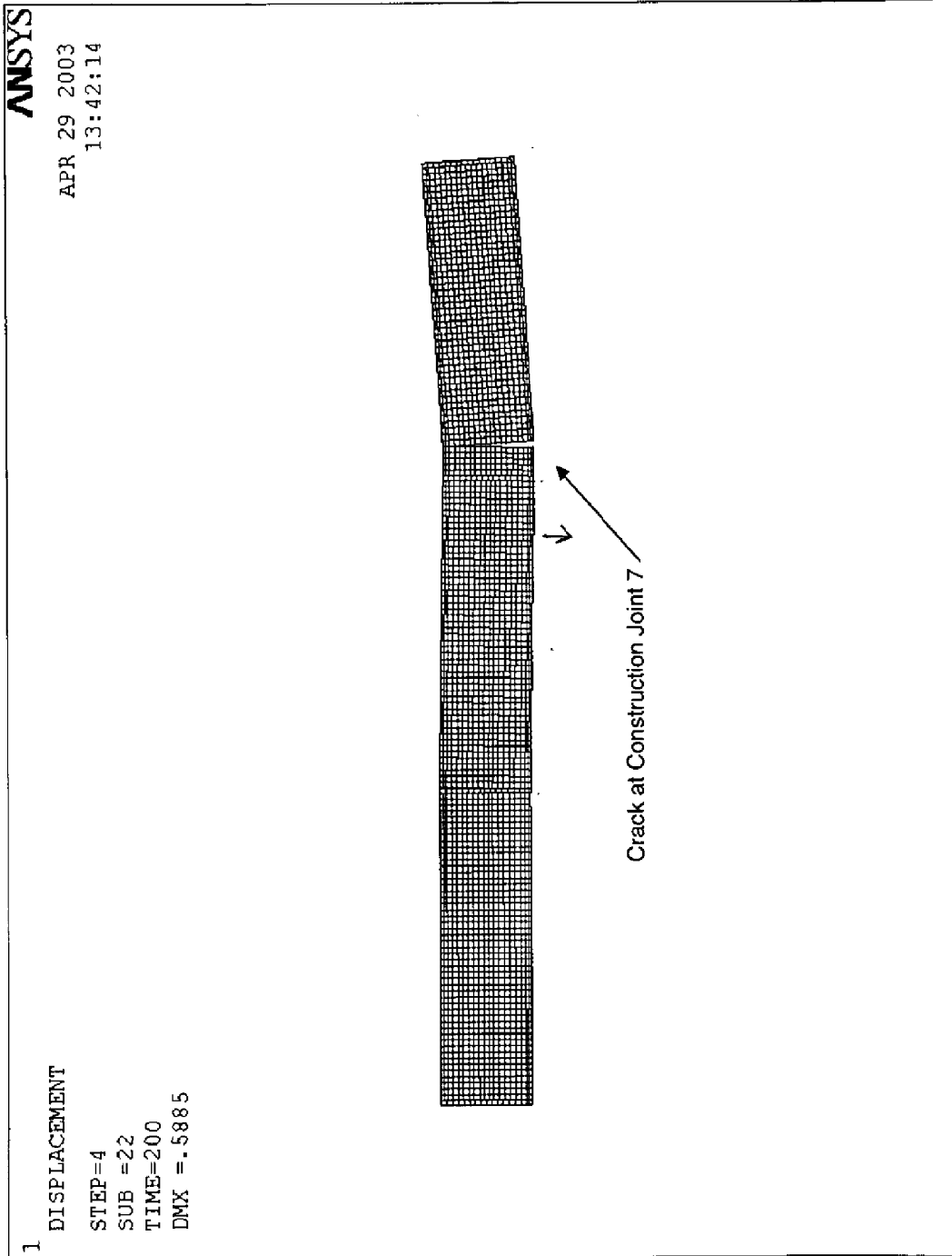
PC4 Location 4 - 1000 years
(Displacements magnified by 25)



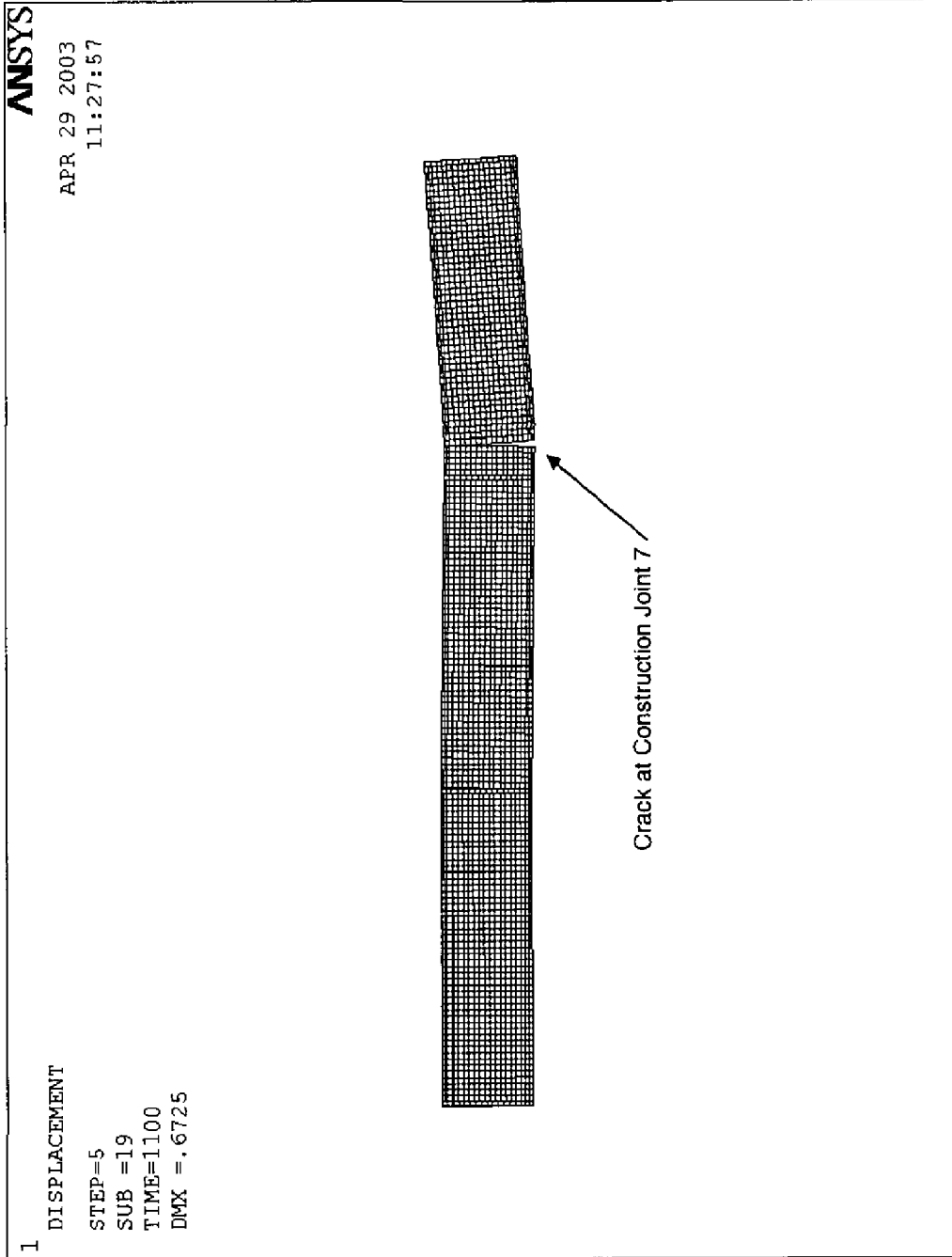
PC4 Location 4 - 5000 years
(Displacements magnified by 25)



PC4 Location 5 - 100 years
(Displacements magnified by 25)



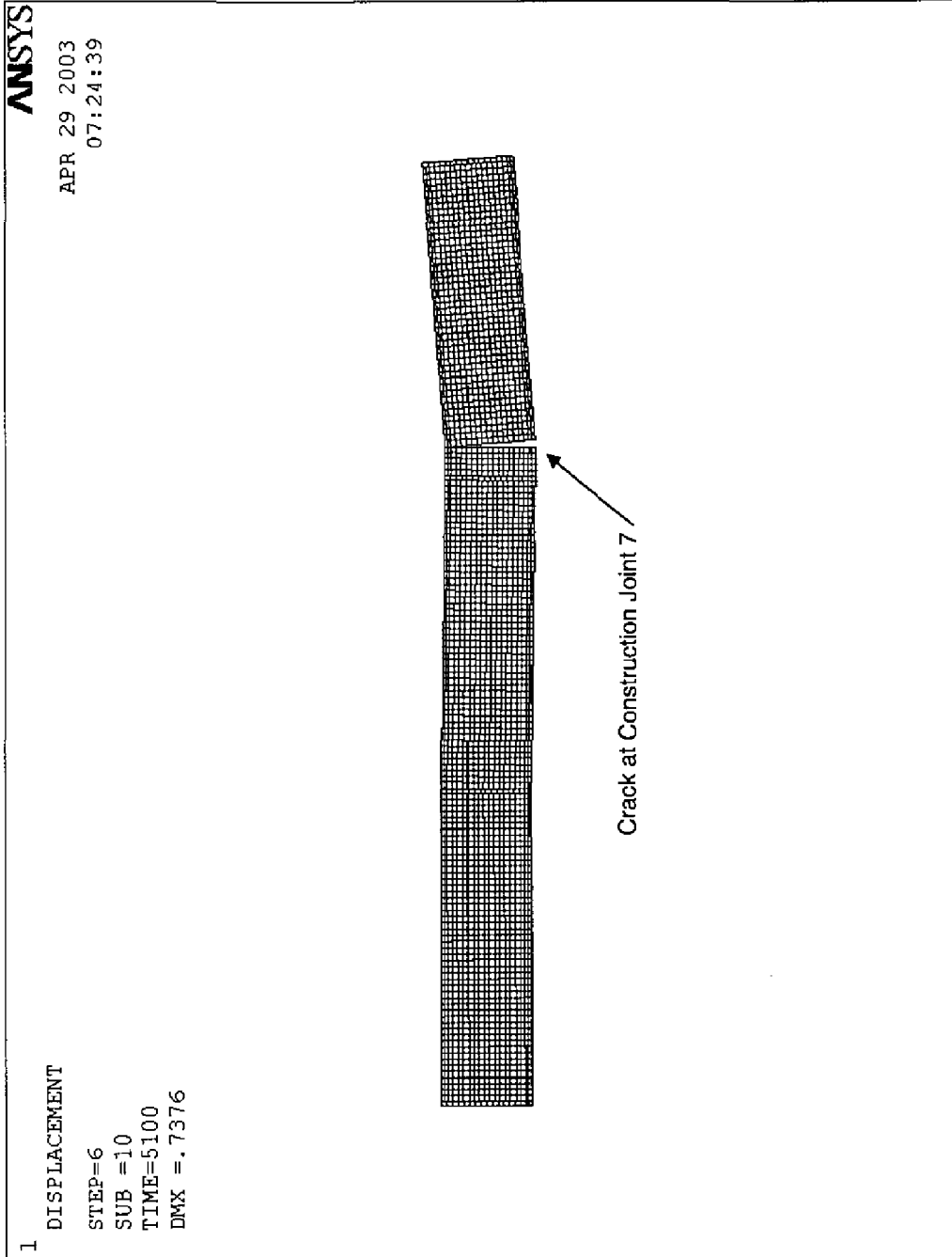
PC4 Location 5 -- 1000 years
(Displacements magnified by 25)



PC4 Location 5 - 5000 years
(Displacements magnified by 25)

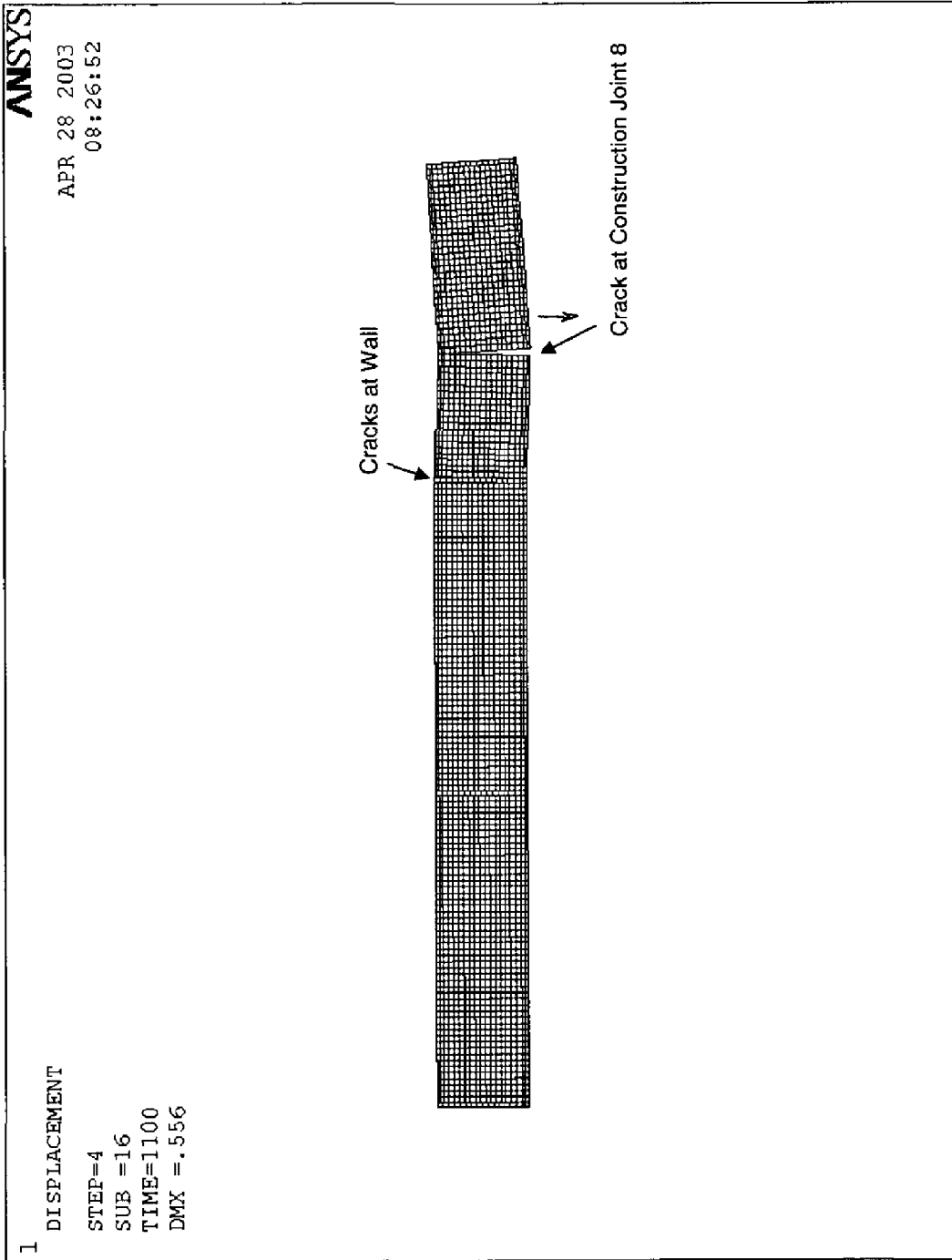
T-CLL-2-00006, Rev.0

134

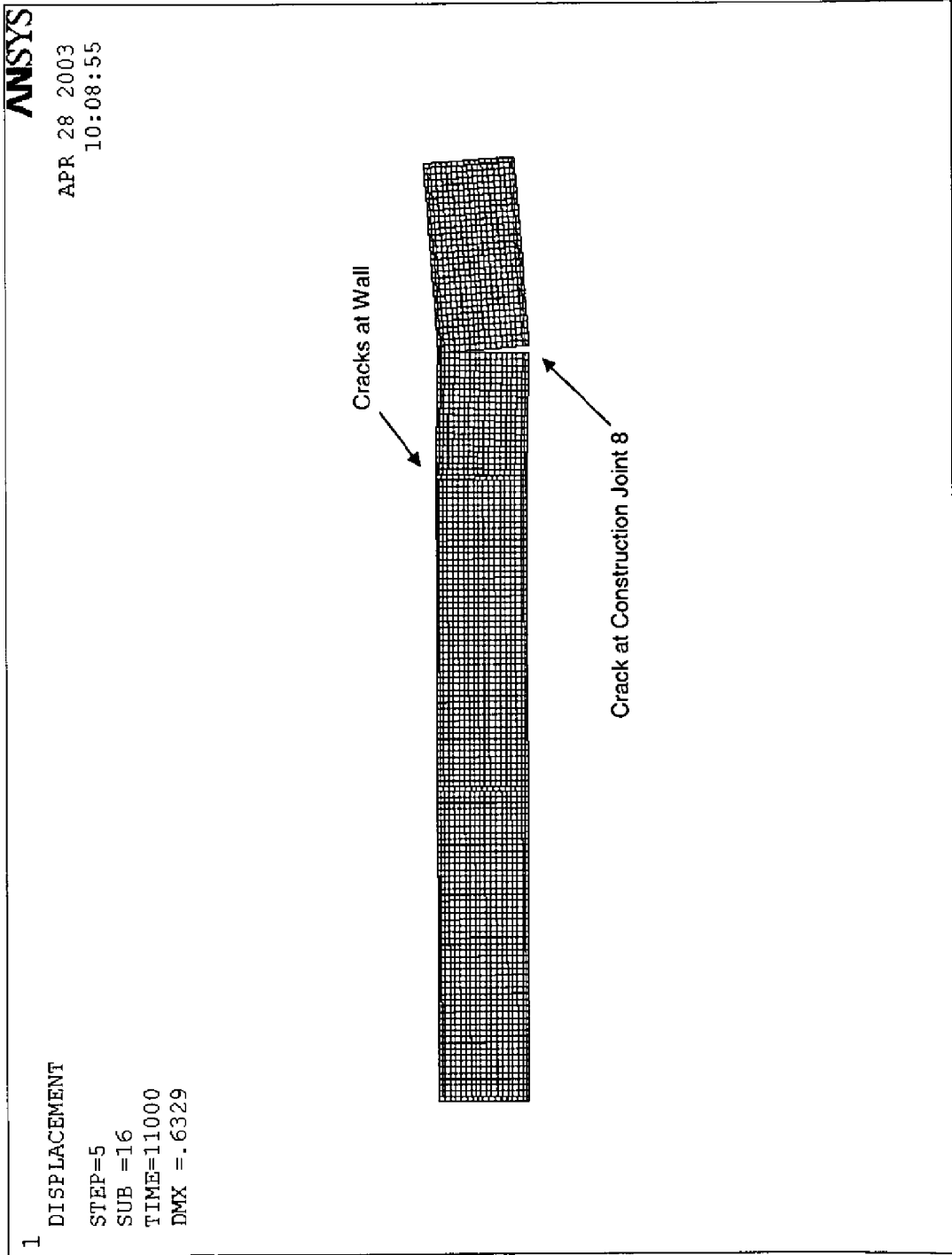


T-CLL-2-00006, Rev. 0

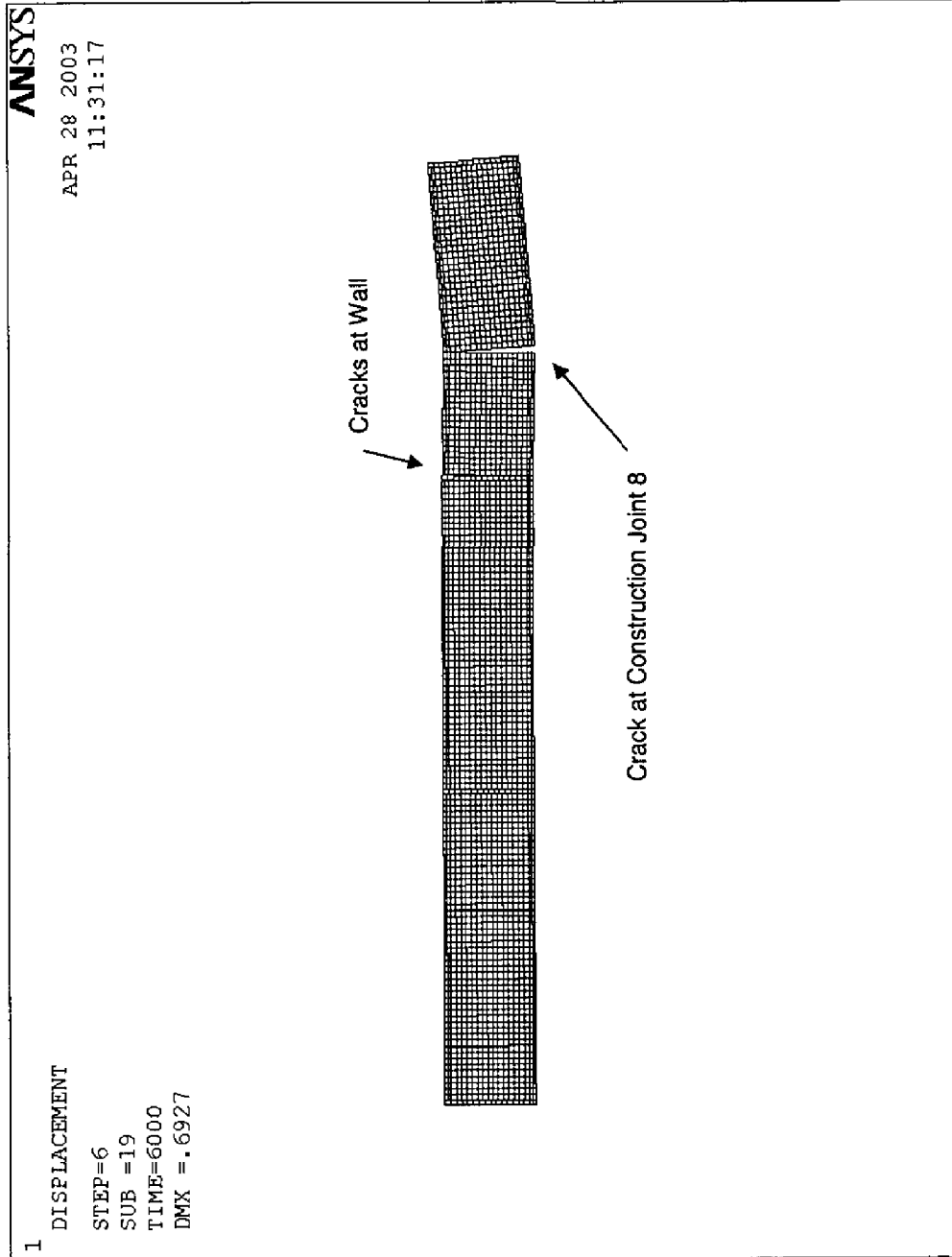
PC4 Location 6 - 100 years
(Displacements magnified by 25)



PC4 Location 6 - 1000 years
(Displacements magnified by 25)

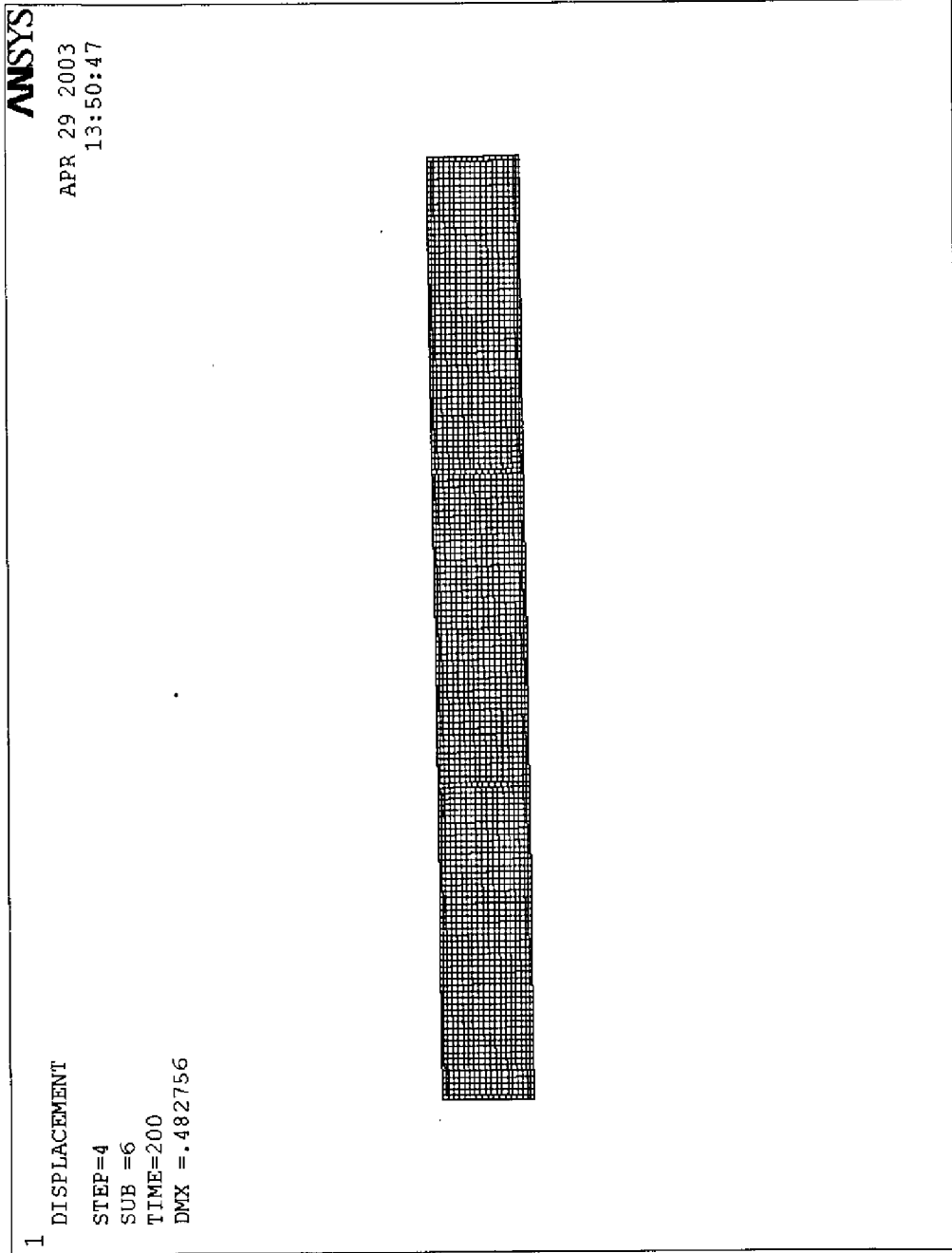


PC4 Location 6 - 5000 years
(Displacements magnified by 25)

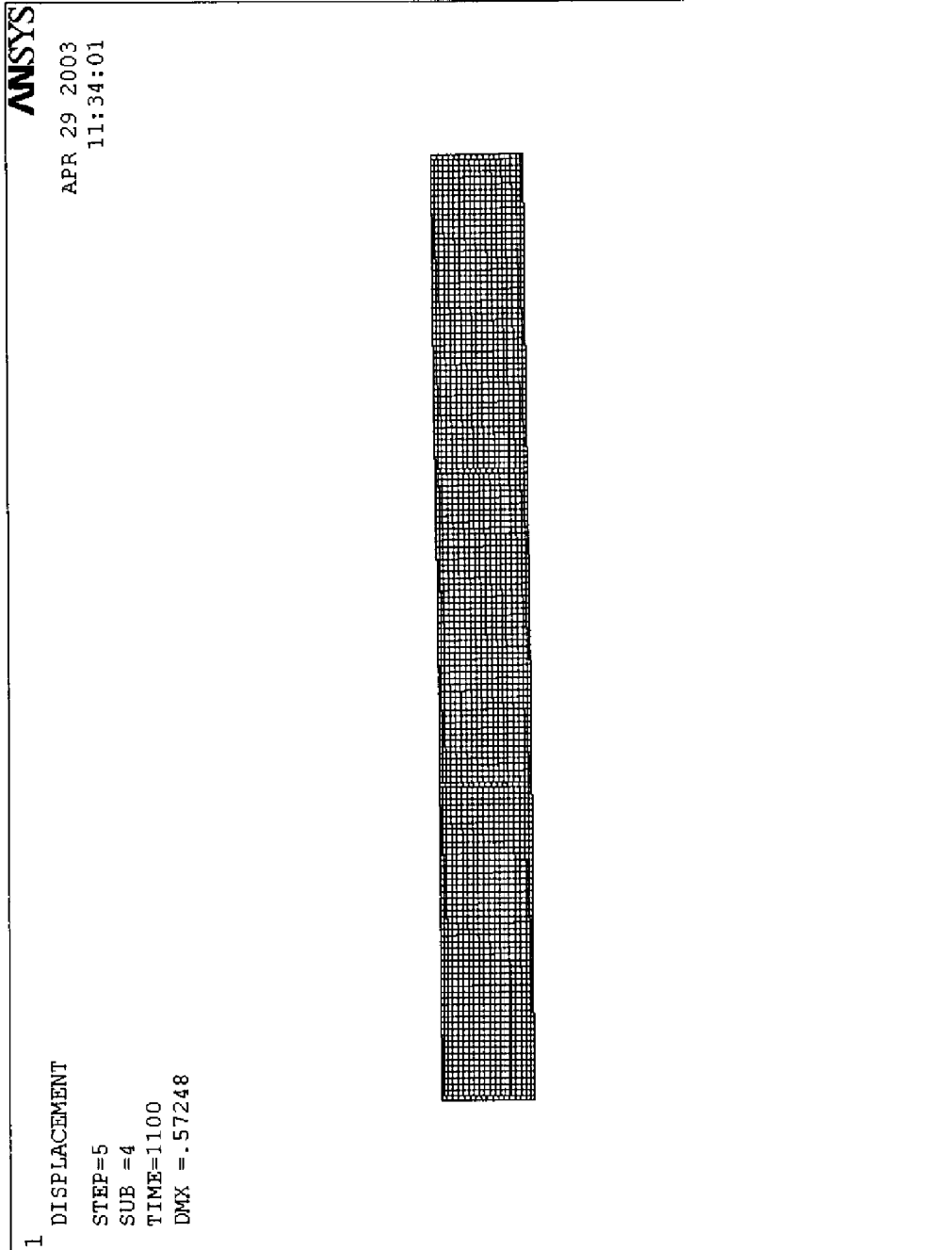


PC4 Location 7 - 1000 years
(Displacements magnified by 50)

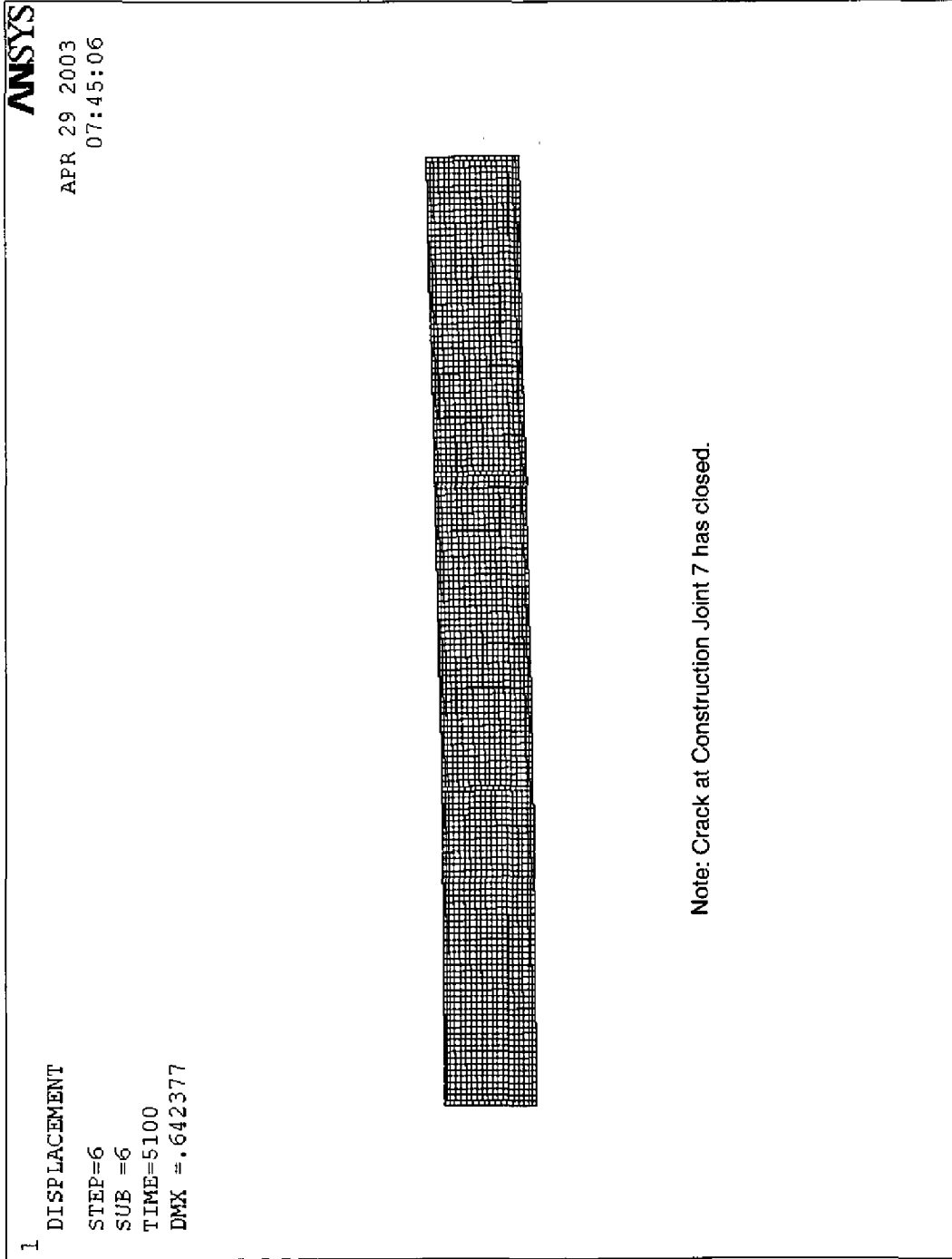
T-CLL-2-00006, Rev.0



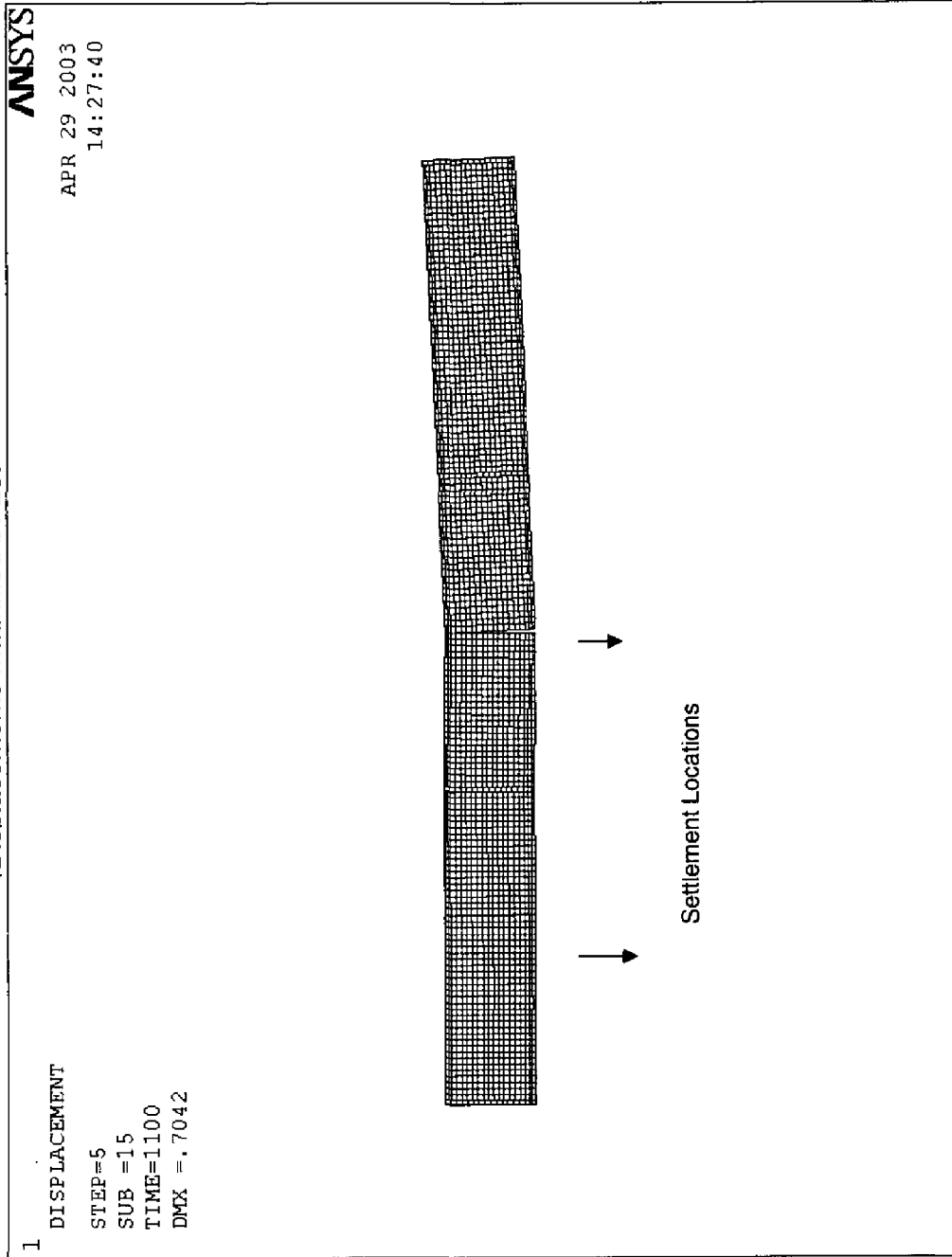
PC4 Location 7 - 1000 years
(Displacements magnified by 50)



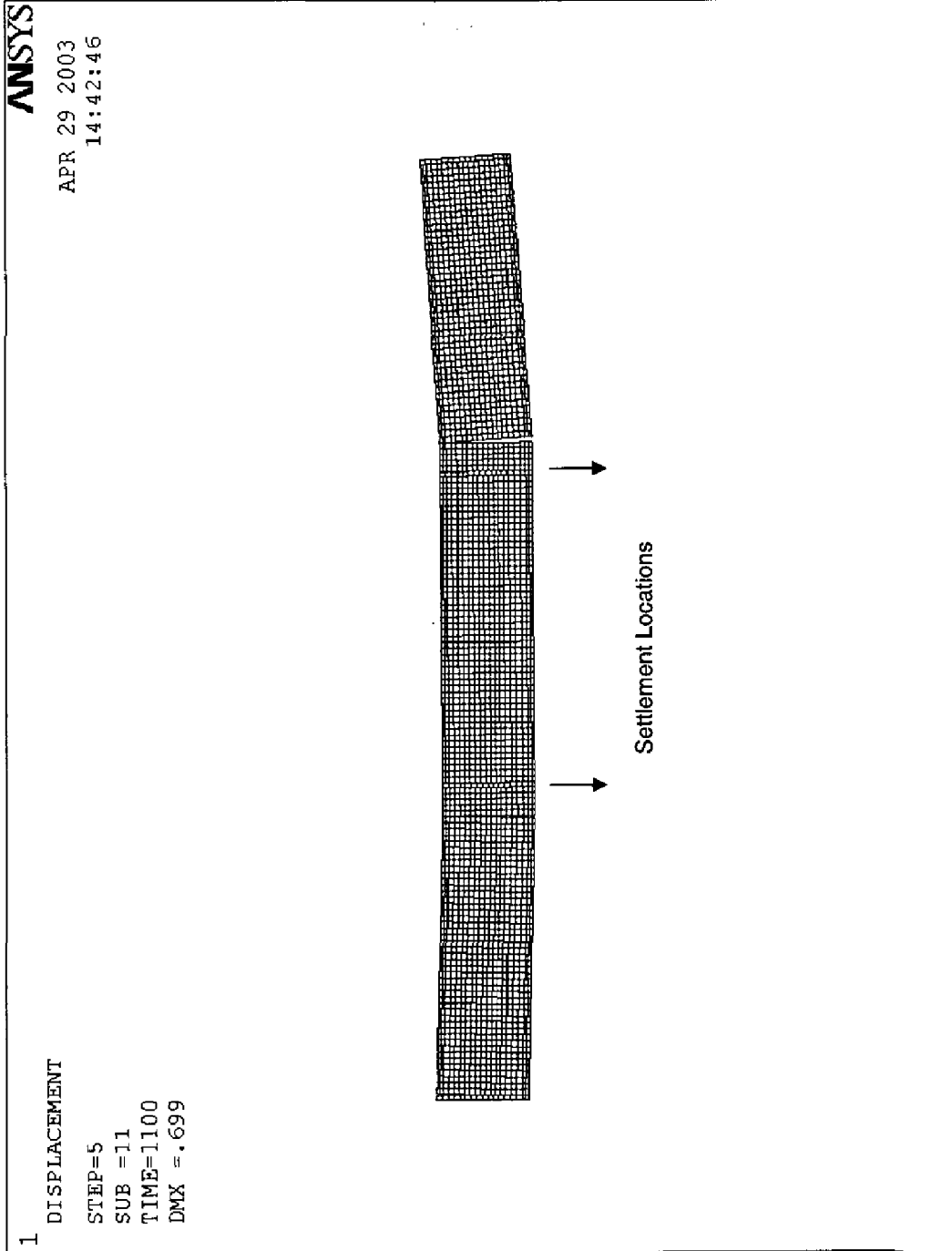
PC4 Location 7 - 5000 years
(Displacements magnified by 50)

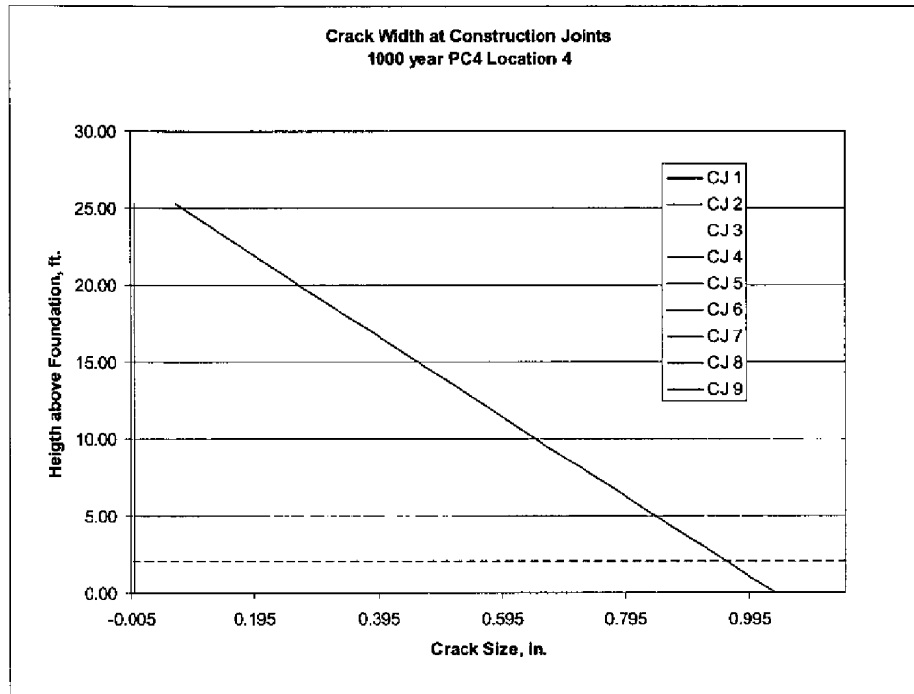


PC4 Locations 2 & 4 -- 1000 years
(Displacements magnified by 25)



PC4 Locations 3 & 5 - 1000 years
(Displacements magnified by 25)

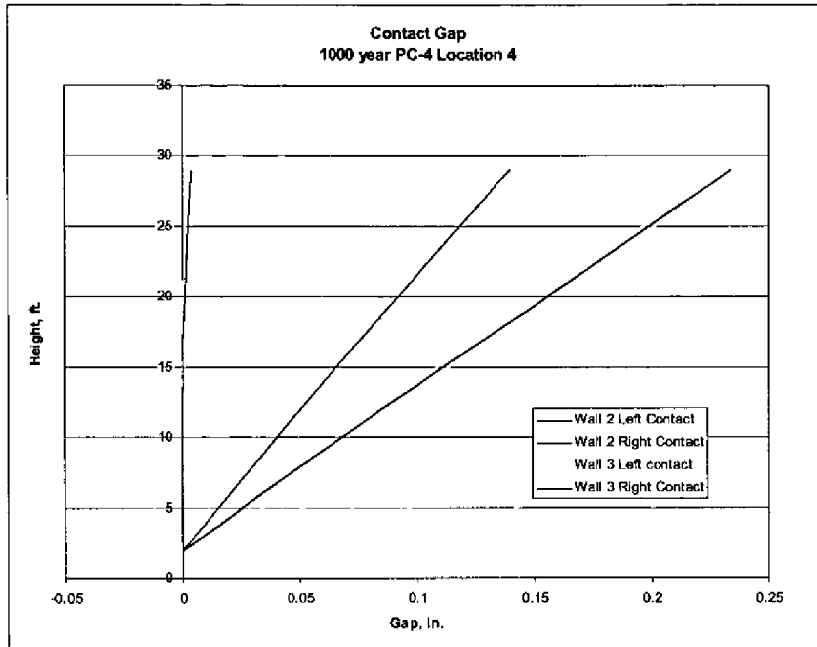


Examples of Crack Area CalculationsExample 1. PC-4, Mean Properties, Location 4, Extent = 62 ft. Time = 1000 yearsBottom Crack

A single crack with a width of 0.959" (measured at the bottom of the saltstone) and a length of about 27 ft. occurs. The crack area is calculated as a triangle closed at the top.

$$\text{Len} := 27\text{ft} \quad \text{Wid} := 0.96\text{in}$$

$$\text{Area} := \frac{1}{2} \cdot \text{Len} \cdot \text{Wid} \quad \text{Area} = 155.52 \text{in}^2$$

Top Cracks

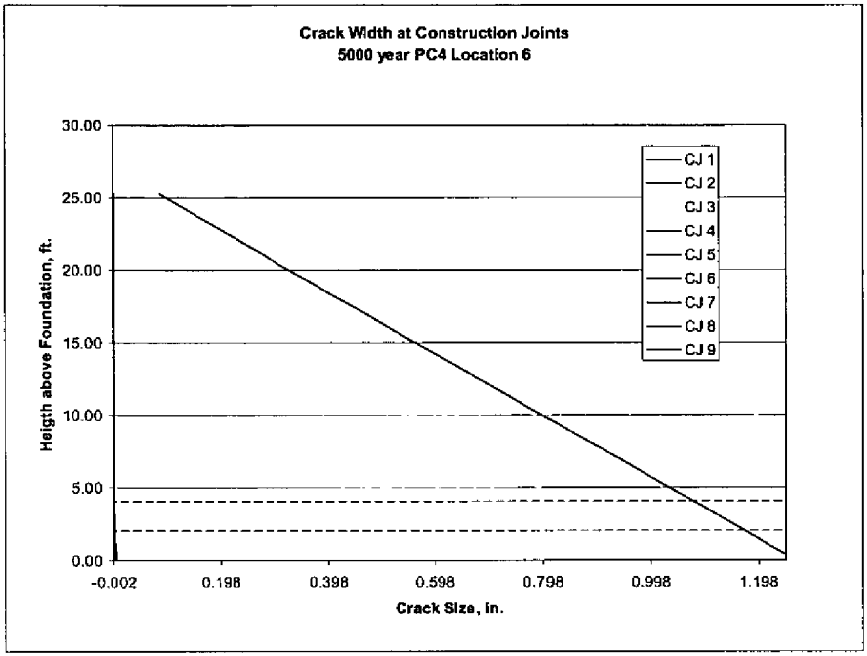
In this case, two cracks occur at wall 2. The widths are 0.140" and 0.234". The length is 27 ft.

$$\text{Wid} := 0.14\text{in} + 0.23\text{in}$$

$$\text{Area} := \frac{1}{2} \cdot \text{Len} \cdot \text{Wid} \quad \text{Area} = 59.94 \text{ in}^2$$

Example 2. PC -4, Low Saltstone Modulus, Location 6, Extent = 62 ft. Time = 5000 years

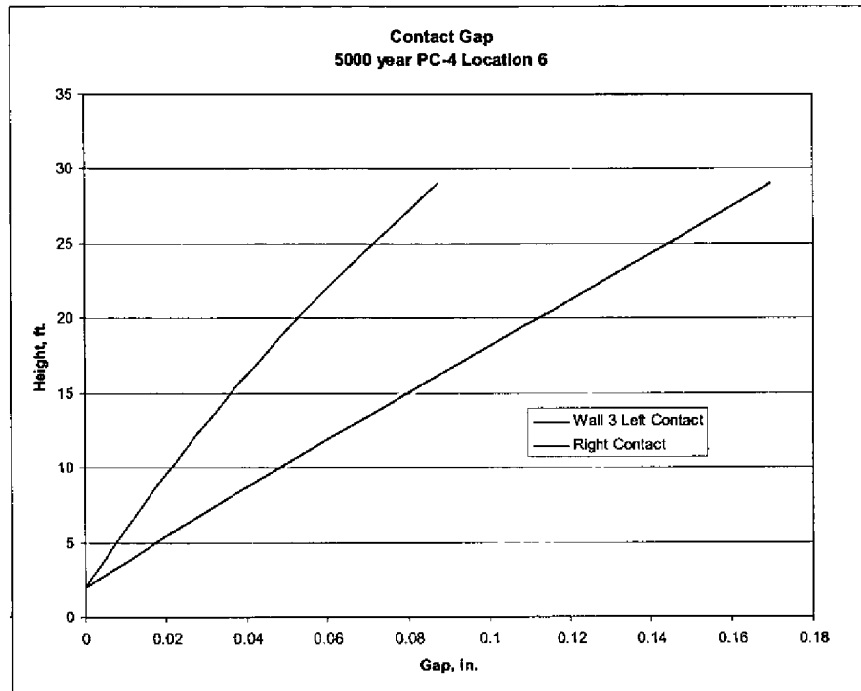
Bottom Cracks



Len := 27ft Wid := 1.17in

$$\text{Area} := \frac{1}{2} \cdot \text{Len} \cdot \text{Wid} \quad \text{Area} = 189.54 \text{in}^2$$

Top Cracks



W1 := 0.087in

W2 := 0.170in

Wid := W1 + W2

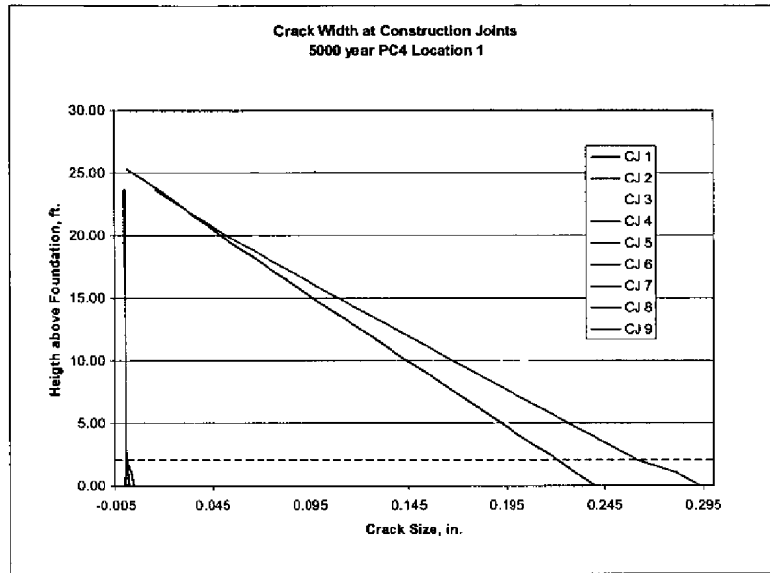
Len := 27ft

Area := $\frac{1}{2} \cdot \text{Len} \cdot \text{Wid}$

Area = 41.634 in²

Example 3. PC -4, High Soil Modulus, Location 1, Extent = 124 ft. Time = 5000 years

Bottom Cracks

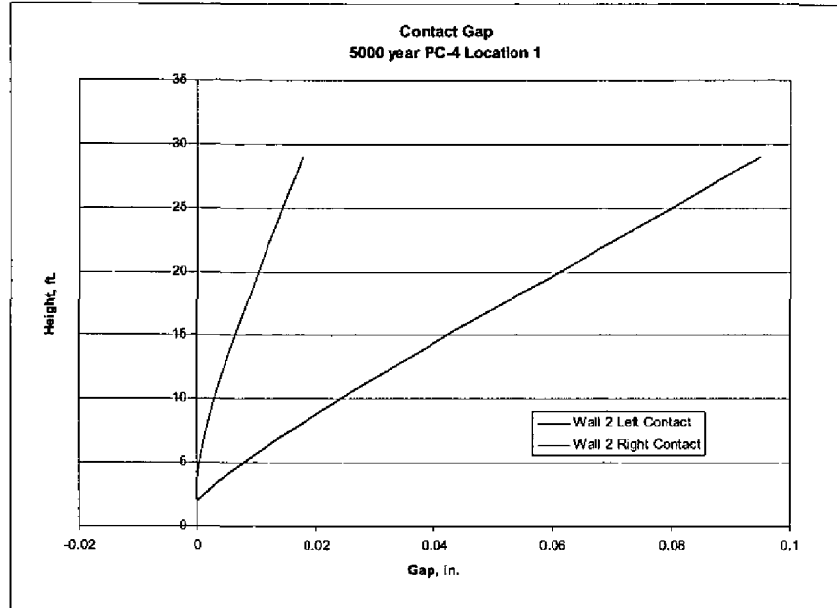


Note that cracks occur at both joints 1 and 7. The crack at joint 7 is caused by static settlement and is accounted for separately.

Wid := 0.221in Len := 25ft

Area := $\frac{1}{2} \cdot \text{Len} \cdot \text{Wid}$ Area = 33.15in²

Top Cracks



W1 := 0in

W2 := 0.09in

Wid := W1 + W2

Len := 27ft

Area := $\frac{1}{2} \cdot \text{Len} \cdot \text{Wid}$

Area = 14.58 in²

Note. the crack at the right side of wall w is on the order of 0.02 inches and is not used. In general cracks of this magnitude were not used in the analysis since they did not add appreciably to the overall crack area. (Area = 2.3 in² in this case.)

1. Cracking Due to Static Settlement
1A. Vary Saltstone Modulus

Index	Saltstone Modulus	Time years	Settlement feet	Bottom Crack Area ln ²	Time at Crack Initiation
1	1.619E+05	100	-0.387	0	
2	1.619E+05	1000	-0.482	39	700
3	1.619E+05	5000	-0.549	46.8	
4	2.048E+05	100	-0.387	0	
5	2.048E+05	1000	-0.482	0	
6	2.048E+05	5000	-0.549	49.92	3300
7	2.396E+05	100	-0.387	3.9	415
8	2.396E+05	1000	-0.482	43.68	1950
9	2.396E+05	5000	-0.549	51.48	
10	1.834E+05	5000	-0.549	48.67	
11	2.222E+05	5000	-0.549	50.86	4450
12	2.309E+05	5000	-0.549	51.17	5000
13	2.350E+05	10000	-0.578	55.54	5550
14	2.370E+05	10000	-0.578	55.69	5800
15	2.380E+05	1000	-0.482	43.06	370
16	2.390E+05	1000	-0.482	43.06	370
17	2.400E+05	1000	-0.482	43.06	415
18	2.420E+05	1000	-0.482	43.21	410
19	2.440E+05	1000	-0.482	43.21	400
20	2.45E+05	1000	-0.482	43.06	600
21	2.460E+05	10000	-0.578	56	7300
22	2.500E+05	10000	-0.578	56.16	8150

1 B. Vary Saltstone Cracking Strain

Index	Cracking Strain	Time years	Settlement feet	Bottom Crack Area ln ²
23	7.540E-05	50	-0.358	0
24	7.540E-05	50	-0.358	20.25
25	7.540E-05	100	-0.387	25.05
26	7.540E-05	1000	-0.482	35.412
27	7.540E-05	5000	-0.549	42.588
28	8.500E-05	99	-0.387	0
29	8.500E-05	99	-0.387	21.75
30	8.500E-05	100	-0.387	24.9
31	8.500E-05	1000	-0.482	35.256
32	8.500E-05	5000	-0.549	42.588
33	9.800E-05	550	-0.458	0
34	9.800E-05	550	-0.458	28.05
35	9.800E-05	1000	-0.482	35.412
36	9.800E-05	5000	-0.549	42.744
37	1.206E-04	100	-0.387	0
38	1.206E-04	1000	-0.482	0
39	1.206E-04	3300	-0.532	0
40	1.206E-04	3300	-0.532	46.8
41	1.206E-04	5000	-0.549	49.92
42	1.309E-04	6150	-0.557	0
43	1.309E-04	6150	-0.557	51.012
44	1.309E-04	10000	-0.578	54.288
45	1.411E-04	100	-0.387	0
46	1.411E-04	1000	-0.482	0
47	1.411E-04	3300	-0.532	0
48	1.411E-04	3300	-0.532	0
49	1.411E-04	5000	-0.549	0

2. Differential Displacement at Location 1

2.A. Differential Displacement Magnitude

Index	Magnitude, in	Time years	Settlement feet	Bottom
				Crack Area in ²
50	1.5	100	-0.387	0
51	1.5	1000	-0.482	13.2
52	1.5	5000	-0.549	10.68
53	2	100	-0.387	16.56
54	2	1000	-0.482	20.286
55	2	5000	-0.549	20.1
56	2.75 (PC-4)	100	-0.387	24.48
57	2.75	1000	-0.482	29.4
58	2.75	5000	-0.549	30
59	2.75	5000	-0.549	31.5

2.B. Vary Settlement Extent

PC-4 Event

Index	Extent, ft.	Time years	Settlement feet	Bottom
				Crack Area in ²
60	62	100	-0.387	24.48
61	62	1000	-0.482	29.4
62	62	5000	-0.549	30
63	62	5000	-0.549	31.5
64	124	100	-0.387	73.32
65	124	1000	-0.482	73.32
66	124	5000	-0.549	78
67	124	5000	-0.549	34.5

2.C. Vary Saltstone Modulus

PC-4 Event

Index	Saltstone Modulus ksf	Time years	Settlement feet	Bottom
				Crack Area in ²
68	1.619E+05	100	-0.387	23.04
69	2.048E+05	100	-0.387	24.48
70	2.396E+05	100	-0.387	27
71	1.619E+05	1000	-0.482	27
72	2.048E+05	1000	-0.482	29.484
73	2.396E+05	1000	-0.482	30
74	1.619E+05	5000	-0.549	25.92
75	2.048E+05	5000	-0.549	28.5
76	2.396E+05	5000	-0.549	30

2.D Vary Saltstone Cracking Strain

Index	Event	Cracking Strain in/in	Time years	Settlement feet	Bottom
					Crack Area in ²
77	PC-3	7.540E-05	1000	-0.482	4.794
78	PC-3	7.540E-05	5000	-0.549	4.998
79	PC-4	7.540E-05	100	-0.387	28.5
80	PC-4	7.540E-05	1000	-0.482	28.5
81	PC-4	7.540E-05	5000	-0.549	30.45
82	PC-4	1.206E-04	100	-0.387	26.85
83	PC-4	1.206E-04	1000	-0.482	27.3
84	PC-4	1.206E-04	5000	-0.549	30
85	PC-4	1.411E-04	100	-0.387	23.904
86	PC-4	1.411E-04	1000	-0.482	27.3
87	PC-4	1.411E-04	5000	-0.549	28.2

2.E. Vary Soil Bulk Modulus

Index	Event	Soil Bulk Modulus ksf	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area in ²
88	PC4	20	100	-0.387	27	
89	PC4	20	1000	-0.482	28.5	
90	PC4	20	5000	-0.549	30	
91	PC4	30	100	-0.387	25.5	
92	PC4	30	1000	-0.482	27	
93	PC4	30	5000	-0.549	30	
94	PC4	40	100	-0.387	29.232	
95	PC4	40	1000	-0.482	29.4	
96	PC4	40	5000	-0.549	33.15	
97	PC4	40	100	-0.387		8.28
98	PC4	40	1000	-0.482		16.2
99	PC4	40	5000	-0.549		14.58

3. Differential Displacement at Location 2

3.A. Differential Displacement Magnitude

Index	Magnitude, in	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area In ²
100	2.75	100	-0.387	74.88	
101	2.75	1000	-0.482	73.32	
102	0.75	1000		0	
103	1.5	1000	-0.482	27.9	
104	2	1000	-0.482	33.9	
105	2.375	1000	-0.482	41.34	
106	2.5	1000	-0.482	52.26	
107	2.75	1000	-0.482	73.32	
108	2.75	5000	-0.549	76.44	
109	2.75	100	-0.387		43.74
110	1.5	1000	-0.482		0
111	2	1000	-0.482		0
112	2.375	1000	-0.482		0
113	2.5	1000	-0.482		12.63
114	2.75	1000	-0.482		37.26
115	2.75	5000	-0.549		40.5

3.B. Vary Settlement Extent

PC-4 Event

Index	Extent, ft.	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area in ²
116	62	100	-0.387	74.88	
117	62	1000	-0.482	73.32	
118	62	5000	-0.549	76.44	
119	62	100	-0.387		43.74
120	62	1000	-0.482		37.26
121	62	5000	-0.549		40.5
122	124	100	-0.387	120.204	
123	124	1000	-0.482	118.26	
124	124	5000	-0.549	116.64	
125	124	100	-0.387		76.63
126	124	1000	-0.482		68.04
127	124	5000	-0.549		63.18

3.C. Vary Saltstone Modulus

PC-4 Event

Index	Saltstone Modulus ksf	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
128	1.619E+05	100	-0.387	80.68	
129	1.619E+05	1000	-0.482	81.49	
130	1.619E+05	5000	-0.549	81.65	
131	1.619E+05	100	-0.387		47.47
132	1.619E+05	1000	-0.482		46.98
133	1.619E+05	5000	-0.549		45.04
134	2.048E+05	100	-0.387	75.35	
135	2.048E+05	1000	-0.482	73.01	
136	2.048E+05	5000	-0.549	76.28	
137	2.048E+05	100	-0.387		43.74
138	2.048E+05	1000	-0.482		35.80
139	2.048E+05	5000	-0.549		41.80
140	2.396E+05	100	-0.387	76.14	
141	2.396E+05	1000	-0.482	76.14	
142	2.396E+05	5000	-0.549	77.76	
143	2.396E+05	100	-0.387		41.80
144	2.396E+05	1000	-0.482		40.50
145	2.396E+05	5000	-0.549		39.04

3.D Vary Saltstone Cracking Strain

Index	Event	Cracking Strain in/in	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
146	PC-3	7.540E-05	100	-0.387	8.4	
147	PC-3	7.540E-05	1000	-0.482	8.76	
148	PC-3	7.540E-05	5000	-0.549	7.68	
149	PC-4	7.540E-05	100	-0.387	77.76	
150	PC-4	7.540E-05	1000	-0.482	76.14	
151	PC-4	7.540E-05	5000	-0.549	76.14	
152	PC-4	7.540E-05	100	-0.387		43.902
153	PC-4	7.540E-05	1000	-0.482		36.45
154	PC-4	7.540E-05	5000	-0.549		34.344
155	PC-4	1.206E-04	100	-0.387	77.76	
156	PC-4	1.206E-04	1000	-0.482	76.14	
157	PC-4	1.206E-04	5000	-0.549	79.38	
158	PC-4	1.206E-04	100	-0.387		43.74
159	PC-4	1.206E-04	1000	-0.482		35.802
160	PC-4	1.206E-04	5000	-0.549		41.796
161	PC-4	1.411E-04	100	-0.387	78.894	
162	PC-4	1.411E-04	1000	-0.482	75.654	
163	PC-4	1.411E-04	5000	-0.549	73.872	
164	PC-4	1.411E-04	100	-0.387		39.528
165	PC-4	1.411E-04	1000	-0.482		35.802
166	PC-4	1.411E-04	5000	-0.549		29.646

3.E. Vary Soil Bulk Modulus

Index	Event	Soil Bulk Modulus ksf	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area In ²
167	PC3	20	5000	-0.549	24	
168	PC4	20	100	-0.387	43.68	
169	PC4	20	1000	-0.482	46.8	
170	PC4	20	5000	-0.549	48.36	
171	PC4	30	100	-0.387	77.76	
172	PC4	30	1000	-0.482	76.14	
173	PC4	30	5000	-0.549	79.38	
174	PC4	40	100	-0.387	126.36	
175	PC4	40	1000	-0.482	129.6	
176	PC4	40	5000	-0.549	129.6	
177	PC4	30	100	-0.387		43.74
178	PC4	30	1000	-0.482		37.26
179	PC4	30	5000	-0.549		40.5
180	PC4	40	100	-0.387		102.06
181	PC4	40	1000	-0.482		105.3
182	PC4	40	5000	-0.549		105.3

4. Differential Displacement at Location 3

4.A. Differential Displacement Magnitude

Index	Magnitude, In	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area In ²
183	0.75	1000	-0.482	25.5	
184	0.75	5000	-0.549	45.24	
185	1.5	1000	-0.482	51.792	
186	2	1000	-0.482	65.985	
187	2.75	100	-0.387	105.3	
188	2.75	1000	-0.482	110.16	
189	2.75	5000	-0.549	115.02	
190	2.75	100	-0.387		53.46
191	2.75	1000	-0.482		55.08
192	2.75	5000	-0.549		55.08

4.B. Vary Settlement Extent

PC-4 Event

Index	Extent, ft.	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area In ²
193	62	1000	-0.482	25.5	
194	62	5000	-0.549	45.24	
195	124	100	-0.387	15.12	
196	124	1000	-0.482	45.24	
197	124	5000	-0.549	63	
198	62	100	-0.387	105.3	
199	62	1000	-0.482	110.16	
200	62	5000	-0.549	115.02	
201	62	100	-0.387		53.46
202	62	1000	-0.482		55.08
203	62	5000	-0.549		55.08
204	124	100	-0.387	174.96	
205	124	1000	-0.482	178.2	
206	124	5000	-0.549	177.9	
207	124	100	-0.387		119.88
208	124	1000	-0.482		108.54
209	124	5000	-0.549		103.68

4.C. Vary Saltstone Modulus

Index	Event	Saltstone Modulus ksf	Time years	Settlement feet	Bottom	Top
					Crack Area in ²	Crack Area in ²
210	PC-3	1.619E+05	1000	-0.482	34.32	
211	PC-3	1.619E+05	5000	-0.549	51.624	
212	PC-3	2.048E+05	1000	-0.482	25.5	
213	PC-3	2.048E+05	5000	-0.549	45.24	
214	PC-3	2.396E+05	1000	-0.482	39	
215	PC-3	2.396E+05	5000	-0.549	45.24	
216	PC-4	1.619E+05	100	-0.387	103.68	
217	PC-4	1.619E+05	1000	-0.482	110.16	
218	PC-4	1.619E+05	5000	-0.549	115.02	
219	PC-4	2.048E+05	100	-0.387	105.3	
220	PC-4	2.048E+05	1000	-0.482	110.16	
221	PC-4	2.048E+05	5000	-0.549	115.02	
222	PC-4	2.396E+05	100	-0.387	103.68	
223	PC-4	2.396E+05	1000	-0.482	110.16	
224	PC-4	2.396E+05	5000	-0.549	115.02	
225	PC-4	1.619E+05	100	-0.387		52.812
226	PC-4	1.619E+05	1000	-0.482		54.27
227	PC-4	1.619E+05	5000	-0.549		55.242
228	PC-4	2.048E+05	100	-0.387		52.812
229	PC-4	2.048E+05	1000	-0.482		54.594
230	PC-4	2.048E+05	5000	-0.549		55.566
231	PC-4	2.396E+05	100	-0.387		52.974
232	PC-4	2.396E+05	1000	-0.482		54.594
233	PC-4	2.396E+05	5000	-0.549		55.566

4.D Vary Saltstone Cracking Strain

Index	Event	Cracking Strain in/in	Time years	Settlement feet	Bottom	Top
					Crack Area in ²	Crack Area in ²
234	PC-3	7.540E-05	100	-0.387	14.4	
235	PC-3	7.540E-05	1000	-0.482	13.2	
236	PC-3	7.540E-05	5000	-0.549	17.28	
237	PC-3	1.206E-04	1000	-0.482	24	
238	PC-4	7.540E-05	100	-0.387	105.3	
239	PC-4	7.540E-05	1000	-0.482	110.16	
240	PC-4	7.540E-05	5000	-0.549	115.02	
241	PC-4	1.206E-04	100	-0.387	105.3	
242	PC-4	1.206E-04	1000	-0.482	110.16	
243	PC-4	1.206E-04	5000	-0.549	115.02	
244	PC-4	1.411E-04	100	-0.387	104.652	
245	PC-4	1.411E-04	1000	-0.482	110.808	
246	PC-4	1.411E-04	5000	-0.549	115.182	
247	PC-4	7.540E-05	100	-0.387		53.46
248	PC-4	7.540E-05	1000	-0.482		55.08
249	PC-4	7.540E-05	5000	-0.549		56.7
250	PC-4	1.206E-04	100	-0.387		53.46
251	PC-4	1.206E-04	1000	-0.482		55.08
252	PC-4	1.206E-04	5000	-0.549		55.08
253	PC-4	1.411E-04	100	-0.387		52.812
254	PC-4	1.411E-04	1000	-0.482		54.594
255	PC-4	1.411E-04	5000	-0.549		55.728

4.E. Vary Soil Bulk Modulus

Index	Event	Soil Bulk Modulus ksf	Time years	Settlement feet	Bottom Crack Area In^2	Top Crack Area in^2
256	PC3	20	1000	-0.482	29.64	
257	PC3	20	5000	-0.549	32.76	
258	PC3	30	1000	-0.482	24	
259	PC3	30	5000	-0.549	42.12	
260	PC3	40	100	-0.387	13.2	
261	PC3	40	1000	-0.482	35.88	
262	PC3	40	5000	-0.549	53.04	
263	PC4	20	100	-0.387	90.72	
264	PC4	20	1000	-0.482	97.2	
265	PC4	20	5000	-0.549	101.25	
266	PC4	30	100	-0.387	105.3	
267	PC4	30	1000	-0.482	110.16	
268	PC4	30	5000	-0.549	115.02	
269	PC4	40	100	-0.387	113.4	
270	PC4	40	1000	-0.482	119.88	
271	PC4	40	5000	-0.549	123.12	
272	PC4	20	100	-0.387		38.88
273	PC4	20	1000	-0.482		42.12
274	PC4	20	5000	-0.549		42.768
275	PC4	30	100	-0.387		53.46
276	PC4	30	1000	-0.482		55.08
277	PC4	30	5000	-0.549		55.08
278	PC4	40	100	-0.387		59.94
279	PC4	40	1000	-0.482		61.56
280	PC4	40	5000	-0.549		61.56

5. Differential Displacement at Location 4

5.A. Differential Displacement Magnitude

Index	Magnitude, In	Time years	Settlement feet	Bottom Crack Area In^2	Top Crack Area In^2
281	0.75	100	-0.387	42.12	
282	2	100	-0.387	102.222	
283	2.75	100	-0.387	147.42	
284	0.75	1000	-0.482	49.92	
285	2	1000	-0.482	111.78	
286	2.75	1000	-0.482	155.52	
287	0.75	5000	-0.549	56.16	
288	2	5000	-0.549	118.584	
289	2.75	5000	-0.549	162	
290	2	100	-0.387		29.16
291	2.75	100	-0.387		58.32
292	2	1000	-0.482		31.428
293	2.75	1000	-0.482		59.94
294	2	5000	-0.549		32.724
295	2.75	5000	-0.549		63.18

5.B. Vary Settlement Extent

Index	Event	Extent, ft.	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
296	PC-3	62	100	-0.387	42.12	
297	PC-3	62	1000	-0.482	49.92	
298	PC-3	62	5000	-0.549	56.16	
299	PC-3	124	100	-0.387	54.6	
300	PC-3	124	1000	-0.482	60.36	
301	PC-3	124	5000	-0.549	65.52	
302	PC-4	62	100	-0.387	147.42	
303	PC-4	62	1000	-0.482	155.52	
304	PC-4	62	5000	-0.549	162	
305	PC-4	124	100	-0.387	205.74	
306	PC-4	124	1000	-0.482	212.22	
307	PC-4	124	5000	-0.549	218.7	
308	PC-4	62	100	-0.387		58.32
309	PC-4	62	1000	-0.482		59.94
310	PC-4	62	5000	-0.549		63.18
311	PC-4	124	100	-0.387		95.58
312	PC-4	124	1000	-0.482		93.96
313	PC-4	124	5000	-0.549		97.2

5.C. Vary Saltstone Modulus

Index	Event	Saltstone Modulus ksf	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
314	PC-3	1.619E+05	100	-0.387	37.5	
315	PC-3	1.619E+05	1000	-0.482	43.68	
316	PC-3	1.619E+05	5000	-0.549	53.04	
317	PC-3	2.048E+05	100	-0.387	42.12	
318	PC-3	2.048E+05	1000	-0.482	49.92	
319	PC-3	2.048E+05	5000	-0.549	56.16	
320	PC-3	2.396E+05	100	-0.387	39	
321	PC-3	2.396E+05	1000	-0.482	49.92	
322	PC-3	2.396E+05	5000	-0.549	59.28	
323	PC-4	1.619E+05	100	-0.387	150.66	
324	PC-4	1.619E+05	1000	-0.482	157.14	
325	PC-4	1.619E+05	5000	-0.549	163.62	
326	PC-4	2.048E+05	100	-0.387	147.42	
327	PC-4	2.048E+05	1000	-0.482	155.52	
328	PC-4	2.048E+05	5000	-0.549	162	
329	PC-4	2.396E+05	100	-0.387	144.18	
330	PC-4	2.396E+05	1000	-0.482	153.9	
331	PC-4	2.396E+05	5000	-0.549	160.38	
332	PC-4	1.619E+05	100	-0.387		61.236
333	PC-4	1.619E+05	1000	-0.482		62.694
334	PC-4	1.619E+05	5000	-0.549		64.314
335	PC-4	2.048E+05	100	-0.387		58.32
336	PC-4	2.048E+05	1000	-0.482		59.94
337	PC-4	2.048E+05	5000	-0.549		63.18
338	PC-4	2.396E+05	100	-0.387		56.7
339	PC-4	2.396E+05	1000	-0.482		58.32
340	PC-4	2.396E+05	5000	-0.549		59.94

5.D Vary Saltstone Cracking Strain

Index	Event	Cracking Strain In/In	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area In ²
341	PC-3	7.540E-05	100	-0.387	40.56	
342	PC-3	7.540E-05	1000	-0.482	49.92	
343	PC-3	7.540E-05	5000	-0.549	53.04	
344	PC-3	1.206E-04	100	-0.387	38.532	
345	PC-3	1.206E-04	1000	-0.482	49.92	
346	PC-3	1.206E-04	5000	-0.549	56.16	
347	PC-3	1.411E-04	100	-0.387	42.12	
348	PC-3	1.411E-04	1000	-0.482	49.92	
349	PC-3	1.411E-04	5000	-0.549	56.16	
350	PC-4	7.540E-05	100	-0.387	147.42	
351	PC-4	7.540E-05	1000	-0.482	155.52	
352	PC-4	7.540E-05	5000	-0.549	162	
353	PC-4	1.206E-04	100	-0.387	147.42	
354	PC-4	1.206E-04	1000	-0.482	155.52	
355	PC-4	1.206E-04	5000	-0.549	162	
356	PC-4	1.411E-04	100	-0.387	147.096	
357	PC-4	1.411E-04	1000	-0.482	155.358	
358	PC-4	1.411E-04	5000	-0.549	162	
359	PC-4	7.540E-05	100	-0.387		58.32
360	PC-4	7.540E-05	1000	-0.482		59.94
361	PC-4	7.540E-05	5000	-0.549		61.236
362	PC-4	1.206E-04	100	-0.387		58.32
363	PC-4	1.206E-04	1000	-0.482		60.588
364	PC-4	1.206E-04	5000	-0.549		61.884
365	PC-4	1.411E-04	100	-0.387		58.806
366	PC-4	1.411E-04	1000	-0.482		60.426
367	PC-4	1.411E-04	5000	-0.549		62.046

5.E. Vary Soil Bulk Modulus

Index	Event	Soil Bulk Modulus ksf	Time years	Settlement feet	Bottom Crack Area In ²	Top Crack Area In ²
368	PC3	20	100	-0.387	33	
369	PC3	20	1000	-0.482	45.24	
370	PC3	20	5000	-0.549	54.6	
371	PC3	30	100	-0.387	42.12	
372	PC3	30	1000	-0.482	46.8	
373	PC3	30	5000	-0.549	56.16	
374	PC3	40	100	-0.387	42.12	
375	PC3	40	1000	-0.482	40.56	
376	PC3	40	5000	-0.549	59.94	
377	PC4	20	100	-0.387	115.02	
378	PC4	20	1000	-0.482	124.74	
379	PC4	20	5000	-0.549	131.22	
380	PC4	30	100	-0.387	147.42	
381	PC4	30	1000	-0.482	155.52	
382	PC4	30	5000	-0.549	162	
383	PC4	40	100	-0.387	186.3	
384	PC4	40	1000	-0.482	186.3	
385	PC4	40	5000	-0.549	187.92	
386	PC4	20	100	-0.387		21.06
387	PC4	20	1000	-0.482		22.68
388	PC4	20	5000	-0.549		22.68
389	PC4	30	100	-0.387		58.32
390	PC4	30	1000	-0.482		59.94
391	PC4	30	5000	-0.549		63.18
392	PC4	40	100	-0.387		113.4
393	PC4	40	1000	-0.482		100.44
394	PC4	40	5000	-0.549		82.62

6. Differential Displacement at Location 5

6.A. Differential Displacement Magnitude

Index	Magnitude, in	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
395	0.75	100	-0.387	60.84	
396	2.75	100	-0.387	157.14	
397	0.75	1000	-0.482	71.76	
398	1.5	1000	-0.482	105.462	
399	2	1000	-0.482	129.438	
400	2.75	1000	-0.482	168.48	
401	0.75	5000	-0.549	81.12	
402	2.75	5000	-0.549	176.58	
403	2.75	100	-0.387		21.06
404	1.5	1000	-0.482		0
405	2	1000	-0.482		8.085
406	2.75	1000	-0.482		19.44
407	2.75	5000	-0.549		17.82

6.B. Vary Settlement Extent

Index	Event	Extent, ft.	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
408	PC-3	62	100	-0.387	60.84	
409	PC-3	62	1000	-0.482	71.76	
410	PC-3	62	5000	-0.549	81.12	
411	PC-3	124	100	-0.387	76.284	
412	PC-3	124	1000	-0.482	87.36	
413	PC-3	124	5000	-0.549	96.72	
414	PC-4	62	100	-0.387	157.14	
415	PC-4	62	1000	-0.482	168.48	
416	PC-4	62	5000	-0.549	176.58	
417	PC-4	124	100	-0.387	234.9	
418	PC-4	124	1000	-0.482	239.76	
419	PC-4	124	5000	-0.549	254.34	
420	PC-4	62	100	-0.387		21.06
421	PC-4	62	1000	-0.482		19.44
422	PC-4	62	5000	-0.549		17.82
423	PC-4	124	100	-0.387		64.8
424	PC-4	124	1000	-0.482		64.8
425	PC-4	124	5000	-0.549		59.94

6.C. Vary Saltstone Modulus

Index	Event	Saltstone Modulus ksf	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
426	PC-3	1.619E+05	100	-0.387	61.56	
427	PC-3	1.619E+05	1000	-0.482	72.9	
428	PC-3	1.619E+05	5000	-0.549	82.62	
429	PC-3	2.048E+05	100	-0.387	60.84	
430	PC-3	2.048E+05	1000	-0.482	74.52	
431	PC-3	2.048E+05	5000	-0.549	84.24	
432	PC-3	2.396E+05	100	-0.387	60.84	
433	PC-3	2.396E+05	1000	-0.482	74.52	
434	PC-3	2.396E+05	5000	-0.549	84.24	
435	PC-4	1.619E+05	100	-0.387	157.14	
436	PC-4	1.619E+05	1000	-0.482	168.48	
437	PC-4	1.619E+05	5000	-0.549	176.58	
438	PC-4	2.048E+05	100	-0.387	157.14	
439	PC-4	2.048E+05	1000	-0.482	168.48	
440	PC-4	2.048E+05	5000	-0.549	176.58	
441	PC-4	2.396E+05	100	-0.387	155.52	
442	PC-4	2.396E+05	1000	-0.482	173.34	
443	PC-4	2.396E+05	5000	-0.549	174.96	
444	PC-4	1.619E+05	100	-0.387		27.378
445	PC-4	1.619E+05	1000	-0.482		25.272
446	PC-4	1.619E+05	5000	-0.549		23.328
447	PC-4	2.048E+05	100	-0.387		27.216
448	PC-4	2.048E+05	1000	-0.482		25.11
449	PC-4	2.048E+05	5000	-0.549		23.49
450	PC-4	2.396E+05	100	-0.387		26.892
451	PC-4	2.396E+05	1000	-0.482		24.624
452	PC-4	2.396E+05	5000	-0.549		23.166

6.D Vary Saltstone Cracking Strain

Index	Event	Cracking Strain in/in	Time years	Settlement feet	Bottom Crack Area in ²	Top Crack Area in ²
453	PC-3	7.540E-05	1000	-0.482	53.04	
454	PC-3	7.540E-05	5000	-0.549	60.84	
455	PC-3	1.206E-04	100	-0.387	60.84	
456	PC-3	1.206E-04	1000	-0.482	71.76	
457	PC-3	1.206E-04	5000	-0.549	82.62	
458	PC-3	1.411E-04	100	-0.387	60.84	
459	PC-3	1.411E-04	1000	-0.482	71.76	
460	PC-3	1.411E-04	5000	-0.549	84.24	
461	PC-4	7.540E-05	100	-0.387	157.14	
462	PC-4	7.540E-05	1000	-0.482	166.86	
463	PC-4	7.540E-05	5000	-0.549	176.58	
464	PC-4	1.206E-04	100	-0.387	157.14	
465	PC-4	1.206E-04	1000	-0.482	168.48	
466	PC-4	1.206E-04	5000	-0.549	176.58	
467	PC-4	1.411E-04	100	-0.387	156.816	
468	PC-4	1.411E-04	1000	-0.482	167.67	
469	PC-4	1.411E-04	5000	-0.549	176.256	
470	PC-4	7.540E-05	100	-0.387		27.054
471	PC-4	7.540E-05	1000	-0.482		24.948
472	PC-4	7.540E-05	5000	-0.549		23.328
473	PC-4	1.206E-04	100	-0.387		27.216
474	PC-4	1.206E-04	1000	-0.482		25.11
475	PC-4	1.206E-04	5000	-0.549		23.49
476	PC-4	1.411E-04	100	-0.387		27.216
477	PC-4	1.411E-04	1000	-0.482		25.11
478	PC-4	1.411E-04	5000	-0.549		23.49

6.E. Vary Soil Bulk Modulus

Index	Event	Soil Bulk Modulus ksf	Time years	Settlement feet	Bottom	Top
					Crack Area In^2	Crack Area In^2
479	PC3	20	1000	-0.482	60.84	
480	PC3	20	5000	-0.549	57.72	
481	PC3	30	100	-0.387	56.16	
482	PC3	30	1000	-0.482	67.08	
483	PC3	30	5000	-0.549	74.88	
484	PC3	40	100	-0.387	65.52	
485	PC3	40	1000	-0.482	76.44	
486	PC3	40	5000	-0.549	84.24	
487	PC4	20	100	-0.387	132.6	
488	PC4	20	1000	-0.482	149.04	
489	PC4	20	5000	-0.549	157.14	
490	PC4	30	100	-0.387	157.14	
491	PC4	30	1000	-0.482	168.48	
492	PC4	30	5000	-0.549	176.58	
493	PC4	40	100	-0.387	166.86	
494	PC4	40	1000	-0.482	178.2	
495	PC4	40	5000	-0.549	186.3	
496	PC4	20	100	-0.387		10.5
497	PC4	20	1000	-0.482		10.5
498	PC4	20	5000	-0.549		7.5
499	PC4	30	100	-0.387		21.06
500	PC4	30	1000	-0.482		19.44
501	PC4	30	5000	-0.549		17.82
502	PC4	40	100	-0.387		27.54
503	PC4	40	1000	-0.482		25.92
504	PC4	40	5000	-0.549		25.92

7. Differential Displacement at Location 6

7.A. Differential Displacement Magnitude

Index	Magnitude, in	Time years	Settlement feet	Bottom	Top
				Crack Area In^2	Crack Area In^2
505	1.5	1000	-0.482	0	
506	1.75	1000	-0.482	102.06	
507	2	1000	-0.482	110.97	
508	2.5	1000	-0.482	152.28	
509	2.75	1000	-0.482	176.58	
510	2.75	100	-0.387		50.22
511	2.5	1000	-0.482		26.73
512	2.75	1000	-0.482		43.74
513	2.75	5000	-0.549		37.26

7.B. Vary Settlement Extent

Index	Event	Extent, ft.	Time years	Settlement feet	Bottom	Top
					Crack Area In^2	Crack Area In^2
514	PC-3	62	5000	-0.549	48.36	
515	PC-3	124	5000	-0.549	46.8	
516	PC-4	62	100	-0.387	168.48	
517	PC-4	62	1000	-0.482	176.58	
518	PC-4	62	5000	-0.549	183.06	
519	PC-4	124	100	-0.387	205.74	
520	PC-4	124	1000	-0.482	215.46	
521	PC-4	124	5000	-0.549	221.94	
522	PC-4	62	100	-0.387		50.22
523	PC-4	62	1000	-0.482		43.74
524	PC-4	62	5000	-0.549		37.26
525	PC-4	124	100	-0.387		79.38
526	PC-4	124	1000	-0.482		74.52
527	PC-4	124	5000	-0.549		69.66

7.C. Vary Saltstone Modulus

Index	Event	Saltstone Modulus ksf	Time years	Settlement feet	Bottom Crack Area in^2	Top Crack Area in^2
528	PC-3	1.619E+05	1000	-0.482	36.192	
529	PC-3	1.619E+05	5000	-0.549	46.176	
530	PC-3	2.048E+05	5000	-0.549	48.36	
531	PC-3	2.396E+05	100	-0.387	3.51	
532	PC-3	2.396E+05	1000	-0.482	40.56	
533	PC-3	2.396E+05	5000	-0.549	49.92	
534	PC-4	1.619E+05	100	-0.387	174.96	
535	PC-4	1.619E+05	1000	-0.482	183.06	
536	PC-4	1.619E+05	5000	-0.549	189.54	
537	PC-4	2.048E+05	100	-0.387	168.48	
538	PC-4	2.048E+05	1000	-0.482	176.58	
539	PC-4	2.048E+05	5000	-0.549	183.06	
540	PC-4	2.396E+05	100	-0.387	162	
541	PC-4	2.396E+05	1000	-0.482	32.76	
542	PC-4	2.396E+05	5000	-0.549	42.12	
543	PC-4	1.619E+05	100	-0.387		53.946
544	PC-4	1.619E+05	1000	-0.482		48.438
545	PC-4	1.619E+05	5000	-0.549		41.634
546	PC-4	2.048E+05	100	-0.387		49.896
547	PC-4	2.048E+05	1000	-0.482		42.768
548	PC-4	2.048E+05	5000	-0.549		37.098
549	PC-4	2.396E+05	100	-0.387		46.656

7.D Vary Saltstone Cracking Strain

Index	Event	Cracking Strain in/in	Time years	Settlement feet	Bottom Crack Area in^2	Top Crack Area in^2
550	PC-3	7.540E-05	100	-0.387	17.28	
551	PC-3	7.540E-05	1000	-0.482	27	
552	PC-3	7.540E-05	5000	-0.549	33	
553	PC-3	1.206E-04	5000	-0.549	48.36	
554	PC-4	7.540E-05	100	-0.387	168.48	
555	PC-4	7.540E-05	1000	-0.482	176.58	
556	PC-4	7.540E-05	5000	-0.549	183.06	
557	PC-4	1.206E-04	100	-0.387	168.48	
558	PC-4	1.206E-04	1000	-0.482	176.58	
559	PC-4	1.206E-04	5000	-0.549	183.06	
560	PC-4	1.411E-04	100	-0.387	168.156	
561	PC-4	1.411E-04	1000	-0.482	176.256	
562	PC-4	1.411E-04	5000	-0.549	175.968	
563	PC-4	7.540E-05	100	-0.387		49.67892
564	PC-4	7.540E-05	1000	-0.482		42.93
565	PC-4	7.540E-05	5000	-0.549		37.26
566	PC-4	1.206E-04	100	-0.387		49.896
567	PC-4	1.206E-04	1000	-0.482		42.768
568	PC-4	1.206E-04	5000	-0.549		37.098
569	PC-4	1.411E-04	100	-0.387		49.896
570	PC-4	1.411E-04	1000	-0.482		42.606
571	PC-4	1.411E-04	5000	-0.549		37.26

7.E. Vary Soil Bulk Modulus

Index	Event	Soil Bulk Modulus ksf	Time years	Settlement feet	Bottom	Top
					Crack Area ln^2	Crack Area ln^2
572	PC3	30	5000	-0.549	48.36	
573	PC3	40	1000	-0.482	30	
574	PC3	40	5000	-0.549	51.48	
575	PC4	20	5000	-0.549	119.88	
576	PC4	30	100	-0.387	168.48	
577	PC4	30	1000	-0.482	176.58	
578	PC4	30	5000	-0.549	183.06	
579	PC4	40	100	-0.387	217.08	
580	PC4	40	1000	-0.482	225.18	
581	PC4	40	5000	-0.549	231.66	
582	PC4	30	100	-0.387		50.22
583	PC4	40	100	-0.387		82.62
584	PC4	30	1000	-0.482		43.74
585	PC4	40	1000	-0.482		76.14
586	PC4	30	5000	-0.549		37.26
587	PC4	40	5000	-0.549		69.66

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 165	Rev. 0
----------------------------------	------------------	-----------

8.3 ~~Monte Carlo Analysis~~ ^{Statistical Model}

To construct a model for Monte Carlo analysis, it is necessary to determine relationships between the variable parameters and resulting cracking of the vault. The base parameters used in the analysis are the following:

1. Static settlement rate
2. Grout modulus
3. Grout cracking strain
4. Soil bulk modulus

The structural analysis varied one parameter at a time while holding the others at their mean values. The variation of crack areas with the change in parameters was calculated using linear regression on the data from the finite element model runs.

These parameters remain fixed for each iteration as the model is stepped through time. During the time sequence, the occurrence of an earthquake is determined by a random number generator. The earthquake causes differential settlement that itself has variable parameters. These are as follows:

1. Location of settlement (one of seven locations, equal probability)
2. Magnitude (depends on Earthquake magnitude)
3. Extent (normal distribution)

The Monte Carlo analysis is run in the @RISK program, an EXCEL based overlay. @RISK is used for the base parameters and to control iterations, while an EXCEL macro is used to set the earthquake parameters and step through time.

There are two spreadsheets used for this analysis. The spreadsheet "Parameter Results.xls" is used to evaluate the data and set up relationships for the crack area to each parameter, and "Crack Workbook.xls" is used to run the Monte Carlo analysis.

The probability distributions and comparison of the model to the structural analysis data are shown in the following sections. The effects of varying the parameters over wide ranges are also shown. The following table provides an index to the model verification.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 166	Rev. 0
----------------------------------	------------------	-----------

Section	Description	Sheet
8.3.1	Static Settlement Rate	167
8.3.2	Saltstone Modulus Distribution	170
8.3.3	Saltstone Cracking Strain Distribution	172
8.3.4	Soil Bulk Modulus Distribution	174
8.3.5	Differential Settlement Magnitude Probability	176
8.3.6	Extent of Differential Settlement Distribution	177
8.3.7	Static Cracking	178
8.3.8	Differential Settlement – Location 1	182
8.3.9	Differential Settlement – Location 2	189
8.3.10	Differential Settlement – Location 3	199
8.3.11	Differential Settlement – Location 4	209
8.3.12	Differential Settlement – Location 5	220
8.3.13	Differential Settlement – Location 6	231
8.3.14	Data Check	242
8.3.15	Sensitivity Study	256
8.3.16	Results	258

Probability Distributions for Statistical Analysis Parameters

8.3.1. Static Settlement Rate

1A. Check Data Fit

	Time, years						
Settlement	1	5	24	100	1000	5000	10000
Low	-0.12077	-0.24512	-0.26762	-0.3008	-0.34893	-0.38633	-0.40428
Mean	-0.13446	-0.28599	-0.32778	-0.3893	-0.47839	-0.54745	-0.58069
High	-0.15589	-0.33059	-0.37795	-0.44766	-0.54862	-0.62687	-0.66452

Time := (1 5 24 100 1000 5000 10000)

(Settlement in feet)

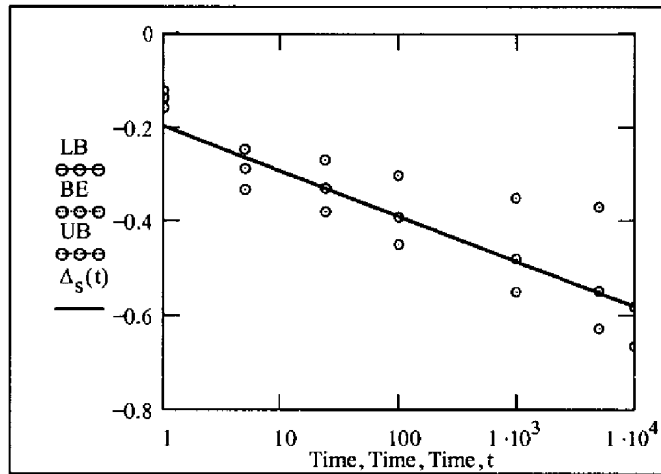
LB := (-.12077 -.24512 -.26762 -.3008 -.34893 -.36833 -.40428)

BE := (-.13446 -.28599 -.32778 -.3893 -.47839 -.54745 -.58069)

UB := (-.15589 -.33059 -.37795 -.44766 -.54862 -.62687 -.66452)

Mean Settlement is a function of log (time)

$$\Delta_s(t) := -.09598 \cdot \log(t) - .196374$$



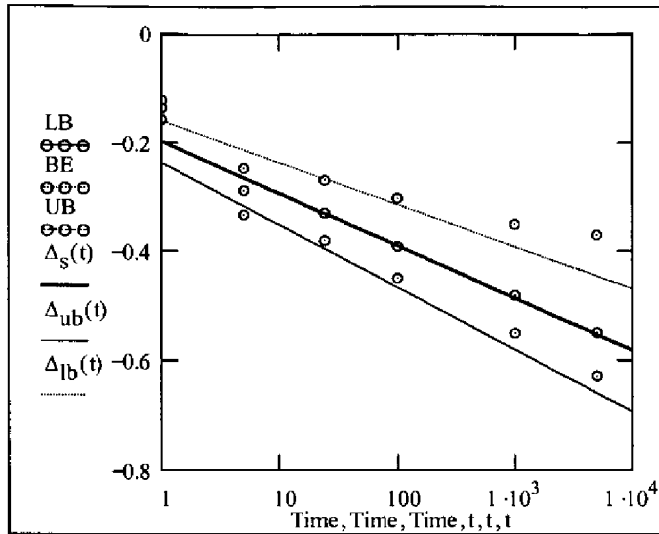
For a random variable X with a standard normal distribution $\mu=1.0607$ and $\sigma=0.53$ truncated at 0.

Relationship of the range of data for each time is as follows:

$$\mu := 1.0607 \quad \sigma := 0.53$$

$$\text{ratio}(X) := \frac{0.368X + 0.609}{0.368 \cdot \mu + 0.609}$$

$$\Delta_{ub}(t) := [\text{ratio}(\mu + \sigma) \cdot (-.09598 \cdot \log(t) - .196374)] \quad \Delta_{lb}(t) := [\text{ratio}(\mu - \sigma) \cdot (-.09598 \cdot \log(t) - .196374)]$$



Data fit is acceptable and slightly conservative due to curve fit.

1B. Check validity of probability distribution.

The ratio is limited to 0.1 since settlement can't be positive and always has at least a small negative value. The effect of this is to truncate the distribution.

$$X_0 := \frac{0.1 - 0.609}{0.368} \qquad X_0 = -1.383$$

Calculate the area under the probability function.

$$f_d(x) := \frac{1}{\sigma \cdot \sqrt{2 \cdot \pi}} \cdot e^{-\frac{1}{2} \cdot \left(\frac{x-\mu}{\sigma}\right)^2}$$

$$Y := \int_{X_0}^{\infty} f_d(x) dx \qquad Y = 1$$

Truncated distribution is valid.

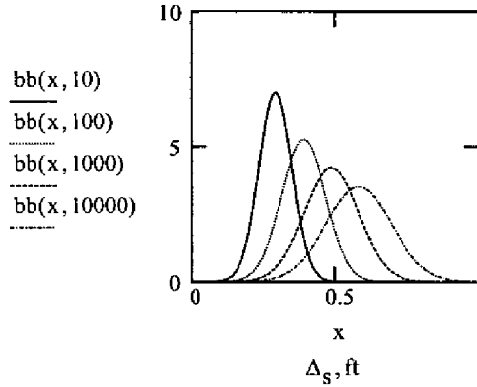
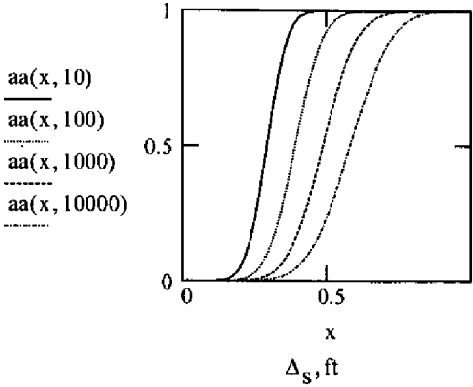
1c. Check the results for the range of probabilities

$$\Delta_s(t, X) := \max(\text{ratio}(X), 0.1) \cdot (-.09598 \cdot \log(t) - .196374)$$

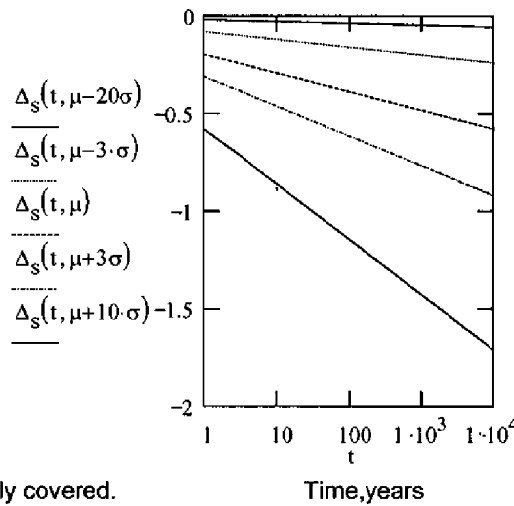
$$r := \text{ratio}(\mu + \sigma) - \text{ratio}(\mu) \qquad r = 0.195$$

$$\mu_s(t) := -.09598 \cdot \log(t) - .196374$$

$$aa(x, t) := \text{pnorm}(x, -\mu_s(t), -r\mu_s(t)) \qquad bb(x, t) := \text{dnorm}(x, -\mu_s(t), -r\mu_s(t))$$



Note: settlement is expressed as positive for the Mathcad probability functions.



Range of probabilities is adequately covered.

8.3.2. Grout Modulus

2A Check Grout Modulus Distribution

Random Variable, X

Saltstone compressive strength is used as the basis for varying the modulus and cracking strain. ACI-318 bases the Young's modulus for concrete on the square root of the compressive strength.

$$\mu_{cs} := 524.4 \quad E_{gmed} := 2.048 \cdot 10^5$$

$$\sigma_{cs} := 196.8$$

$$C_V := \frac{\sigma_{cs}}{\mu_{cs}} \quad C_V = 0.375 \quad r := 1.0187 \text{ Truncation adjustment}$$

$$\text{ratio}(X) := \left(1.0187 \cdot \sqrt{\frac{\mu_{cs} + \sigma_{cs}(X)}{\mu_{cs}}} \right) \quad E_{gm}(X) := E_{gmed} \cdot \text{ratio}(X)$$

$$X := \begin{pmatrix} -2.157 \\ -2 \\ -1.5 \\ -1 \\ -0.5 \\ 0 \\ .5 \\ 1 \\ 2 \\ 3 \\ 4 \end{pmatrix}$$

Distribution is truncated at compressive strength = 100 psi minimum.

$$X_0 := \frac{100 - \mu_{cs}}{\sigma_{cs}} \quad X_0 = -2.157$$

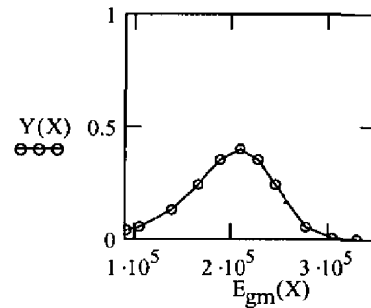
Mean Value $\mu_E := E_{gm}(0) \quad \mu_E = 2.086 \times 10^5$

$\sigma_{pl} := E_{gm}(1) \quad \sigma_{pl} = 2.447 \times 10^5$

$\sigma_{nl} := E_{gm}(-1) \quad \sigma_{nl} = 1.649 \times 10^5$

$Y(X) := \text{dnorm}(X, 0, 1)$

$E_{gm}(X) =$	9.106·10 ⁴	0.039
	1.042·10 ⁵	0.054
	1.379·10 ⁵	0.13
	1.649·10 ⁵	0.242
	1.88·10 ⁵	0.352
	2.086·10 ⁵	0.399
	2.274·10 ⁵	0.352
	2.447·10 ⁵	0.242
	2.76·10 ⁵	0.054
	3.042·10 ⁵	4.432·10 ⁻³
	3.299·10 ⁵	1.338·10 ⁻⁴



ksf

2B. Check Probability Sum

$\mu := 0$

$\sigma := 1$

$$f_d(x) := \frac{1}{\sigma \cdot \sqrt{2 \cdot \pi}} \cdot e^{-\frac{1}{2} \cdot \left(\frac{x - \mu}{\sigma} \right)^2}$$

$$Y := \int_{X_0}^{\infty} f_d(x) dx$$

$Y = 0.984$

$Y \cdot r = 1.003$

Close to 1 O.K.

Distribution Appears OK

2C. Range of Parameter Test

X := $\begin{pmatrix} -5 \\ -4 \\ -3 \\ -2 \\ -1 \\ 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{pmatrix}$

$E_{gm}(X) =$

1.953i·10 ⁵
1.477i·10 ⁵
7.401i·10 ⁴
1.042·10 ⁵
1.649·10 ⁵
2.086·10 ⁵
2.447·10 ⁵
2.76·10 ⁵
3.042·10 ⁵
3.299·10 ⁵
3.538·10 ⁵

-3 to -5 not used.

8.3.3. Grout Cracking Strain

3A Check Grout Cracking Strain Distribution

Random Variable, X (assumed to be independent of modulus; correlation added later.)

Saltstone Compressive Strength

$\mu_{cs} := 524.4$ $\sigma_{cs} := 196.8$

$\epsilon_{med} := 1.206 \cdot 10^{-4}$

X :=

$$\text{ratio}(X) := \left(1.0187 \cdot \sqrt{\frac{\mu_{cs} + \sigma_{cs} \cdot (X)}{\mu_{cs}}} \right)$$

$\epsilon_{gm}(X) := \epsilon_{med} \cdot \text{ratio}(X)$

- 2.157
- 2
- 1.5
- 1
- 0.5
- 0
- .5
- 1
- 2
- 3
- 4

Distribution is truncated at compressive strength = 100 psi minimum.

$X_0 := \frac{100 - \mu_{cs}}{\sigma_{cs}}$

$X_0 = -2.157$

Mean Value

$\mu_E := \epsilon_{gm}(0)$

$\mu_E = 1.229 \times 10^{-4}$

$\sigma_{pl} := \epsilon_{gm}(1)$

$\sigma_{pl} = 1.441 \times 10^{-4}$

$\sigma_{nl} := \epsilon_{gm}(-1)$

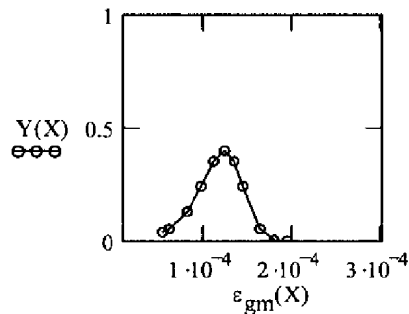
$\sigma_{nl} = 9.71 \times 10^{-5}$

$Y(X) := \text{dnorm}(X, 0, 1)$

$5.362 \cdot 10^{-5}$
$5.136 \cdot 10^{-5}$
$3.122 \cdot 10^{-5}$
$9.71 \cdot 10^{-5}$
$1.107 \cdot 10^{-4}$
$1.229 \cdot 10^{-4}$
$1.339 \cdot 10^{-4}$
$1.441 \cdot 10^{-4}$
$1.625 \cdot 10^{-4}$
$1.791 \cdot 10^{-4}$
$1.943 \cdot 10^{-4}$

Y(X) =

0.039
0.054
0.13
0.242
0.352
0.399
0.352
0.242
0.054
$4.432 \cdot 10^{-3}$
$1.338 \cdot 10^{-4}$



3B. Check Probability Sum

$\mu := 0$

$\sigma := 1$

$$f_d(x) := \frac{1}{\sigma \cdot \sqrt{2 \cdot \pi}} \cdot e^{-\frac{1}{2} \cdot \left(\frac{x - \mu}{\sigma} \right)^2}$$

$Y := \int_{X_0}^{\infty} f_d(x) dx$

Y = 0.984

Y-r = 1.003

Distribution Appears OK

Close to 1 O.K.

3C. Range of Parameter Test

$$X := \begin{pmatrix} -5 \\ -4 \\ -3 \\ -2 \\ -1 \\ 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{pmatrix}$$

$$\varepsilon_{gm}(X) = \begin{array}{|c|} \hline 1.151 \cdot 10^{-4} \\ \hline 8.6971 \cdot 10^{-5} \\ \hline 4.3581 \cdot 10^{-5} \\ \hline 6.136 \cdot 10^{-5} \\ \hline 9.71 \cdot 10^{-5} \\ \hline 1.229 \cdot 10^{-4} \\ \hline 1.441 \cdot 10^{-4} \\ \hline 1.625 \cdot 10^{-4} \\ \hline 1.791 \cdot 10^{-4} \\ \hline 1.943 \cdot 10^{-4} \\ \hline 2.084 \cdot 10^{-4} \\ \hline \end{array}$$

3D. Correlation of Cracking Strain and Modulus

It is very unlikely that the saltstone would have a high Young's modulus and low tensile strength since they are both related to the compressive strength for concrete per ACI 318.

The EXCEL spreadsheet allows correlation of variables where -1.0 represents a 100% negative correlation, and 1.0 corresponds to a 100% positive correlation. In this instance, it is judged that there is a better than 50% but less than 100% correlation, so 0.75 is used to correlate modulus and tensile cracking strain.

8.3.4. Soil Bulk Modulus

4A Check Soil Bulk Modulus Strain Distribution

Random Variable, X

$\mu_s := 30$ $\sigma_s := 15$ $r := 1.0504$ $k := r \cdot 30$

$$\text{ratio}(X) := \frac{\mu_s + \sigma_s \cdot (X)}{\mu_s}$$

$$K_s(X) := k \cdot \text{ratio}(X)$$

X :=
 -1.6667
 -1.5
 -1
 -0.75
 -0.5
 0
 .5
 1
 2
 3
 4

Distribution is truncated at soil bulk modulus = 5kcf minimum.

Note that the FE model is done with k = 20, 30, and 40 kcf. A COV of 0.5 is used in the statistical analysis, while the 20, 30, 40 values are used in the FE analysis to establish the relationships with crack area.

$X_0 := \frac{5 - \mu_s}{\sigma_s}$ $X_0 = -1.667$

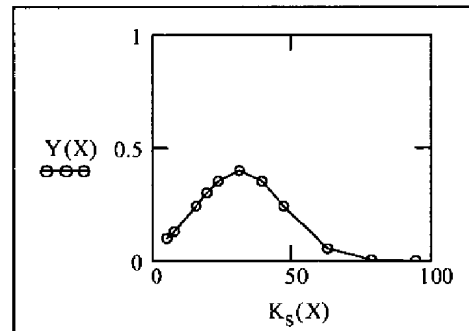
Mean Value $\mu_E := K_s(0)$ $\mu_E = 31.512$

$\sigma_{pl} := K_s(1)$ $\sigma_{pl} = 47.268$

$\sigma_{nl} := K_s(-1)$ $\sigma_{nl} = 15.756$

$Y(X) := \text{dnorm}(X, 0, 1)$

$K_s(X) =$	5.251	$Y(X) =$	0.099
	7.878		0.13
	15.756		0.242
	19.695		0.301
	23.634		0.352
	31.512		0.399
	39.39		0.352
	47.268		0.242
	63.024		0.054
	78.78		$4.432 \cdot 10^{-3}$
	94.536		$1.338 \cdot 10^{-4}$



Distribution Appears OK

4B. Check Probability Sum

$$\mu := 0$$

$$\sigma := 1$$

$$f_d(x) := \frac{1}{\sigma \cdot \sqrt{2 \cdot \pi}} \cdot e^{-\frac{1}{2} \cdot \left(\frac{x-\mu}{\sigma}\right)^2}$$

$$Y := \left(\int_{X_0}^{\infty} f_d(x) dx \right) \cdot r \quad Y = 1$$

$$\frac{1}{Y} = 1$$

4C. Range for Data Check (Truncate at 5kcf).

$$X := \begin{pmatrix} -5 \\ -4 \\ -3 \\ -2 \\ -1 \\ 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{pmatrix}$$

$$K_S(X) = \begin{array}{|c|} \hline -47.268 \\ \hline -31.512 \\ \hline -15.756 \\ \hline 0 \\ \hline 15.756 \\ \hline 31.512 \\ \hline 47.268 \\ \hline 63.024 \\ \hline 78.78 \\ \hline 94.536 \\ \hline 110.292 \\ \hline \end{array}$$

8.3.5. Magnitude of Differential Settlement

PC-3 is 0.75 inches with annual probability of 1/2500 or 4E-3; PC-4 is 2.75 inches with annual probability of 1E-4. 10 year probabilities are 3.993E-3 and 1E-3, respectively.

Probability Calculation (DOE-1020, Appendix A)

$$EP(n,p) := 1 - (1 - p)^n$$

n is time period, years EP is exceedance probability
p is annual probability of exceedance

PC - 3 n := 10 $p := \frac{1}{2500}$ $EP(n,p) = 3.993 \times 10^{-3}$

PC - 4 $p := \frac{1}{10000}$ $EP(n,p) = 9.996 \times 10^{-4}$

Excel Formulation

minEP	6.71E-03	0	6.71E-03
Ap1	-0.3006	0.75	0.003993
Bp1	-2.173213448	2.75	1.00E-03
Ap2	-0.8	4	0.0001
Bp2	-0.8		

$$=IF(D29>minEP,0,IF(D29>Q19,(LOG(D29)-Bp1_)/Ap1_,(LOG(D29)-Bp2_)/Ap2_))$$

D29 is random variable representing 10 year probability

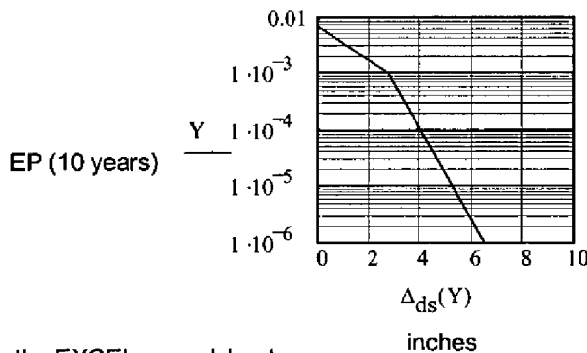
$$EP_{min} := 6.71 \cdot 10^{-3} \quad a1 := -0.3006 \quad a2 := -0.8$$

$$EP_{pc4} := 10^{-3} \quad b1 := -2.1732 \quad b2 := -0.8$$

$$\Delta_{ds}(Y) := \text{if} \left[\left(Y \geq EP_{min} \right), 0, \text{if} \left(Y \geq EP_{pc4}, \frac{\log(Y) - b1}{a1}, \frac{\log(Y) - b2}{a2} \right) \right]$$

$$\Delta_{ds}(EP_{min}) = 0 \quad \Delta_{ds}(10^{-3}) = 2.75 \quad \Delta_{ds}(0.003993) = 0.75$$

$$Y := 10^{-6}, 10^{-5} .. 10^{-2}$$



Curve matches the functions in the EXCEL spreadsheet.

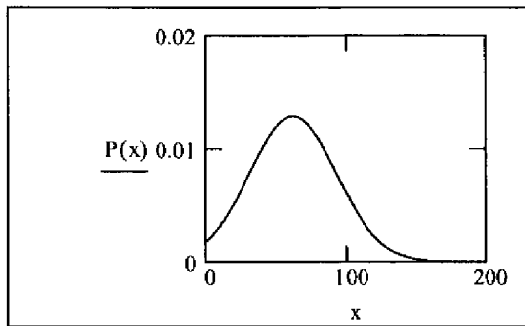
8.3.6. Extent of Settlement

6A. Check Distribution

Truncate at 0 ft.

$$P(x) := \text{dnorm}(x, 62, 31)$$

$$r := 1.0235$$



Distribution Appears OK

6B. Check Probability Sum

$$\mu := 62$$

$$\sigma := 31$$

$$f_d(x) := \frac{1}{\sigma \cdot \sqrt{2 \cdot \pi}} \cdot e^{-\frac{1}{2} \cdot \left(\frac{x-\mu}{\sigma}\right)^2}$$

$$Y := \left(\int_0^{\infty} f_d(x) dx \right) \cdot r$$

$$Y = 1$$

Extent is in feet.

6C. Range for Data Check

$$X := \begin{pmatrix} -5 \\ -4 \\ -3 \\ -2 \\ -1 \\ 0 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{pmatrix}$$

$$V(X) := \mu + \sigma \cdot X$$

$$V(X) =$$

-93
-62
-31
0
31
62
93
124
155
186
217

8.3.7 Parameters Affecting Static Settlement

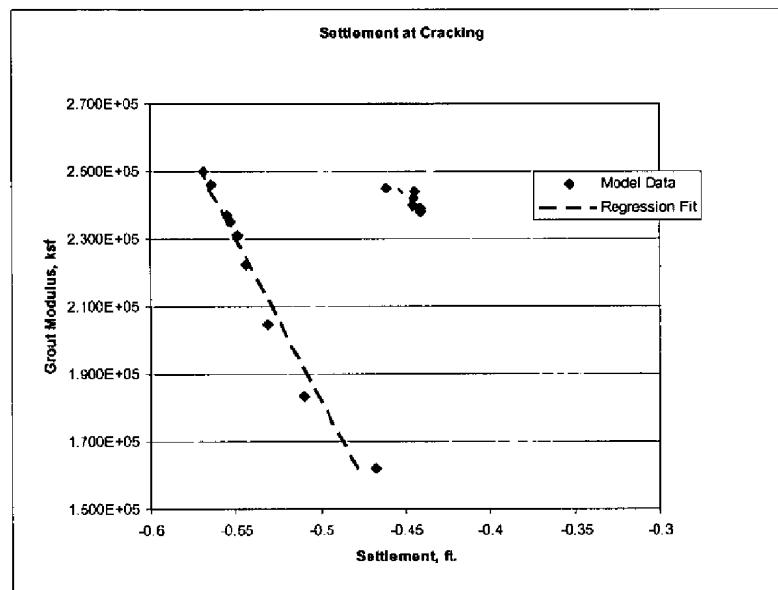
First calculate whether crack occurs.

The parameters that affect the occurrence of a crack are:

- The static settlement rate
- The saltstone modulus
- The saltstone cracking strain.

Note that the soil bulk modulus is directly related to the static settlement rate in that softer soil would have a higher settlement rate than stiffer soil. The static settlement occurs over a long period and over that period, the vault would tend to conform to the shape of the static settlement curve. The soil bulk modulus will therefore not be considered as a parameter to be varied for the static case but is accounted for by the static settlement rate..

Saltstone Modulus Effect



There is an anomaly in the data caused by the problem geometry. For a narrow range of saltstone modulus values, the vault tends to crack at a lower static settlement. This effect is demonstrated by numerous runs of the FE model. From linear regression analysis, the settlement at crack initiation is expressed as follows:

E_g - Grout Modulus, ksf

Δ_s - Static Settlement, ft

Δ_{co} - Settlement at Crack Initiation, ft.

$$\Delta_{co1}(E_g) := -1.05 \cdot 10^{-6} \cdot E_g - .3087$$

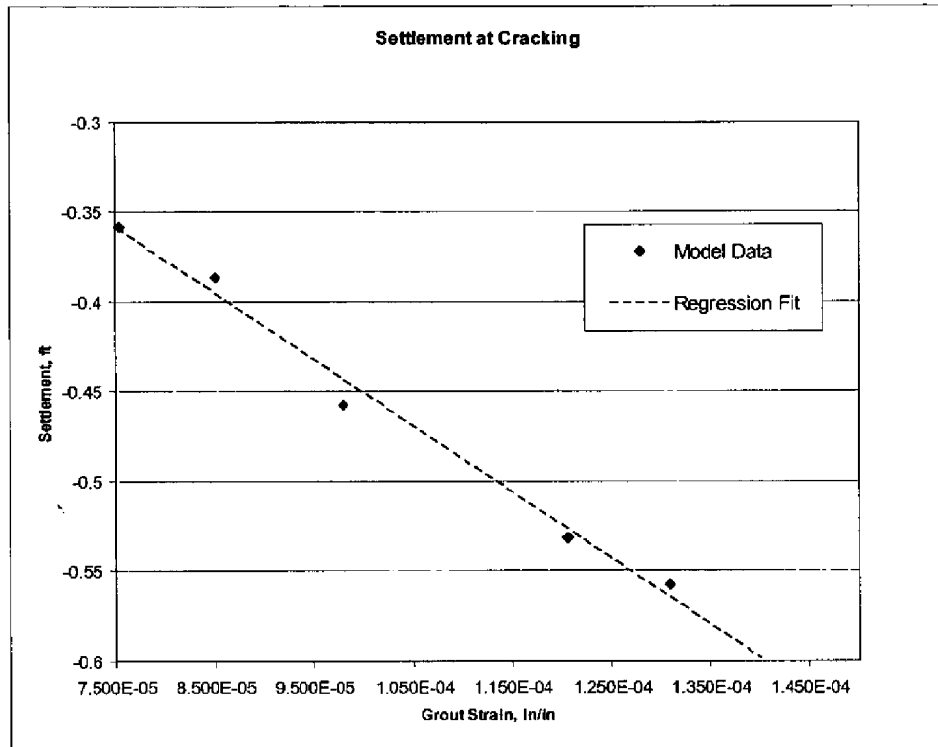
For E_g between 238000 and 245000:

$$\Delta_{co2}(E_g) := -1.89 \cdot 10^{-6} \cdot E_g - .0103$$

Examples

$$\Delta_{co1}(204800) = -0.524$$

$$\Delta_{co2}(240000) = -0.464$$

Saltstone Cracking Strain Effect

The saltstone cracking strain also determines whether the vault will crack under static settlement. a linear regression of the FE model results gives the following relationship.

ε_{cr} - Saltstone Cracking Strain

$$\Delta_{co}(\varepsilon_{cr}) := -3698.5 \cdot \varepsilon_{cr} - 0.08113 \quad \varepsilon_{crm} := 1.206 \cdot 10^{-4}$$

$$\text{ratio}(\varepsilon_{cr}) := \frac{\Delta_{co}(\varepsilon_{cr})}{\Delta_{co}(\varepsilon_{crm})}$$

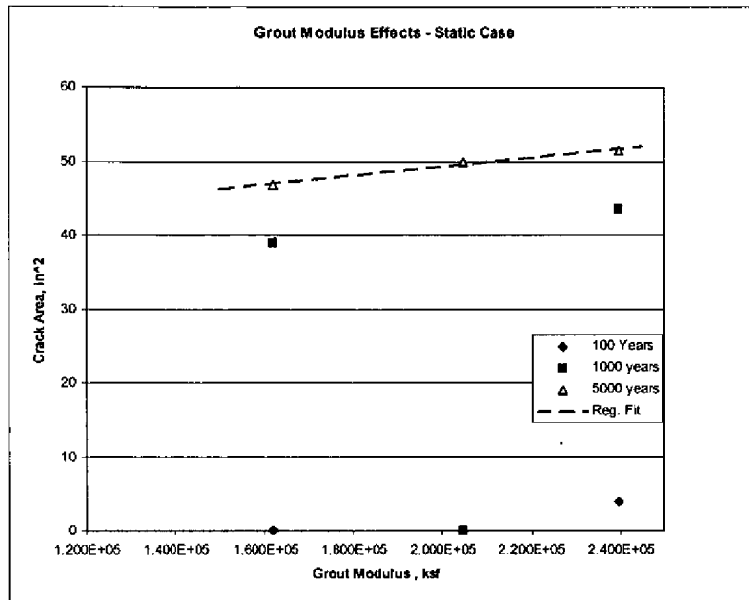
Examples $\varepsilon_{cr} := 1.05 \cdot 10^{-4}$ $\Delta_{co}(\varepsilon_{cr}) = -0.469$ $\text{ratio}(\varepsilon_{cr}) = 0.891$

$\varepsilon_{cr} := 1.3 \cdot 10^{-4}$ $\Delta_{co}(\varepsilon_{cr}) = -0.562$ $\text{ratio}(\varepsilon_{cr}) = 1.066$

The value for Δ_{co} calculated from the saltstone modulus is modified by this ratio.

Crack Area for Static Settlement Case

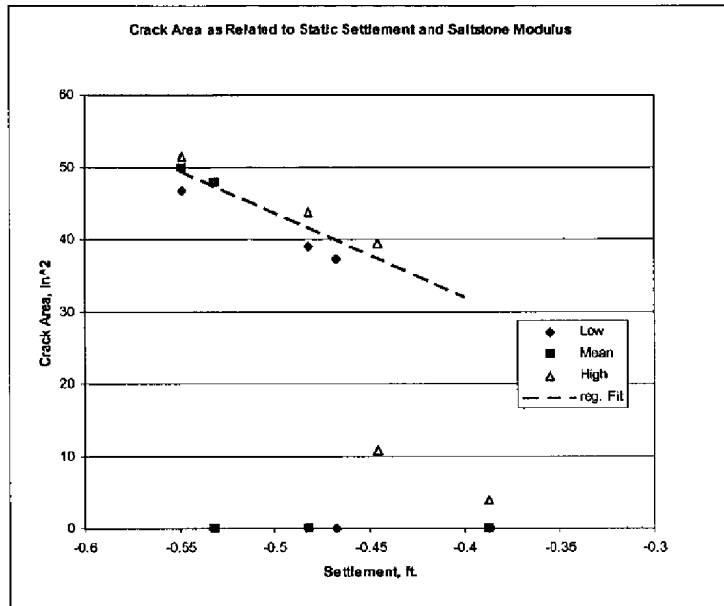
Once it has been determined that a crack occurs, the data from the 5000 year settlement case is used to determine crack area, and is modified by a factor dependent on the settlement at the specific time being considered.



Linear regression is used to relate the crack area to the grout modulus for the 5000 year data.

CA1 - Crack Area related to saltstone modulus

$$CA1(E_g) := 6.071 \cdot 10^{-5} \cdot E_g + 37.13$$



The crack area is related to the settlement also by linear regression:

CA2 - Crack Area related to settlement.

Since the first relationship was based on 5000 year settlement, the CA2 value is calculated as a modifier of the 5000 year value.

$$\text{Slope} := -117.198$$

$$\Delta_{5000} := -0.549$$

$$CA2(\Delta_{st}) := \text{Slope} \cdot (\Delta_{st} - \Delta_{5000})$$

Examples

$$E_g := 204800$$

$$\Delta_{st} := -0.5$$

$$CA1(E_g) = 49.563$$

$$CA2(\Delta_{st}) = -5.743$$

$$E_g := 245000$$

$$\Delta_{st} := -0.6$$

$$CA1(E_g) = 52.004$$

$$CA2(\Delta_{st}) = 5.977$$

Overall Crack Area

$$CA := CA1(E_g) + CA2(\Delta_{st})$$

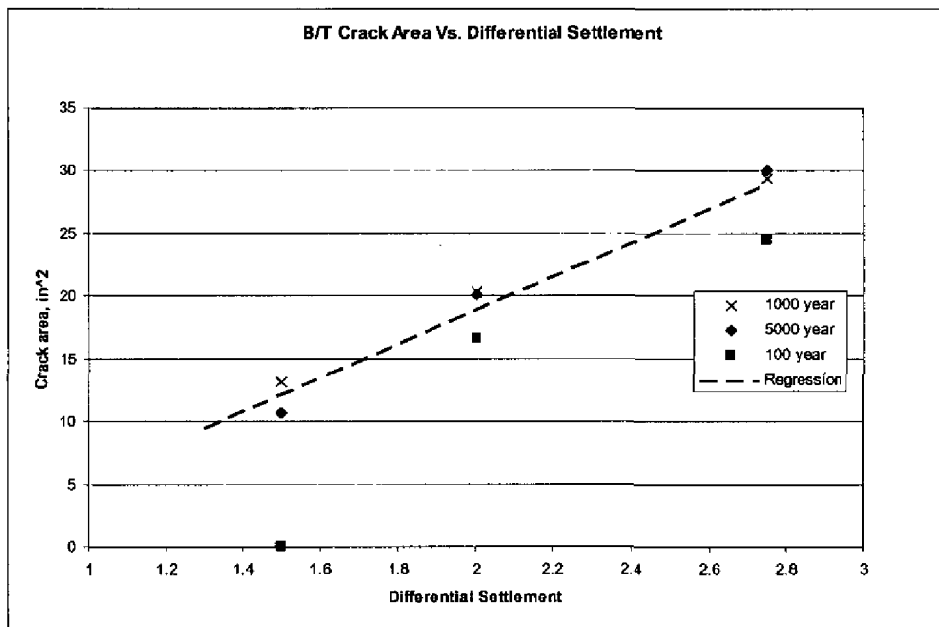
8.3.8 Differential Settlement at Location 1

The parameters affecting the formation of cracks due to differential settlement are:

- magnitude of settlement
- time of settlement with respect to the static settlement condition
- extent of settlement
- saltstone modulus
- saltstone cracking strain
- soil bulk modulus

Note: B/T cracks are cracks open at the bottom. T/B cracks are cracks open at the top.

Settlement Magnitude



The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{ds} - Crack Area due to differential settlement magnitude, in²

Δ_d - Differential settlement, in.

$$CA_{ds}(\Delta_d) := 13.44 \cdot \Delta_d - 8.073$$

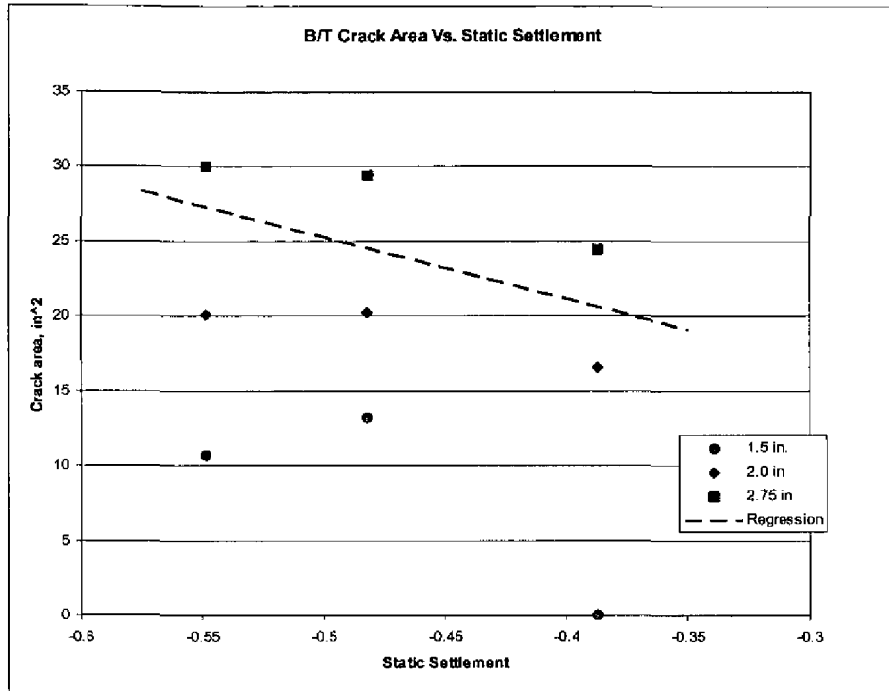
Examples

$$CA_{ds}(2) = 18.807$$

$$CA_{ds}(1.25) = 8.727$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Effect of Static Settlement (time)



Data from the 2 in and 2.75 in differential settlements were used to find the slope change of the crack area as a function of static settlement. The relationship is as follows:

$$\Delta_{1000} := -0.4823$$

$$CA_{SS}(\Delta_s) := -41.2249 \cdot (\Delta_s - \Delta_{1000})$$

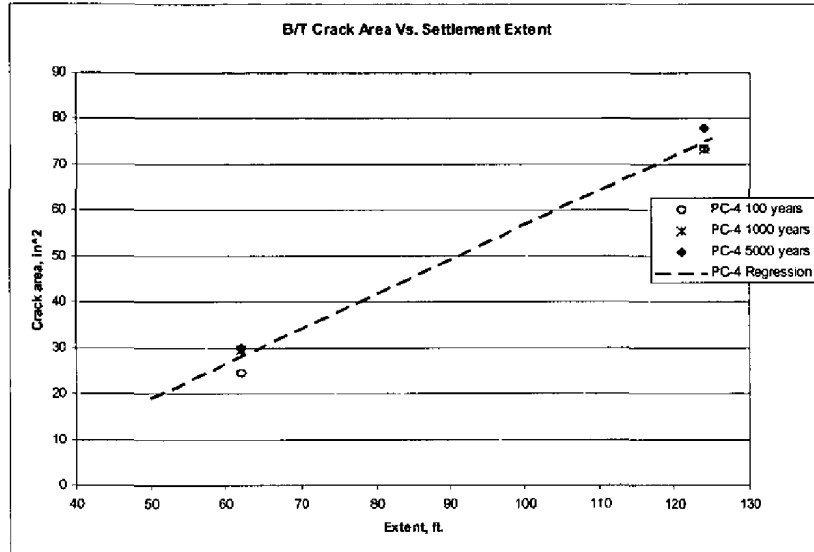
Examples

$$CA_{SS}(-.4) = -3.393$$

$$CA_{SS}(-.55) = 2.791$$

This value is added to the crack area.

Effect of Extent of Settlement



The effect of settlement extent is assumed to be linear and is extrapolated for larger settlement areas. The expression for the relationship is:

Ex is settlement extent, ft. $Ex_m := 62$

Exm is mean settlement extent

$$CA_{ext}(Ex) := 0.7568 \cdot (Ex - Ex_m)$$

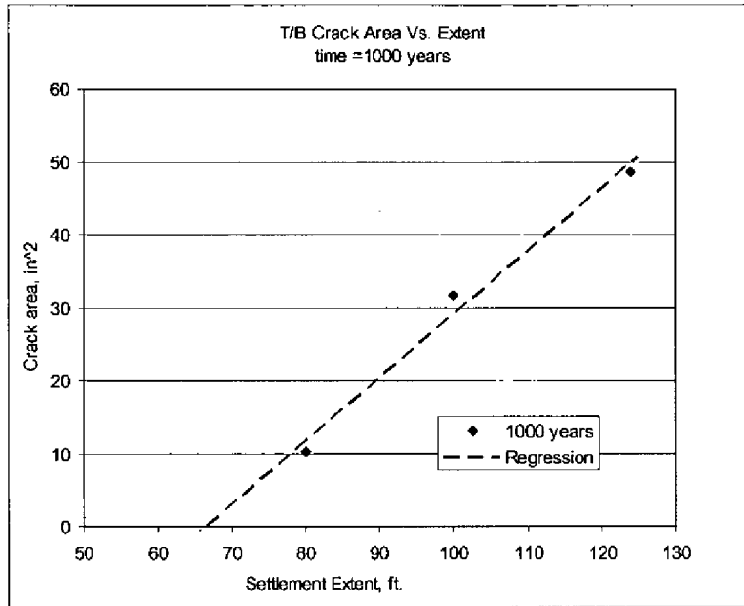
Examples

$$CA_{ext}(40) = -16.65$$

$$CA_{ext}(140) = 59.03$$

This value is added to the crack area.

There are also cracks open at the top for larger values of the extent parameter and for differential settlements greater than 2 in..



The relationship is expressed as follows:

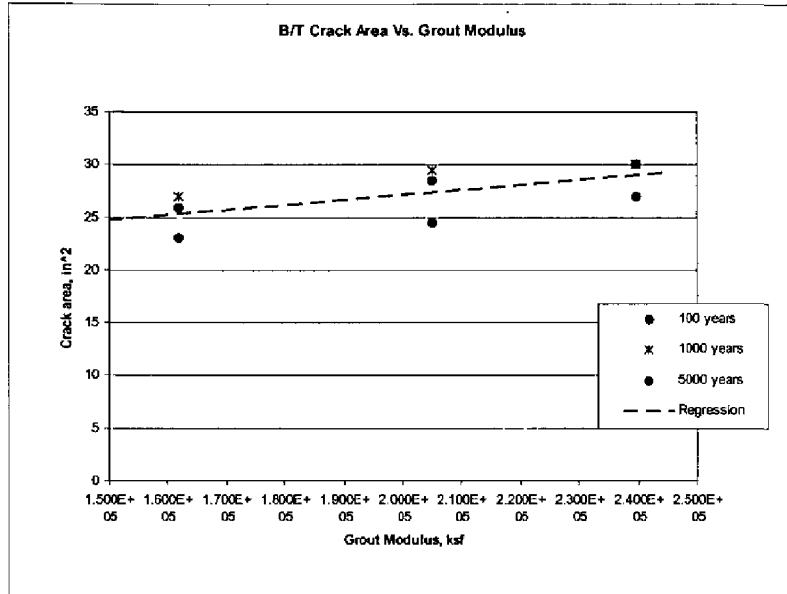
$$CA_{tex}(Ex) := 0.867 \cdot (Ex) - 57.73 \quad \text{for } \Delta_d > 2\text{in.}$$

Examples

$$CA_{tex}(75) = 7.295$$

$$CA_{tex}(125) = 50.645$$

Effect of Saltstone Modulus



The expression for the Saltstone modulus effect is derived similarly:

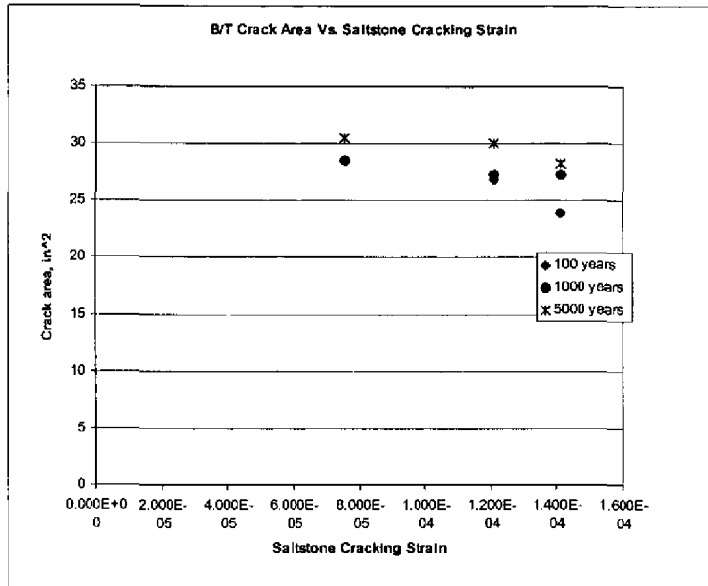
$$E_{gm} := 2.048 \cdot 10^5$$

$$CA_{gm}(E_g) := 4.75 \cdot 10^{-5} \cdot (E_g - E_{gm})$$

Examples $CA_{gm}(1.9 \cdot 10^5) = -0.703$ $CA_{gm}(2.5 \cdot 10^5) = 2.147$

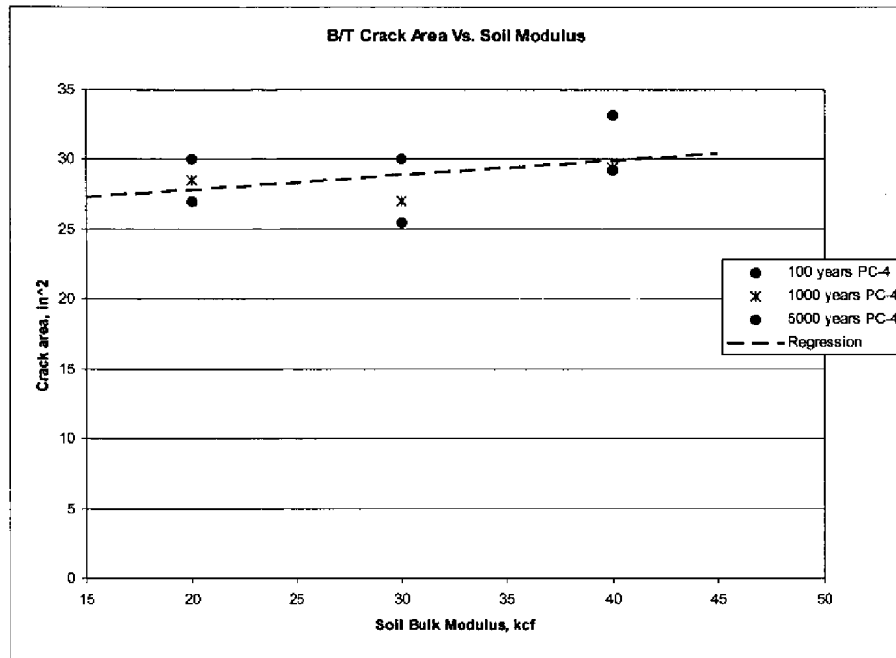
This value is added to the crack area.

Grout Cracking Strain Effect



No significant effect of saltstone cracking strain on crack area was noted.

Soil Bulk Modulus Effect



The expression for the soil bulk modulus effect is derived similarly:

$$K_{sm} := 30$$

$$CA_{sm}(K_s) := 0.1047 \cdot (K_s - K_{sm})$$

Examples $CA_{sm}(25) = -0.523$ $CA_{sm}(45) = 1.571$

This value is added to the crack area.

Total Crack Area

Bottom Cracks $CA_b := CA_{ds}(\Delta_d) + CA_{ss}(\Delta_s) + CA_{ext}(Ex) + CA_{gm}(E_g) + CA_{sm}(K_s)$

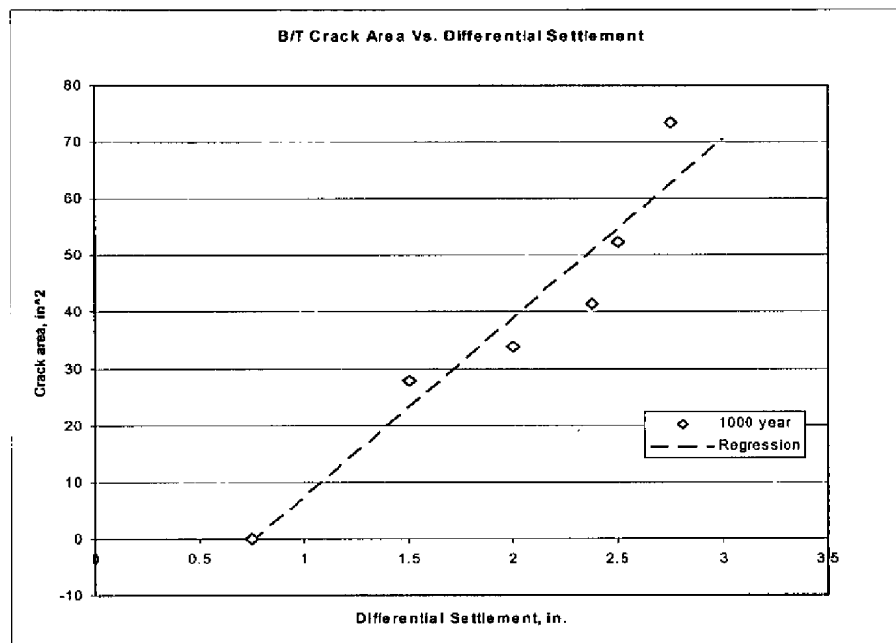
Top Cracks $CA_t := CA_{tex}(Ex)$

8.3.9 Differential Settlement at Location 2

The parameters affecting the formation of cracks due to differential settlement are:

- magnitude of settlement
- time of settlement with respect to the static settlement condition
- extent of settlement
- saltstone modulus
- saltstone cracking strain
- soil bulk modulus

Note: B/T cracks are cracks open at the bottom. T/B cracks are cracks open at the top.

Settlement Magnitude**Bottom Cracks**

The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{ds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

$$CA_{ds}(\Delta_d) := 31.645 \cdot \Delta_d - 24.512$$

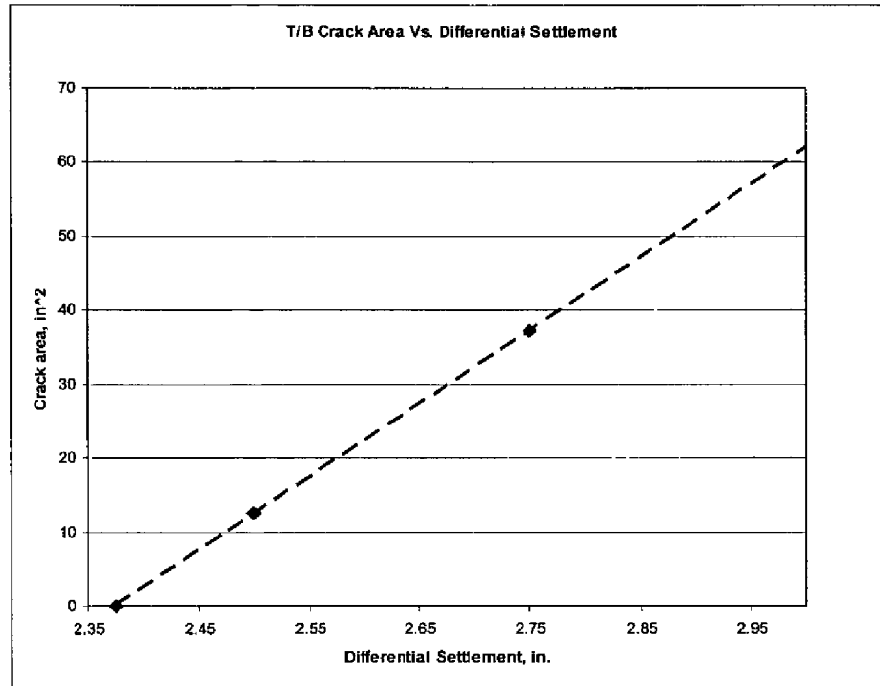
Examples

$$CA_{ds}(2) = 38.778$$

$$CA_{ds}(1.25) = 15.044$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Top Cracks



The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{tds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

$$CA_{tds}(\Delta_d) := 99.24 \cdot \Delta_d - 235.605$$

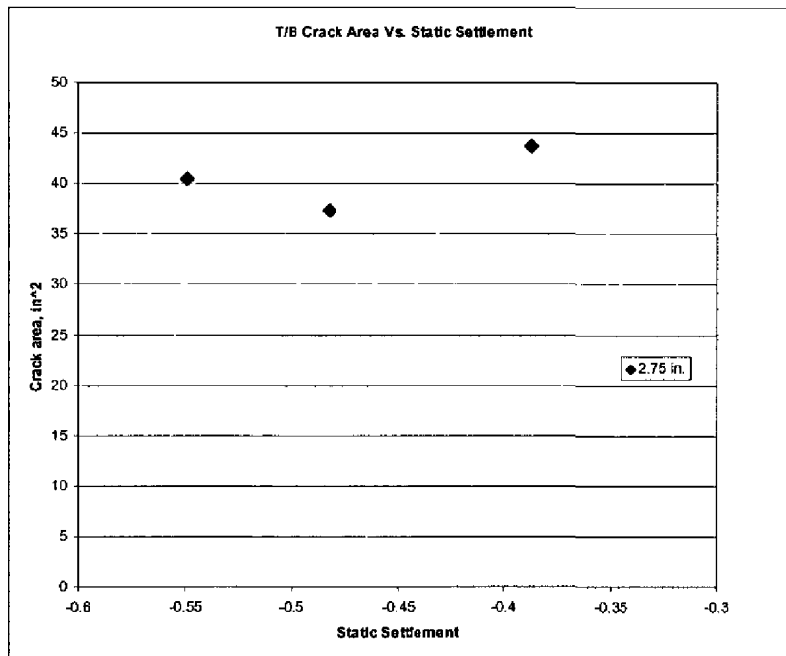
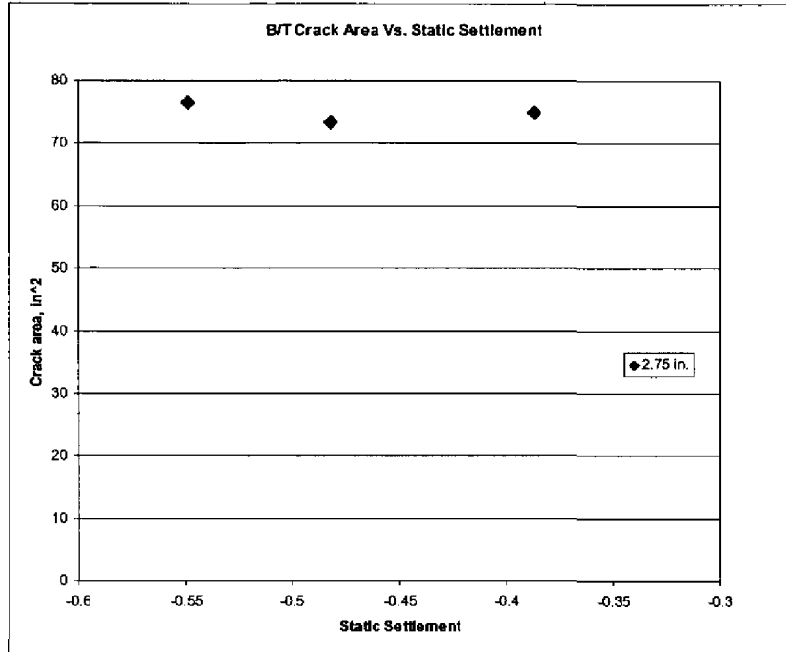
Examples

$$CA_{tds}(2.4) = 2.571$$

$$CA_{tds}(2.8) = 42.267$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

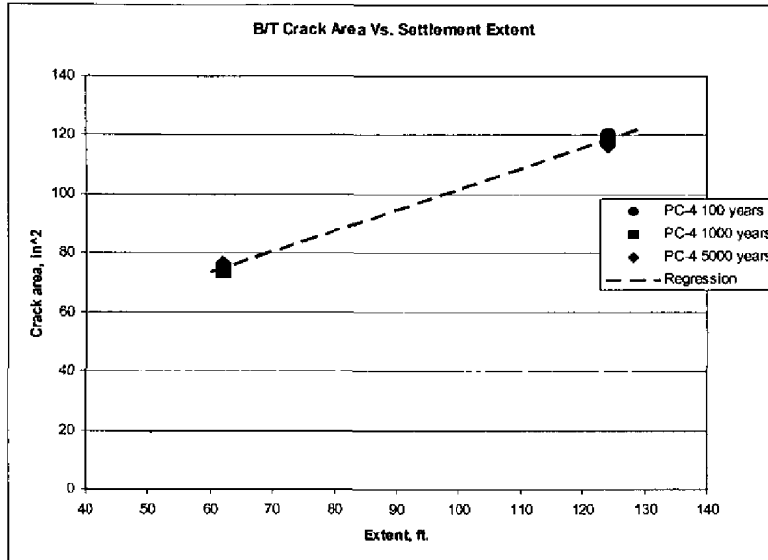
Effect of Static Settlement (time)



There were no trends noted for static settlement condition at the time of occurrence of the earthquake.

Effect of Extent of Settlement

Bottom Cracks



The effect of settlement extent is assumed to be linear and is extrapolated for larger settlement areas. The expression for the relationship is:

Ex is settlement extent, ft. $Ex_m := 62$

Exm is mean settlement extent

$$CA_{ext}(Ex) := .7014 \cdot (Ex - Ex_m)$$

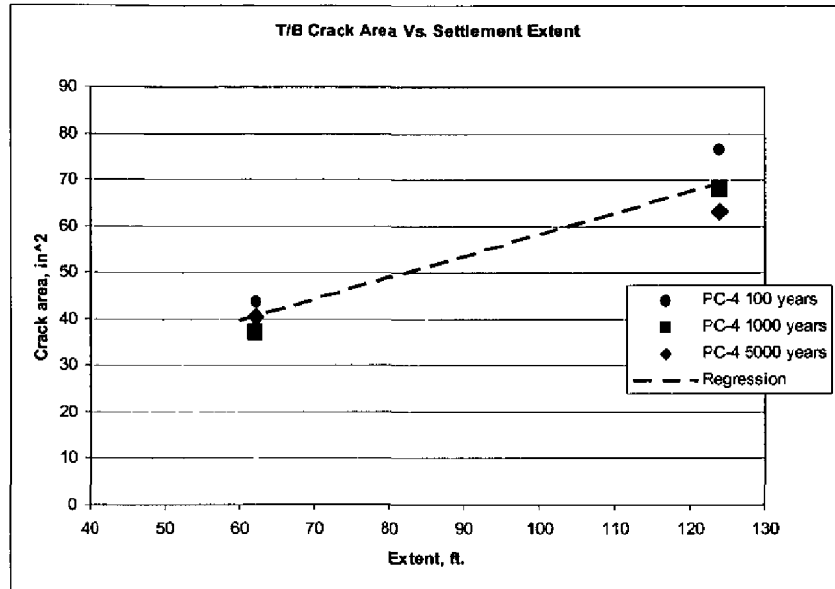
Examples

$$CA_{ext}(40) = -15.431$$

$$CA_{ext}(140) = 54.709$$

This value is added to the crack area.

Top Cracks



The relationship is expressed as follows:

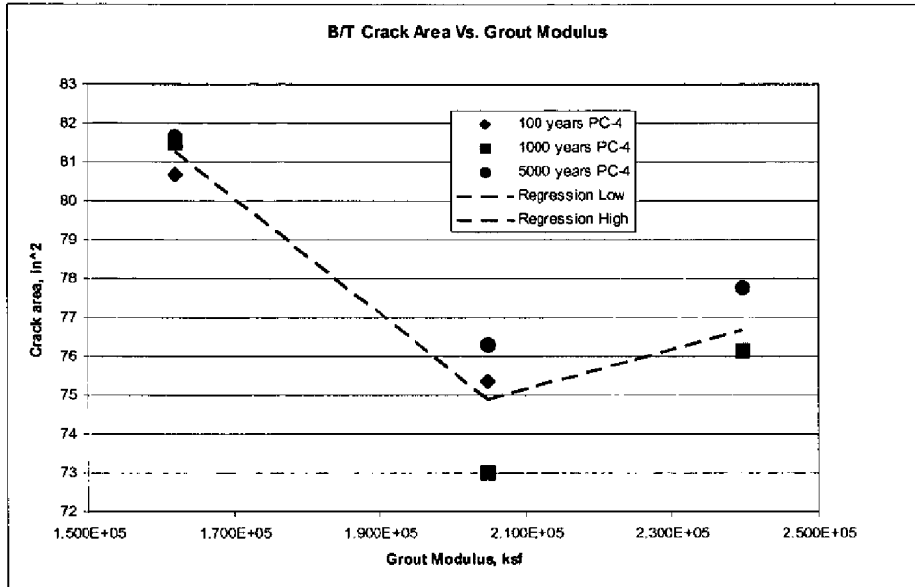
$$CA_{\text{tex}}(\text{Ex}) := 0.464 \cdot (\text{Ex} - \text{Exm})$$

Examples $CA_{\text{tex}}(55) = -3.248$ $CA_{\text{tex}}(125) = 29.232$

This value is added to the crack area.

Effect of Saltstone Modulus

Bottom Cracks



The data is fit with two lines.

$$E_{gm} := 2.048 \cdot 10^5$$

$$\text{For } E_g \leq E_{gm} \quad CA_{1gm}(E_g) := -1.49 \cdot 10^{-4} \cdot (E_g - E_{gm})$$

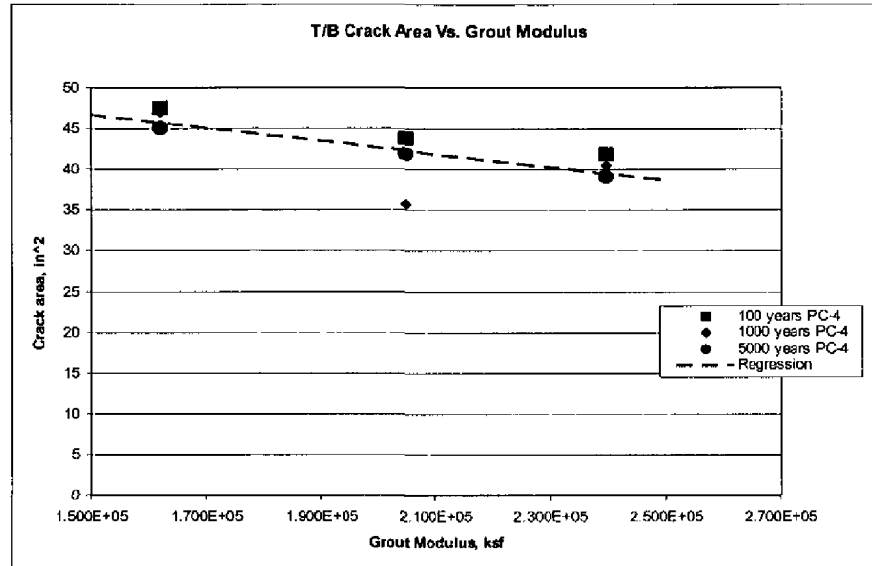
For $E_g > E_{gm}$

$$CA_{2gm}(E_g) := 5.17 \cdot 10^{-5} \cdot (E_g - E_{gm})$$

$$\text{Examples} \quad CA_{1gm}(1.9 \cdot 10^5) = 2.205 \quad CA_{2gm}(2.5 \cdot 10^5) = 2.337$$

This value is added to the crack area.

Top Cracks



A linear regression fit gives the following expression

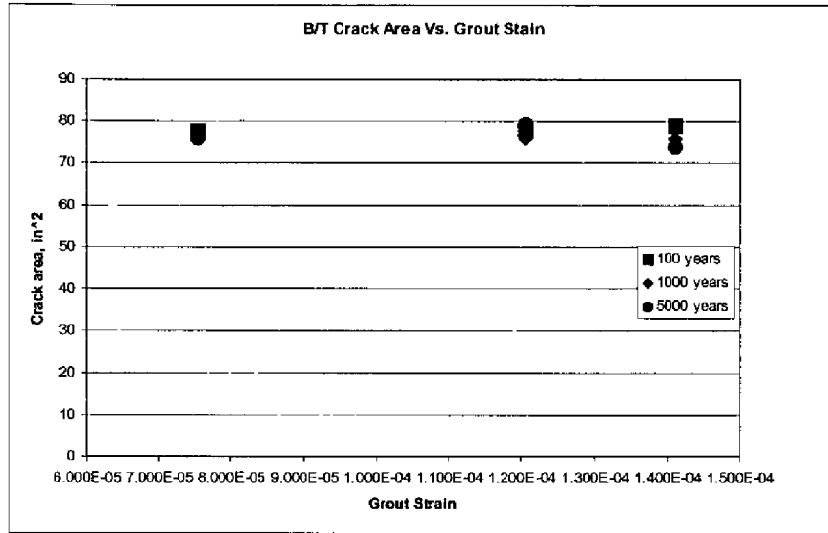
$$CA_{tgm}(E_g) := -8.025 \cdot 10^{-5} \cdot (E_g - E_{gm})$$

Examples $CA_{tgm}(1.9 \cdot 10^5) = 1.188$ $CA_{tgm}(2.5 \cdot 10^5) = -3.627$

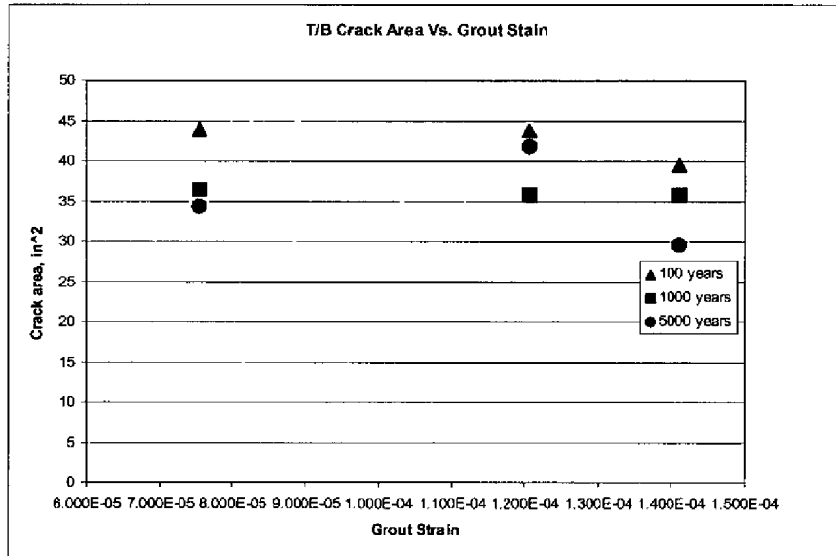
This value is added to the crack area.

Grout Cracking Strain Effect

Bottom Cracks



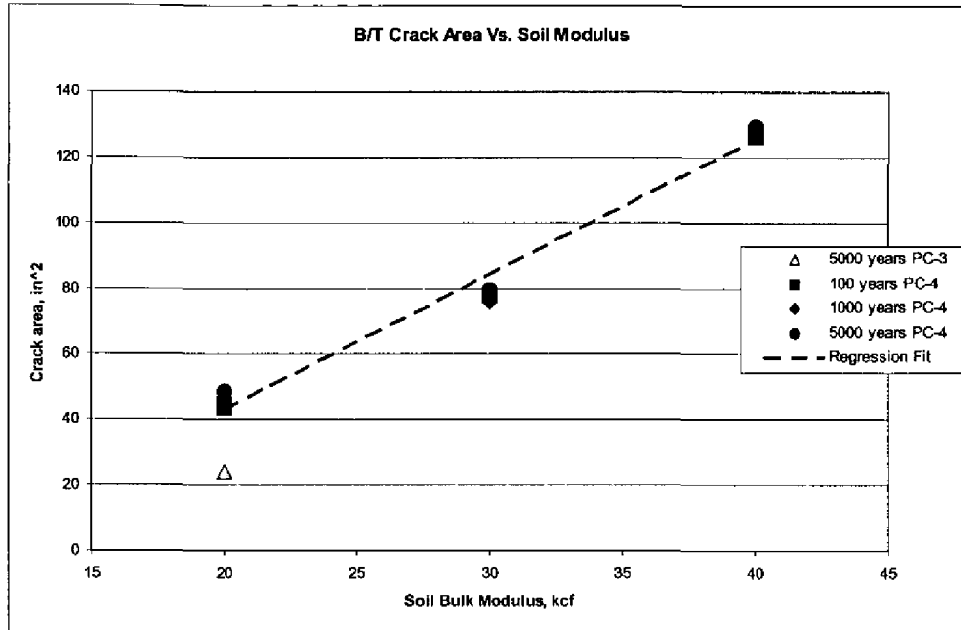
Top Cracks



No significant effect of saltstone cracking strain on crack area was noted.

Soil Bulk Modulus Effect

Bottom Cracks



The expression for the soil bulk modulus effect is derived similarly:

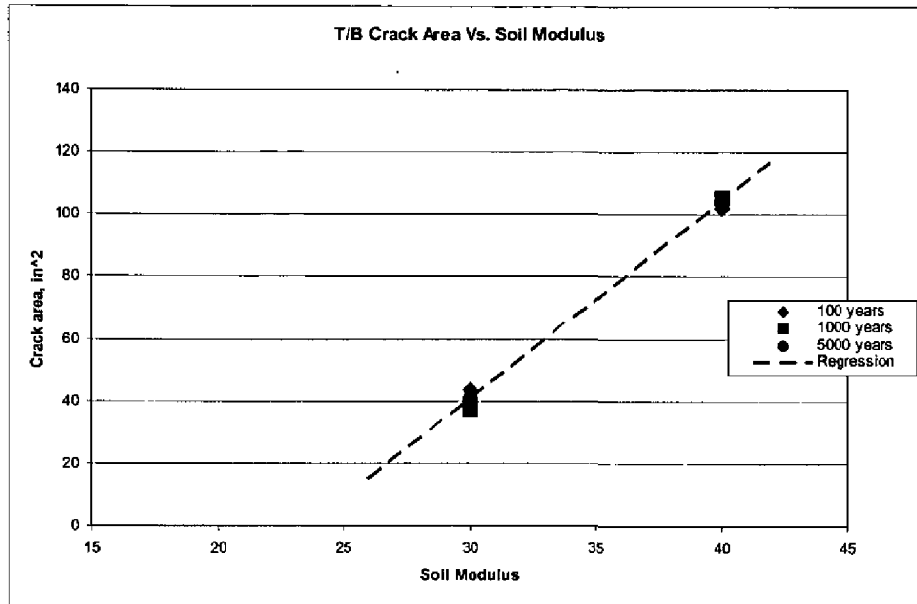
$$K_{sm} := 30$$

$$CA_{sm}(K_s) := 4.112 \cdot (K_s - K_{sm})$$

Examples $CA_{sm}(25) = -20.56$ $CA_{sm}(45) = 61.68$

This value is added to the crack area.

Top Cracks



The expression for the effect on top crack area is derived similarly:

$$K_{sm} := 30$$

$$CA_{tsm}(K_s) := 6.372 \cdot (K_s - K_{sm})$$

Examples $CA_{tsm}(25) = -31.86$ $CA_{tsm}(45) = 95.58$

This value is added to the crack area.

Total Crack Area

Bottom Cracks $CA_b := CA_{ds}(\Delta_d) + CA_{ext}(Ex) + CA_{gm}(E_g) + CA_{sm}(K_s)$

CA_{gm} is either CA_{1gm} or CA_{2gm}

Top Cracks $CA_t := CA_{tds}(\Delta_d) + CA_{tex}(Ex) + CA_{tgm}(E_g) + CA_{tsm}(K_s)$

8.3.10 Differential Settlement at Location 3

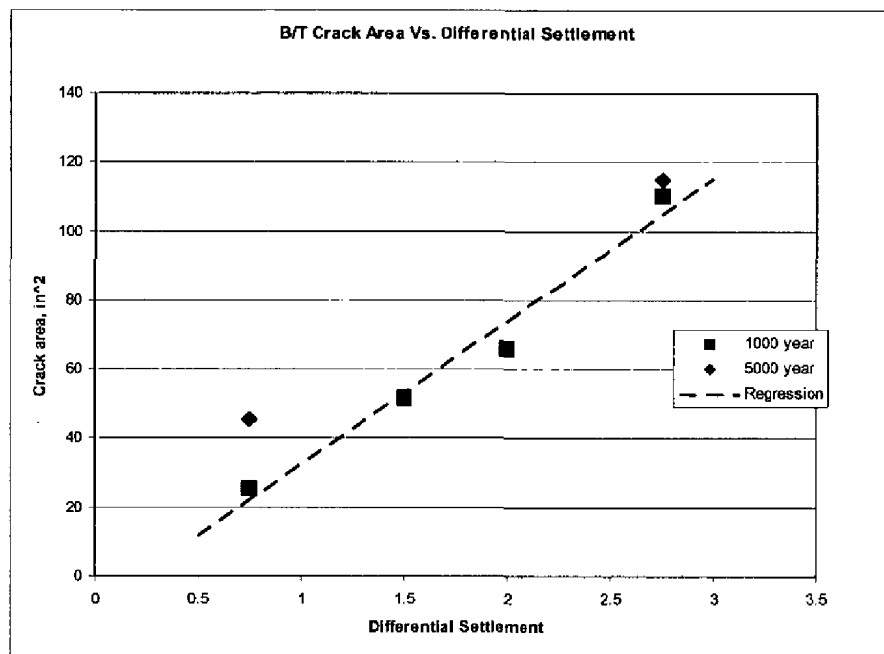
The parameters affecting the formation of cracks due to differential settlement are:

- magnitude of settlement
- time of settlement with respect to the static settlement condition
- extent of settlement
- saltstone modulus
- saltstone cracking strain
- soil bulk modulus

Note: B/T cracks are cracks open at the bottom. T/B cracks are cracks open at the top.

Settlement Magnitude

Bottom Cracks



The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{ds} - Crack Area due to differential settlement magnitude, in²

Δ_d - Differential settlement, in.

$$CA_{ds}(\Delta_d) := 41.51 \cdot \Delta_d - 9.28$$

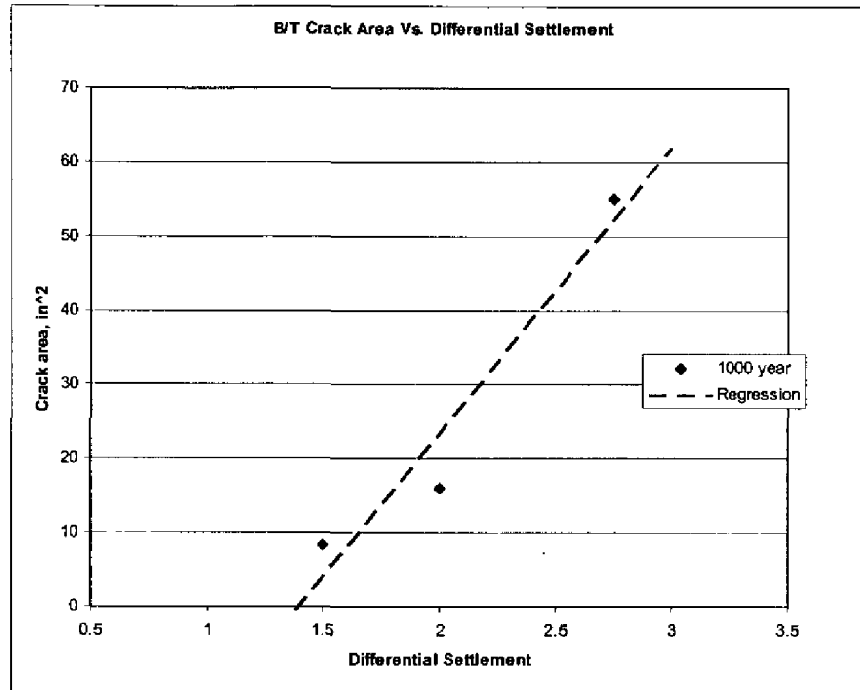
Examples

$$CA_{ds}(2) = 73.74$$

$$CA_{ds}(1.25) = 42.607$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Top Cracks



The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{tds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

$$CA_{tds}(\Delta_d) := 38.61 \cdot \Delta_d - 53.97$$

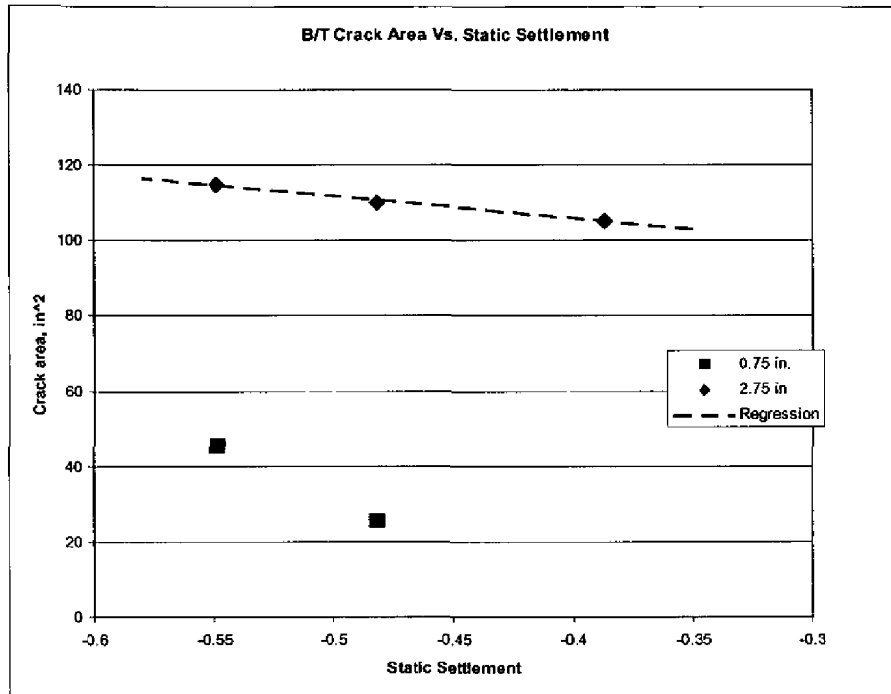
Examples

$$CA_{tds}(2.4) = 38.694 \qquad CA_{tds}(2.8) = 54.138$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Effect of Static Settlement (time)

Bottom Cracks



PC-4 data is used to adjust the crack area for the static settlement effect on the earthquake differential settlement.

Δ_{1000} is static settlement at 1000 years, ft.

$$\Delta_{1000} := -0.4823$$

Δ_s is static settlement, ft.

$$CA_{SS}(\Delta_s) := -59.41 \cdot (\Delta_s - \Delta_{1000})$$

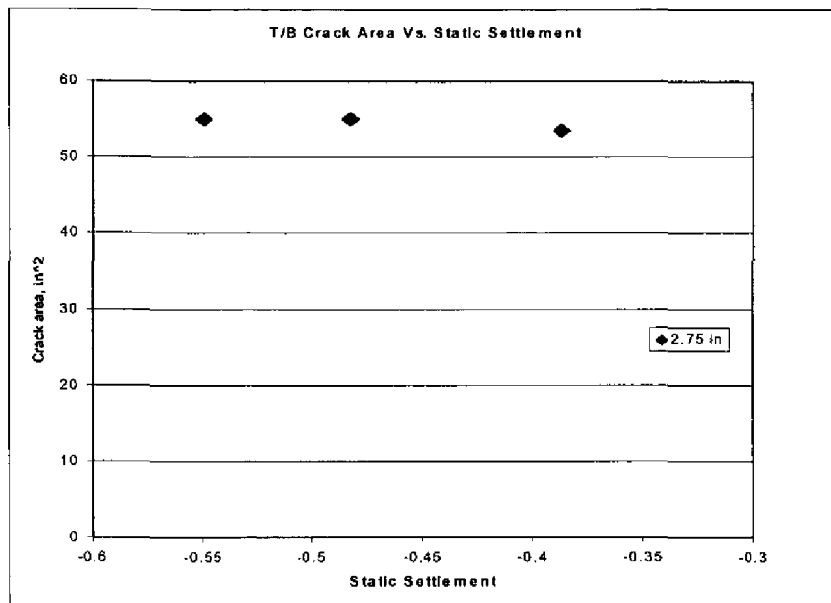
Examples

$$CA_{SS}(-0.4) = -4.889$$

$$CA_{SS}(-0.6) = 6.993$$

This value is added to the crack area

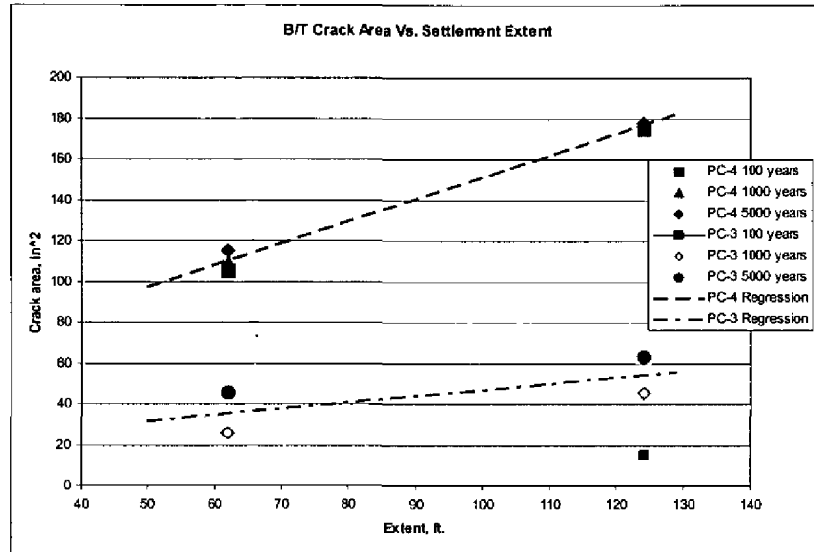
Top Cracks



There were no trends noted for static settlement condition at the time of occurrence of the earthquake that affect the top crack area.

Effect of Extent of Settlement

Bottom Cracks



Exm := 62

The slope of the data regression fit is greater for the PC-4 than the PC-3 data. Assume a linear variation of the slope.

$$S_{pc3} := 0.3024 \quad S_{pc4} := 1.0784 \quad A_{sl} := .5 \quad B_{sl} := .5$$

Given

$$S_{pc3} = A_{sl} \cdot 0.75 + B_{sl}$$

$$S_{pc4} = A_{sl} \cdot 2.75 + B_{sl}$$

$$AA := \text{Find}(A_{sl}, B_{sl})$$

$$AA = \begin{pmatrix} 0.388 \\ 0.011 \end{pmatrix}$$

$$Sl(\Delta_d) := 0.388 \cdot \Delta_d + 0.011$$

Ex is settlement extent, ft.

$$CA_{ex}(Ex, \Delta_d) := Sl(\Delta_d) \cdot (Ex - Exm)$$

Exm is mean settlement extent

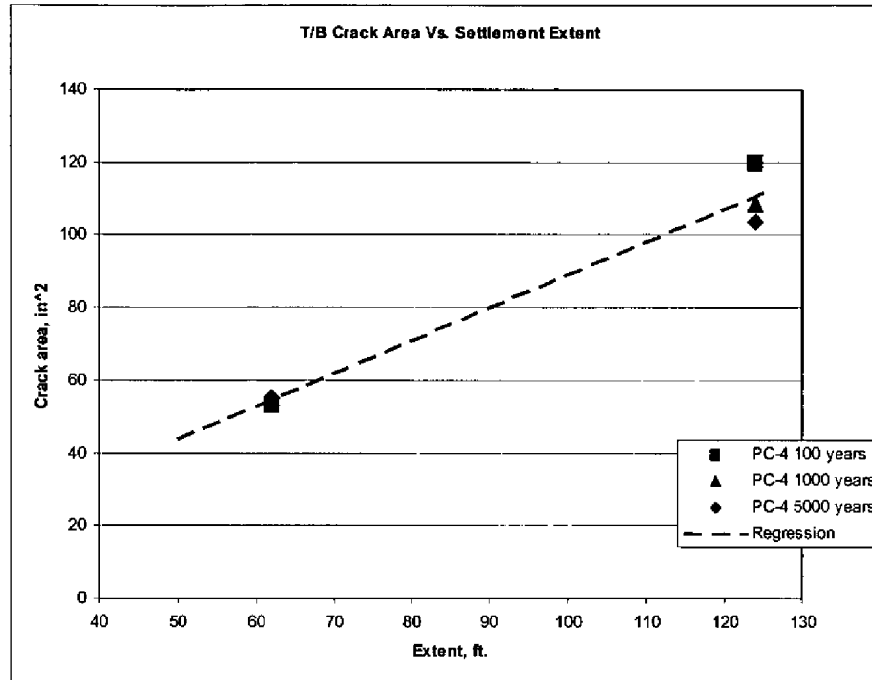
Examples

$$CA_{ex}(40, 2) = -17.314$$

$$CA_{ex}(140, 1.5) = 46.254$$

This value is added to the crack area.

Top Cracks



The relationship is expressed as follows:

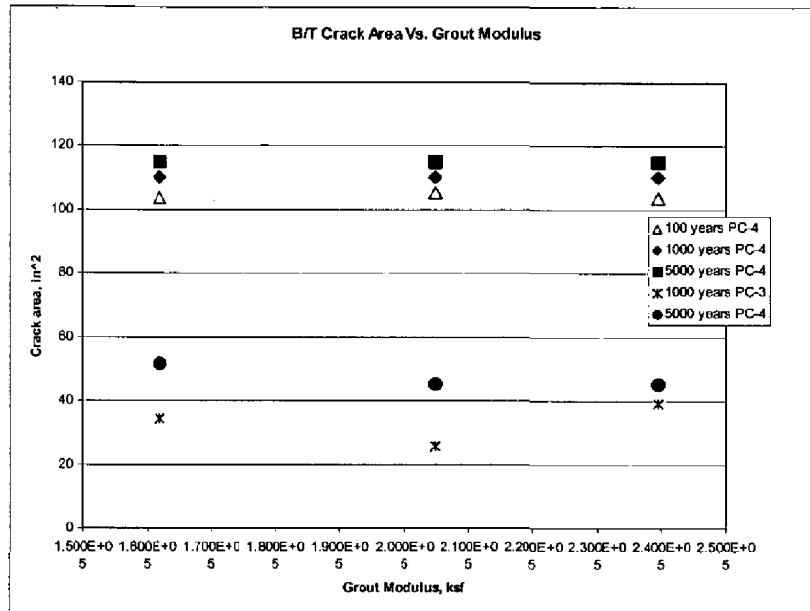
$$CA_{tex}(Ex) := 0.9058 \cdot (Ex - Ex_m)$$

Examples $CA_{tex}(55) = -6.341$ $CA_{tex}(125) = 57.065$

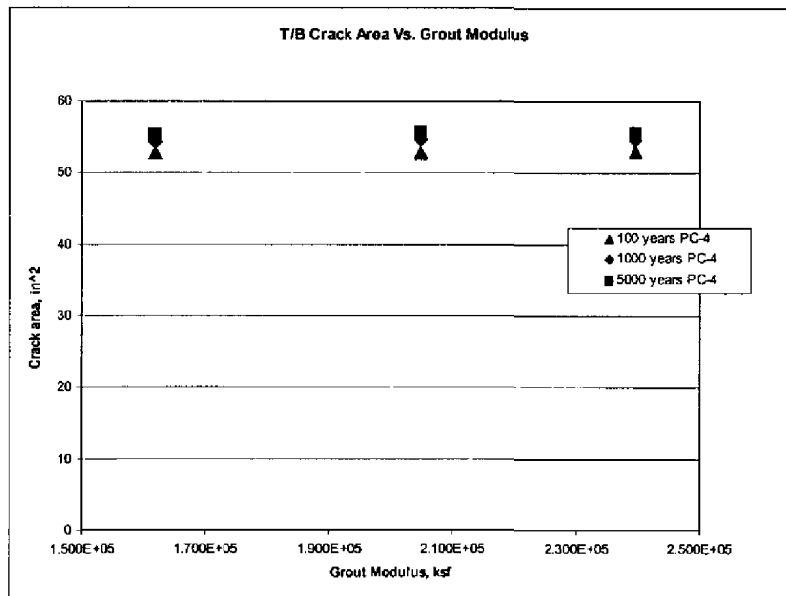
This value is added to the crack area.

Effect of Saltstone Modulus

Bottom Cracks



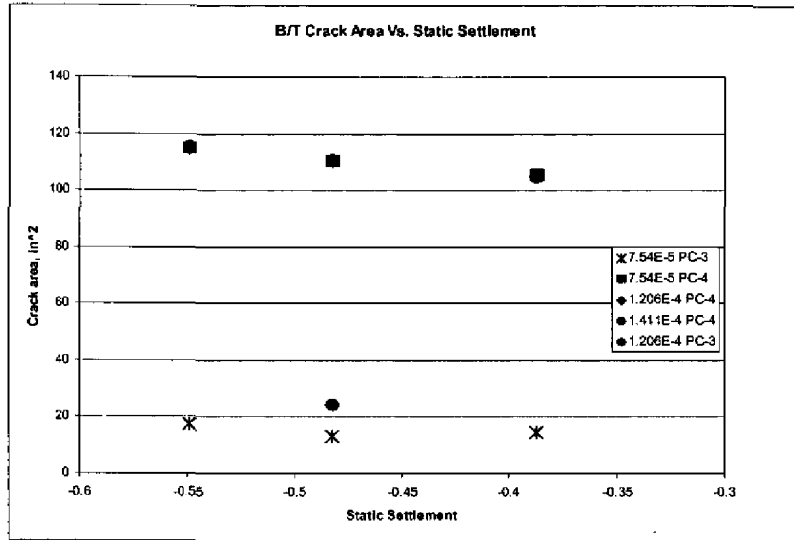
Top Cracks



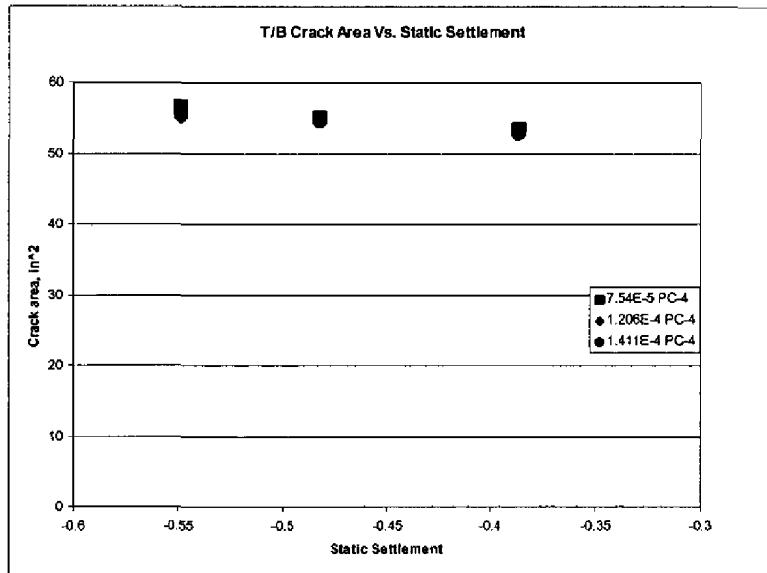
No trends in the data were noted for Saltstone Modulus Effects.

Grout Cracking Strain Effect

Bottom Cracks



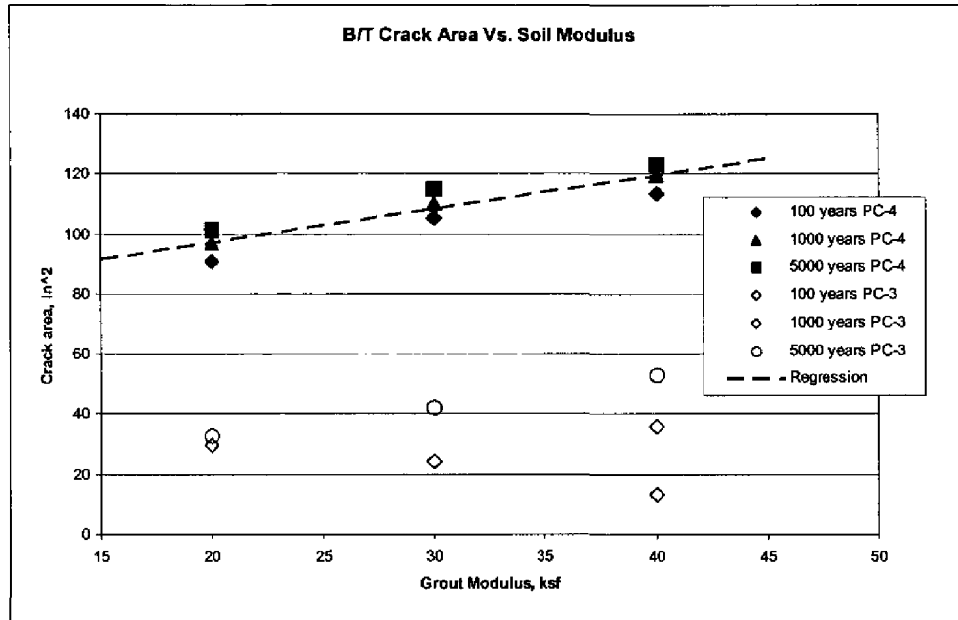
Top Cracks



No significant effect of saltstone cracking strain on crack area was noted.

Soil Bulk Modulus Effect

Bottom Cracks



The PC-4 data was used to establish an expression for the soil bulk modulus effect by linear regression. The PC-3 data has a similar slope:

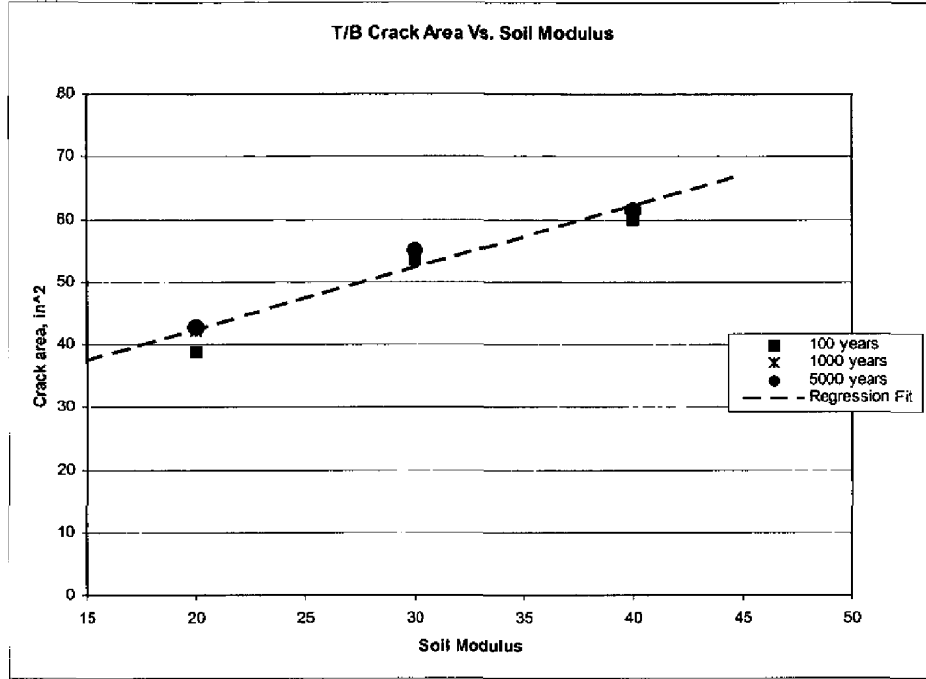
$$K_{sm} := 30$$

$$CA_{sm}(K_s) := 1.1205 \cdot (K_s - K_{sm})$$

Examples $CA_{sm}(25) = -5.603$ $CA_{sm}(45) = 16.808$

This value is added to the crack area.

Top Cracks



The expression for the effect on top crack area is derived similarly:

$$K_{sm} := 30$$

$$CA_{tsm}(K_s) := 0.9882 \cdot (K_s - K_{sm})$$

Examples $CA_{tsm}(25) = -4.941$ $CA_{tsm}(45) = 14.823$

This value is added to the crack area.

Total Crack Area

Bottom Cracks $CA_b := CA_{ds}(\Delta_d) + CA_{ss}(\Delta_s) + CA_{ex}(Ext, \Delta_d) + CA_{sm}(K_s)$

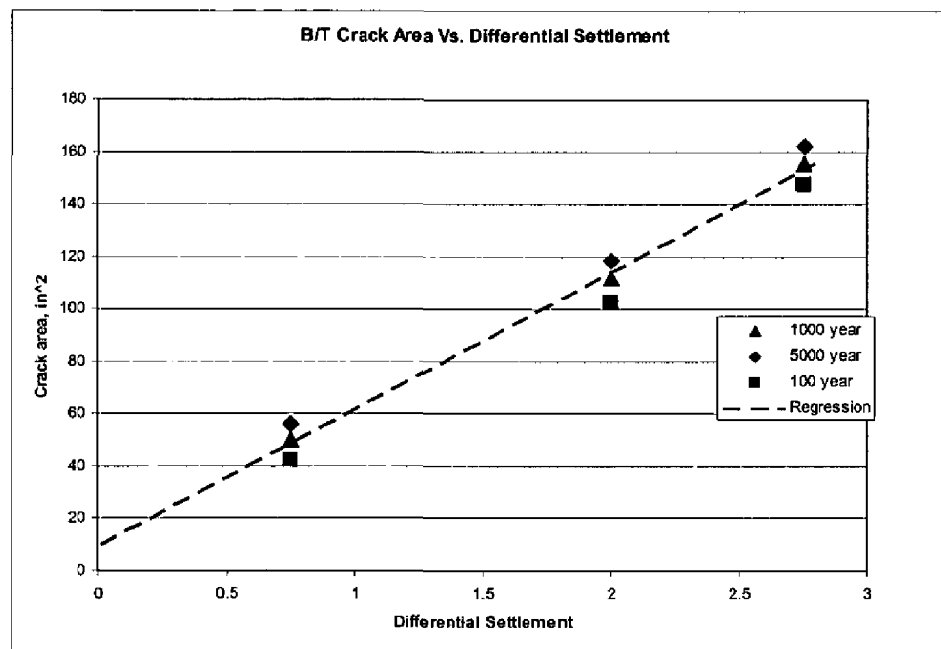
Top Cracks $CA_t := CA_{tds}(\Delta_d) + CA_{tex}(Ex) + CA_{tsm}(K_s)$

8.3.11 Differential Settlement at Location 4

The parameters affecting the formation of cracks due to differential settlement are:

- magnitude of settlement
- time of settlement with respect to the static settlement condition
- extent of settlement
- saltstone modulus
- saltstone cracking strain
- soil bulk modulus

Note: B/T cracks are cracks open at the bottom. T/B cracks are cracks open at the top.

Settlement Magnitude**Bottom Cracks**

The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{ds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

$$CA_{ds}(\Delta_d) := 52.4206 \cdot \Delta_d + 8.9763$$

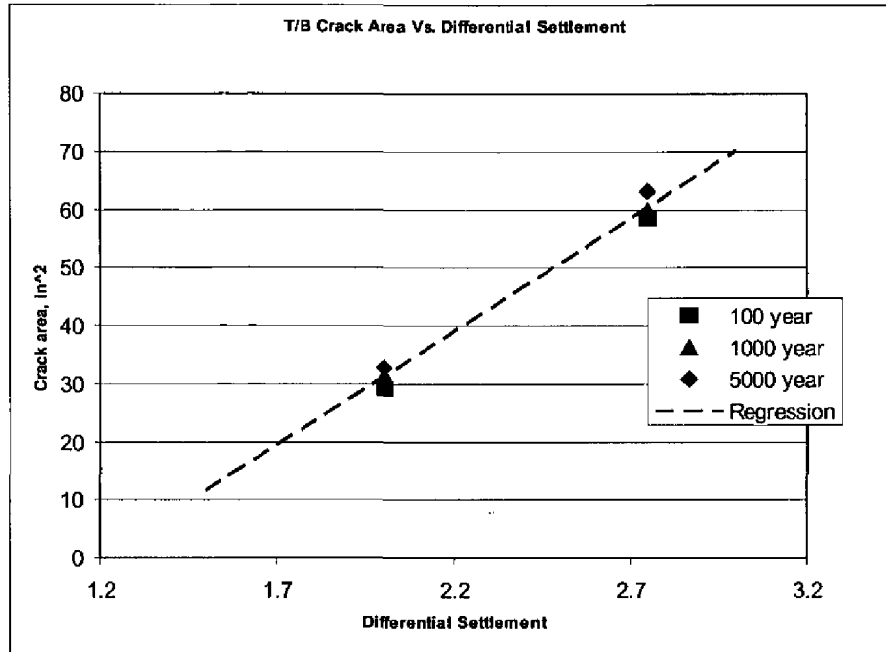
Examples

$$CA_{ds}(2) = 113.817$$

$$CA_{ds}(1.25) = 74.502$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Top Cracks



The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{tds} - Crack Area due to differential settlement magnitude, in²

Δ_d - Differential settlement, in.

$$CA_{tds}(\Delta_d) := 39.168 \cdot \Delta_d - 47.232$$

Examples

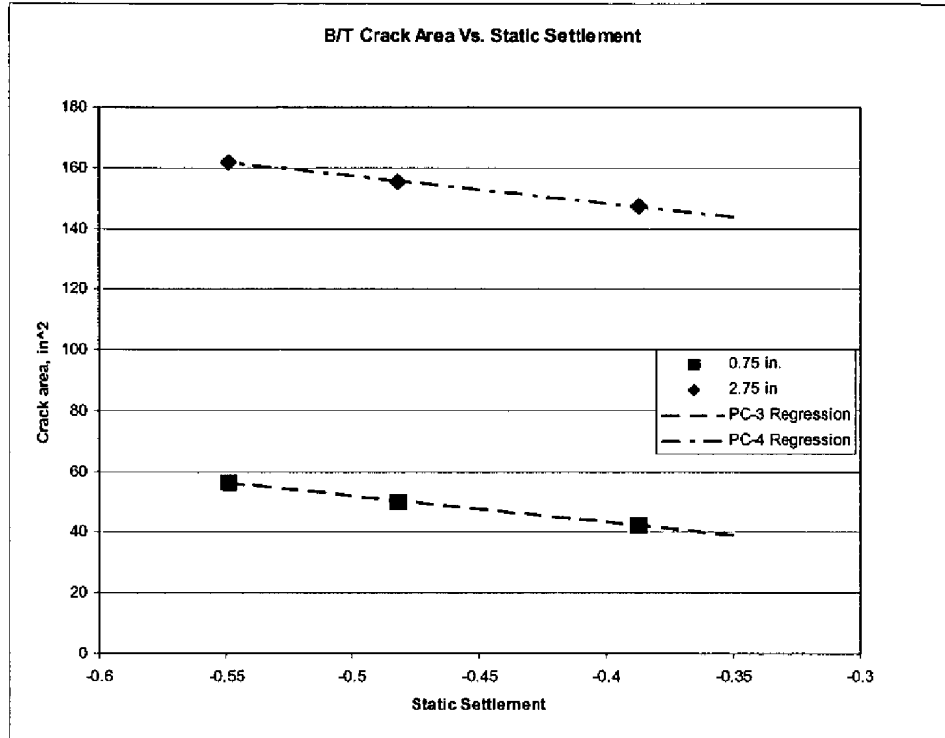
$$CA_{tds}(2.4) = 46.771$$

$$CA_{tds}(2.8) = 62.438$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Effect of Static Settlement (time)

Bottom Cracks



Average slope of the linear regression for PC-3 and PC-4 is used to calculate crack area.

$$S_{pc3} := -86.38942 \quad S_{pc4} := -89.7028 \quad SI := \frac{S_{pc3} + S_{pc4}}{2}$$

$$SI = -88.046$$

$$\Delta_{1000} := -4823$$

$$CA_{ss}(\Delta_s) := SI \cdot (\Delta_s - \Delta_{1000})$$

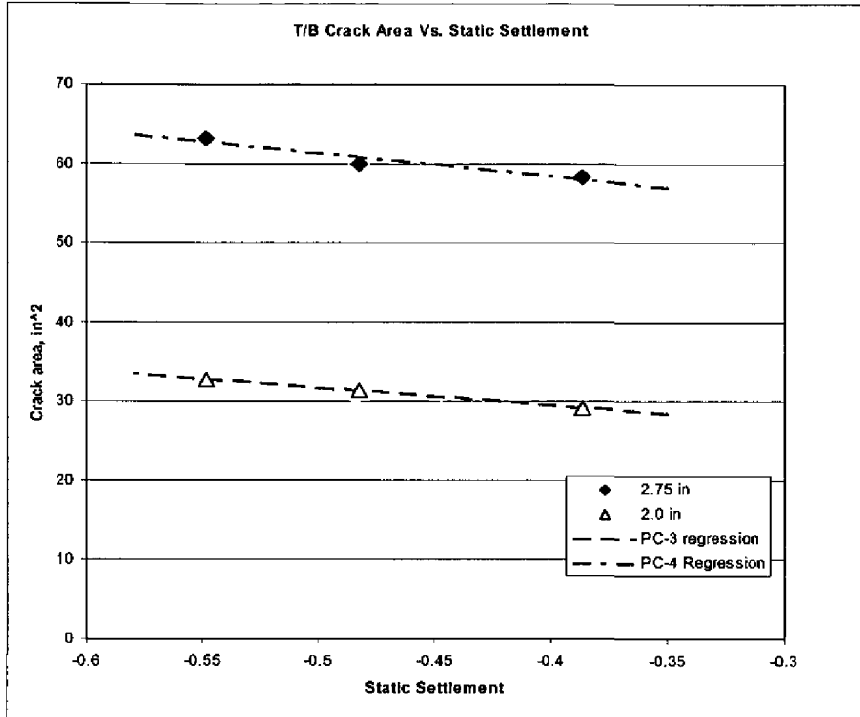
Examples

$$CA_{ss}(-.4) = -7.246$$

$$CA_{ss}(-.6) = 10.363$$

This value is added to the crack area

Top Cracks



Average slope of the linear regression for PC-3 and PC-4 is used to calculate crack area.

$$S_{pc3} := -22.15328 \quad S_{pc4} := -29.12115 \quad SI := \frac{S_{pc3} + S_{pc4}}{2}$$

$$SI = -25.637$$

$$\Delta_{1000} := -4823$$

$$CA_{tss}(\Delta_s) := SI \cdot (\Delta_s - \Delta_{1000})$$

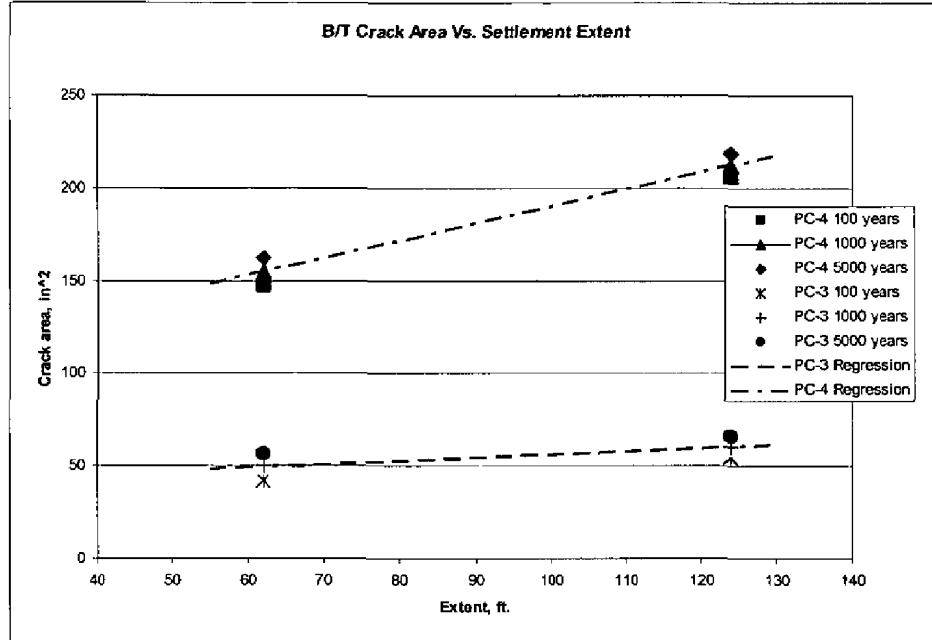
Examples

$$CA_{tss}(-4) = -2.11 \quad CA_{tss}(-.6) = 3.018$$

This value is added to the crack area

Effect of Extent of Settlement

Bottom Cracks



Exm := 62

The slope of the data regression fit is greater for the PC-4 than the PC-3 data. Assume a linear variation of the slope.

$$S_{pc3} := 0.17354 \quad S_{pc4} := 0.92323 \quad A_{sl} := .5 \quad B_{sl} := .5$$

Given

$$S_{pc3} = A_{sl} \cdot 0.75 + B_{sl}$$

$$S_{pc4} = A_{sl} \cdot 2.75 + B_{sl}$$

$$AA := \text{Find}(A_{sl}, B_{sl}) \quad AA = \begin{pmatrix} 0.375 \\ -0.108 \end{pmatrix}$$

$$Sl(\Delta_d) := 0.375 \cdot \Delta_d - 0.108 \quad \text{Ex is settlement extent, ft.}$$

$$CA_{ex}(Ex, \Delta_d) := Sl(\Delta_d) \cdot (Ex - Exm) \quad \text{Exm is mean settlement extent}$$

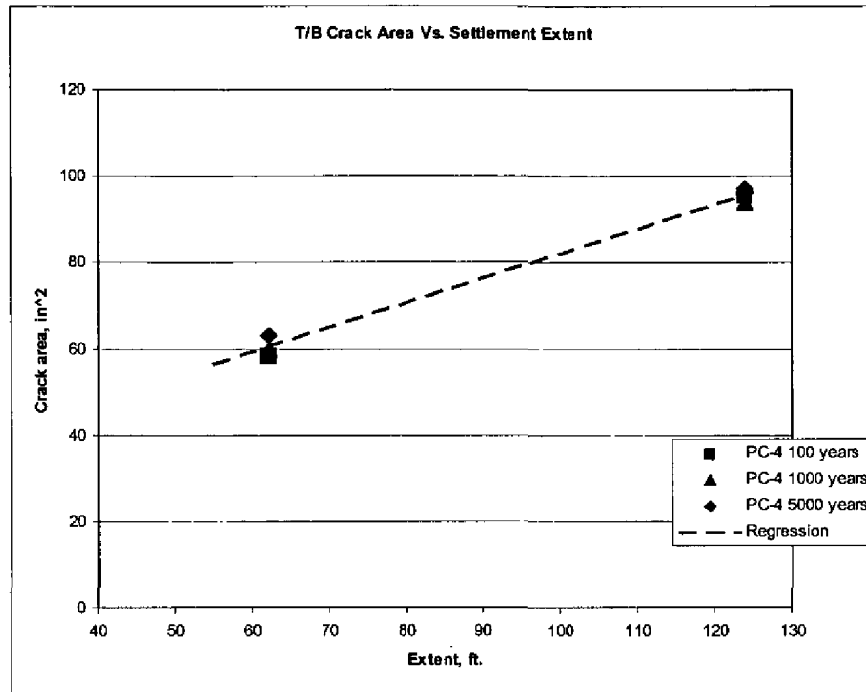
Examples

$$CA_{ex}(40, 2) = -14.124$$

$$CA_{ex}(140, 1.5) = 35.451$$

This value is added to the crack area.

Top Cracks



The relationship is expressed as follows:

$$CA_{tex}(Ex) := 0.566 \cdot (Ex - Exm)$$

Examples

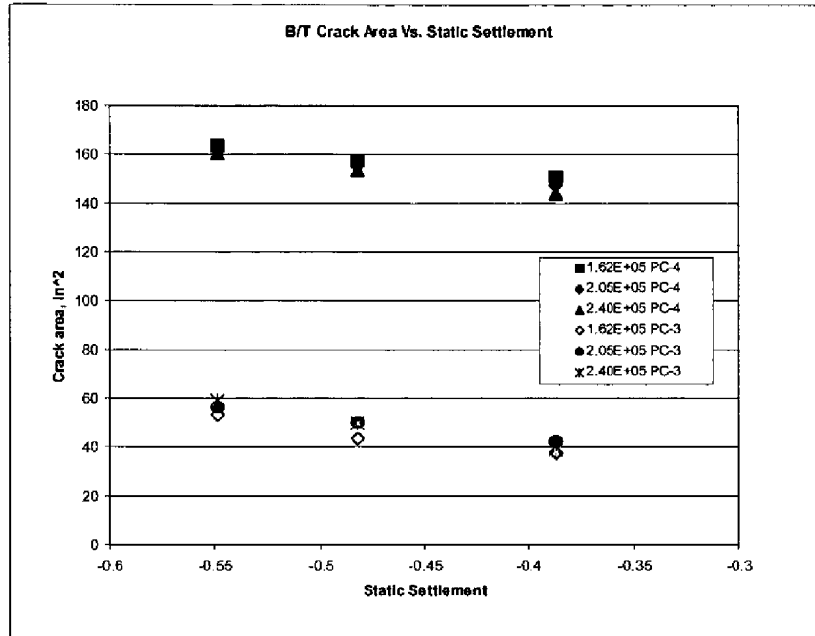
$$CA_{tex}(55) = -3.962$$

$$CA_{tex}(125) = 35.658$$

This value is added to the crack area.

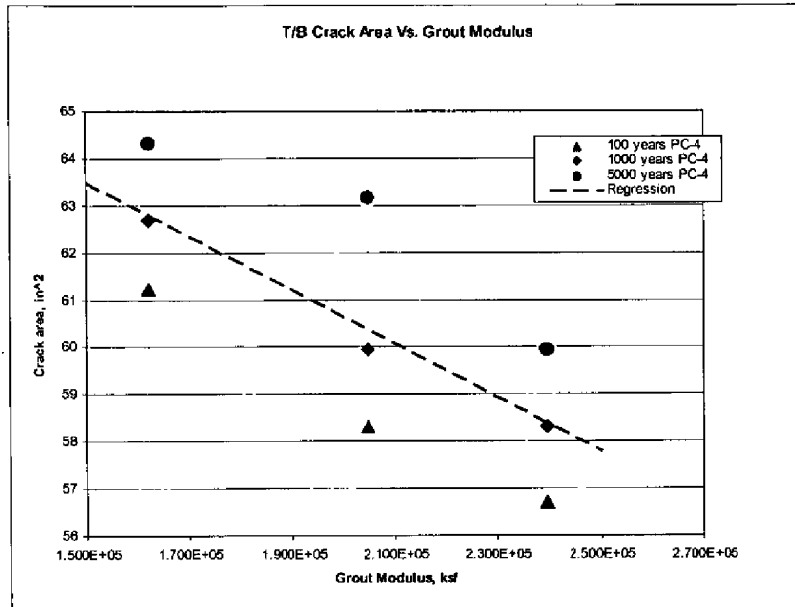
Effect of Saltstone Modulus

Bottom Cracks



No trends in the data were noted for Saltstone Modulus effects with respect to bottom cracks.

Top Cracks



Linear regression was used to compute the slope of the change in crack area for top cracks with respect to Saltstone modulus

$$E_{gm} := 2.048 \cdot 10^5$$

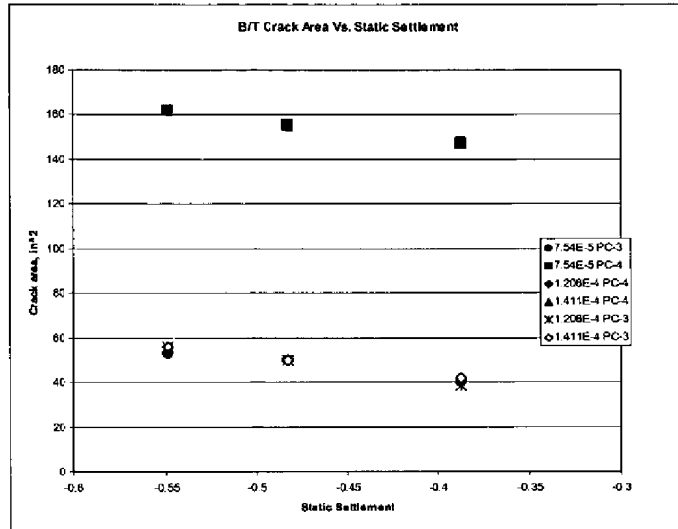
$$CA_{tgm}(E_g) := -5.6831 \cdot 10^{-5} \cdot (E_g - E_{gm})$$

Examples $CA_{tgm}(2.5 \cdot 10^5) = -2.569$ $CA_{tgm}(1.9 \cdot 10^5) = 0.841$

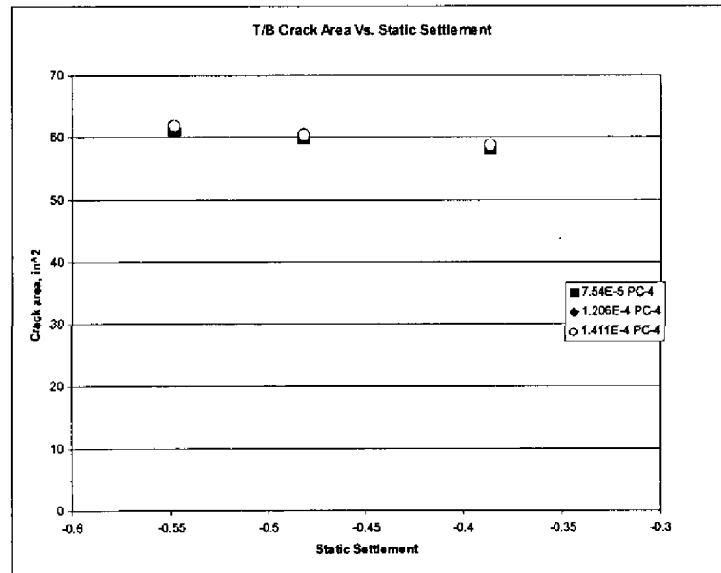
This value is added to the crack area.

Grout Cracking Strain Effect

Bottom Cracks



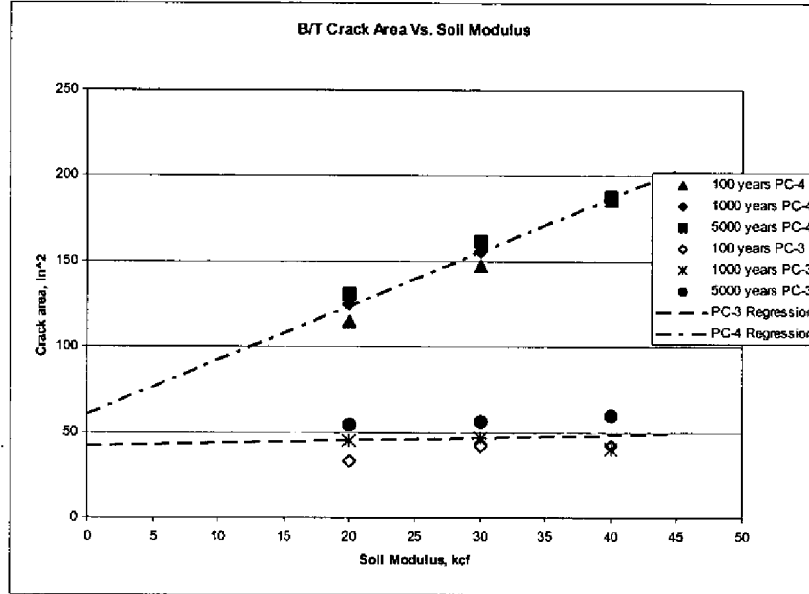
Top Cracks



No significant effect of saltstone cracking strain on crack area was noted.

Soil Bulk Modulus Effect

Bottom Cracks



$K_{sm} := 30$

The slope of the data regression fit is greater for the PC-4 than the PC-3 data. Assume a linear variation of the slope.

$S_{pc3} := 0.163$ $S_{pc4} := 3.159$ $A_{sl} := .5$ $B_{sl} := .5$

Given

$S_{pc3} = A_{sl} \cdot 0.75 + B_{sl}$

$S_{pc4} = A_{sl} \cdot 2.75 + B_{sl}$

$AA := \text{Find}(A_{sl}, B_{sl})$

$AA = \begin{pmatrix} 1.498 \\ -0.96 \end{pmatrix}$

$Sl(\Delta_d) := 1.498 \cdot \Delta_d - 0.96$

K_s is soil bulk modulus, kcf

$CA_{sm}(K_s, \Delta_d) := Sl(\Delta_d) \cdot (K_s - K_{sm})$

K_{sm} is mean soil bulk modulus

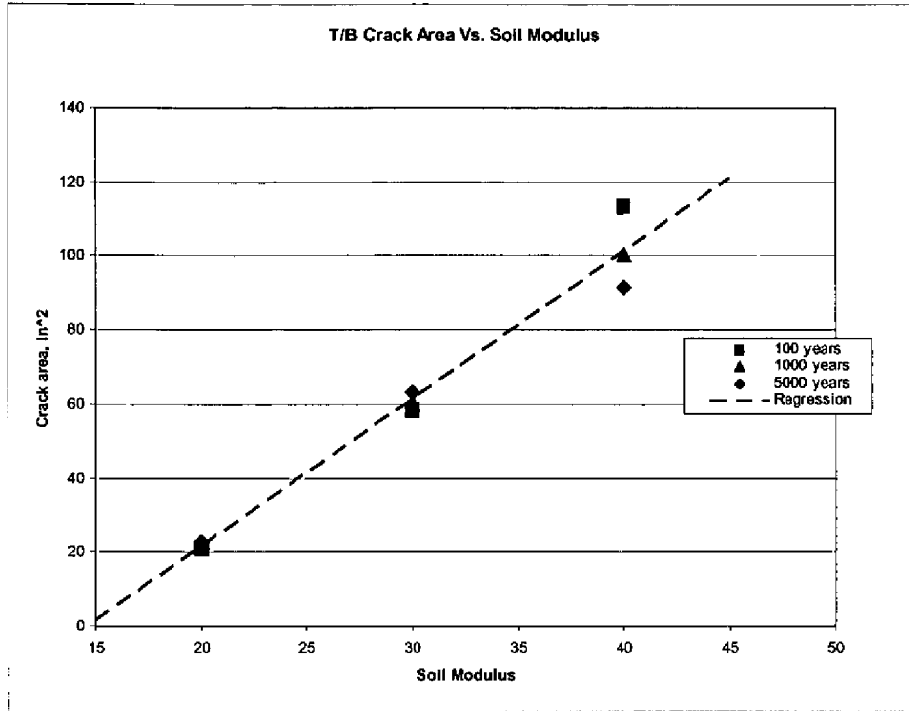
Examples

$CA_{sm}(20, 2) = -20.36$

$CA_{sm}(45, 1.5) = 19.305$

This value is added to the crack area.

Top Cracks



The expression for the effect on top crack area is based on the PC-4 data.

$$K_{sm} := 30$$

$$CA_{tsm}(K_s) := 3.9822 \cdot (K_s - K_{sm})$$

Examples $CA_{tsm}(25) = -19.911$ $CA_{tsm}(45) = 59.733$

This value is added to the crack area.

Total Crack Area

Bottom Cracks $CA_b := CA_{ds}(\Delta_d) + CA_{ss}(\Delta_s) + CA_{ex}(Ext, \Delta_d) + CA_{sm}(K_s, \Delta_d)$

Top Cracks $CA_t := CA_{tds}(\Delta_d) + CA_{tss}(\Delta_s) + CA_{tex}(Ex) + CA_{tgm}(E_g) + CA_{tsm}(K_s)$

8.3.12 Differential Settlement at Location 5

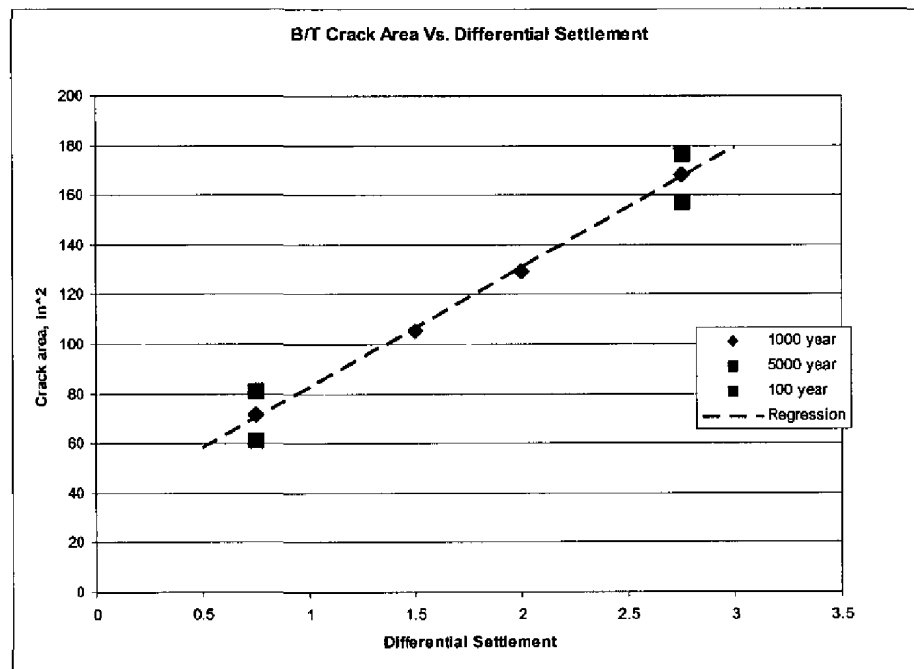
The parameters affecting the formation of cracks due to differential settlement are:

- magnitude of settlement
- time of settlement with respect to the static settlement condition
- extent of settlement
- saltstone modulus
- saltstone cracking strain
- soil bulk modulus

Note: B/T cracks are cracks open at the bottom. T/B cracks are cracks open at the top.

Settlement Magnitude

Bottom Cracks



The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{ds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

$$CA_{ds}(\Delta_d) := 48.336 \cdot \Delta_d + 34.197$$

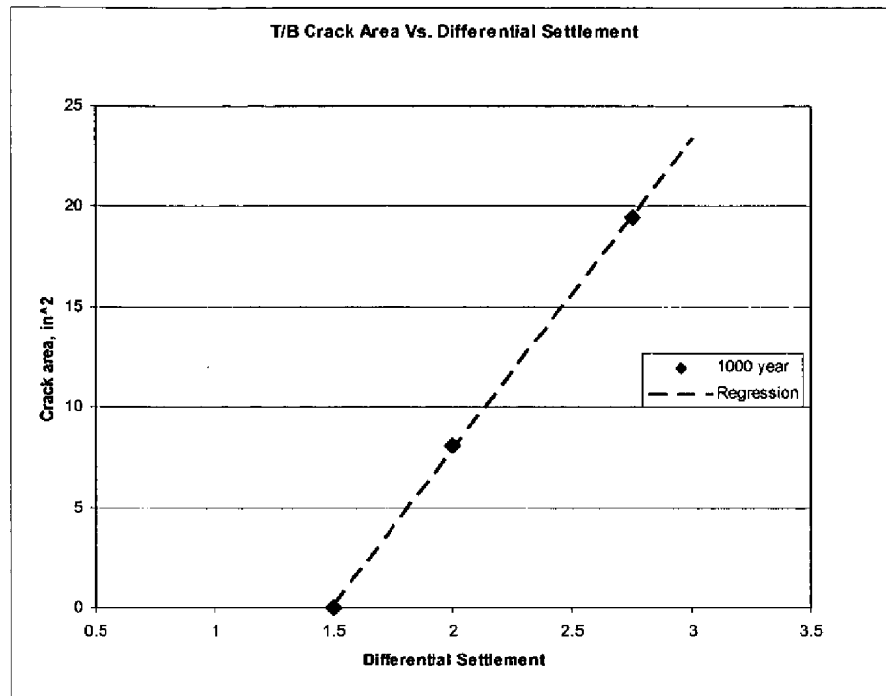
Examples

$$CA_{ds}(2) = 130.869$$

$$CA_{ds}(1.25) = 94.617$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Top Cracks



The settlement is related to the magnitude by linear regression of the 1000 year data.

CA_{tds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

$$CA_{tds}(\Delta_d) := 15.519 \cdot \Delta_d - 23.1572$$

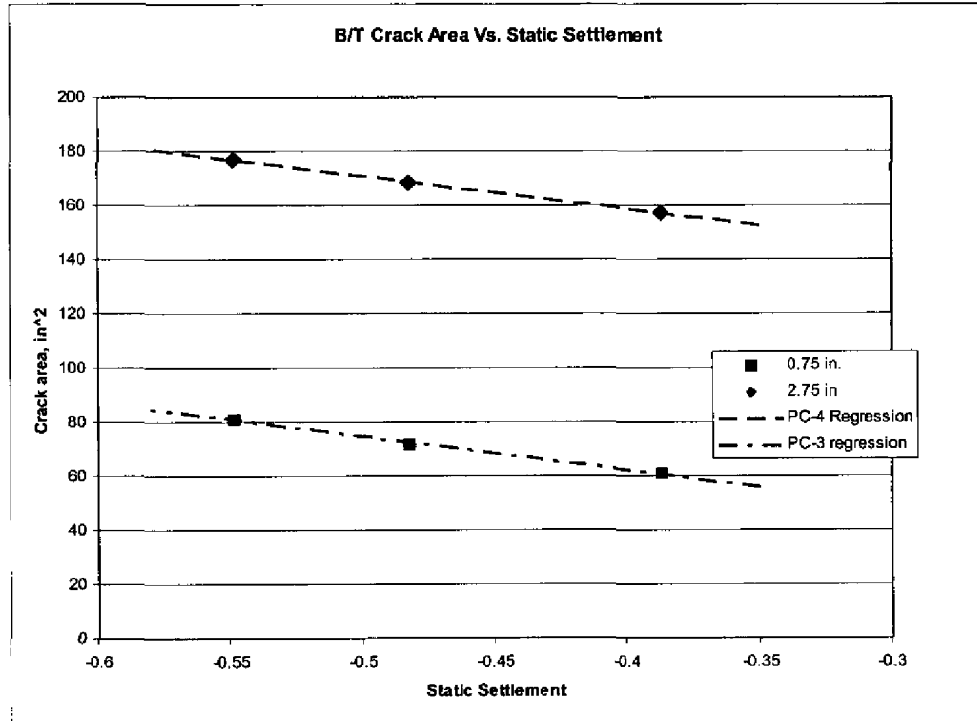
Examples

$$CA_{tds}(2.4) = 14.088 \quad CA_{tds}(2.8) = 20.296$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Effect of Static Settlement (time)

Bottom Cracks



Average slope of the linear regression for PC-3 and PC-4 is used to calculate crack area.

$$S_{pc3} := -124.521 \quad S_{pc4} := -119.994 \quad SI := \frac{S_{pc3} + S_{pc4}}{2}$$

$$SI = -122.257$$

$$\Delta_{1000} := -4823$$

$$CA_{ss}(\Delta_s) := SI \cdot (\Delta_s - \Delta_{1000})$$

Examples

$$CA_{ss}(-.4) = -10.062$$

$$CA_{ss}(-.6) = 14.39$$

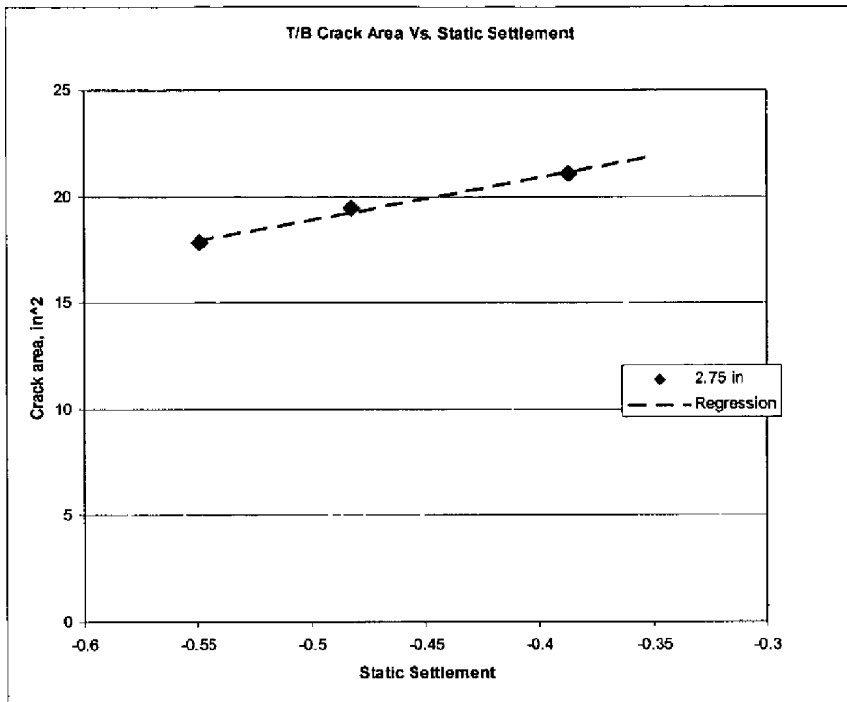
This value is added to the crack area

T-CLC-Z-00006, Rev. 0

PAGE 223

This page Left
intentionally Blank

Top Cracks



Slope of the linear regression for PC-4 is used to calculate crack area.

$$S_{pc4} := 19.804$$

$$\Delta_{1000} := -0.4823$$

$$CA_{tss}(\Delta_s) := S_{pc4} \cdot (\Delta_s - \Delta_{1000})$$

Examples

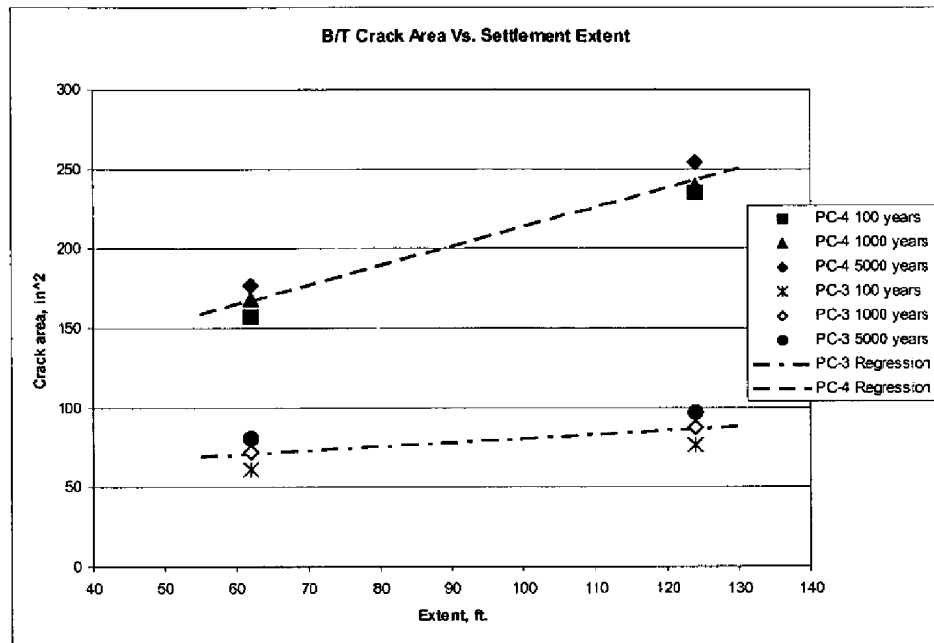
$$CA_{tss}(-.4) = 1.63$$

$$CA_{tss}(-.6) = -2.331$$

This value is added to the crack area

Effect of Extent of Settlement

Bottom Cracks



Exm := 62

The slope of the data regression fit is greater for the PC-4 than the PC-3 data. Assume a linear variation of the slope.

$$S_{pc3} := 0.25077 \quad S_{pc4} := 1.21936 \quad A_{sl} := .5 \quad B_{sl} := .5$$

Given

$$S_{pc3} = A_{sl} \cdot 0.75 + B_{sl}$$

$$S_{pc4} = A_{sl} \cdot 2.75 + B_{sl}$$

$$AA := \text{Find}(A_{sl}, B_{sl})$$

$$AA = \begin{pmatrix} 0.484 \\ -0.112 \end{pmatrix}$$

$$SI(\Delta_d) := 0.484 \cdot \Delta_d - 0.112$$

Ex is settlement extent, ft.

$$CA_{ex}(Ex, \Delta_d) := SI(\Delta_d) \cdot (Ex - Exm)$$

Exm is mean settlement extent

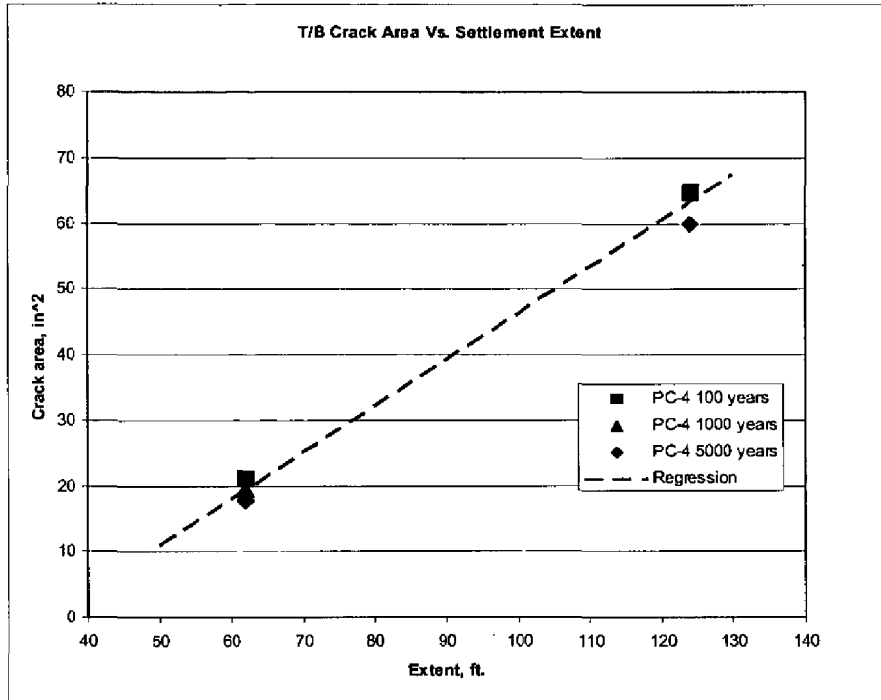
Examples

$$CA_{ex}(40, 1) = -8.184$$

$$CA_{ex}(140, 2.5) = 85.644$$

This value is added to the crack area.

Top Cracks



The relationship is expressed as follows:

$$CA_{tex}(Ex) := 0.7055 \cdot (Ex - Exm)$$

Examples

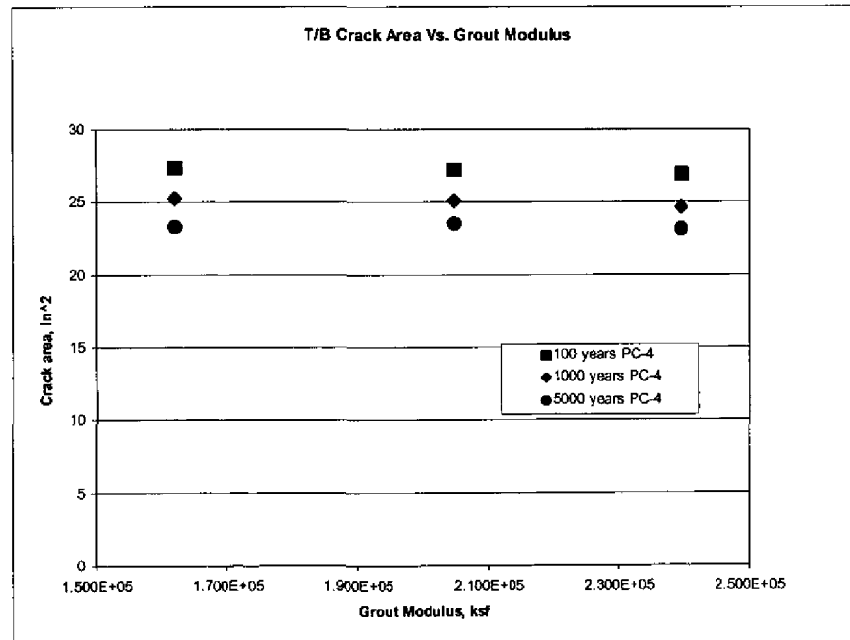
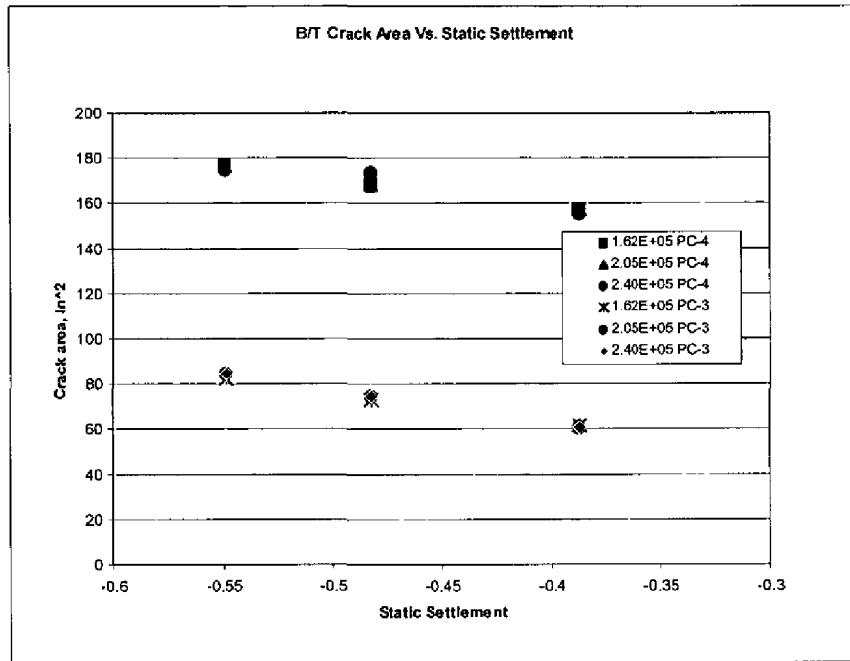
$$CA_{tex}(55) = -4.939$$

$$CA_{tex}(125) = 44.447$$

This value is added to the crack area.

Effect of Saltstone Modulus

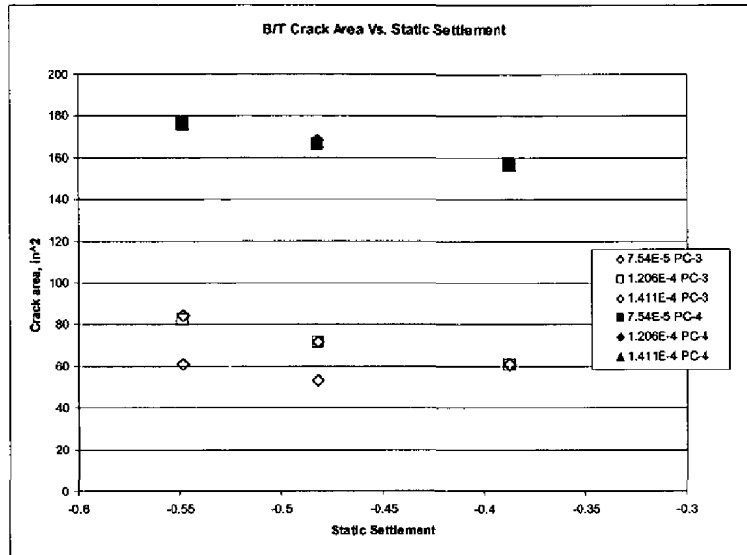
Bottom Cracks



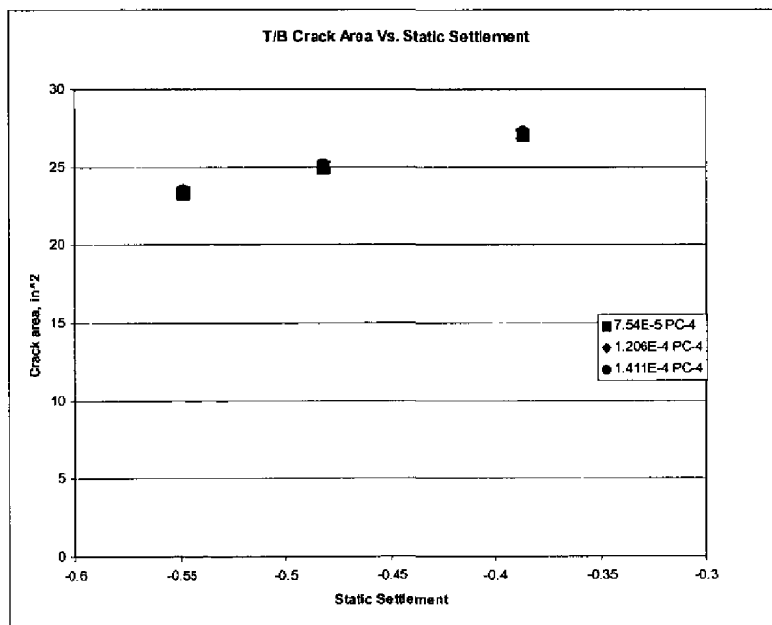
No trends in the data were noted for Saltstone Modulus effects with respect to bottom cracks.

Grout Cracking Strain Effect

Bottom Cracks



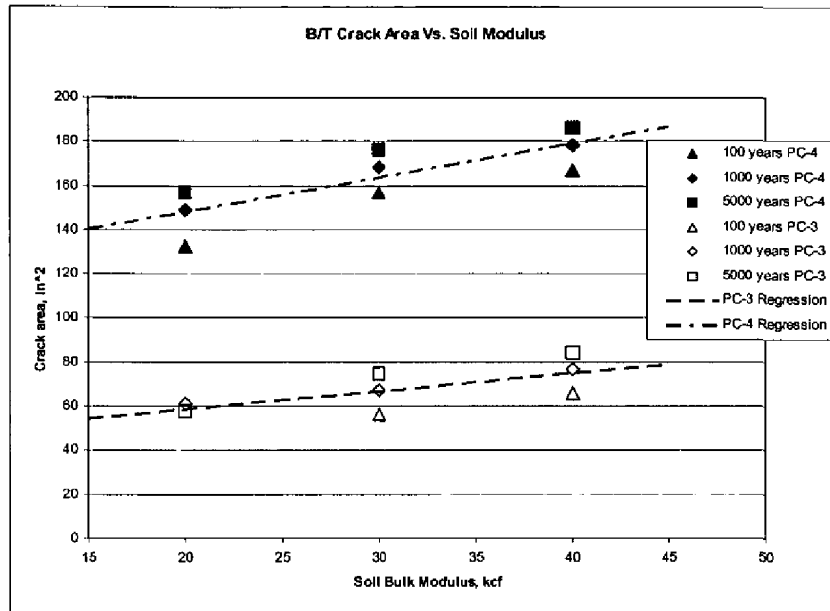
Top Cracks



No significant effect of saltstone cracking strain on crack area was noted.

Soil Bulk Modulus Effect

Bottom Cracks



$K_{sm} := 30$

The slope of the data regression fit is greater for the PC-4 than the PC-3 data. Assume a linear variation of the slope.

$S_{pc3} := 0.816$ $S_{pc4} := 1.543$ $A_{sl} := .5$ $B_{sl} := .5$

Given

$S_{pc3} = A_{sl} \cdot 0.75 + B_{sl}$

$S_{pc4} = A_{sl} \cdot 2.75 + B_{sl}$

$AA := \text{Find}(A_{sl}, B_{sl})$

$AA = \begin{pmatrix} 0.364 \\ 0.543 \end{pmatrix}$

$Sl(\Delta_d) := .364 \cdot \Delta_d + .543$

K_s is soil bulk modulus, kcf

$CA_{sm}(K_s, \Delta_d) := Sl(\Delta_d) \cdot (K_s - K_{sm})$

K_{sm} is mean soil modulus

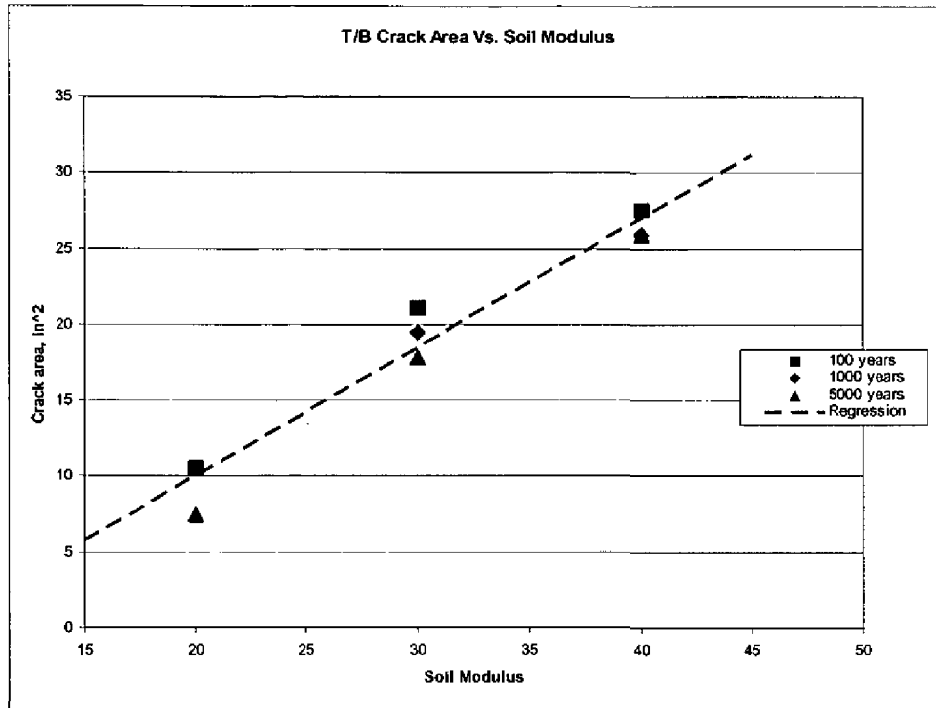
Examples

$CA_{sm}(20, 2) = -12.71$

$CA_{sm}(45, 1.5) = 16.335$

This value is added to the crack area.

Top Cracks



The expression for the effect on top crack area is based on the PC-4 data.

$$K_{sm} := 30$$

$$CA_{tsm}(K_s) := 0.848 \cdot (K_s - K_{sm})$$

Examples $CA_{tsm}(25) = -4.24$ $CA_{tsm}(45) = 12.72$

This value is added to the crack area.

Total Crack Area

Bottom Cracks $CA_b := CA_{ds}(\Delta_d) + CA_{ss}(\Delta_s) + CA_{ex}(Ext, \Delta_d) + CA_{sm}(K_s, \Delta_d)$

Top Cracks $CA_t := CA_{tds}(\Delta_d) + CA_{tss}(\Delta_s) + CA_{tex}(Ex) + CA_{tsm}(K_s)$

8.3.13 Differential Settlement at Location 6

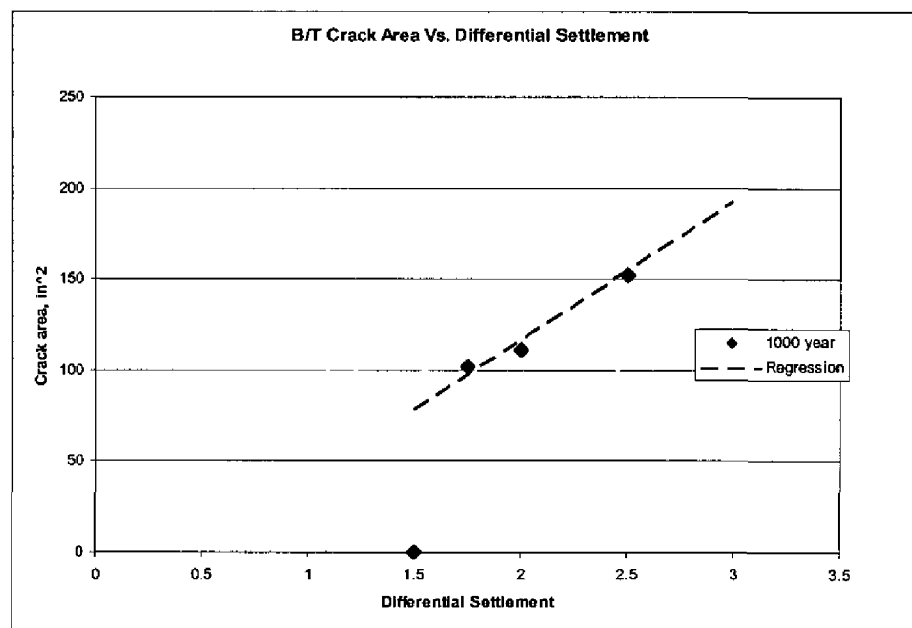
The parameters affecting the formation of cracks due to differential settlement are:

- magnitude of settlement
- time of settlement with respect to the static settlement condition
- extent of settlement
- saltstone modulus
- saltstone cracking strain
- soil bulk modulus

Note: B/T cracks are cracks open at the bottom. T/B cracks are cracks open at the top.

Settlement Magnitude

Bottom Cracks



The settlement is related to the magnitude by linear regression of the 1000 year data. The regression is truncated at 1.5 in differential settlement

CA_{ds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

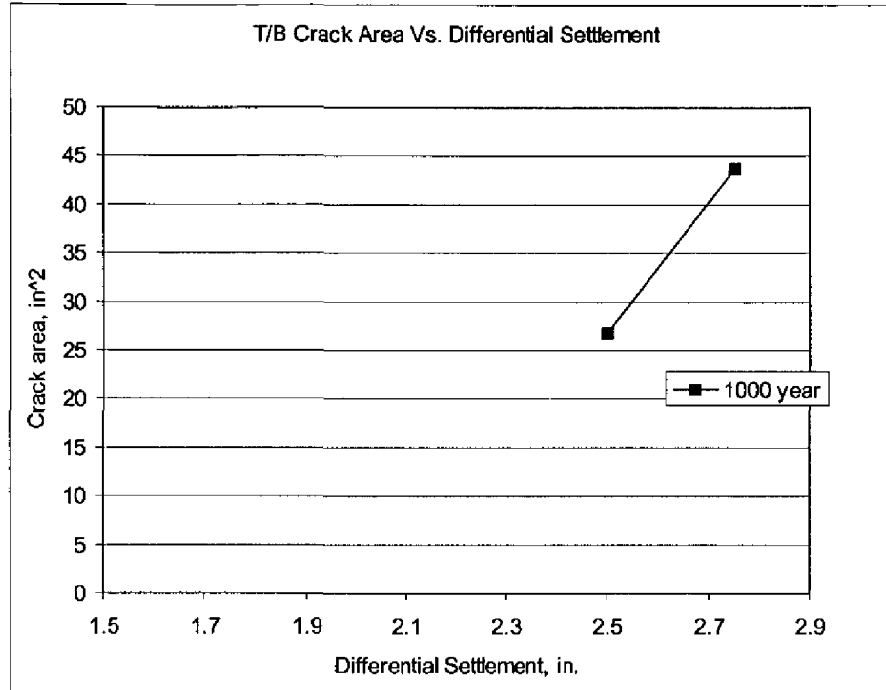
$$CA_{ds}(\Delta_d) := 76.14 \cdot \Delta_d - 35.8425$$

Examples

$$CA_{ds}(2.5) = 154.507 \quad CA_{ds}(1.75) = 97.403$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Top Cracks



The settlement is related to the magnitude by the 1000 year data. Data is truncated at crack area = 0.

CA_{tds} - Crack Area due to differential settlement magnitude

Δ_d - Differential settlement, in.

$$CA_{tds}(\Delta_d) := 68.04 \cdot \Delta_d - 143.37$$

Examples

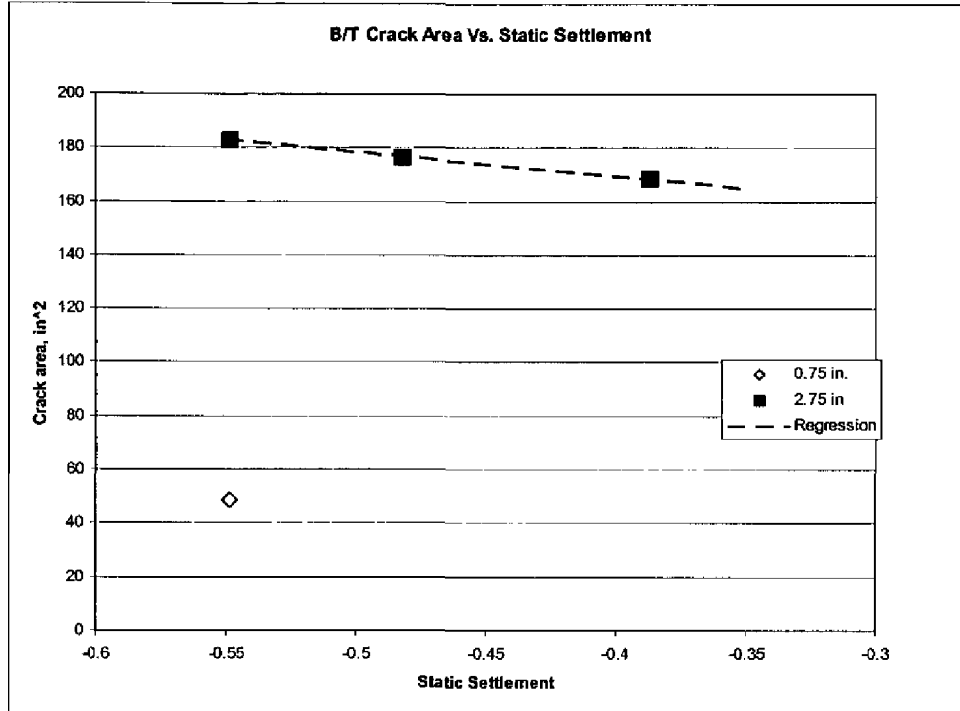
$$CA_{tds}(2.2) = 6.318$$

$$CA_{tds}(2.8) = 47.142$$

Settlements larger than PC-4 (2.75 in.) are linearly extrapolated.

Effect of Static Settlement (time)

Bottom Cracks



Linear regression for PC-4 is used to calculate crack area.

$$S_{pc4} := -89.703$$

$$\Delta_{1000} := -.4823$$

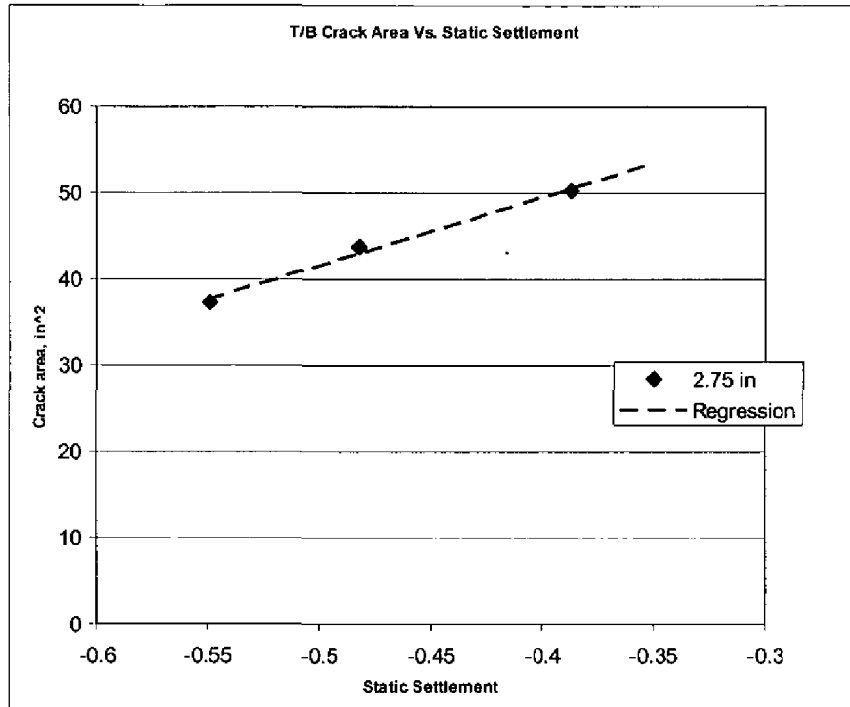
$$CA_{ss}(\Delta_s) := S_{pc4}(\Delta_s - \Delta_{1000})$$

Examples $CA_{ss}(-.4) = -7.383$

$CA_{ss}(-.6) = 10.558$

This value is added to the crack area

Top Cracks



Slope of the linear regression for PC-4 is used to calculate crack area.

$$S_{pc4} := 79.216$$

$$\Delta_{1000} := -0.4823$$

$$CA_{tss}(\Delta_s) := S_{pc4} \cdot (\Delta_s - \Delta_{1000})$$

Examples

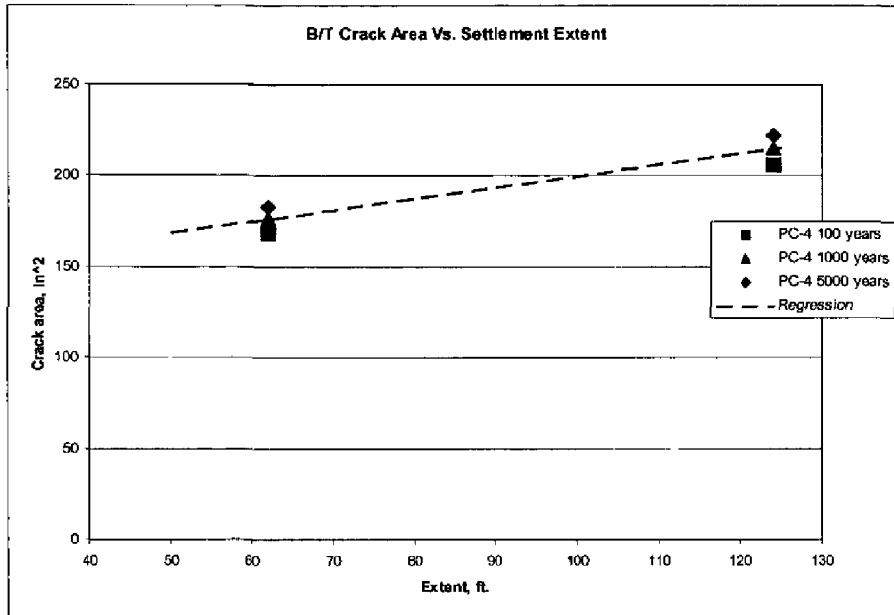
$$CA_{tss}(-0.4) = 6.519$$

$$CA_{tss}(-0.6) = -9.324$$

This value is added to the crack area

Effect of Extent of Settlement

Bottom Cracks



Linear regression is used for the PC-4 data to calculate change in crack area.

$$Ex_m := 62$$

$$S_{pc4} := 0.6184$$

$$CA_{ex}(Ex) := S_{pc4} \cdot (Ex - Ex_m)$$

Ex is settlement extent, ft.

Ex_m is mean settlement extent

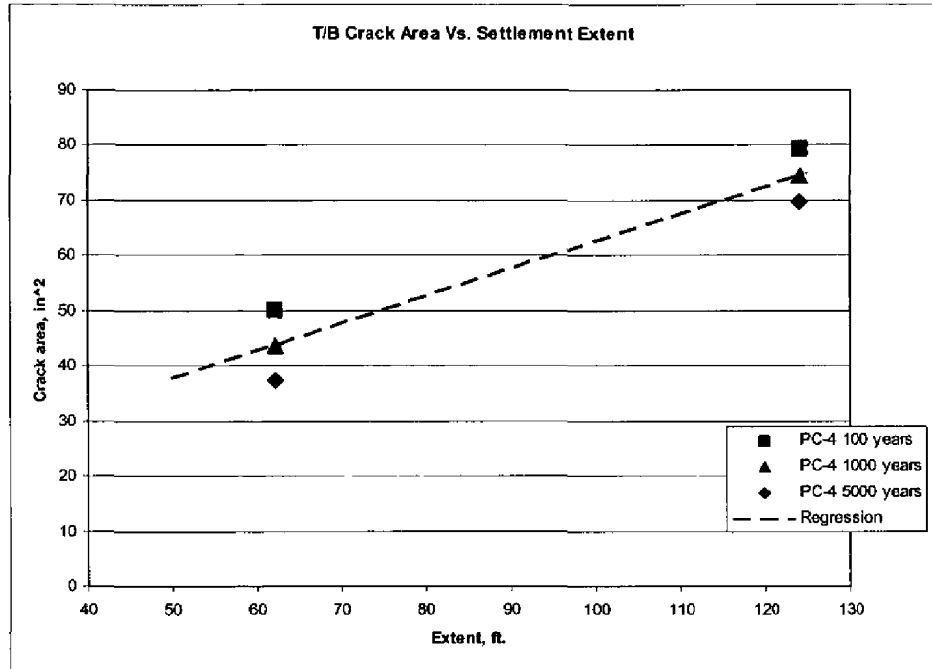
Examples

$$CA_{ex}(40) = -13.605$$

$$CA_{ex}(140) = 48.235$$

This value is added to the crack area.

Top Cracks



The relationship is expressed as follows:

$$CA_{tex}(Ex) := 0.4964 \cdot (Ex - Ex_m)$$

Examples

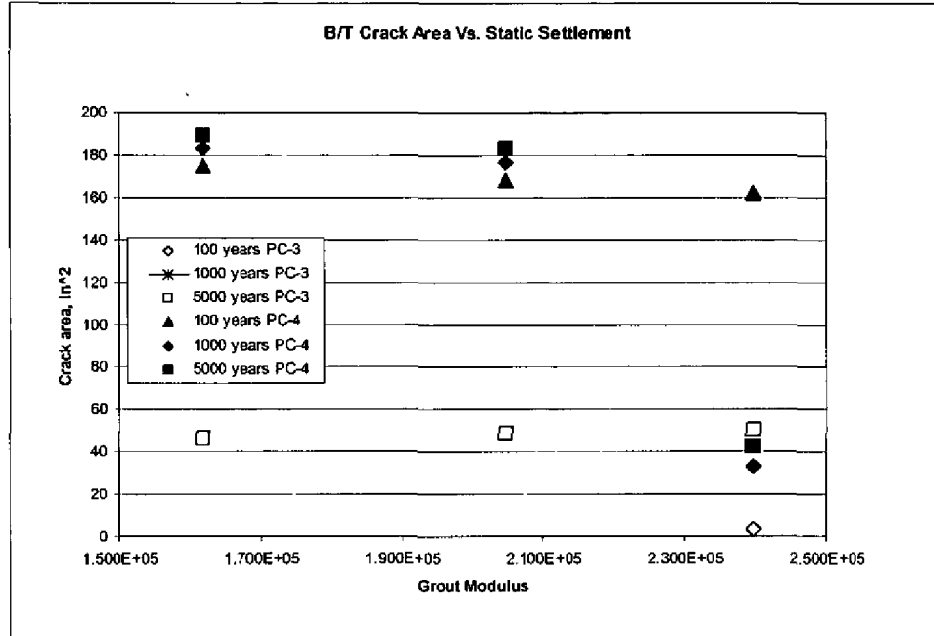
$$CA_{tex}(55) = -3.475$$

$$CA_{tex}(125) = 31.273$$

This value is added to the crack area.

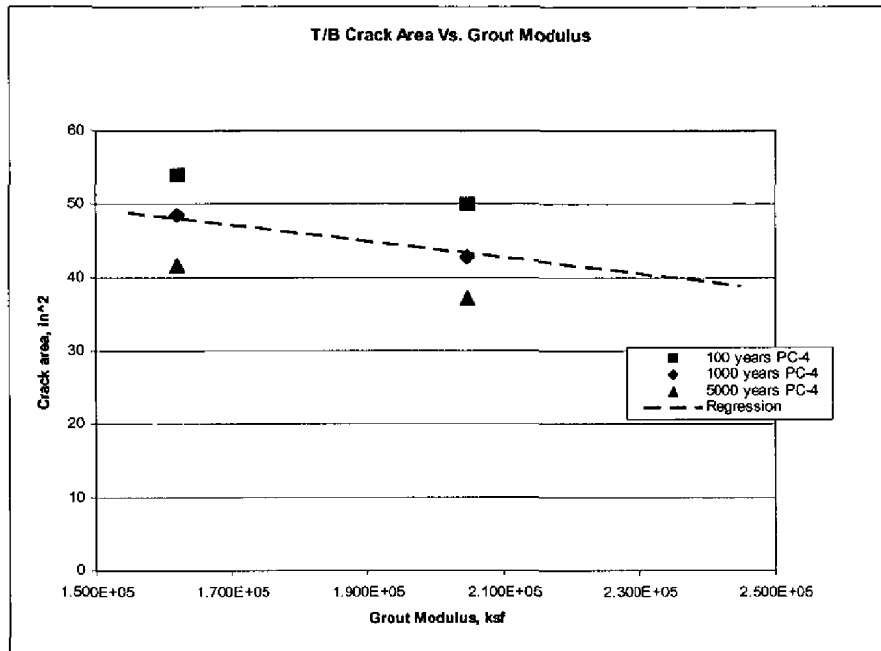
Effect of Saltstone Modulus

Bottom Cracks



There is an anomalous effect for high saltstone modulus. This is related to the anomalous cracking caused by the static settlement as noted previously, since the differential settlements are input to the model in combination with the static settlements. In addition, the crack caused by differential settlement at location 6 is at the same joint (7) as that caused by the static settlement. Otherwise no significant trends are noted.

Top Cracks



A linear regression is used to calculate change in crack area with saltstone modulus.

$$S_{pc4} := -1.1077 \cdot 10^{-4} \quad E_{gm} := 2.048 \cdot 10^5$$

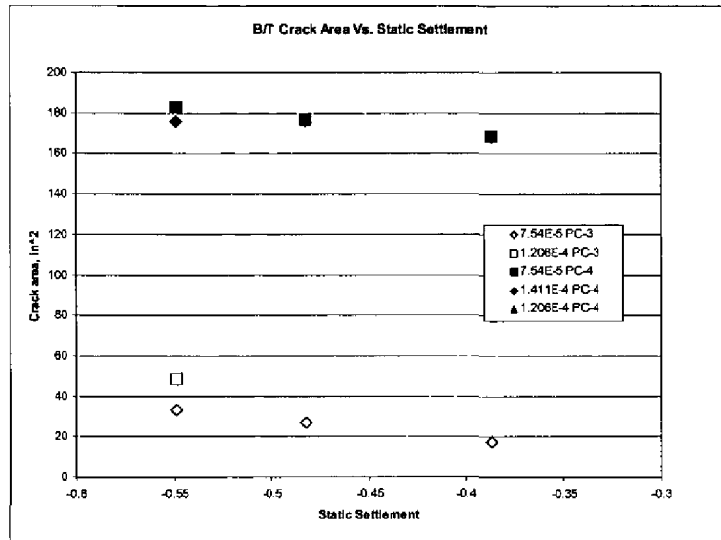
$$CA_{tgm}(E_g) := S_{pc4} \cdot (E_g - E_{gm})$$

Examples $CA_{tgm}(1.9 \cdot 10^5) = 1.639$ $CA_{tgm}(2.4 \cdot 10^5) = -3.899$

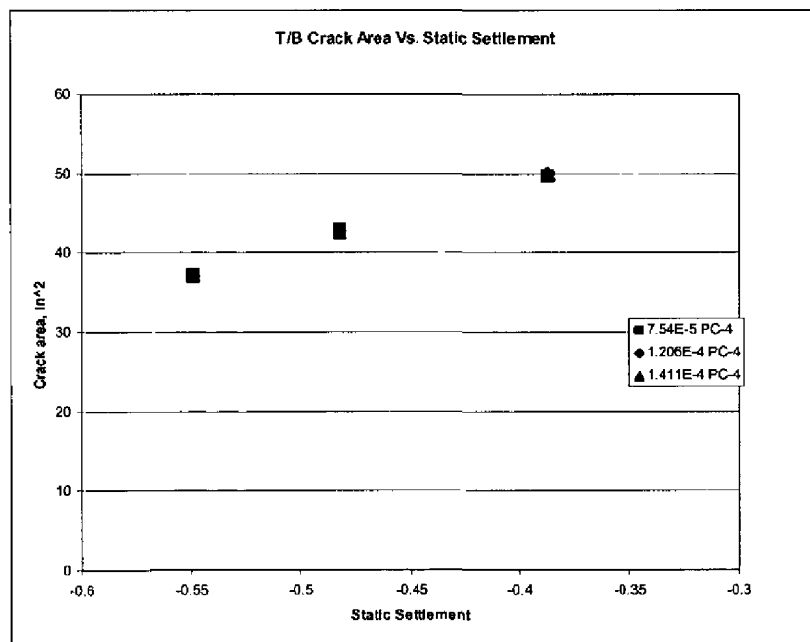
Value is added to the crack area.

Grout Cracking Strain Effect

Bottom Cracks



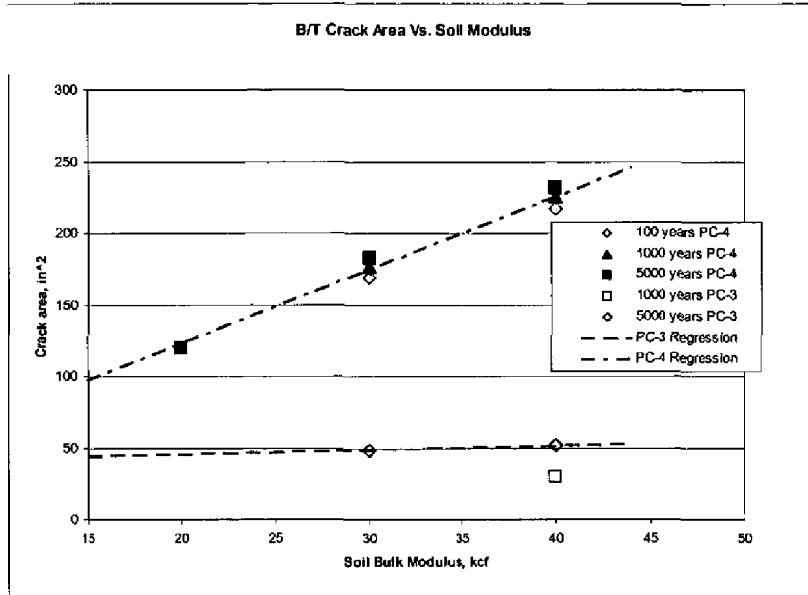
Top Cracks



No significant effect of saltstone cracking strain on crack area is noted.

Soil Bulk Modulus Effect

Bottom Cracks



$K_{sm} := 30$

The slope of the data regression fit is greater for the PC-4 than the PC-3 data. Assume a linear variation of the slope.

$S_{pc3} := 0.312$ $S_{pc4} := 5.1435$ $A_{sl} := .5$ $B_{sl} := .5$

Given

$S_{pc3} = A_{sl} \cdot 0.75 + B_{sl}$

$S_{pc4} = A_{sl} \cdot 2.75 + B_{sl}$

$AA := \text{Find}(A_{sl}, B_{sl})$

$AA = \begin{pmatrix} 2.416 \\ -1.5 \end{pmatrix}$

$SI(\Delta_d) := 2.416 \cdot \Delta_d - 1.5$

K_s is soil bulk modulus, kcf

$CA_{sm}(K_s, \Delta_d) := SI(\Delta_d) \cdot (K_s - K_{sm})$

K_{sm} is mean soil bulk modulus, kcf

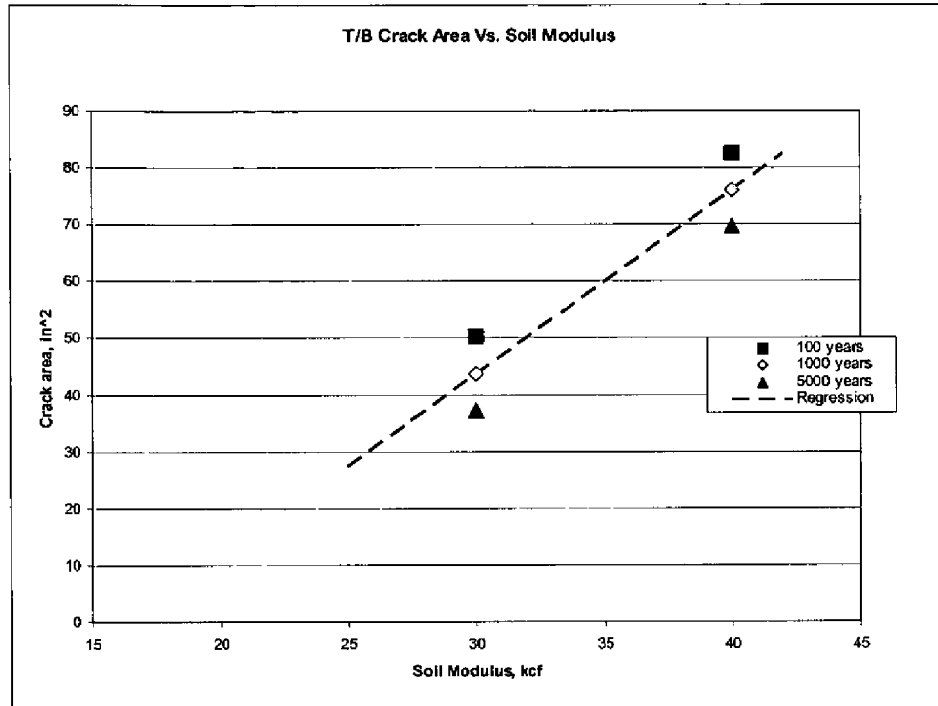
Examples

$CA_{sm}(20, 1.5) = -21.24$

$CA_{sm}(45, 2) = 49.98$

This value is added to the crack area.

Top Cracks



The expression for the effect on top crack area is based on the PC-4 data.

$$K_{sm} := 30$$

$$CA_{tsm}(K_s) := 3.24 \cdot (K_s - K_{sm})$$

Examples $CA_{tsm}(25) = -16.2$ $CA_{tsm}(45) = 48.6$

This value is added to the crack area.

Total Crack Area

Bottom Cracks $CA_b := CA_{ds}(\Delta_d) + CA_{ss}(\Delta_s) + CA_{ex}(Ext, \Delta_d) + CA_{sm}(K_s, \Delta_d)$

Top Cracks $CA_t := CA_{tds}(\Delta_d) + CA_{tss}(\Delta_s) + CA_{tb}(Ex) + CA_{tgm}(E_g) + CA_{tsm}(K_s)$

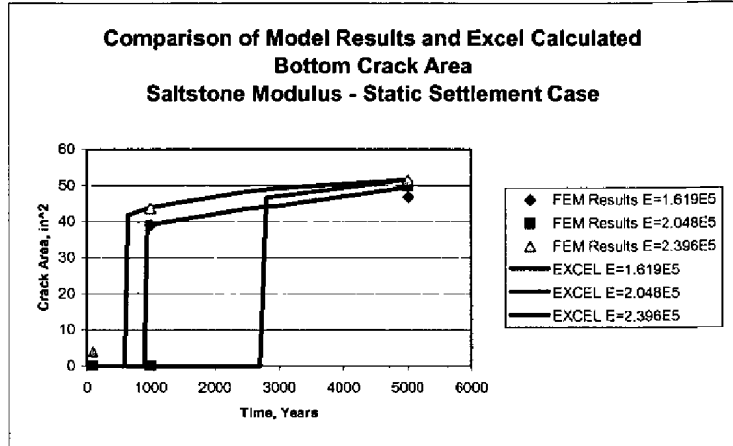
Section 8.3.14 Data Check

Note: There is a slight variation in the data due to the graphical take-offs of the crack widths and lengths. This variation is insignificant in terms of standard deviations.

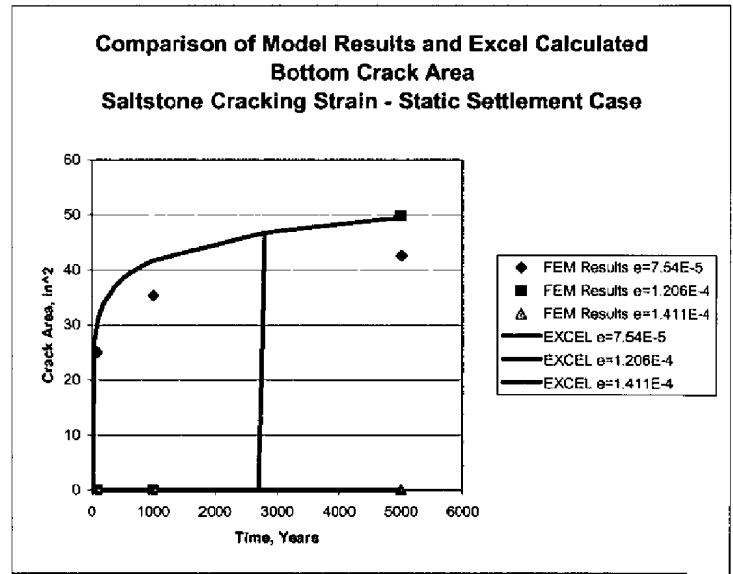
Comparison of Model Results with Excel Calculated Crack Areas

Bottom Cracks from Static Settlement

Time	Crack Areas - FE Model Results		
	1.62E+05	2.05E+05	2.40E+05
Grout Mod			
Time			
100	0	0	3.9
1000	39	0	43.65
5000	46.8	49.92	51.48
Grout Strain	7.54E-05	1.21E-04	1.41E-04
Time			
100	25.05	0	0
1000	35.4	0	0
5000	42.6	49.92	0



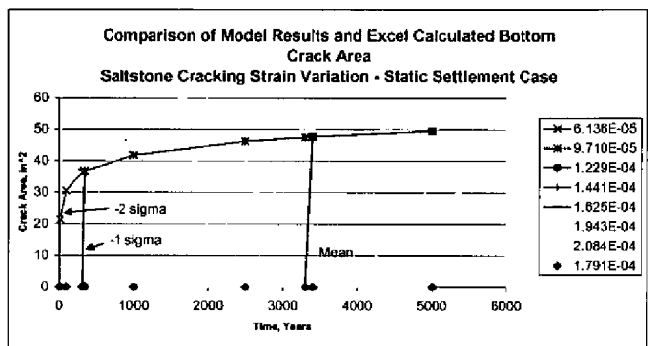
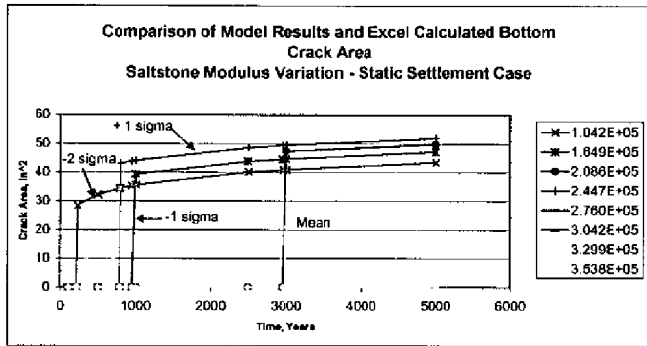
Grout Mod	Crack Areas EXCEL Workbook		
	1.62E+05	2.05E+05	2.40E+05
Time			
100	0	0	0
500	0	0	0
600	0	0	0
650	0	0	41.78
700	0	0	42.14
800	0	0	42.79
900	0	0	43.36
950	39.9	0	43.62
1000	39.16	0	43.95
2500	43.6	0	48.31
2700	43.97	0	48.69
2800	44.15	46.75	48.86
3000	44.48	47.09	48.2
5000	49.56	51.75	51.68



Grout Strain	Crack Areas EXCEL Workbook		
	7.54E-05	1.21E-04	1.41E-04
Time			
25	0	0	0
50	27.23	0	0
100	30.61	0	0
125	31.67	0	0
150	32.55	0	0
200	33.95	0	0
400	37.31	0	0
500	38.4	0	0
600	39.28	0	0
650	39.66	0	0
950	41.51	0	0
1000	41.76	0	0
2700	46.58	0	0
2800	46.75	46.75	0
3000	47.09	47.09	0
5000	49.56	49.56	0

Saltstone Modulus		Time, years												
		100	200	225	500	775	800	950	1000	2500	2950	3000	5000	
-5 sigma	N/A													
-4 sigma	N/A													
-3 sigma	N/A													
-2 sigma	1.042E+05	0	0	28.41	32.29	34.41	34.57	35.4	35.657	40.097	40.9	40.98	43.457	
-1 sigma	1.648E+05	0	0	0	0	0	0	0	39.34	43.762	44.58	44.66	47.142	
mean	2.086E+05	0	0	0	0	0	0	0	0	0	0	47.32	49.796	
+1 sigma	2.447E+05	0	0	0	0	0	43.1	43.93	44.188	48.627	49.43	49.51	51.986	
+2 sigma	2.760E+05	0	0	0	0	0	0	0	0	0	0	0	0	
+3 sigma	3.042E+05	0	0	0	0	0	0	0	0	0	0	0	0	
+4 sigma	3.299E+05	0	0	0	0	0	0	0	0	0	0	0	0	
+5 sigma	3.538E+05	0	0	0	0	0	0	0	0	0	0	0	0	

Saltstone Cracking Strain		Time, years											
		10	15	100	325	350	1000	2500	3300	3400	5000		
-5 sigma	N/A												
-4 sigma	N/A												
-3 sigma	N/A												
-2 sigma	6.136E-05	0	21.39	30.59	36.31	36.67	41.78	46.2	47.55	47.69	49.56		
-1 sigma	9.710E-05	0	0	0	0	36.67	41.78	46.2	47.55	47.69	49.56		
mean	1.229E-04	0	0	0	0	0	0	0	0	47.69	49.56		
+1 sigma	1.441E-04	0	0	0	0	0	0	0	0	0	0		
+2 sigma	1.625E-04	0	0	0	0	0	0	0	0	0	0		
+3 sigma	1.791E-04	0	0	0	0	0	0	0	0	0	0		
+4 sigma	1.943E-04	0	0	0	0	0	0	0	0	0	0		
+5 sigma	2.084E-04	0	0	0	0	0	0	0	0	0	0		



Data Check

Note: There is a slight variation in the data due to the graphical take-offs of the crack widths and lengths. This variation is insignificant in terms of standard deviations.

Comparison of Model Results with Excel Calculated Crack Areas

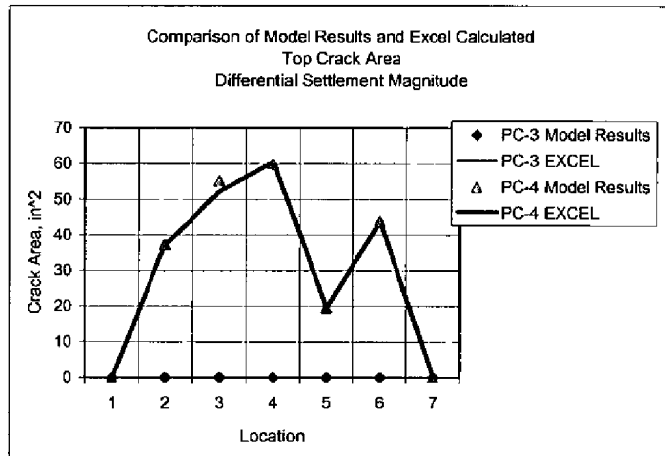
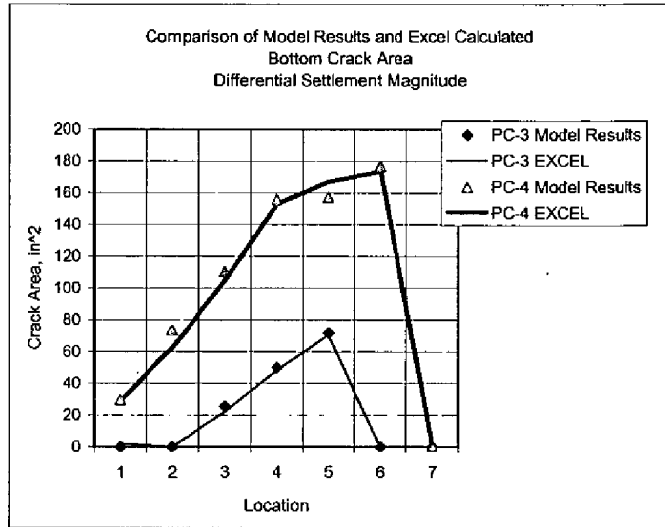
Crack Area as Related to Differential Settlement Magnitude

PC-3 0.75 in. @ 1000 years

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	0	0	2.01	0.00
2	0	0	0.00	0
3	25.5	0	21.85	0
4	49.92	0	48.29	0
5	71.76	0	70.45	0
6	0	0	0.00	0
7	0	0	0	0

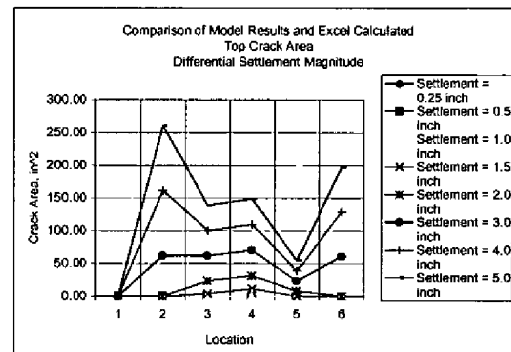
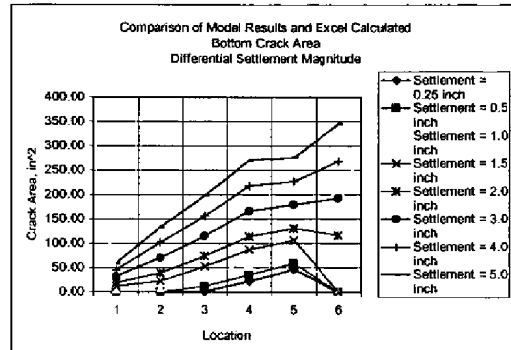
PC-4 2.75 in. @ 1000 years

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	29.48	0	28.89	0.00
2	73.32	37.26	62.51	37.30
3	110.16	55.08	104.87	52.21
4	155.52	59.94	153.13	60.49
5	157.14	19.44	167.13	19.48
6	176.58	43.74	173.54	43.74
7	0	0	0.00	0.00



Check Range of Parameter
mean properties - 1000 years

Bottom Cracks Location	Settlement							
	0.25	0.5	1	1.5	2	3	4	5
1	0.00	0.00	5.37	12.09	18.81	32.25	45.69	59.13
2	0.00	0.00	7.13	22.96	38.78	70.42	102.07	133.72
3	1.10	11.47	32.23	52.98	73.74	115.25	156.76	198.27
4	22.08	35.19	61.40	87.61	113.82	166.24	218.66	271.08
5	46.28	58.37	82.54	106.71	130.88	179.22	227.56	275.90
6	0.00	0.00	0.00	0.00	116.44	192.58	268.72	344.86
Top Cracks								
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	62.11	161.35	260.59
3	0.00	0.00	0.00	3.95	23.25	61.86	100.47	139.08
4	0.00	0.00	0.00	11.52	31.11	70.26	109.45	148.62
5	0.00	0.00	0.00	0.00	7.84	23.36	38.68	54.40
6	0.00	0.00	0.00	0.00	0.00	60.75	128.79	196.83



Data Check

Note: There is a slight variation in the data due to the graphical take-offs of the crack widths and lengths. This variation is insignificant in terms of standard deviations.

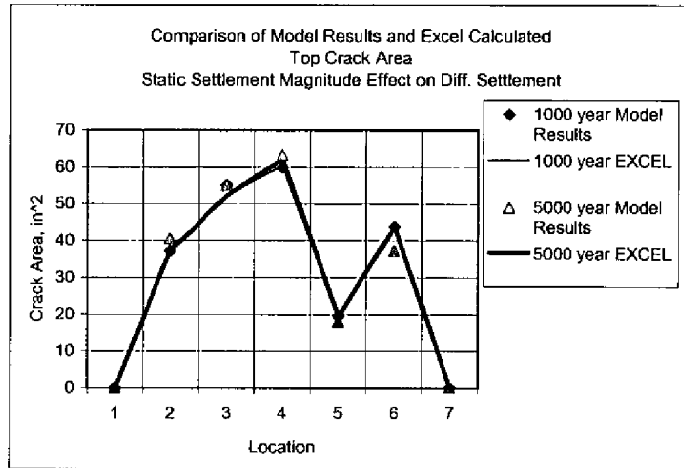
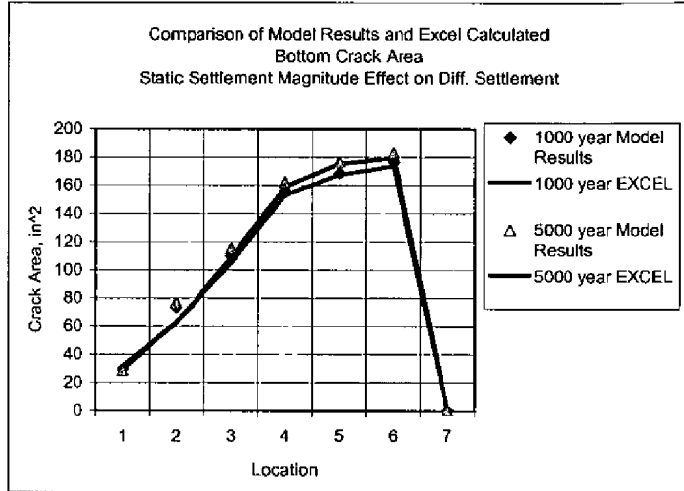
Comparison of Model Results with Excel Calculated Crack Areas
Crack Area (caused by differential settlement) as Related to Static Settlement Magnitude

PC-4 2.75 in. @ 1000 years

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	29.49	0	28.89	0.00
2	73.32	37.26	62.51	37.30
3	110.16	55.08	104.87	52.21
4	155.52	59.91	153.13	60.49
5	168.48	19.44	167.13	19.48
6	176.58	43.74	173.54	43.74
7	0	0	0.00	0.00

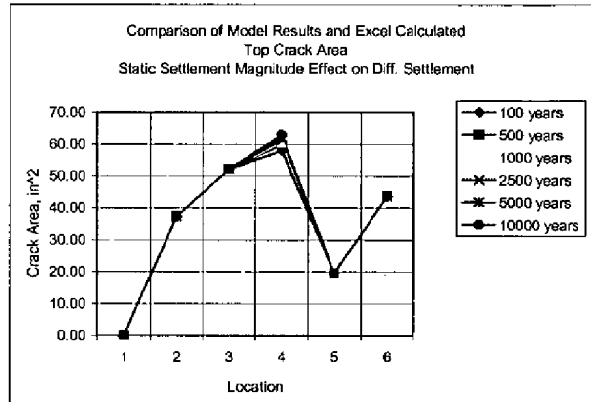
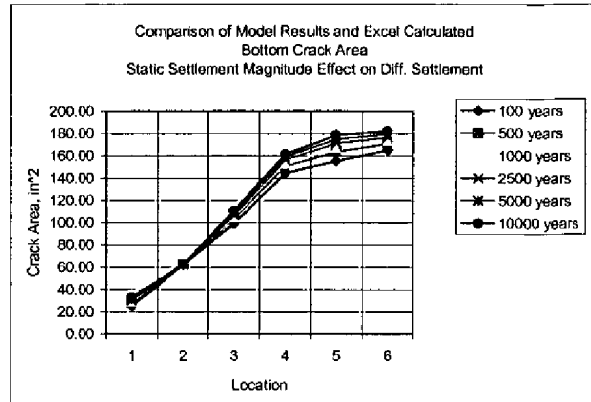
PC-4 2.75 in. @ 5000 years

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	28.5	0	31.63	0.00
2	76.44	40.5	62.51	37.30
3	115.02	55.08	108.83	52.21
4	162	63.18	159.00	62.20
5	176.56	17.82	175.28	19.48
6	183.06	37.23	179.52	43.74
7	0	0	0.00	0.00



Check Range of Parameter
Mean properties - PC-4 EQ

Location	Time					
	100	500	1000	2500	5000	10000
Bottom Cracks						
1	24.96	27.70	28.89	30.45	31.63	32.82
2	62.51	62.51	62.51	62.51	62.51	62.51
3	99.21	103.17	104.87	107.13	108.83	110.53
4	144.74	150.61	153.13	156.47	159.00	161.52
5	155.48	163.63	167.13	171.77	175.28	178.79
6	165.00	170.97	173.54	176.95	179.52	182.09
Top Cracks						
1	0.00	0.00	0.00	0.00	0.00	0.00
2	37.30	37.30	37.30	37.30	37.30	37.30
3	52.21	52.21	52.21	52.21	52.21	52.21
4	58.04	59.75	60.49	61.46	62.20	62.93
5	19.48	19.48	19.48	19.48	19.48	19.48
6	43.74	43.74	43.74	43.74	43.74	43.74



Data Check

Note: There is a slight variation in the data due to the graphical take-offs of the crack widths and lengths. This variation is insignificant in terms of standard deviations.

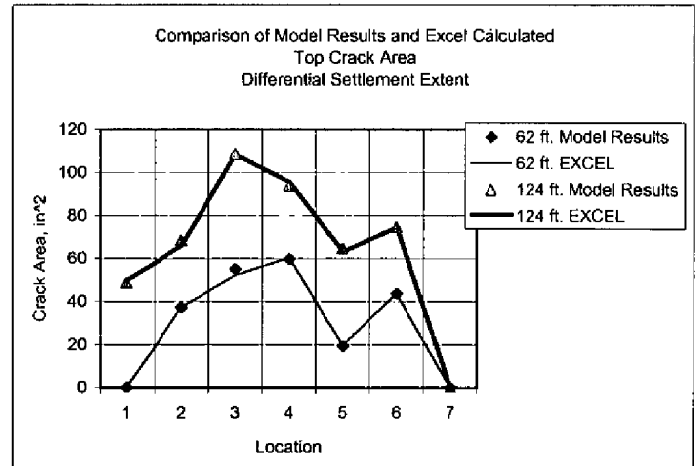
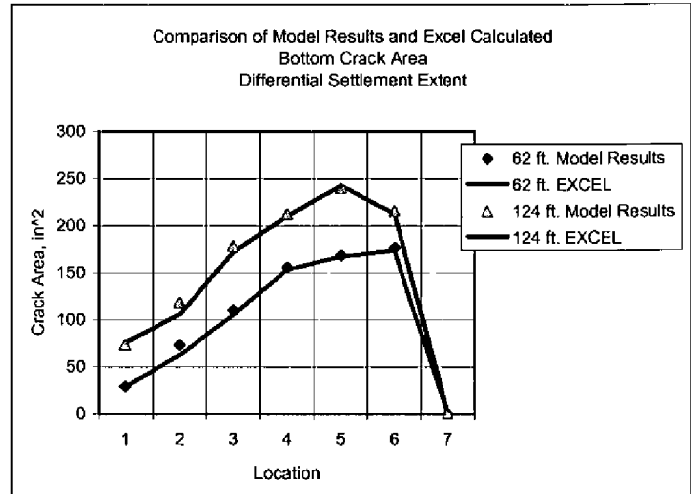
**Comparison of Model Results with Excel Calculated Crack Areas
Crack Area as Related to Differential Settlement Extent
PC-4 2.75 in. @ 1000 years**

Extent = 62 ft.

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	29.4	0	28.89	0.00
2	73.32	37.26	62.51	37.30
3	110.16	55.08	104.87	52.21
4	155.52	59.91	153.13	60.49
5	168.48	19.44	167.13	19.48
6	176.58	43.74	173.54	43.74
7	0	0	0.00	0.00

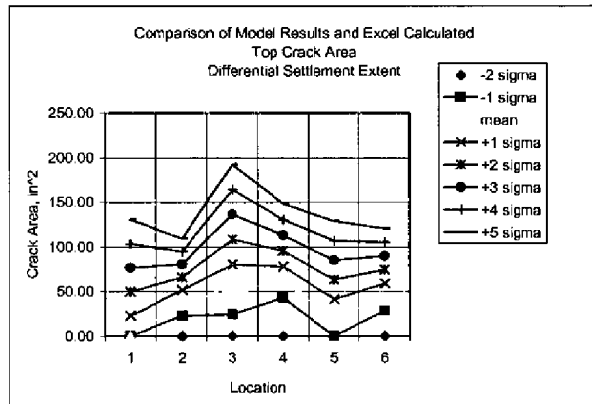
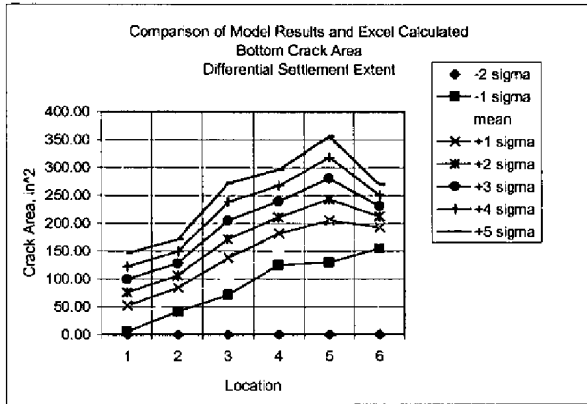
Extent = 124 ft.

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	73.32	48.6	75.81	49.78
2	118.26	68.4	105.98	65.07
3	178.2	108.54	171.71	108.37
4	212.22	93.96	210.40	95.58
5	239.76	64.8	242.71	63.19
6	215.46	74.52	211.89	74.49
7	0	0	0.00	0.00



Check Range of Parameter
 Mean properties - 1000 years, PC-4 EQ

Location	Extent of Settlement					mean	+1 sigma	+2 sigma	+3 sigma	+4 sigma	+5 sigma
	-5 sigma	-4 sigma	-3 sigma	-2 sigma	-1 sigma						
	-83	-62	-31	0	31	62	93	124	155	186	217
1	N/A	N/A	N/A	0.00	5.43	28.89	52.35	75.81	99.27	122.73	146.19
2	N/A	N/A	N/A	0.00	40.78	82.51	84.24	105.98	127.71	149.44	171.17
3	N/A	N/A	N/A	0.00	71.45	104.87	138.29	171.71	205.13	238.54	271.96
4	N/A	N/A	N/A	0.00	124.50	153.13	181.77	210.40	239.03	267.67	296.30
5	N/A	N/A	N/A	0.00	129.35	167.13	204.92	242.71	280.50	318.29	356.08
6	N/A	N/A	N/A	0.00	154.37	173.54	192.72	211.69	231.06	250.23	269.40
Top Cracks											
1	N/A	N/A	N/A	0.00	0.00	0.00	22.90	49.78	76.66	103.53	130.41
2	N/A	N/A	N/A	0.00	22.92	37.30	51.68	66.07	80.45	94.84	109.22
3	N/A	N/A	N/A	0.00	24.13	52.21	80.29	108.37	136.45	164.53	192.61
4	N/A	N/A	N/A	0.00	42.94	60.49	78.03	95.58	113.13	130.67	148.22
5	N/A	N/A	N/A	0.00	0.00	19.48	41.34	63.19	85.05	106.90	128.76
6	N/A	N/A	N/A	0.00	26.36	43.74	59.12	74.49	89.87	105.24	120.62



Data Check

Note: There is a slight variation in the data due to the graphical take-offs of the crack widths and lengths. This variation is insignificant in terms of standard deviations.

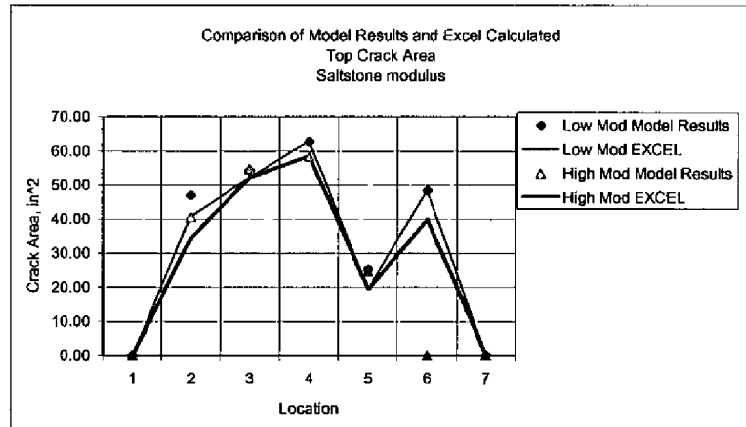
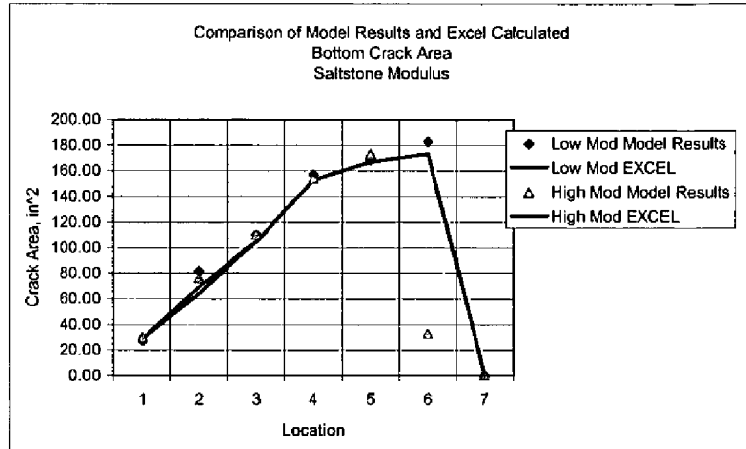
Comparison of Model Results with Excel Calculated Crack Areas
Crack Area as Related to Saltstone Modulus
PC-4 2.75 in. @ 1000 years

Low 1.619E5

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	27.00	0.00	28.89	0.00
2	81.49	46.98	68.91	40.74
3	110.16	54.27	104.87	52.21
4	157.14	62.69	153.13	62.93
5	168.48	25.27	167.13	19.48
6	183.06	48.44	173.54	48.49
7	0.00	0.00	0.00	0.00

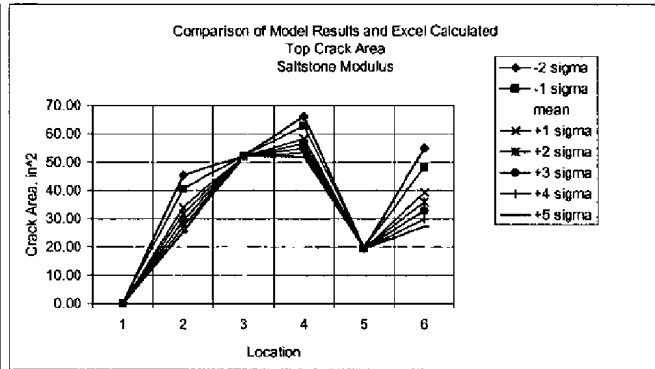
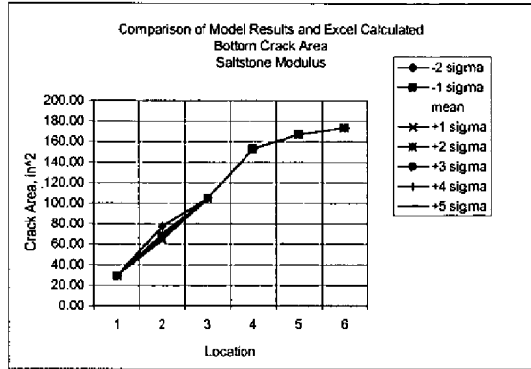
High 2.396E5

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	30	0	28.89	0.00
2	76.14	40.5	64.31	34.51
3	110.16	54.59	104.87	52.21
4	153.9	58.32	153.13	58.51
5	173.34	24.62	167.13	19.48
6	32.76	0	173.54	39.88
7	0	0	0.00	0.00



Check Range of Parameter
Mean properties - 1000 years, PC-4 EQ, 62 ft.

Bottom Cracks		Saltstone Modulus									
Location	-5 sigma	-4 sigma	-3 sigma	-2 sigma	-1 sigma	mean	+1 sigma	+2 sigma	+3 sigma	+4 sigma	+5 sigma
1	N/A	N/A	N/A	1.04E+05	1.66E+05	2.09E+05	2.46E+05	2.76E+05	3.04E+05	3.30E+05	3.54E+05
2	N/A	N/A	N/A	28.89	28.89	28.89	28.89	28.89	28.89	28.89	28.89
3	N/A	N/A	N/A	77.50	68.46	62.71	64.56	66.20	67.65	68.98	70.22
4	N/A	N/A	N/A	104.67	104.67	104.67	104.67	104.67	104.67	104.67	104.67
5	N/A	N/A	N/A	153.13	153.13	153.13	153.13	153.13	153.13	153.13	153.13
6	N/A	N/A	N/A	167.13	167.13	167.13	167.13	167.13	167.13	167.13	167.13
Top Cracks											
1	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	N/A	N/A	N/A	45.37	40.50	37.00	34.10	31.59	29.32	27.26	25.34
3	N/A	N/A	N/A	52.21	52.21	52.21	52.21	52.21	52.21	52.21	52.21
4	N/A	N/A	N/A	66.20	62.75	60.27	58.22	56.44	54.84	53.38	52.02
5	N/A	N/A	N/A	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48
6	N/A	N/A	N/A	54.69	48.16	43.32	39.32	35.85	32.73	29.68	27.23



Data Check

Note: There is a slight variation in the data due to the graphical take-offs of the crack widths and lengths. This variation is insignificant in terms of standard deviations.

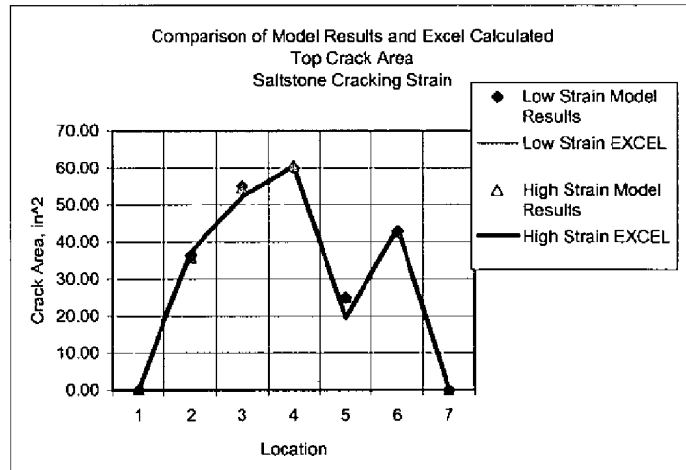
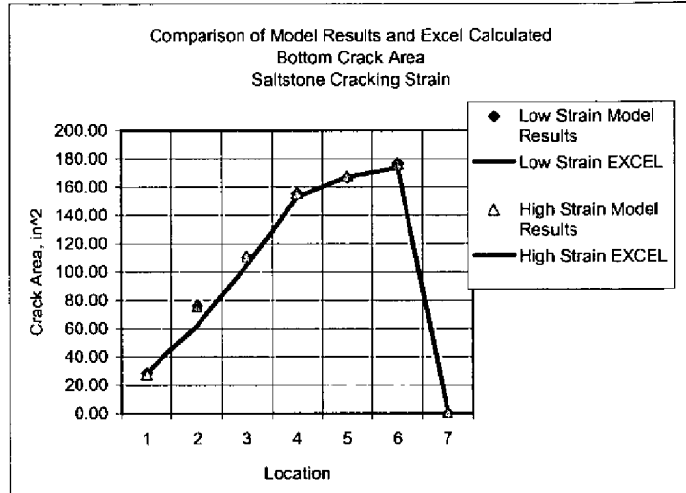
Comparison of Model Results with Excel Calculated Crack Areas
Crack Area as Related to Saltstone Cracking Strain
PC-4 2.75 In. @ 1000 years

Low 7.54E-5

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	28.50	0.00	28.89	0.00
2	76.14	36.45	62.51	37.30
3	110.16	55.08	104.87	52.21
4	155.52	59.94	153.13	60.49
5	166.83	24.95	167.13	19.48
6	176.58	42.93	173.54	43.74
7	0.00	0.00	0.00	0.00

High 1.411E-4

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	27.3	0	28.89	0.00
2	75.65	35.8	62.51	37.30
3	110.81	54.59	104.87	52.21
4	155.36	60.43	153.13	60.49
5	167.67	25.11	167.13	19.48
6	176.26	42.61	173.54	43.74
7	0	0	0.00	0.00



Check Range of Parameter

Mean properties - 1000 years, PC-3 EQ, 62 ft.

Bottom Cracks		Saltstone Cracking Strain									
Location	-5 sigma	-4 sigma	-3 sigma	-2 sigma	-1 sigma	mean	+1 sigma	+2 sigma	+3 sigma	+4 sigma	+5 sigma
	N/A	N/A	N/A	6.14E-05	9.71E-05	1.23E-04	1.44E-04	1.63E-04	1.79E-04	1.94E-04	2.08E-04
1	N/A	N/A	N/A	28.89	28.89	28.89	28.89	28.89	28.89	28.89	28.89
2	N/A	N/A	N/A	62.51	62.51	62.51	62.51	62.51	62.51	62.51	62.51
3	N/A	N/A	N/A	104.87	104.87	104.87	104.87	104.87	104.87	104.87	104.87
4	N/A	N/A	N/A	153.13	153.13	153.13	153.13	153.13	153.13	153.13	153.13
5	N/A	N/A	N/A	167.13	167.13	167.13	167.13	167.13	167.13	167.13	167.13
6	N/A	N/A	N/A	173.54	173.54	173.54	173.54	173.54	173.54	173.54	173.54
Top Cracks											
1	N/A	N/A	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	N/A	N/A	N/A	37.30	37.30	37.30	37.30	37.30	37.30	37.30	37.30
3	N/A	N/A	N/A	52.21	52.21	52.21	52.21	52.21	52.21	52.21	52.21
4	N/A	N/A	N/A	60.49	60.49	60.49	60.49	60.49	60.49	60.49	60.49
5	N/A	N/A	N/A	19.48	19.48	19.48	19.48	19.48	19.48	19.48	19.48
6	N/A	N/A	N/A	43.74	43.74	43.74	43.74	43.74	43.74	43.74	43.74

No effect of Grout Cracking Strain on Crack Area caused by Differential Settlement

Data Check

Note: There is a slight variation in the data due to the graphical take-offs of the crack widths and lengths. This variation is insignificant in terms of standard deviations.

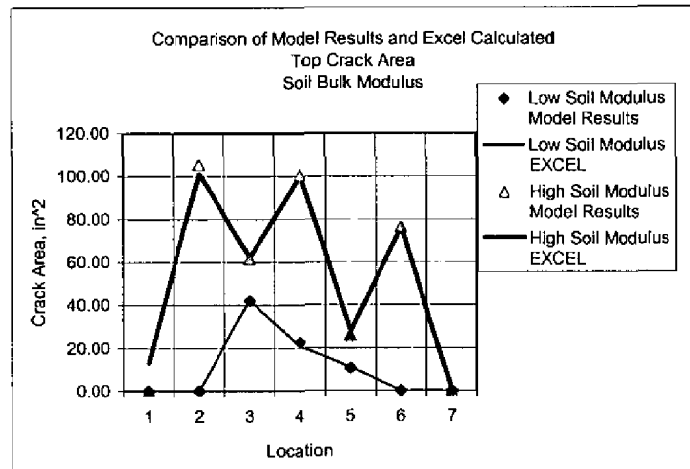
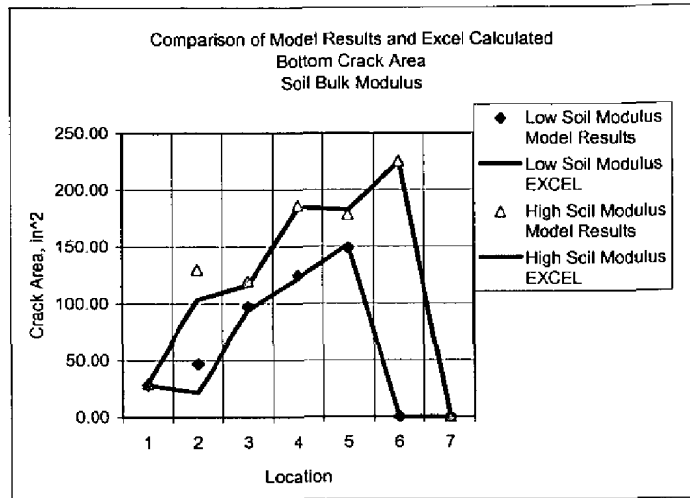
Comparison of Model Results with Excel Calculated Crack Areas
Crack Area as Related to Soil Bulk Modulus
PC-4 2.75 in. @ 1000 years

Low 20 kcf

Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	28.50	0.00	27.84	0.00
2	46.80	0.00	21.39	0.00
3	97.20	42.12	93.67	42.33
4	124.74	22.68	121.55	20.67
5	149.04	10.50	151.69	11.00
6	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00

High 40 kcf

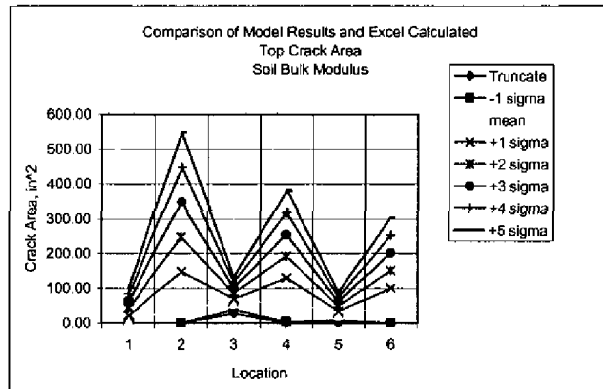
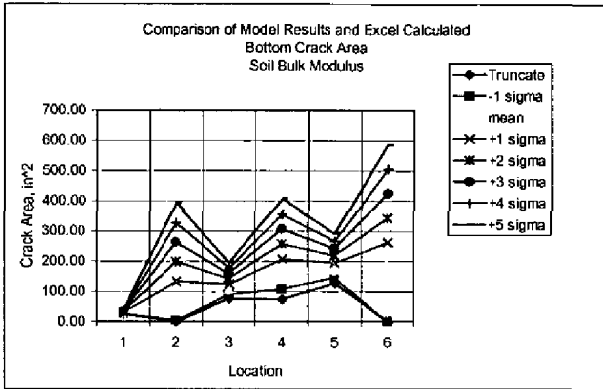
Location of Settlement	Crack Areas From FE Model Results		Crack Areas From EXCEL	
	Bottom	Top	Bottom	Top
1	29.4	0	29.93	13.00
2	129.6	105.3	103.63	101.02
3	119.88	61.56	116.08	62.09
4	186.3	100.44	184.72	100.31
5	178.2	25.92	182.57	27.96
6	225.18	76.14	224.98	76.14
7	0	0	0.00	0.00



Check Range of Parameter

Mean properties - 1000 years, PC-3 EQ, 62 ft.

Location	Saltstone Cracking Strain								
	Truncate	-1 sigma	mean	+1 sigma	+2 sigma	+3 sigma	+4 sigma	+5 sigma	
Bottom Cracks									
	5	15.756	31.512	47.268	63.024	78.78	94.536	110.292	
1	26.27	27.40	29.05	30.69	32.34	33.99	35.64	37.29	
2	0.00	3.95	68.73	133.52	198.31	263.10	327.89	392.68	
3	76.86	88.91	106.57	124.22	141.88	159.53	177.18	194.84	
4	74.17	108.15	157.91	207.68	257.44	307.21	356.97	406.74	
5	128.53	145.14	169.47	193.80	218.12	242.45	266.78	291.11	
6	0.00	0.00	181.32	262.37	343.42	424.47	505.52	586.57	
Top Cracks									
1	0.00	0.00	1.97	22.45	42.93	63.41	83.90	104.38	
2	0.00	0.00	46.93	147.33	247.73	348.13	448.52	548.92	
3	27.50	38.13	53.70	69.27	84.84	100.41	115.98	131.55	
4	0.00	3.76	66.51	129.25	192.00	254.74	317.48	380.23	
5	0.00	7.40	20.76	34.12	47.48	60.85	74.21	87.57	
6	0.00	0.00	48.64	99.69	150.74	201.79	252.84	303.89	



Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 256	Rev. 0
----------------------------------	------------------	-----------

8.3.16. Sensitivity Study for Differential Settlement Magnitude.

The geotechnical data for differential settlement consists of two data points. There is a settlement of 0.75 inches for a PC-3 event with an annual recurrence interval of 2500 years, and a settlement of 2.75 inches for a PC-4 event with a 10,000 year annual recurrence. Seismic probability curves are generally expressed as log functions. For this study, the differential settlement is expressed as a linear function of the log of probability. The analysis uses 10 year time steps so the annual probabilities are converted into probabilities of occurrence in a ten year interval.

Per DOE-1020, Appendix A:

$$EP = 1 - (1 - p)^n \quad \text{where } EP \text{ is exceedence probability during a period of } n \text{ years,}$$

and p is the annual probability of occurrence.

The 10 year probability of exceedence is 3.993×10^{-3} for PC-3 and 1×10^{-3} for PC-4.

The opinion of the SGS is that, since the settlement zones are small, settlement would decrease relatively for larger events until some threshold is reached for an incredible event that would cause massive subsidence of the region.

The slope of the probability curve after PC-4 is reduced to account for this effect. A value of 4 inches for a 10^{-5} event was judged appropriate to anchor the curve. To verify that this choice would have little effect on the analysis results, a sensitivity study was run where the increased slope was compared to a constant slope. The following page shows the results of this study.

At 10,000 years, the mean increased by 9% for bottom cracks and by 28% for top cracks. However, because of the large uncertainties in this analysis, these variations are well within a +1 sigma band for the increased slope assumption.

Case 1 - No decrease in differential settlement for extreme events

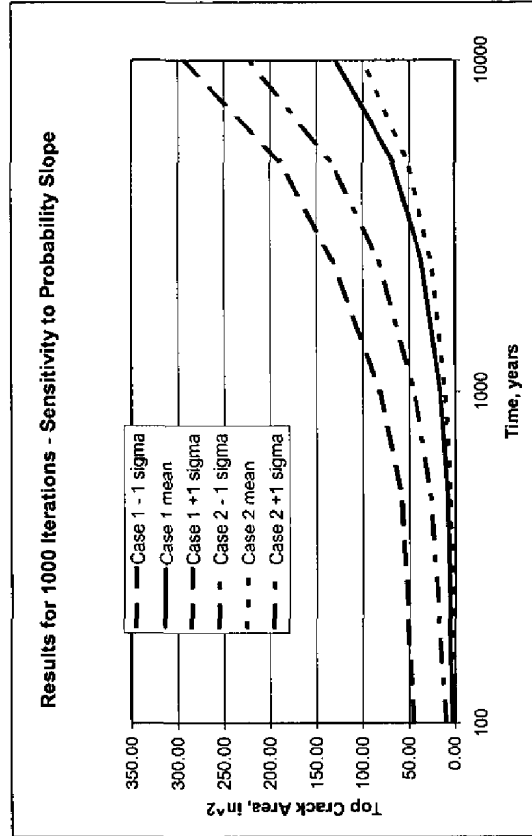
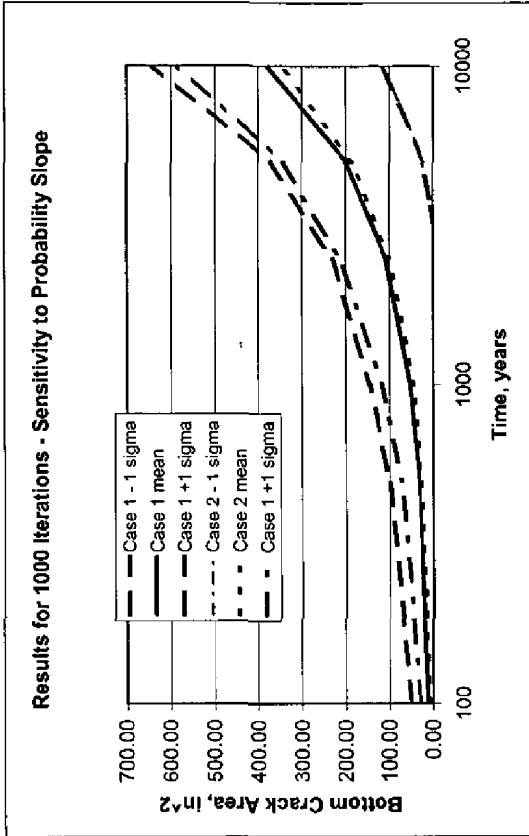
Bottom Cracks		Crack Area, in ²	
Time	-1 sigma	Mean	+1 sigma
100	-29.54	11.36	52.26
500	-35.44	32.80	101.04
1000	-36.26	55.00	146.26
2500	-15.58	108.69	232.97
5000	22.87	198.80	374.72
10000	117.13	379.59	642.04

Top Cracks		Crack Area, in ²	
Time	-1 sigma	Mean	+1 sigma
100	-39.20	3.07	45.34
500	-42.10	8.29	58.68
1000	-49.49	15.84	81.16
2500	-61.13	36.11	133.35
5000	-55.53	67.65	190.83
10000	-37.40	128.96	295.32

Case 2 - Decreased Slope for Extreme Events

Bottom Cracks		Crack Area, in ²	
Time	-1 sigma	Mean	+1 sigma
100	-13.02	7.69	28.39
500	-19.20	27.57	74.34
1000	-22.72	47.19	117.10
2500	-12.36	100.36	213.08
5000	22.80	184.80	346.80
10000	113.27	348.72	584.17

Top Cracks		Crack Area, in ²	
Time	-1 sigma	Mean	+1 sigma
100	-7.21	0.99	9.19
500	-16.74	5.14	27.02
1000	-22.82	10.66	44.15
2500	-30.51	26.00	82.50
5000	-31.79	51.53	134.85
10000	-23.64	100.46	224.56



Calculation Continuation Sheet

Calculation No.	Sheet No.	Rev.
T-CLC-Z-00006	258	0

8.3.17 Results

A Monte Carlo analysis is performed in EXCEL. A copy of the EXCEL spreadsheets and Visual Basic program are found at the end of this section. The following pages show the analysis results and cumulative probability distributions for the analysis. The sharp rise at low probabilities is caused by the truncation of some of the parameters and by the lack of seismic events except at very low probabilities. The truncation effect is more pronounced for lower analysis times. Probability curves for 1000 and 10,000 years are shown.

The spreadsheet performs 6300 iterations until convergence is reached. The convergence criterion is that the mean, standard deviation and 95% values for the crack areas at the predefined times change by less than 1.5% for two successive periods of 100 iterations each. The next page shows the crack areas for bottom and top cracks plotted against time. The mean and standard deviation are provided.

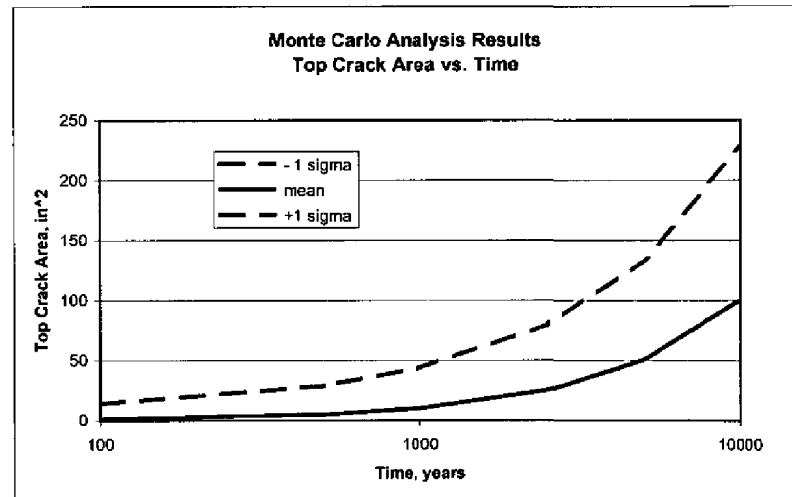
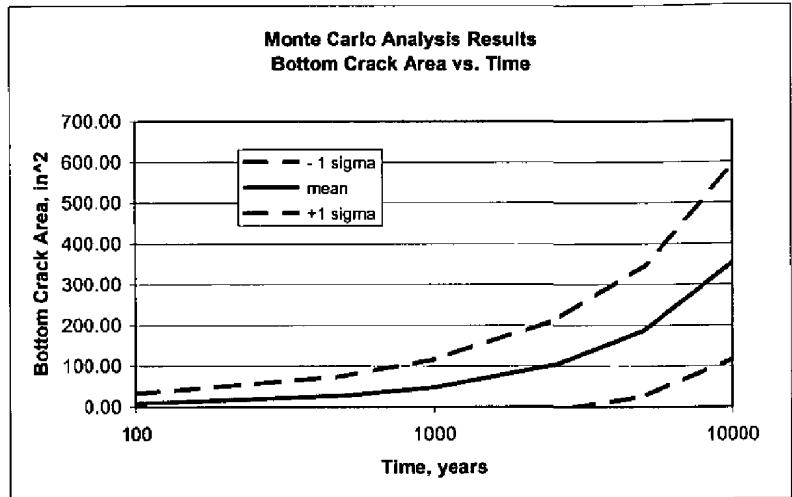
Monte Carlo Analysis - 6300 Iterations 1.5% Convergence (100 Iteration Interval)

Bottom Cracks

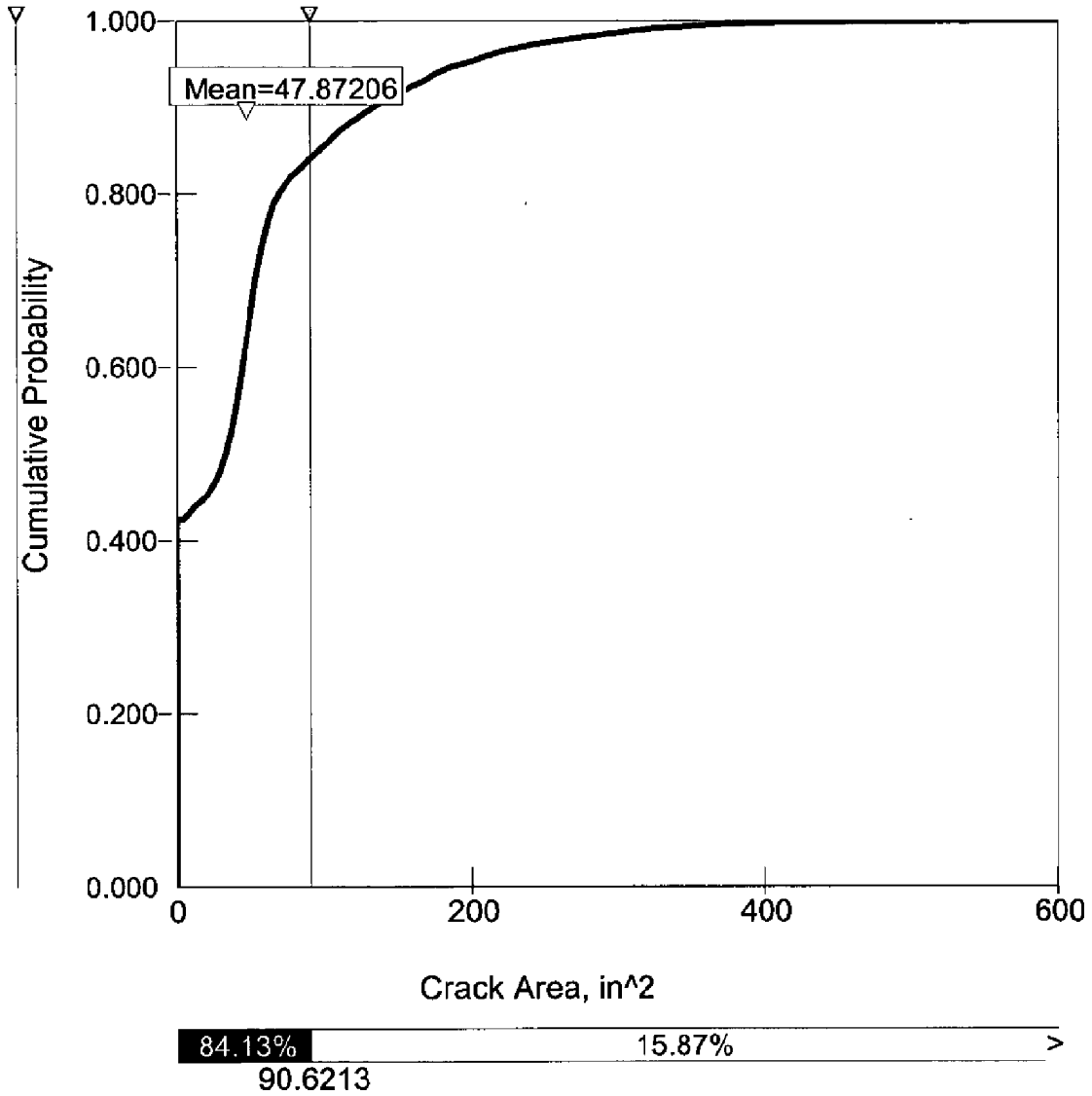
Time	Crack Area, in ²			
	-1 sigma	Mean	+1 sigma	95%
100	-16.07	8.48	33.02	43.41
500	-20.81	27.39	75.60	120.00
1000	-21.14	47.87	116.88	193.94
2500	-8.98	101.50	211.98	323.95
5000	26.00	186.53	347.05	503.82
10000	117.80	353.26	588.72	803.26

Top Cracks

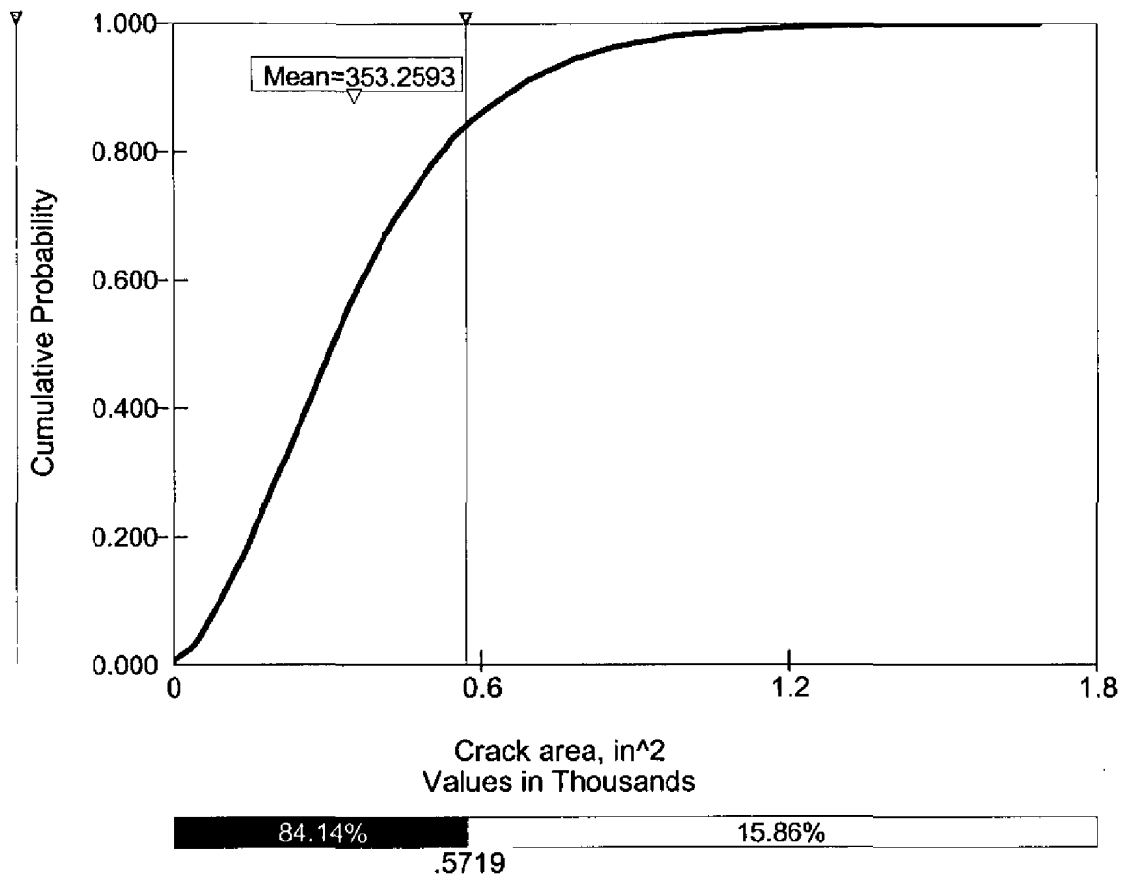
Time	Crack Area, in ²			
	-1 sigma	Mean	+1 sigma	95%
100	-11.7473	1.138347	14.02396	0
500	-19.3953	4.702576	28.80046	27.48173
1000	-23.8571	10.00278	43.86267	70.27372
2500	-29.5225	25.20769	79.93791	136.4661
5000	-32.4191	50.77802	133.9751	221.9252
10000	-26.6981	100.5485	227.7951	355.855

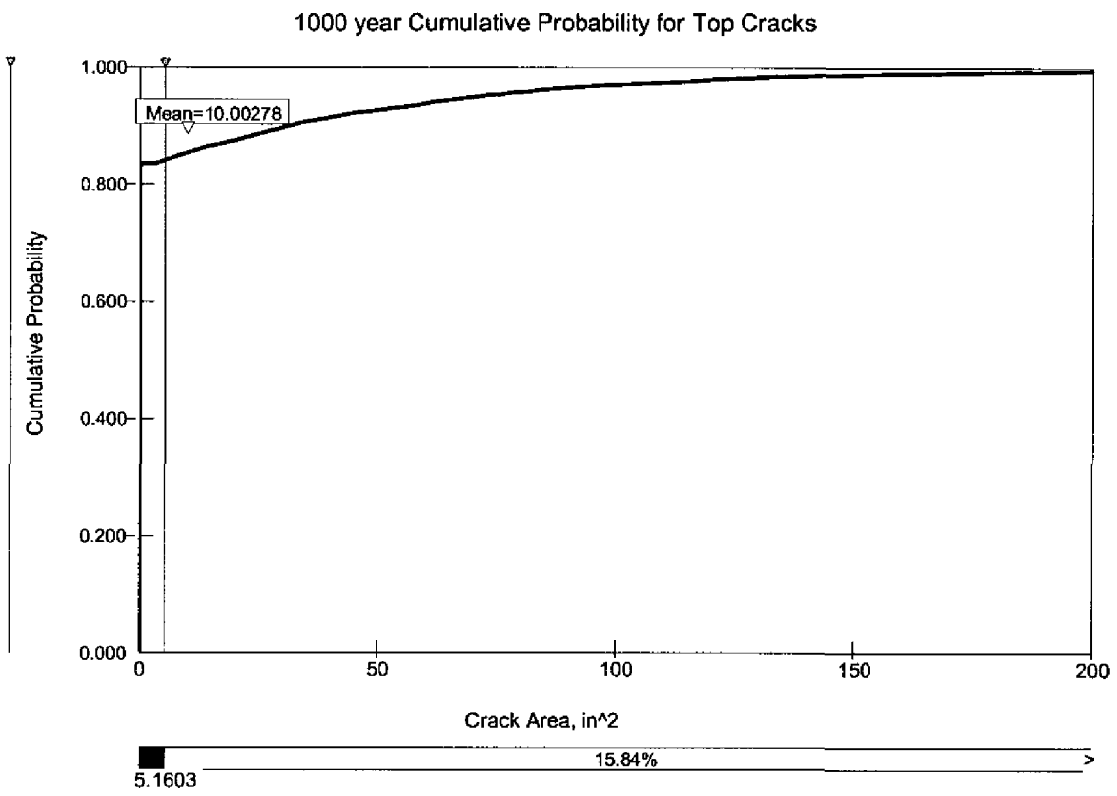


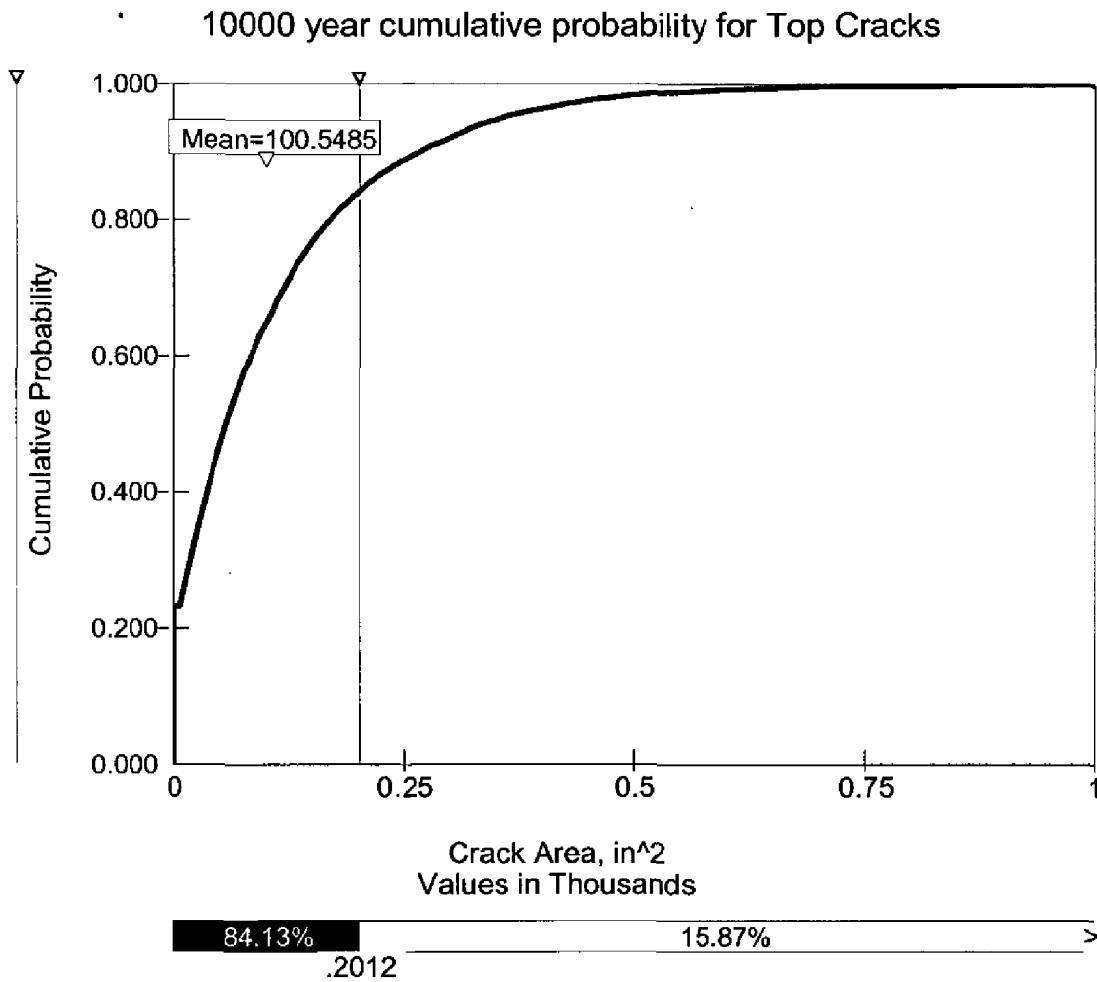
10000 year Cumulative Probability for Bottom Cracks



10000 year Cumulative Probability for Bottom Cracks







Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. T-CLC-Z-00006				
	Subject " "					Sheet No. 264				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
0	WLP	7/9/03	GEM	7/10/3						

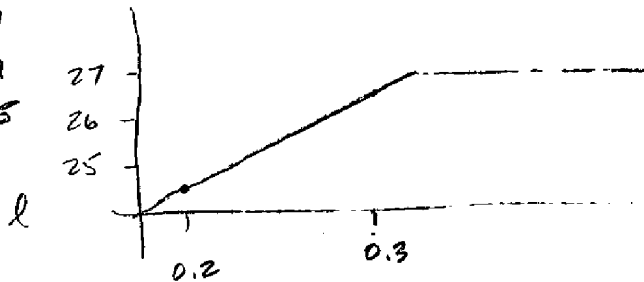
The following calculates the crack size based on crack area based on typical cracks observed in the FE Model

$$A = \frac{1}{2} w \times (h \times 12) = wh \times 6 \quad (\text{triangular crack assumed})$$

TYPICAL CRACKS		Area
w	h	
0.164	26	25.4
0.297	26	43.2
0.238	26	37.1
0.208	26	32.4
0.307	27	49.7
0.182	25	27.3
0.407	27	75.7
0.708	27	114.7
0.203	25	30.5

length & width are related

max length = 27' (small compression zone, as top is necessary for equilibrium)



$$l = 9.259w + 23.758 \leq 27 \quad \text{where } l = \text{crack length}$$

$$w = \text{crack width}$$

$$A = w(l)(6)$$

$$= w(9.259w + 23.758)6$$

$$= 55.554w^2 + 142.548w$$

$$0 = 55.554w^2 + 142.548w - A$$

$$w = \frac{-142.55 \pm \sqrt{20320 + 222.22 A}}{111.11}$$

Calculation Sheet

SRS	Project <i>See Cover</i>						Calculation No. <i>T-CLC-2-00006</i>		
	Subject <i>- -</i>						Sheet No. <i>265</i>		
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
0	WVP	7/9/03	GEM	7/10/03					

for $w < 0.349$

$$w = \frac{\sqrt{20320 + 222.22A}}{111.11} - 1.283$$

for $l = 27$, $w = 0.350$ for $w \geq 0.350$

$$w = \frac{A}{27 \times 6} = \frac{A}{162} = 0.349 \quad A = 56.70$$

Results

$$\text{for } A < 56.70, \quad w = \frac{1}{111.11} (20320 + 222.22A)^{1/2} - 1.283$$

$$\text{for } A \geq 56.70, \quad w = \frac{A}{162}$$

Cracks open @ top

$$l = 27 \text{ ft.}$$

$$w = \frac{A}{162}$$

T-CLC-Z-00006, Rev. 0

@Risk Controls

Eg Dist.	0 Grout Modulus Distribution
Geps dist.	0 Grout Cracking Strain Distribution
Ksn dust.	0 Soil Bulk Modulus Distribution
Static Dist.	1.0607 Static Settlement Rate Distribution

Parameters	
Eg	2.09E+05 ksf
eps	1.23E-04
sbm	31.512 kcf
	Grout Modulus
	Grout Strain
	Soil Bulk Modulus

Time Intervals	
Time, years	100
	500
	1000
	2500
	5000
	10000

Time Interval	10
Time Counter	10000
Static Settlement	-0.5776

Random Variable	
Differential Settlement	0.159399434
	0

Location	
Random #	0.376994771
Location	3

Extent	
Random #	0.673166243
Extent	77.69

Values Sent to Worksheets	
Static Sett.	-0.578
Dif. Sett.	0.000
Extent	77.69

Returned From Worksheets	B/T	T/B
Static	53.15853267	NA
Location 1	0.00	0.00
Location 2	0.00	0.00
Location 3	0.00	0.00
Location 4	0.00	0.00
Location 5	0.00	0.00
Location 6	0.00	0.00
Location 7	0.00	0.00

Grout Modulus	
Grout Mod	2.09E+05
Ratio2	1.0187
Csmean	524.4
Cssig	196.8
Egmean	2.05E+05

Grout Cracking Strain	
Cr. Strain	0.000122855
Ratio3	1.0187
Cepsm	1.21E-04

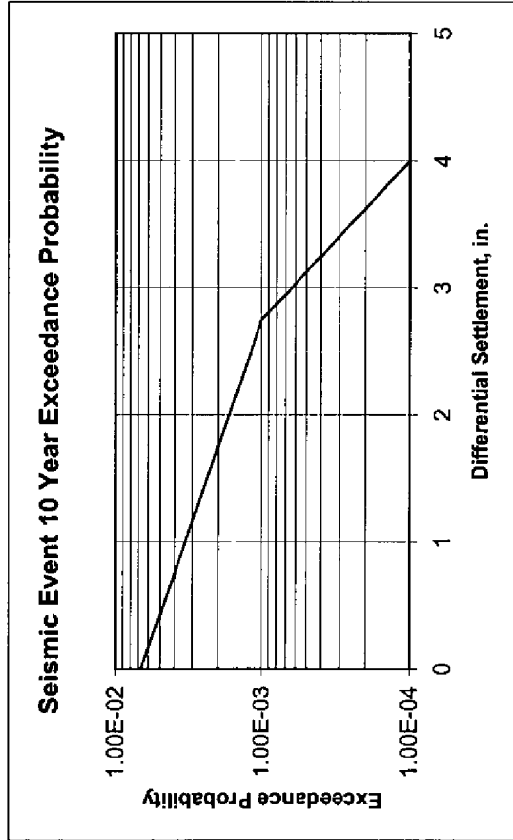
Settlement Rate		Actual Settlement	
Time, years	Mean Settlement ft.	ft.	
100	-0.3870	-0.3870	
500	-0.4536	-0.4536	
1000	-0.4823	-0.4823	
2500	-0.5202	-0.5202	
5000	-0.5489	-0.5489	
10000	-0.5776	-0.5776	

AI	-0.095298
Bt	-0.196374
Ratio1	0.999993785
Aq	0.368413272
Bq	0.609217827

Crack Area						
Time	Static Settlement	Static B/T	EQ B/T	EQ T/B	Total B/T	Total T/B
100	-0.3870	33.18386688	0	0	33.18386688	0
500	-0.4536	41.99867809	0	0	41.99867809	0
1000	-0.4823	45.79501073	0	0.00	45.79501073	0
2500	-0.5202	50.8134895	283.6083938	120.90	334.4218833	120.8985509
5000	-0.5489	54.60982213	119.0195724	40.07	457.2377883	160.9714423
10000	-0.5776	58.40615477	11.57381676	0.00	472.6079377	160.9714423

Soil Modulus	
Soil Mod	31.512
Ratio4	1.0504
Ksmisig	15
Ksmmean	30

0	6.71E-03	minEP	6.71E-03
0.75	0.003993	Ap1	-0.3006
2.75	1.00E-03	Bp1	-2.173213448
4	0.0001	Ap2	-0.8
		Bp2	-0.8



B/T Crack Areas					
100	500	1000	2500	5000	10000
33.18386668	41.99867809	45.79501073	334.4218833	457.2377883	472.6079377

T/B Crack Areas					
100	500	1000	2500	5000	10000
0	0	0	120.8985509	160.9714423	160.9714423

Eg	Cr Strain	Soil Mod	Sett Rate
208629.76	0.000122855	31.512	0.999993785

T-CLC-Z-00006, Rev. 0

@Risk Controls

Eg Dist. =RiskNormal(0.1,RiskName("Eg Dist."),RiskCommat("Crack workbook.xls\Risk35Matrix.1.)) Grout Modulus Distribution
 Geps dist. = RiskNormal(0, 1,RiskName("Geps dist."),RiskCommat("Crack workbook.xls\Risk35Matrix. 2.)) Grout Cracking Strain Distribution
 Ksn dist. = RiskNormal(0, 1,RiskName("Ksn dist."),RiskCommat("Crack workbook.xls\Risk35Matrix. 2.)) Soil Bulk Modulus Distribution
 Static Dist. = RiskNormal(1.0607, 0.53,RiskName("Static Dist."),RiskCommat("Crack workbook.xls\Risk35Matrix. 2.)) Static Settlement Rate Distribution

Parameters
 Eg =J10 ksf Grout Modulus
 eps =M10 Grout Strain
 isbm =P10 kcf Soil Bulk Modulus

Time Intervals
 Time, years
 100
 500
 1000
 2500
 5000
 10000

Time Interval 10
 Time Counter 10000
 Static Settlement =MIN(Ratio1*(A1*LOG(B26)+B1),0)

Random Variable
 Differential Settlement =RAND()
 =IF(D29<minEP,0,IF(D29>0.19,(LOG(\$D\$29)-Bp1_/Ap1_/LOG(\$D\$29)-Bp2_/Ap2_/))

Location
 Random # =RAND()
 Location =MIN(INT(7*B33)+1,7)

Extent
 Random # =RAND()
 Extent =1.0235*MAX(NORMINV(B37,62.31),0)

Values Sent to Worksheets
 Static Sett. =B27
 Diff. Sett. =D30
 Extent =B38

Returned From Worksheets		B/T	T/B
Static	=Static!F3		NA
Location 1	=Location 1!B12		=Location 1!C12
Location 2	=Location 2!B12		=Location 2!C12
Location 3	=Location 3!B12		=Location 3!C12
Location 4	=Location 4!B12		=Location 4!C12
Location 5	=Location 5!B12		=Location 5!C12
Location 6	=Location 6!B12		=Location 6!C12
Location 7	0		0

Grout Modulus	
Grout Mod	=J14*Ratio2
Ratio2	=1.0187*SQR7((MAX(Csmean+Csig*B4, 100))/Csmean)
Csmean	524.4
Csig	196.6
Egmean	204800

Grout Cracking Strain	
Cr. Strain	=Cepsm*Ratio3
Ratio3	=1.0187*SQR7((MAX(Csmean+Csig*B5, 100))/Csmean)
Cepsin	0.0001206

Settlement Rate	
Time, years	
=A18	=A1*LOG(A18)/BI
=A19	=A1*LOG(A19)/BI
=A20	=A1*LOG(A20)/BI
=A21	=A1*LOG(A21)/BI
=A22	=A1*LOG(A22)/BI
=A23	=A1*LOG(A23)/BI
AI	-0.065298
BI	-0.196374
Ratio1	=MAX(Aq*B7+Bq,0.1)
Aq	0.368413272300143
Bq	0.50921792694547

Settlement Rate	
Mean Settlement ft.	
=J21*Ratio1	
=J22*Ratio1	
=J23*Ratio1	
=J24*Ratio1	
=J25*Ratio1	
=J26*Ratio1	
Actual Settlement ft.	
=K49+H49	
=K50+H50	
=K51+H51	
=K52+H52	
=K53+H53	
=K54+H54	

Time	Static		Crack Area		EQ		EQ		Total	
	Settlement	B/T	EQ	B/T	EQ	B/T	EQ	B/T	Total	T/B
=A18	=VLOOKUP(F48,\$I\$21:\$K\$26,3,FALSE)	33.18336666828967	0	0	0	0	0	0	=K49+H49	=J49
=A19	=VLOOKUP(F50,\$I\$21:\$K\$26,3,FALSE)	41.9986780960079	0	0	0	0	0	0	=K50+H50	=M49+J50
=A20	=VLOOKUP(F51,\$I\$21:\$K\$26,3,FALSE)	45.7950107289465	0	0	0	0	0	0	=K51+H51	=M50+J51
=A21	=VLOOKUP(F52,\$I\$21:\$K\$26,3,FALSE)	50.8134694971594	283.608995767213	120.898650852065	116.01957243813	40.0728914651702	0	0	=K52+H52	=M51+J52
=A22	=VLOOKUP(F53,\$I\$21:\$K\$26,3,FALSE)	54.6098221340268	116.01957243813	40.0728914651702	0	0	0	0	=K53+H53	=M52+J53
=A23	=VLOOKUP(F54,\$I\$21:\$K\$26,3,FALSE)	58.4061541708943	11.573816760892	0	0	0	0	0	=K54+H54	=M53+J54

Soil Modulus	
Soil Mod	=MAX(P1,Kmmmm,5)
Ratio4	=1.0004*(Kmmmm/Kmmmm)
Kmmmm	15
Kmmmm	30

$$=10^{(LOG(C1B1)+P1B1*(LOG(C1B1)+LOG(C1B1)+P1B1))}$$

$$=0.000882$$

$$0.001$$

$$0.0001$$

$$=0.17$$

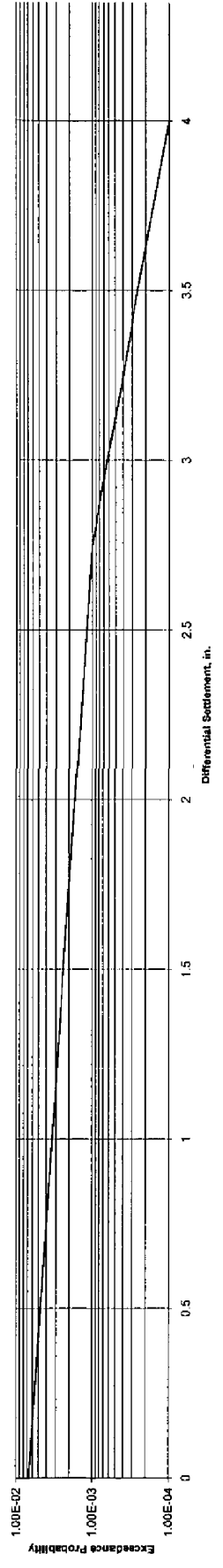
$$0.0008$$

$$-LOG(C17)$$

$$-0.8$$

$$-0.8$$

Seismic Event 10 Year Exceedance Probability



BT Crack Assess	
FFS0	=RiskOutput("Location 4", "Range 2.1") * L48
FFS1	=RiskOutput("Location 4", "Range 2.2") * L49
FFS2	=RiskOutput("Location 4", "Range 2.3") * L50
FFS3	=RiskOutput("Location 4", "Range 2.4") * L51
FFS4	=RiskOutput("Location 4", "Range 2.5") * L52
FFS5	=RiskOutput("Location 4", "Range 2.6") * L53
FFS6	=RiskOutput("Location 4", "Range 2.7") * L54
FFS7	=RiskOutput("Location 4", "Range 2.8") * L55
FFS8	=RiskOutput("Location 4", "Range 2.9") * L56
FFS9	=RiskOutput("Location 4", "Range 3.0") * L57
FFS10	=RiskOutput("Location 4", "Range 3.1") * L58
FFS11	=RiskOutput("Location 4", "Range 3.2") * L59
FFS12	=RiskOutput("Location 4", "Range 3.3") * L60
FFS13	=RiskOutput("Location 4", "Range 3.4") * L61
FFS14	=RiskOutput("Location 4", "Range 3.5") * L62
FFS15	=RiskOutput("Location 4", "Range 3.6") * L63
FFS16	=RiskOutput("Location 4", "Range 3.7") * L64
FFS17	=RiskOutput("Location 4", "Range 3.8") * L65
FFS18	=RiskOutput("Location 4", "Range 3.9") * L66
FFS19	=RiskOutput("Location 4", "Range 4.0") * L67
FFS20	=RiskOutput("Location 4", "Range 4.1") * L68
FFS21	=RiskOutput("Location 4", "Range 4.2") * L69
FFS22	=RiskOutput("Location 4", "Range 4.3") * L70
FFS23	=RiskOutput("Location 4", "Range 4.4") * L71
FFS24	=RiskOutput("Location 4", "Range 4.5") * L72
FFS25	=RiskOutput("Location 4", "Range 4.6") * L73
FFS26	=RiskOutput("Location 4", "Range 4.7") * L74
FFS27	=RiskOutput("Location 4", "Range 4.8") * L75
FFS28	=RiskOutput("Location 4", "Range 4.9") * L76
FFS29	=RiskOutput("Location 4", "Range 5.0") * L77
FFS30	=RiskOutput("Location 4", "Range 5.1") * L78
FFS31	=RiskOutput("Location 4", "Range 5.2") * L79
FFS32	=RiskOutput("Location 4", "Range 5.3") * L80
FFS33	=RiskOutput("Location 4", "Range 5.4") * L81
FFS34	=RiskOutput("Location 4", "Range 5.5") * L82
FFS35	=RiskOutput("Location 4", "Range 5.6") * L83
FFS36	=RiskOutput("Location 4", "Range 5.7") * L84
FFS37	=RiskOutput("Location 4", "Range 5.8") * L85
FFS38	=RiskOutput("Location 4", "Range 5.9") * L86
FFS39	=RiskOutput("Location 4", "Range 6.0") * L87
FFS40	=RiskOutput("Location 4", "Range 6.1") * L88
FFS41	=RiskOutput("Location 4", "Range 6.2") * L89
FFS42	=RiskOutput("Location 4", "Range 6.3") * L90
FFS43	=RiskOutput("Location 4", "Range 6.4") * L91
FFS44	=RiskOutput("Location 4", "Range 6.5") * L92
FFS45	=RiskOutput("Location 4", "Range 6.6") * L93
FFS46	=RiskOutput("Location 4", "Range 6.7") * L94
FFS47	=RiskOutput("Location 4", "Range 6.8") * L95
FFS48	=RiskOutput("Location 4", "Range 6.9") * L96
FFS49	=RiskOutput("Location 4", "Range 7.0") * L97
FFS50	=RiskOutput("Location 4", "Range 7.1") * L98
FFS51	=RiskOutput("Location 4", "Range 7.2") * L99
FFS52	=RiskOutput("Location 4", "Range 7.3") * L100
FFS53	=RiskOutput("Location 4", "Range 7.4") * L101
FFS54	=RiskOutput("Location 4", "Range 7.5") * L102
FFS55	=RiskOutput("Location 4", "Range 7.6") * L103
FFS56	=RiskOutput("Location 4", "Range 7.7") * L104
FFS57	=RiskOutput("Location 4", "Range 7.8") * L105
FFS58	=RiskOutput("Location 4", "Range 7.9") * L106
FFS59	=RiskOutput("Location 4", "Range 8.0") * L107
FFS60	=RiskOutput("Location 4", "Range 8.1") * L108
FFS61	=RiskOutput("Location 4", "Range 8.2") * L109
FFS62	=RiskOutput("Location 4", "Range 8.3") * L110
FFS63	=RiskOutput("Location 4", "Range 8.4") * L111
FFS64	=RiskOutput("Location 4", "Range 8.5") * L112
FFS65	=RiskOutput("Location 4", "Range 8.6") * L113
FFS66	=RiskOutput("Location 4", "Range 8.7") * L114
FFS67	=RiskOutput("Location 4", "Range 8.8") * L115
FFS68	=RiskOutput("Location 4", "Range 8.9") * L116
FFS69	=RiskOutput("Location 4", "Range 9.0") * L117
FFS70	=RiskOutput("Location 4", "Range 9.1") * L118
FFS71	=RiskOutput("Location 4", "Range 9.2") * L119
FFS72	=RiskOutput("Location 4", "Range 9.3") * L120
FFS73	=RiskOutput("Location 4", "Range 9.4") * L121
FFS74	=RiskOutput("Location 4", "Range 9.5") * L122
FFS75	=RiskOutput("Location 4", "Range 9.6") * L123
FFS76	=RiskOutput("Location 4", "Range 9.7") * L124
FFS77	=RiskOutput("Location 4", "Range 9.8") * L125
FFS78	=RiskOutput("Location 4", "Range 9.9") * L126
FFS79	=RiskOutput("Location 4", "Range 10.0") * L127
FFS80	=RiskOutput("Location 4", "Range 10.1") * L128
FFS81	=RiskOutput("Location 4", "Range 10.2") * L129
FFS82	=RiskOutput("Location 4", "Range 10.3") * L130
FFS83	=RiskOutput("Location 4", "Range 10.4") * L131
FFS84	=RiskOutput("Location 4", "Range 10.5") * L132
FFS85	=RiskOutput("Location 4", "Range 10.6") * L133
FFS86	=RiskOutput("Location 4", "Range 10.7") * L134
FFS87	=RiskOutput("Location 4", "Range 10.8") * L135
FFS88	=RiskOutput("Location 4", "Range 10.9") * L136
FFS89	=RiskOutput("Location 4", "Range 11.0") * L137
FFS90	=RiskOutput("Location 4", "Range 11.1") * L138
FFS91	=RiskOutput("Location 4", "Range 11.2") * L139
FFS92	=RiskOutput("Location 4", "Range 11.3") * L140
FFS93	=RiskOutput("Location 4", "Range 11.4") * L141
FFS94	=RiskOutput("Location 4", "Range 11.5") * L142
FFS95	=RiskOutput("Location 4", "Range 11.6") * L143
FFS96	=RiskOutput("Location 4", "Range 11.7") * L144
FFS97	=RiskOutput("Location 4", "Range 11.8") * L145
FFS98	=RiskOutput("Location 4", "Range 11.9") * L146
FFS99	=RiskOutput("Location 4", "Range 12.0") * L147
FFS100	=RiskOutput("Location 4", "Range 12.1") * L148

Input Data

del1	-0.5776 in
Eg	2.086E+05 ksf
eps	1.229E-04
sbm	31.51 kcf

Out1	53.159 Crack Area
------	-------------------

Grout Modulus Effect

Asc	6.07094E-05
Bsc	37.1306292
CAGm	49.796
del5000	-0.549
slope	-117.198
CAst	3.362

Crack Occurrence

Aco1	-1.05E-06
Bco1	-0.3087
Aco2	-1.89E-06
Bco2	-0.0103
Eg1	2.38E+05
Eg2	2.45E+05
delco	-0.536111548

Grout Strength Effect

Modifies time at which first crack occurs

Ags	-3698.5
Bgs	-0.08113
delm	-0.5271691
delgs	-0.535510031
ratio	1.015822117

AI	6.74961E-05
BI	-28.237
Intercept	-14.155
Ac	-129.730
Crack Area	60.772

Soil Bulk Modulus Effect

No effect since settlement rate and soil modulus are related

gsmean	0.0001206
--------	-----------

ratio2

1

sbmmean

30

Input Data	
del1	=Main1B42
Eg	=Main1Eg
eps	=Main1eps
sbm	=Main1sbm
in	
ksf	
ksf	

Out1	Crack Area
	=F*(del1-co-del1-r,0.CAgmt+CAst)

GROUT MODULUS EFFECT

Asc	0.0000607094052540978
Bsc	37.1306291961258
CAgmt	=B10*Eg+B11
del5000	-0.548875032124479
slope	-117.1984
CAst	=slope*(del1-del5000)

Crack Occurrence

Acco1	-0.00000105
Bco1	-0.3087
Acco2	-0.00000189
Bco2	-0.0103
Eg1	238000
Eg2	245000
delco	=ratio*ratio2*(IF(OR(Eg<Eg1,_Eg>Eg2_),Acco1*Eg+Bco1,Acco2*Eg+Bco2))

GROUT STRENGTH EFFECT

Modifies time at which first crack occurs

Ags	-3698.5
Bgs	-0.08113
delm	=Ags*F31+Bgs
delgs	=Ags*eps+Bgs
ratio	=delgs/delm

SOIL BULK MODULUS EFFECT

No effect since settlement rate and soil modulus are related

ratio2

1

AI	0.0000674960720038472
BI	-28.23686510515708
Intercept	=Eg*AI+BI
AC	-128.73
Crack Area	=F25*del1+Intercept

gsmean 0.0001206

sbmmean 30

Input Data

del1	-0.57756241 ft.	Static Settlement
gm	2.09E+05 ksf	Grout Modulus
gs	1.23E-04	Grout Strain
sbrn	31.512 kcf	Soil Bulk Modulus
sett	0 in.	Settlement
extent	77.69 ft.	Extent

Egmean	2.05E+05
Gsmean	1.21E-04
Sbrmean	30
1000 del1000	-0.4823
setrmean	62

Crack Areas	B/T	T/B
	0	0

B/T Cracks

T/B Cracks

Magnitude

CAr1	0
Amag1	13.44
Bmag1	-8.073

Static Settlement

CAst1	0
Sst1	-41.225

Extent of Settlement

CAext1	0	CAext2	0
Sext	0.7568	Sext2	0.867
		Bext2	-57.73

Grout Modulus

CAgm1	0
Sgm	4.75E-05

Grout Strength - No Appreciable Effect

Soil Bulk Modulus

CAsm1	0	CAsm2	0
Ssm1	0.1047		

T-LLC-2-00006, Rev. 0

Egmean 204800
 Gsmean 0.0001206
 Sbmmean 30
 del1000 =4ft*LOG(FB)+B1
 sbmean 62

Input Data	
del1	=MainIB42
gim	=MainIE0
gs	=MainIEps
slum	=MainISbm
sett	=MainIB43
extent1	=MainIB44

1000

Static Settlement
 Grout Modulus
 Grout Strain
 Soil Bulk Modulus
 Settlement
 Extent

Crack Areas	
B1	=IF(extent1>20,MAX(CA1+CAset1+CAext1+CAgm1+CAsm1,0),0)
T1B	=IF(extent1>20,MAX(CAext2+CAsm2,0),0)

B1/T Cracks

T1B Cracks

Magnitude
 CA1 =IF(sett>0,Amag1*sett+Bmag1,0)
 Amag1 13.44
 Bmag1 -8.073

Static Settlement
 CAset1 =IF(sett>0,Set1*(del1-H0),0)
 Set1 -41.225

Extent of Settlement
 CAext1 =IF(sett>0,Set1*(extent-setmean),0)
 Set1 0.7569

Grout Modulus
 CAgm1 =IF(sett>0,(gm-Egmean)*Sgm,0)
 Sgm 0.00004748

Grout Strength - No Appreciable Effect
 Soil Bulk Modulus
 CAsm1 =IF(sett>0,(sbm-Sbmmean)*Ssm1,0)
 Ssm1 0.1047

CAext2 =IF(sett>2,MAX((Set2)*extent+Bext2,0),0)
 Set2 0.887
 Bext2 -57.73

CAsm2 =IF(sett>2,MAX(1.3*(sbm-Sbmmean),0),0)

Input Data	
del1	-0.57756241 ft
gm	2.09E+05 ksf
gs	1.23E-04
sbm	31.512 kcf
sett	0 in
extent	77.69 ft
Static Settlement	
GROUT Modulus	
GROUT Strain	
SOIL Bulk Modulus	
Settlement	
Extent	
Egmean	2.05E+05
Gsmean	1.21E-04
Sbmmean	30
1000 del1000	-0.4823
setmean	62

Crack Areas	B/T	T/B
	0	0

T/B Cracks

B/T Cracks

Magnitude

CA1	0	CA12	-235.61
Amag1	31.65	Amag2	99.24
Bmag1	-24.51	Bmag2	-235.61

Extent of Settlement

CAext1	0	CAext2	0
CAext11	0	CAext21	0
Sext	0.701	Sext2	0.464

Static Settlement

No effect

GROUT Modulus

CAGm1	0	CAGm2	0
Sgm11	-1.49E-04	Sgm2	-8.03E-05
Sgm12	5.17E-05		

GROUT Strength - No Appreciable Effect

SOIL Bulk Modulus

CAasm1	0	CAasm2	0
Ssm1	4.112	Ssm2	6.372

Input Data	
del1	=MainB42
gm	=MainEg
ks	=MainEg
sbm	=MainB43
sett	=MainB43
extent	=MainB44
ft	ft
ksf	ksf
kcf	kcf
in	in
ft	ft

204800
0.0001206
30
=ACTOG(F8)H81
82

Egmean
Gmean
Sbmean
del1000
sbmean

1000

Crack Areas	
BIT	=IF(extent>20,MAX(CACT+CAext1+CAgm1+CAsm1,0),0)
T/B	=IF(extent>20,MAX

T/B Cracks	
Magnitude	
CAr1	=IF(sett>0.75,Amag1*sett+Bmag1,0)
Amag1	31.646
Bmag1	-24.51
Extent of Settlement	
CAext1	=IF(sett>1.5,IF(extent<=30,0,CAext1),0)
CAext1	0.701
Sett	
Static Settlement	
No effect	
Grout Modulus	
CAgm1	=IF(sett>1.5,IF(gm>204800,Sgm12*(gm-Egmean),Sgm1*(gm-Egmean),0)
Sgm1	-0.000149
Sgm12	0.00005172
Grout Strength - No Appreciable Effect	
Soil Bulk Modulus	
CAsm1	=IF(sett>1.5,(sbm-Sbmean)*Ssm1,0)
Ssm1	4.112
CAr2	=Amag2*sett+Bmag2
Amag2	96.24
Bmag2	-235.61
CAext2	=IF(CAr2>0,IF(extent
CAext21	=IF(CAr1>0,(extent-se
Set2	0.494
CAgm2	=IF(CAr2>0,Sgm2*(gr
Sgm2	-0.0000602319161071
CAsm2	=IF(sett>2.75,(sbm-l
Ssm2	6.372

Input Data

del1	-0.57756241 ft.	Static Settlement
gm	2.09E+05 ksf	Grout Modulus
gs	1.23E-04	Grout Strain
sbm	31.512 kcf	Soil Bulk Modulus
sett	0 in	Settlement
extent	77.69 ft.	Extent

Egmean	2.05E+05
Gsmean	1.21E-04
Sbmean	30
del1000	-0.4823
setmean	62

Crack Areas	B/T	T/B
	0	0

T/B Cracks

B/T Cracks

Magnitude

CAR1	0	CAR2	0
Amag1	41.51	Amag2	38.61
Bmag1	-9.28	Bmag2	-53.97

Static Effect

CAs11	0
Sst1	-59.41

Extent of Settlement

CAext1	0	CAext2	0
Sext	0.388	Sext2	0.9058
Sbext	0.011		

Grout Modulus

No significant effect

Grout Strength

No significant effect

Soil Bulk Modulus

CAsm1	0	CAsm2	0
Ssm1	1.1205	Ssm2	0.9882

Input Data

dell	=MainIB42	ft.	Static Settlement
gfm	=MainIEg	ksf	Grout Modulus
gs	=MainIEps		Grout Strain
sbn	=MainISbn	ksf	Soil Bulk Modulus
sett	=MainIB43	in	Settlement
extent	=MainIB44	ft.	Extent

Egmean 204900
 Gsmean 0.0001206
 Sbmmean 30
 del1000 =A*LOG(F9)/Bt
 setmean 62

Crack Areas	B/T	T/B
	=IF(extent>20,MAX(CAr1+CAst1+CAext1+CAsm1,0),0)	=IF(extent>20,MAX(CAr2+CAext2+CAsm2,0),0)

B/T Cracks

Magnitude

CAr1 =IF(sett>0,Amag1*sett+Bmag1,0)
 Amag1 41.51
 Bmag1 -9.28

Static Effect

CAst1 =IF(sett>0,B26*(del1-del1000),0)
 Sst1 -59.41

Extent of Settlement

CAext1 =IF(sett>0,IF(extent>20,(extent-setmean)*(Sext*sett+Sbext),0),0)
 Sext 0.388
 Sbext 0.011

Grout Modulus

No significant effect

Grout Strength

No significant effect

Soil Bulk Modulus

CAsm1 =IF(sett>0,(sbn-Sbmmean)*Ssm1,0)
 Ssm1 1.1205

T/B Cracks

CAr2 =IF(sett>0,Amag2*sett+Bmag2,0)
 Amag2 38.61
 Bmag2 -53.97

CAext2 =IF(sett>0,IF(extent>30,(extent-setmean)*Sext2,0),0)
 Sext2 0.9058

CAsm2 =IF(sett>0,(sbn-Sbmmean)*Ssm2,0)
 Ssm2 0.9892

T-CLL-B-00006, Rev.0

Input Data

del1	-0.57756241 ft.	Static Settlement
gm	2.09E+05 ksf	Grout Modulus
gs	1.23E-04	Grout Strain
sbm	31.512 kcf	Soil Bulk Modulus
sett	0 in	Settlement
extent	77.69 ft.	Extent

Egmean	2.05E+05
Gsmean	1.21E-04
Sbmmean	30
1000 del1000	-0.4823
setmean	62

Crack Areas	B/T	T/B
	0	0

T/B Cracks

Magnitude	T/B Cracks
CAr1	0.00
CAr2	0.00
Amag1	39.17
Bmag1	-47.23
Amag2	39.17
Bmag2	-47.23
CAsta1	0
CAsta2	0
Asta1	-88.04
Asta2	-25.637
CAext1	0
CAext2	0
Aext1	0.375
Aext2	0.375
Bext1	-0.1076
Bext2	-0.1076
Sext1	0.566
Sext2	0.566
CAgm1	0
CAgm2	0
Agm1	-5.68E-05
Agm2	-5.68E-05
CAasm1	0
CAasm2	0
Asm1	3.9822
Asm2	3.9822
Bsm1	1.498
Bsm2	-0.961
Ssm1	-0.961
Ssm2	-0.961

Grout Strength - no significant effect

Soil Bulk Modulus

Egmean 234800
 Gcmean 0.0001306
 Sbmmean 30
 del1000 =AT*LOG(F8)+Bt
 setmean 62

del1	=MaintB42	ft	Static Settlement
gcm	=MaintEg	ksf	Grout Modulus
ps	=Maintps	ksf	Grout Strain
Sbm	=MaintSbm	in	Soil Bulk Modulus
set	=MaintB43	ft	Settlement
extent	=MaintB44	ft	Extent

1000

BT	=F(extent>20,MAX(CAr1+CAsta1+CAgpm1+CAsm1,0,0))	T/B	=F(extent>20,MAX(CAr2+CAsta2+CAext2+CAgpm2+CAsm2,0,0))
----	---	-----	--

BT Cracks

Magnitude

CAr1 =F(sett>0,Amag1*sett+Bmag1,0)

Amag1 52.42
 Bmag1 6.88

Static Settlement

CAsta1 =F(sett>0,(del1-del1000)*Asta1,0)

Asta1 -86.04

Extent of Settlement

CAext1 =F(sett>0,Sex1*(extent-setmean),0)

Aext 0.375
 Bext -0.1076
 Sext =Aext*sett+Bext

Grout Modulus

CAgpm1 0

Grout Strength - no significant effect

Soil Bulk Modulus

CAsm1 =F(sett>0,(sbm-Sbmmean)*Csm,0)

Asm 1.488
 Bsm -0.961
 Ssm =Asm*sett+Bsm

T/B Cracks

CAr2 =F(sett>0,Amag2*sett+Bmag2,0)

Amag2 39.17
 Bmag2 -47.23

CAsta2 =F(sett>0,(del1-del1000)*Asta2,0)

Asta2 -25.637

CAext2 =F(sett>0,Sex2*(extent-setmean),0)

Sex2 0.568

CAgpm2 =F(sett>0,(gcm-Egmean)*Agm,0)

Agm -0.00005683

CAsm2 =F(sett>0,(sbm-Sbmmean)*Asm2,0)

Asm2 3.9822

Egmean 204800
 Gsmean 0.001206
 Sbmmean 30
 del1000 =AT*LOG(F8)*Bt
 setfmean 62

Input Data		ft.	Static Settlement
del1	=MainIB42		Grout Modulus
gm	=MainIEg	ksf	Grout Strain
gs	=MainIeps		Soil Bulk Modulus
sbm	=MainIsbm	kcf	Settlement
set	=MainIB43	in	Extent
extent	=MainIB44	ft.	

1000

Crack Areas	B/T	T/B
	=IF(extent>20,MAX(CA1+CAstat1+CAext1+CAasm1),0)	=IF(extent>20,MAX(CA2+CAext2+CAasm2),0)

B/T Cracks	Magnitude	Crack Areas	T/B Cracks
CA1	=IF(sett>0,Amag1*sett*Bmag1,0)	CA12	=IF(sett>0,Amag2*sett*Bmag2,0)
Amag1	48.34	Amag2	15.52
Bmag1	34.2	Bmag2	-23.2
Static Effect		CAstat2	=IF(sett>0,Sstat2*(del1-del1000),0)
CAstat1	=IF(sett>0,Sstat1*(del1-del1000),0)	Sstat2	19.8
Sstat1	-122.257	CAext2	=IF(sett>0,IF(extent>20,(extent-setfmean)*Sext2,0),0)
Extent of Settlement		Sext2	0.705
CAext1	=IF(sett>0,(extent-setfmean)*(Sext1*sett+Sbext1),0)	CAasm2	=IF(sett>0,(sbm-Sbmmean)*Sasm2,0)
Sext	0.484	Sasm2	0.848
Sbext	-0.112		
Grout Modulus			
No significant effect			
Grout Strength			
No significant effect			
Soil Bulk Modulus			
CAasm1	=IF(sett>0,(sbm-Sbmmean)*(Sasm1*sett+Sbsm1),0)		
Sasm1	0.364		
Sbsm1	0.543		

Input Data

del1	-0.57756241 ft.	Static Settlement
gm	2.09E+05 ksf	Grout Modulus
gs	1.23E-04	Grout Strain
sbm	31.512 kcf	Soil Bulk Modulus
sett	0 in	Settlement
extent	77.69 ft.	Extent

Egmean	2.05E+05
Gsmean	1.21E-04
Sbmean	30
del1000	-0.4823
setmean	62

Crack Areas	B/T	T/B
	0	0

B/T Cracks

Magnitude		T/B Cracks
CAr1	0	CAr2
Amag1	76.14	Amag2
Bmag1	-35.84	Bmag2

Static Effect	
CAstat1	0
Sstat1	-89.7
CAstat2	0
Sstat2	79.22

Extent of Settlement	
CAext1	0
Sext1	0.6184
CAext2	0
Sext2	0.496

Grout Modulus	
CAGm2	0
Sgm2	-1.11E-04

Grout Strength	
No significant effect	

Soil Bulk Modulus	
CAsm1	0
Ssm1	2.416
Sbsm1	-1.5
CAsm2	0
Ssm2	3.24

Sub Timestep()

r-LLC-2-00006, Rev.0

' Timestep Macro

' Macro written 6/9/2003 by SRS

'Set parameters for Risk Iteration

Application.Calculation = xlCalculationManual

' Initialize cells for time stepping

Cells(26, 2) = 0.001

timerow = 49

CABT = 0

CATB = 0

'cellcnt = 61

'Initialize Crack Area cells

For i = 49 To 54

For j = 8 To 10

Cells(i, j) = 0

Next j

Next i

nstep = 10000 / Cells(25, 2)

For ii = 1 To nstep

If (ii = 1) Then tcount = Cells(25, 2)

Cells(26, 2) = tcount

Cells(27, 2).Calculate

Cells(29, 4).Calculate

Cells(30, 4).Calculate

dsett = Cells(30, 4)

If (dsett > 0) Then

Range("B33:B44").Calculate

'Rndm = Cells(29, 4)

locate = Cells(34, 2)

'Eg = Cells(10, 10)

'Stra = Cells(10, 13)

'Ks = Cells(10, 16)

'Extent = Cells(38, 2)

r1 = 49 + locate - 1

Worksheets("Static").Calculate

Worksheets("Location 1").Calculate

Worksheets("Location 2").Calculate

Worksheets("Location 3").Calculate

Worksheets("Location 4").Calculate

Worksheets("Location 5").Calculate

Worksheets("Location 6").Calculate

Range("B48:C55").Calculate

CABT = Cells(r1, 2)

CATB = Cells(r1, 3)

'Cells(cellcnt, 1) = tcount

'Cells(cellcnt, 2) = Rndm

'Cells(cellcnt, 3) = Eg

'Cells(cellcnt, 4) = Stra

'Cells(cellcnt, 5) = Ks

'Cells(cellcnt, 6) = dsett

'Cells(cellcnt, 7) = locate

'Cells(cellcnt, 8) = Extent

'Cells(cellcnt, 9) = CABT

'Cells(cellcnt, 10) = CATB

'cellcnt = cellcnt + 1

```
End If
Cells(timerow, 9) = Cells(timerow, 9) + CABT
Cells(timerow, 10) = Cells(timerow, 10) + CATB

CABT = 0
CATB = 0

If (tcount >= Cells(timerow, 6)) Then
    Cells(42, 2).Calculate
    Worksheets("Static").Calculate
    Cells(48, 2).Calculate
    CAsat = Cells(48, 2)
    Cells(timerow, 8) = CAsat
    timerow = timerow + 1
End If
tcount = tcount + Cells(25, 2)
Next ii
Worksheets("Main").Calculate
End Sub
```

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 287	Rev. 0
----------------------------------	------------------	-----------

APPENDIX A

Saltstone Properties

analyses of the extracts will be performed by a SCDHEC certified laboratory, GEL, Inc. Charleston, SC.

Table 2-1. Ingredients and proportions of the Tank 23-Tank 50 Saltstone Samples.

Ingredient (Grams in sample/Wt. % total mix)	Mix 64	Mix 65	Mix 66	Mix 67	Mix 68	Mix 69	Mix 70
Cement	40 6.25%	40 6.1%	40 5.8%	40 5.7%	80 6.0%	80 6.1%	80 6.1%
Slag	180 28.13%	180 27.6%	180 26.3%	180 25.6%	360 26.9%	360 27.5%	360 27.5%
Fly Ash	180 28.13%	180 27.6%	180 26.3%	180 25.6%	360 26.9%	360 27.5%	360 27.5%
Salt Solution Hold Tank	--	--	--	--	--	--	110 8.4%
Tank 23 Solution	240 37.5%	252.6 38.6%	252.6 36.9%	302 43%	505.2 37.8%	505.2 38.6%	397 30.4%
Tank 50 Solids	--	--	29.8 4.4%	--	29.8 2.2%	3.75 0.29%	--
Daratard 17	--	1.4 0.21%	1.5 0.22%	0.7 0.1%	1.5 0.11%	1.5 0.11%	--
Tank 50 Solids in Tank 50 - Tank 23 Mixture (vol.%)	--	--	8	--	4	0.5	--
PreMix (wt%) Cement-slag-fly ash = 10, 45, 45 wt %	62.5	61.3	58.4	56.9	59.8	61.1	61.1
Water to premix ratio	0.570	0.599	0.599	0.717	0.599	0.599	0.601

3.0 RESULTS



Slurry processing results and compressive strength results for samples cured for 28 days are summarized in Table 3.1. Mix 64 was prepared without Daratard 17 set retarder. This sample gelled too quickly and was therefore unacceptable for processing in Z-Area. Daratard was added to Mix 65 to delay gelling. This was accomplished but the amount of set retarder in this mix was too high as indicated by the amount of standing water remaining after 3 day. The amount of Daratard set retarder was reduced in the subsequent mixes and acceptable processing properties (gel time, set time and standing water) were achieved.



Acceptable gel times are in the range of 30 to 120 minutes. Setting should occur within the first three days after mixing and acceptable formulations have zero standing water after three

days curing in a closed container. The compressive strength after curing for 28 days must be at least 200 psi.

Table 3-1. Summary of Processing Properties.

Property	Mix 64	Mix 65	Mix 66	Mix 67	Mix 68	Mix 69	Mix 70
Gel Time (minutes)	<5				>120	120	80
Set Time (days)	1	1	1-2	1-2	<1	<1	<1
Standing Water	0 @ 1 day	0 @ 3 days	1.5 vol. % @ 3 days	0 @ 3 days	0 @ 3 days	0 @ 3 days	0 @ 3 days
Compressive Strength after 28 days curing (psi)	--	--	488	388	471	642	633

4.0 CONCLUSIONS

Saltstone laboratory samples made with Tank 23 low-level waste solution containing up to 8 volume percent Tank 50 solids met the Z-Area processing and compressive strength requirements. The acceptable formulations were prepared with a premix blend of 10 wt. % cement, 45 wt. % slag, and 45 wt. % fly ash. The premix was mixed with the Tank 23, tank 23 – Tank 50 waste at a water to premix ratio of about 0.60. Due to the low salt content of the Tank 23 waste, Daratard 17, a set retarder is required to extend the gel time. A target formulation is provided in Table 4-1.

Table 4-1. Acceptable Tank 23 Solution-Tank 50 Solids Saltstone Formulation.

Ingredient (Wt. % total mix)		Target Mix Tank 23 – Tank 50 Solids (wt. %)
Premix Cement, Slag, Fly Ash 10, 45, 45 wt. %	Cement	5.8%
	Slag	26.3%
	Fly Ash	26.3%
Tank 23 Solution		36.9%
Tank 50 Solids		4.4%
Daratard 17		0.1%
Tank 50 Solids in Tank 50 - Tank 23 Mixture (vol. %)		8 (0 to 8)
PreMix (wt%) Cement-slag-fly ash = 10, 45, 45 wt %		58.4
Water to premix ratio		0.60

Classification	Rock	Description	Major Mineral Constituents
Massive	Hornfels	Microfine grained	Quartz
	Quartzite	Fine grained	Quartz
	Marble	Fine to coarse grained	Calcite or dolomite
Foliated	Slate	Microfine grained, laminated	Clay minerals, mica
	Phyllite	Soft, laminated	Mica, clay minerals
	Schist	Altered, hypabyssal rocks, coarse grained	Feldspars, quartz, mica
	Gneiss	Altered granite	Hornblende

TABLE 2.6 HARDNESS OF MINERALS.

Mohs' Scale	Standard Mineral	Chemical Composition	Field Test can be scratched with—
1	Talc	$Mg_3Si_4O_{10}(OH)_2$	Finger nails—easily
2	Gypsum	$CaSO_4 \cdot 2H_2O$	—with difficulty
3	Calcite	$CaCO_3$	Knife—easily
4	Fluorite	CaF_2	—with moderate pressure
5	Apatite	$Ca_5(PO_4)_3(OH, F, Cl)$	—with difficulty
6	Orthoclase	$KAlSi_3O_8$	—no longer
7	Quartz	SiO_2	Gives sparks with steel
8	Topaz	$Al_2SiO_4(OH, F)_2$	—
9	Corundum	Al_2O_3	—
10	Diamond	C	—

face layers have smaller crystals than the deeper ones. The higher the silica content of a magma the greater the rate of crystal growth under the same environmental conditions. The size of the individual crystals in rocks, as in metals, determines many important physical properties with an optimum effect usually at some intermediate size.

ROCKS IS CONTRIBUTED by oxygen, silicon, and aluminum; five further elements (iron, calcium, sodium, potassium, and magnesium) make up about 16 percent. These elements form minerals of which more than 90 percent belong to a few groups as shown in Table 2.4. Table 2.5 gives a classification of metamorphic rock according to Farmer (1968). Table 2.6 presents the Mohs Hardness Scale for minerals together with simple field tests.

1. Properties of Rocks

The mechanical properties of rocks vary significantly within the same rock type and even within the same formation. Hence, tabulated data may serve only as general indicators of the expected range of properties. The actual properties of rock in situ must be determined by appropriate tests for any major projects. For purposes of general orientation, elasticity and strength properties are given in Table 2.7 for various rock types.

Other important properties of rocks and natural rock bodies are:

1. Permeability to water and effect of water on elastic and strength properties;
2. Creep of rocks under high stresses, and underlying rheologic properties;
3. Dynamic properties including acceptance, transmission and dispersion of seismic energy;
4. Thermal and electric capacities and transmission properties;
5. Response upon exposure to environmental conditions that differ physically and chemically from those of the original rock environment.

2. Properties and Engineering Classification of Shales

Shales predominate among the sedimentary rocks in the earth's crust; their properties vary from those of "solid" rock that must be blasted for excavation to those of soil-like materials that fall within the engineering definition of

TABLE 2.7 MECHANICAL PROPERTIES OF VARIOUS ROCKS.

Rock	Young's Modulus at Zero Load, 10^5 kg/cm ²	Bulk Density, g/cm ³	Porosity, Percent	Compressive Strength, kg/cm ²	Tensile Strength, kg/cm ²
Granite	2-6	2.6-2.7	0.5-1.5	1000-2500	70-250
Microgranite	3-8				
Syenite	6-8	3.0-3.05	0.1-0.5	1800-3000	150-300
Diorite	7-10				
Dolerite	8-11	3.0-3.1	0.1-0.2	2000-3500	150-350
Gabbro	7-11				
Basalt	6-10	2.8-2.9	0.1-1.0	1000-3000	150-300
Sandstone	0.5-8				
Shale	1-3.5	2.0-2.6	5-25	200-1700	40-250
Mudstone	2-5				
Limestone	2-5	2.0-2.4	10-30	100-1000	20-100
Dolomite	1-8				
Coal	4-8.4	2.2-2.6	5-20	300-3500	50-250
Quartzite	1-2				
Gneiss	1-2	2.5-2.6	1-5	800-2500	150-250
Marble	1-2				
Slate	1-2	2.65	0.1-0.5	50-500	20-50
Gneiss	1-2				
Gneiss	2.9-3.0	0.5-1.5	1500-3000	500-2000	100-300
Marble	2.6-2.7				
Slate	2.6-2.7	0.5-2	1000-2500	500-2000	50-200
Slate	2.6-2.7				
Slate	2.6-2.7	0.1-0.5	1000-2000	1000-2000	70-200
Slate	2.6-2.7				

Note: (1) For the igneous rocks listed above Poisson's ratio is approximately 0.25. (2) For a certain rock type, the strength normally increases with increase in density and increase in Young's modulus. (After Farmer, 1968.)

$f_c = 500 \text{ psi}$
 $= 35 \text{ kg/cm}^2$
 $E = 1.65 \text{ kg/cm}^2$
 2.04855 k/ft^2

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 291	Rev. 0
----------------------------------	------------------	-----------

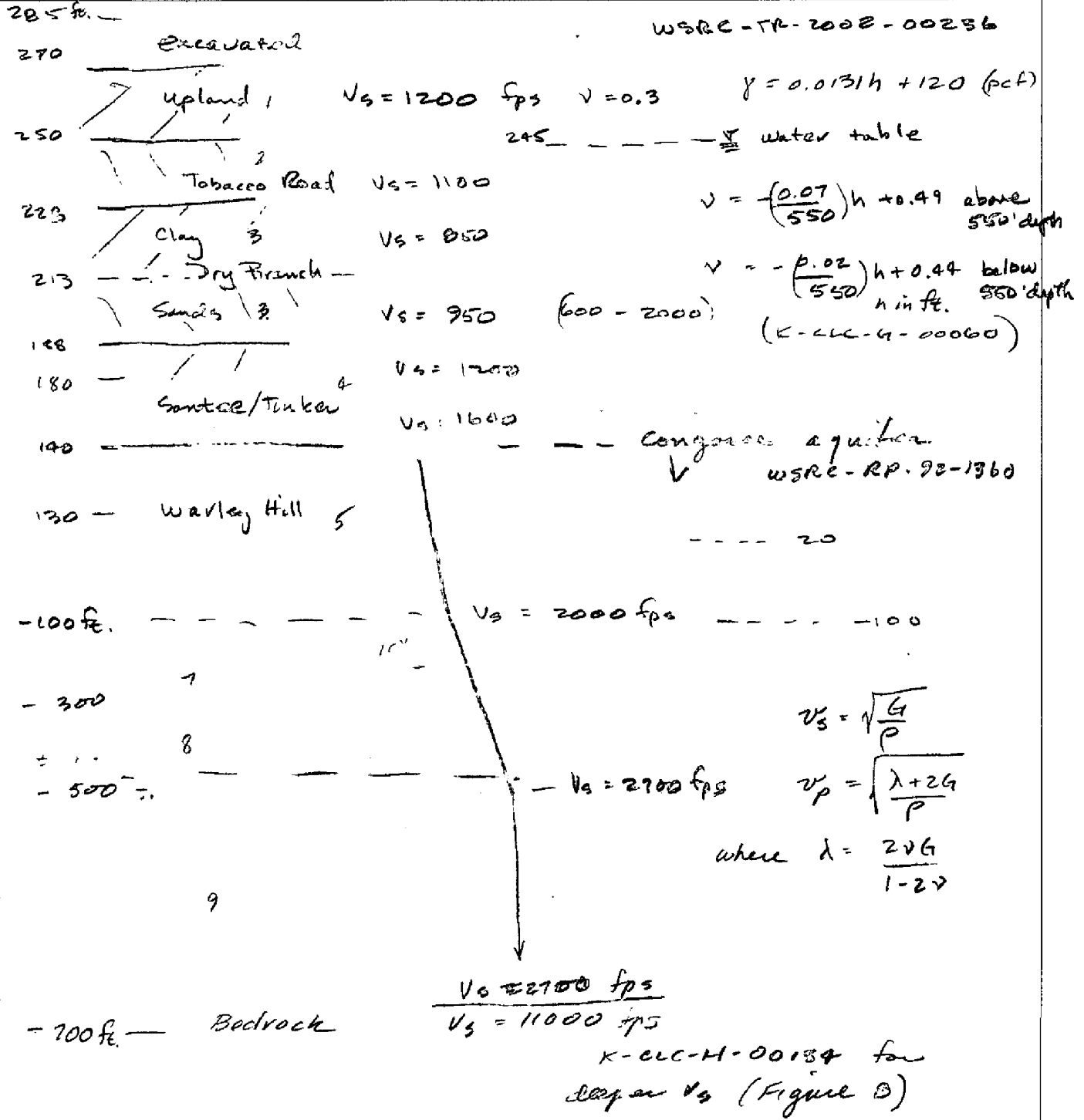
APPENDIX B

Soil Layer Properties DWPF Settlement Data

Calculation Sheet

	Project <u>See below</u>					Calculation No. <u>T-LLC-2-00006</u>			
	Subject <u> </u>					Sheet No. <u>292</u>			

Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
0	WRP	7/9/03	GEM	7/10/03					

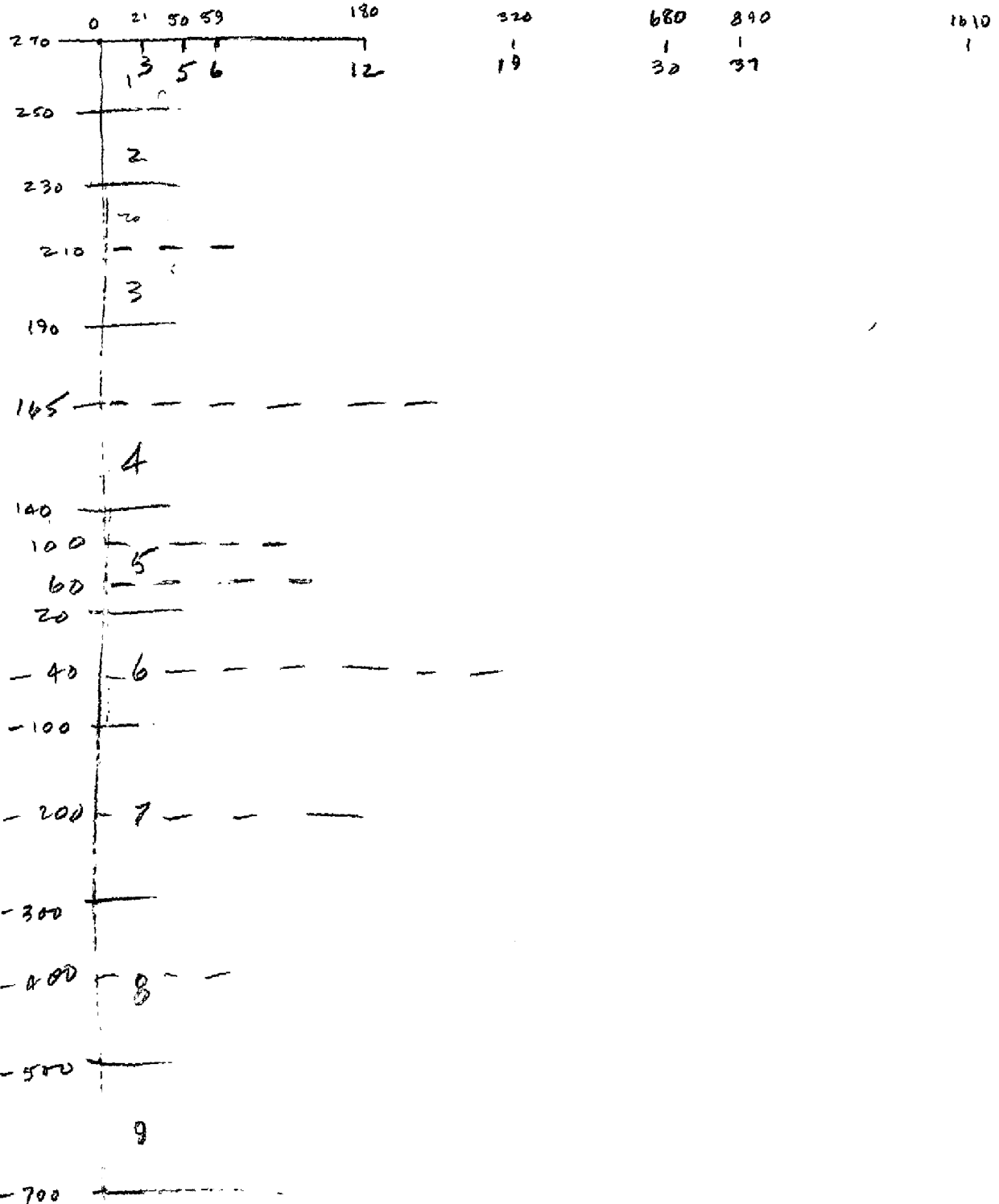


SOIL PROFILE
Z AREA

Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. <i>T-CLL-2-00006</i>				
	Subject <i>u</i>					Sheet No. <i>293</i>				
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date	
<i>0</i>	<i>WVP</i>	<i>7/9/03</i>	<i>GEM</i>	<i>7/10/03</i>						

MODELS SSVAULT 6, SSV1E1



foundation explorations. In descending order, they are: Hawthorne, Barnwell, McBean, Congaree, and Ellenton Formations. New nomenclature has evolved for the various strata and are presented in Figure 2. Table 1 illustrates the relative positions of these strata at the DWPF site.

Table 1. Sedimentary Stratigraphy at the DWPF Site Based on Subsurface Exploration (Mueser, 1984a).

Stratum - old nomenclature (new nomenclature)	Soil Designation	Stratum Thickness (ft)	Stratum Elevation Range (ft, msl)	Geologic Soil Characterization
Hawthorne Formation (Altamaha Fm. - also Upland Unit)	S1	0 +	surficial unit above 275 ±	poorly sorted, sandy with frequent lenses of gravel, pebbly sand; and oxidized, massive clay.
Barnwell Formation (Tobacco Road Fm., Irwinton Sand Mbr., Tan Clay Mbr.)	S2a S2b	80 ±	275 to 195	interbedded, clayey sand and sand with thin layers and lenses of clay or silt.
Undifferentiated (Tan Clay Mbr. - included above)	C2	5 to 20	215 to 195	stiff, silty clay.
McBean Formation (Tinker Fm. and Santee Limestone)	S3a S3b S3c	70	195 ± to 125 ±	alternating layers of sand, some clay and sand with trace clay or silt; discontinuous calcareous sand in lower strata.
Undifferentiated (Green Clay)	M1	10 ±	140 to 130	discontinuous, compact silt.
Congaree Formation (same)	S4	100 ±	125 to 30	continuous, dense sand and silty sand.
Ellenton Formation	---	---	---	dense, sandy to clayey silt with some silty sand.

2.2 Geotechnical Characteristics of Soil at DWPF

SPT N-value profiles were prepared by D'Appolonia (1982a) for boreholes near the major facilities. The location of the borehole groups is shown in Figure 3 and the average ± 1 standard deviation profiles are given in Figure 4. Shear and compressional wave velocities for the DWPF soil profile are shown in Figure 5. Also, grain size distributions for soils in the Barnwell, McBean, Congaree, and Ellenton Formations are given in Figure 6. The geotechnical engineering characterization of the soils is given in Table 2.

Table 2. Geotechnical Engineering Characterization of Soil Strata at the DWPF Site (D'Appolonia, 1982a; Mueser, 1984a).

Soil Designation	Soil Description	Water Content (range, %)	SPT N-Value (bpf)
S1	Clayey Sand, trace Gravel; or Sand, some Clay; organic Silt (see notes).	15 to 25	10 to 50 [20] (see notes)
S2a	Sand, trace Silt and Gravel; occasional Clay lenses.	12 to 26 [22]	4 to 50 (see notes)
S2b	Sand, trace Clay, occasional Silty Clay lenses.	15 to 28 [22]	8 to 45 (see notes)
C2	stiff, Silty Clay to Clayey Silt, trace Sand.	[53]	9 to 27
S3a	Sand, some Clay, trace shell fragments.	20 to 30 [23] U 25 to 35 [30] M,L (see notes)	10 to 40 U 10 to 60 M,L (see notes)
S3b	Sand, Trace Clay and Silt.	20 to 30 [25]	15 to > 100 [35]
S3c	Sand, some Silt, trace Clay	22 to 28 [25]	12 to 110 [40]

Notes: average values, where available, are given in [brackets].

Stratum S1: organic Silt forms up to 20 ft thick lenses in depressions at ground surface. SPT N-values occasionally as low as 10 bpf in upper 5 ft of soil and as high as 50 bpf throughout possibly due to gravel.

Stratum S2a: typical SPT N-values range from 20 to 25 bpf. Five percent of N-values are below 10 bpf, but no loose, continuous layers were encountered.

Stratum S2b: seven percent of N-values below 8 bpf with continuous loose layer at about elevation 220 ft.

Stratum S3a: U, M, L denotes upper, middle, and lower portions of strata S3a, respectively. Isolated occurrences of SPT N-values as low as 2 bpf.

3.0 STRUCTURAL FAULTS AND SEISMICITY

3.1 Faulting at SRS

Subsurface mapping and seismic reflection surveys performed from 1988 to 1989 at SRS indicate a fault that displaces Cretaceous through Tertiary sediments with about 30 to 100 ft of vertical offset (WSRC, 1994a) (Figure 7). This fault, interpreted as a Cretaceous/Tertiary reactivation of earlier Mesozoic faulting, has been named the Pen Branch fault. The fault trends northwest across the site and closely parallels the fault that forms the northern boundary of the Dunbarton Basin. Based on deformation and sediment age, the fault is not capable (WSRC, 1994a).

Shallow faulting has been observed in the central area of SRS (F, H, and E-Areas). Current knowledge suggests these features are restricted generally to the Santee Formation and overlying sediments and generally do not extend with depth to basement (WSRC, 1994b). Based on profiles constructed from drilling and geophysical data, no capable faults were identified in the Cenozoic sediments at, or near, DWPF (duPont, 1982). Seismic reflection surveys indicate older faults with a maximum of about 50 ft of offset at the top of basement rock about 800 to 980 ft beneath the ground surface. However, reflecting horizons of Cretaceous age, and younger, are not displaced by these faults, which places a minimum age of about 80 to 85 million years before present (mybp) for these features (duPont, 1982).

T-LLC-2-00006, Rev. 0

Settlement Pattern Comparison

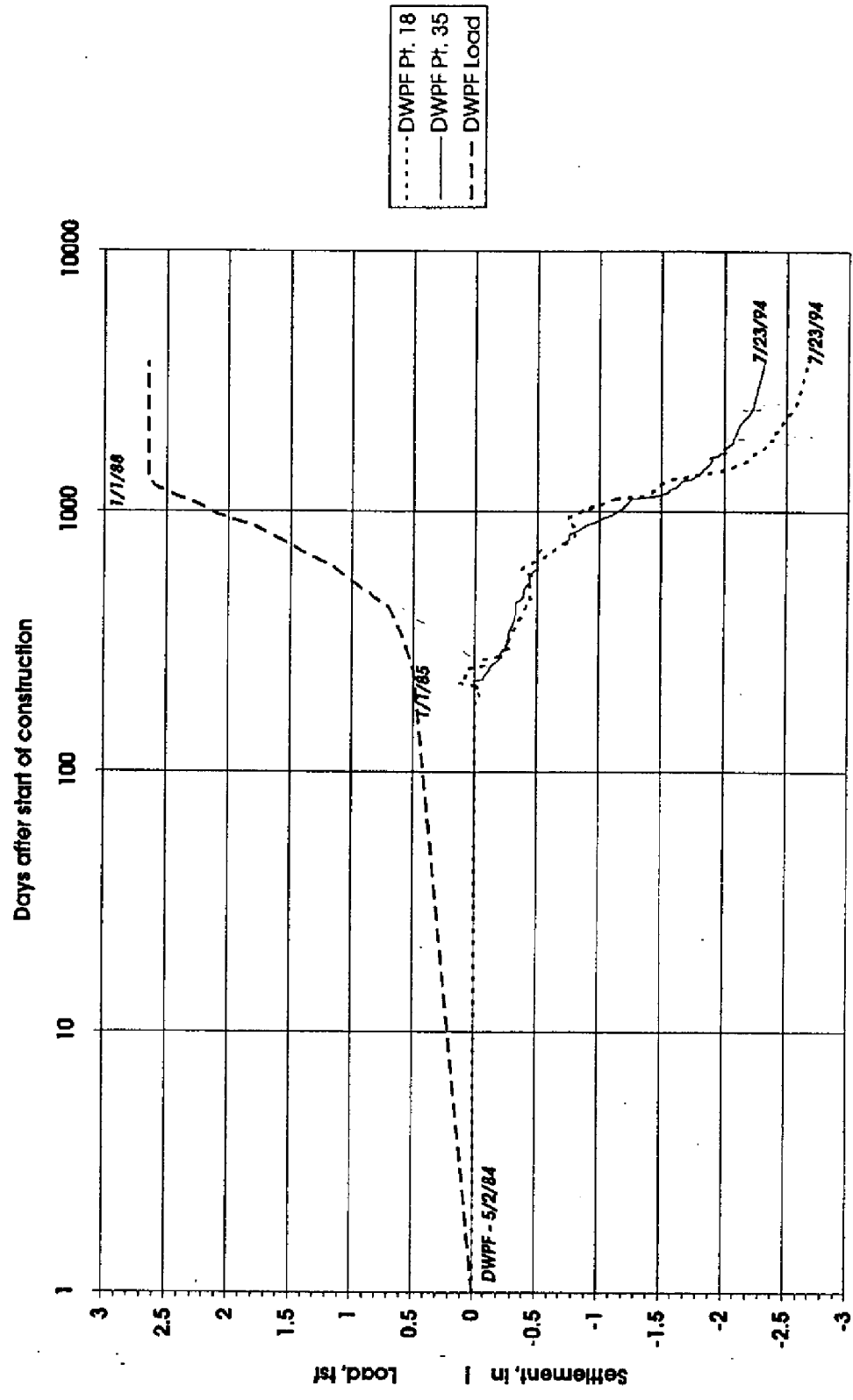


Figure 9. Settlement of DWPF During Construction.

Calculation No. K-CLC-G-00060
Sheet No. 3
Rev. 0

Purpose

The purpose of this calculation is to provide a "best estimate" strain compatible soil profile for areas at the Savannah River Site having a soil column thickness between 800 and 1000 feet overlying crystalline bedrock. The best estimate profile includes shear wave velocities, damping ratios, Poisson's ratio and unit weights. The shear wave velocities and damping ratios are strain compatible values consistent with the Charleston event (50th percentile) developed by Lee et al., 1997. The Accelerator Production of Tritium (APT) site falls into the 800-1000 feet soil column thickness range over crystalline bedrock.

Calculation Approach and Input

Strain Compatible Shear Wave Velocity and Damping Ratio

In March of 1997 the Site Geotechnical Services Department (SGS) issued "SRS Seismic Response Analysis and Design Basis Guidelines" (Lee et al., 1997). Work for this report involved review of existing geotechnical data and development of models representing the range of conditions expected at the SRS. The SRS was subdivided into areas based on the soil column thickness and bedrock type and a probabilistic model was developed and used to generate 30 soil profiles consistent with the SRS geotechnical data (Toro, 1997). This work is documented in reports and calculations (Lee et al., 1997; Toro, 1997; WSRC, 1997a,b,c,d).

For this calculation the 30 soil profiles representing soil column thickness between 800 and 1000 feet overlying crystalline bedrock were used. Specifically the strain compatible shear wave velocities and damping ratios from the median Charleston earthquake (M_w 7.3 and $\Delta\sigma = 150$ bar) (WSRC, 1997d) were used. The results from these computer runs are averaged to get mean and log-mean strain compatible shear wave velocities and damping ratios consistent with the Charleston event. The data sets from the Charleston event come from the computer files listed in Table 1 and documented in WSRC, 1997d.

Poisson's Ratio

The "best estimate" Poisson's ratio is from shear/compression wave measurements. Poisson's ratio is calculated for each shear/compression wave set using Equation 1.

$$\mu = \frac{(V_p^2 - 2 \cdot V_s^2)}{(2 \cdot V_p^2 - 2 \cdot V_s^2)} \quad (\text{Eq. 1})$$

where: μ is Poisson's ratio
 V_p is compression wave velocity
 V_s is shear wave velocity

Calculation No. K-CLC-G-00060
Sheet No. 4
Rev. 0

The shear/compression wave sets were measured at deep boreholes CFD-1, CFD-18, GCB-1, GCB-2, GCB-4, GCB-5, GCB-7, MMP-2A-SB, MMP-3-SB, and MMP-4-SB (Agbabian, 1992a,b; 1994; 1996a,b; 1997). The Poisson's ratio from the individual borings is plotted on Figure 1. The "best estimate" Poisson's ratio is based on Figure 1 and visual fitting of the data plotted.

Unit Weight

The "best estimate" unit weight is from geophysical bulk density logs recorded in deep borings at SRS. The bulk density logs were made using gamma-gamma cross sectional measurements, where the back scatter from the source is measured for discrete intervals. The density logging was performed at boreholes GCB-1, GCB-2, GCB-4, GCB-5, GCB-7, MMP-2A-SB, MMP-3-SB, MMP-4-SB, SSW-1, SSW-2, and SSW-3 (WSRC, 1998). Data from the individual bulk density logs is plotted on Figure 2. The "best estimate" unit weight is based on Figure 2 and visual fitting of the data plotted.

Computations and Results

Strain Compatible Shear Wave Velocity and Damping Ratio

Extracting the data from the RASCALS output files and the averaging was performed using a FORTRAN program VSDSTAT. The code for VSDSTAT is presented in Attachment A. The program VSDSTAT locates the strain compatible properties (i.e., shear wave velocity and damping ratio) in the RASCALS output file and computes the average for each layer assuming both a normal and log-normal distribution. Five VSDSTAT runs were performed, one for each of the source depth dependent Charleston (M_w 7.3 and $\Delta\sigma = 150$ bar) data sets. The five data sets represent five earthquake source depths. Output files from the five VSDSTAT runs are presented in Attachment B. The averages from the five VSDSTAT runs are then copied into an EXCEL spreadsheet, weighted based on the depth distribution of seismicity in the southeastern U.S. (Lee et al., 1997), and the weighted average is computed. The five source depths and their weights are:

Depth (km)	Weight
4	0.1
10	0.3
15	0.2
20	0.2
25	0.2

The top depth for each layer and layer thickness are also given in the RASCALS output files. The top depth and layer thickness for each layer were copied to an EXCEL spreadsheet, the mid-layer depth was then calculated from the average layer top depths. Table 2 presents the top depths extracted from the RASCALS files and their averages. Table 3 presents the thickness of the layers from the RASCALS files and their averages.

Calculation No. - K-CLC-G-00060
Sheet No. 5
Rev. 0

Figures 3 and 4 present the Charleston 50th percentile strain compatible shear wave velocities from each of the five VSDSTST runs and the weighted average. Figure 3 assumes normal distribution and Figure 4 assumes log-normal distribution. Figures 5 and 6 present the Charleston 50th percentile strain compatible damping ratios from each of the five VSDSTST runs and the weighted average. Figure 5 assumes normal distribution and Figure 6 assumes log-normal distribution. Tables 4 and 5 contain the data plotted in Figures 3 and 4 and Tables 6 and 7 contain the data plotted in Figures 5 and 6.

Poisson's Ratio

The Poisson's ratio from the individual borings logs is plotted on Figure 1. Based on Figure 1 and literature values presented in Table 8, the "best estimate" Poisson's ratio is 0.3 above the water table. Below the water table Poisson's ratio can be described by Equations 2 and 3.

$$\mu = -\left(\frac{0.07}{550}\right)h + 0.49 \quad \text{Water Table to 550 feet (Eq. 2)}$$

$$\mu = -\left(\frac{0.02}{550}\right)h + 0.44 \quad \text{550 feet and deeper (Eq. 3)}$$

Where h is depth in feet, and
μ is Poisson's ratio.

Unit Weight

Data from the individual bulk density logs is plotted on Figure 2. Based on Figure 2, the "best estimate" soil unit weight (γ_{insitu}) as a function of depth described by Equation 4.

$$\gamma_{insitu} = 0.0131 \times h + 120 \quad \text{Soils only - not rock (Eq. 4)}$$

Where h is depth in feet, and
 γ_{insitu} is insitu unit weight in pounds per cubic foot.

Assumptions

The relationships (Equations 2, 3 and 4) developed for Poisson's ratio and unit weight were visually fit. Variation from the visually fit relationships is expected. An estimated standard deviation for Poisson's ratio is approximately 0.03. An estimated standard deviation for the unit weight is 8 pounds per cubic foot.

Calculation No. K-CLC-G-00060
Sheet No. 6
Rev. 0

Poisson's ratio determined in this calculation is a low-strain property. The shear wave velocities presented in Tables 4 and 5 and Figures 3 and 4 are strained values for the Charleston 50th percentile event. It is assumed that the low-strain Poisson's ratio can be used in conjunction with the Charleston 50th percentile shear wave values and equation 1 to determine Charleston 50th percentile strain compatible compression wave velocities.

The Shear wave velocity and damping data are assumed to be log-normally distributed and consequently the log-normal averages are considered the "best estimate". This assumption was checked by W-testing (Gilbert 1987) many of the data sets (a data set being the data for a given layer and earthquake source depth). Approximately 40 percent of the layers were tested at the alpha = 0.10 significance level. At the alpha = 0.10 significance level the null hypothesis (i.e., the data has a normal distribution) was accepted for 14 percent of the data sets and the null hypothesis was accepted for 89 percent of the log transformed data sets. Based on the W-testing the data are more likely log-normally distributed as opposed to normally distributed.

Conclusions

The purpose of this calculation is to provide a "best estimate" strain compatible soil profile for areas at the Savannah River Site having a soil column thickness between 800 and 1000 feet overlying crystalline bedrock. This includes strain compatible shear wave velocities and strain compatible damping ratios consistent with the Charleston event (50th percentile) developed by Lee et al., 1997. Also included are low-strain Poisson's ratio and unit weights. These properties are summarized in Table 9.

The recommended low-strain Poisson's ratio is 0.3 above the water table and 0.47 beneath the water table (see Table 9 footnotes). These values are reasonable for most problems where the upper soil profile (depth less than 200 feet) is of concern. These values compare well with other values used for previous work at SRS (WSRC 1991, 1995, 1996). If the model is sensitive to Poisson's ratio or unit weight, Equations 2, 3, and 4 can be used. However, parametric runs should be performed as variation from the visually fit relationships is expected.

The shear wave velocities presented in Table 9 and damping ratios are strained values for the Charleston 50th percentile event. It is assumed that the low-strain Poisson's ratio can be used in conjunction with the Table 9 shear wave values and Equation 1 to determine Charleston 50th percentile strain compatible compression wave velocities.

In this calculation, statistics for the strain compatible shear wave velocities and damping ratios were calculated assuming both normal and log-normal distributions. Based on W-testing the data appear to be log-normally distributed and the log-normal values are the recommended "best estimate". Table 9 presents the strain compatible shear wave velocities and damping ratios assuming log-normal distribution.

Calculation No. K-CLC-G-00060
Sheet No. 25
Rev. 0

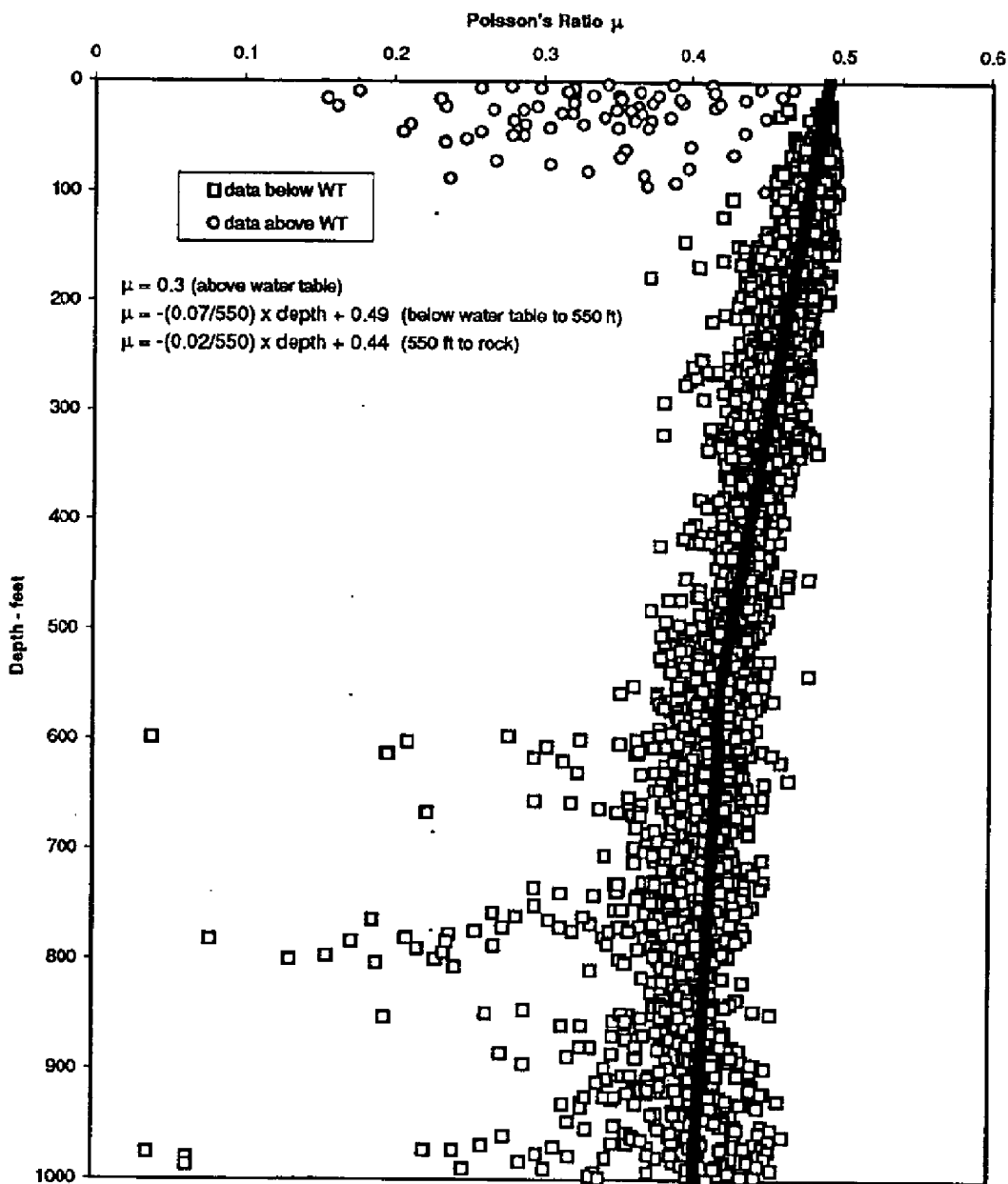
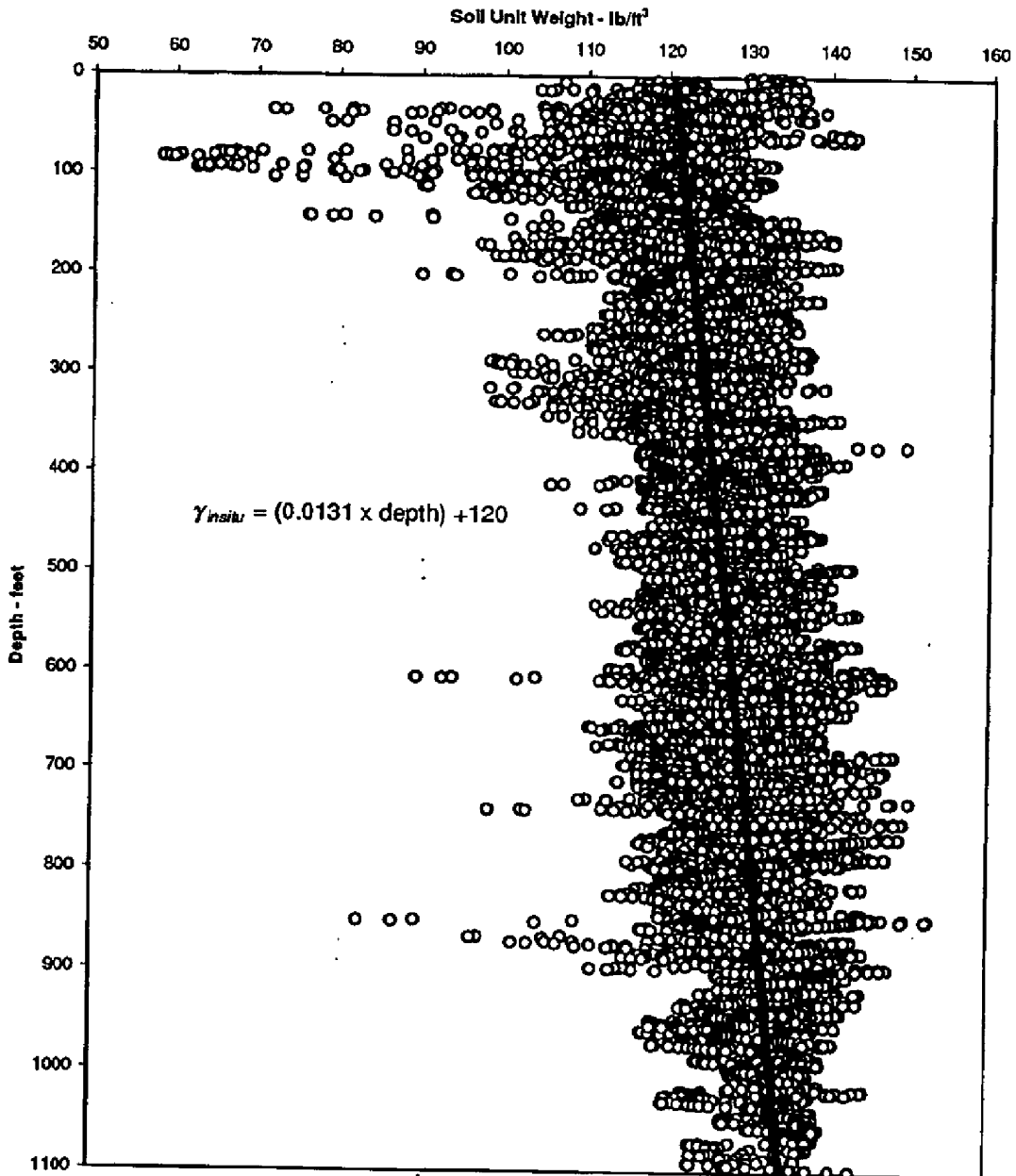


Figure 1. Poisson's Ratio Data for SRS Soils versus Depth and Visual Fit Relationships

Calculation No. K-CLC-G-00060
Sheet No. 26
Rev. 0



densdat.xls

Figure 2. In situ Unit Weight versus Depth for SRS Soils and Visual Fit Relationships

Calculation No. K-CLC-G-00060
Sheet No. 27
Rev. 0

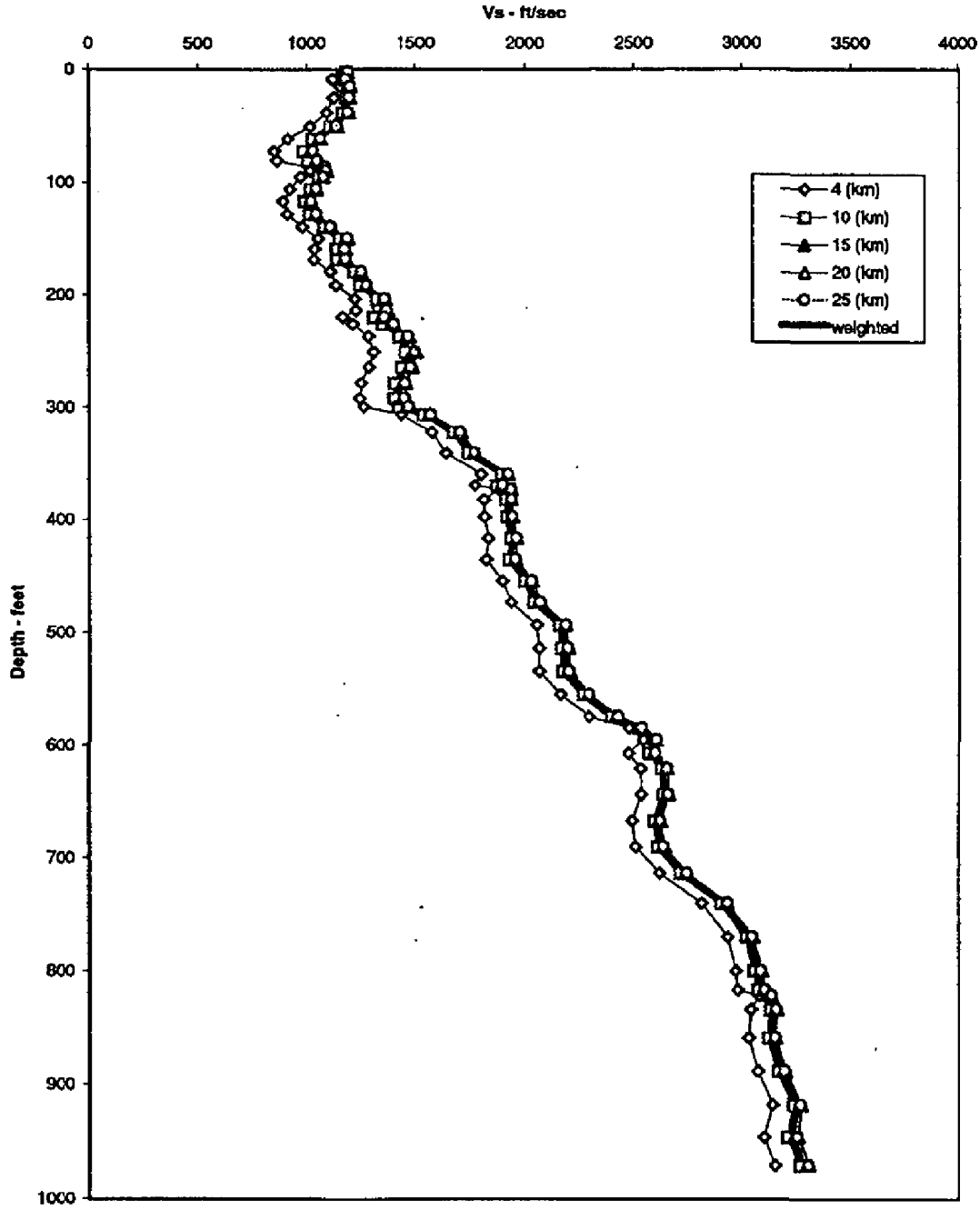
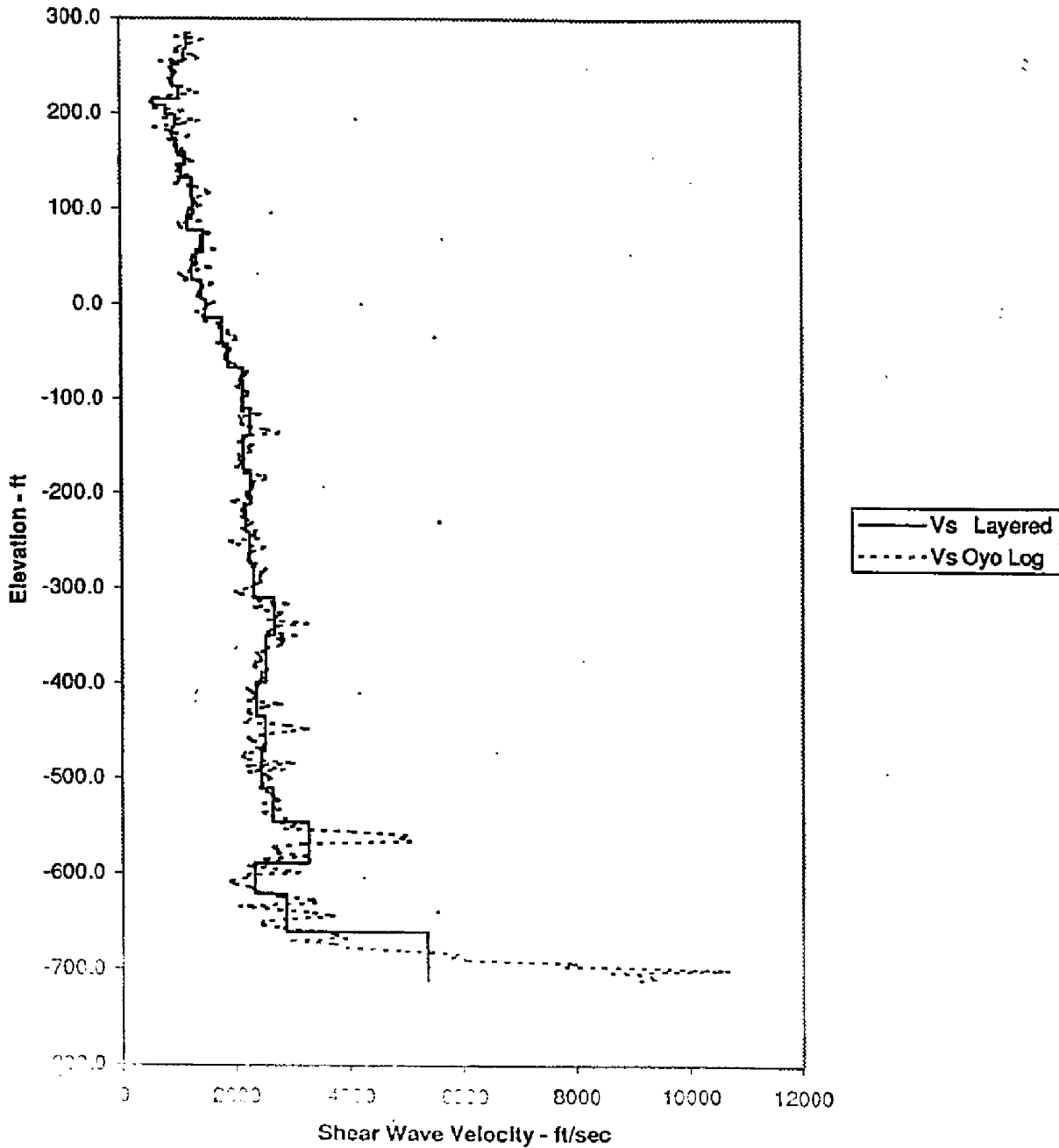


Figure 3. Charleston Source Depth Dependent Strain Compatible Shear Wave Velocity Averages (normal distribution) from VSDSTST Runs and the Weighted Average

Shear Wave Velocities for Deep Boring MMP-2A-SB


Calculation No. K-CLC-H-00134
Sheet No. 15
Rev. 0



Mmp-2sb.xls

Figure 8. Oyo Shear-wave Velocity Logger Survey of Borehole MMP-2A-SB Results and the LAYERSH Filter Interpretation (from Agabian Associates, 1994 and WSRC, 1996b)

Calculation Sheet

	Project <i>See Comm</i>					Calculation No. <i>T-CLL-2-0000G</i>			
	Subject <i>u v</i>					Sheet No. <i>305</i>			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
<i>0</i>	<i>wsp</i>	<i>7/9/09</i>	<i>GEM</i>	<i>7/9/09</i>					

DWPF MONUMENTS K-ESR-5-0000Z

dis from center

monument	dis.	monument	dis.
10	21 ft.	5	38 ft.
15	26	28	45
11	59	4	44
16	67	25	99
37	113.5	26	176
14	180	18	190

Building is 117'-0" x 361'-6"

Table 2 Monument Coordinates

No.	North	East
1	74,045.25	64,616.35
2	74,055.00	64,576.00
3	74,055.00	64,576.00
4	73,946.25	64,662.00
5	73,946.25	64,603.00
6	73,884.25	64,662.00
7	73,824.00	64,662.00
8	73,758.75	64,662.00
9	73,725.50	64,693.00
10	73,882.00	64,629.50
11	73,823.75	64,629.50
12	73,761.00	64,627.50
13	73,728.50	64,627.50
14	73,727.50	64,591.00
15	73,884.25	64,603.00
16	73,824.00	64,603.00
17	73,758.75	64,603.00
18	74,084.00	64,693.00
19	74,059.00	64,693.00
20	74,004.00	64,693.00
21	73,953.00	64,693.00
22	73,884.00	64,693.00
23	73,817.00	64,693.00
24	73,805.00	64,693.00
25	74,005.00	64,662.00
26	74,087.00	64,638.00
27	74,005.75	64,629.50
28	73,951.75	64,622.50
29	74,087.00	64,608.00
31	74,005.00	64,603.00
33	74,004.00	64,558.00
34	73,950.00	64,576.00
35	73,887.00	64,576.00
36	73,817.00	64,576.00
37	73,793.00	64,576.00

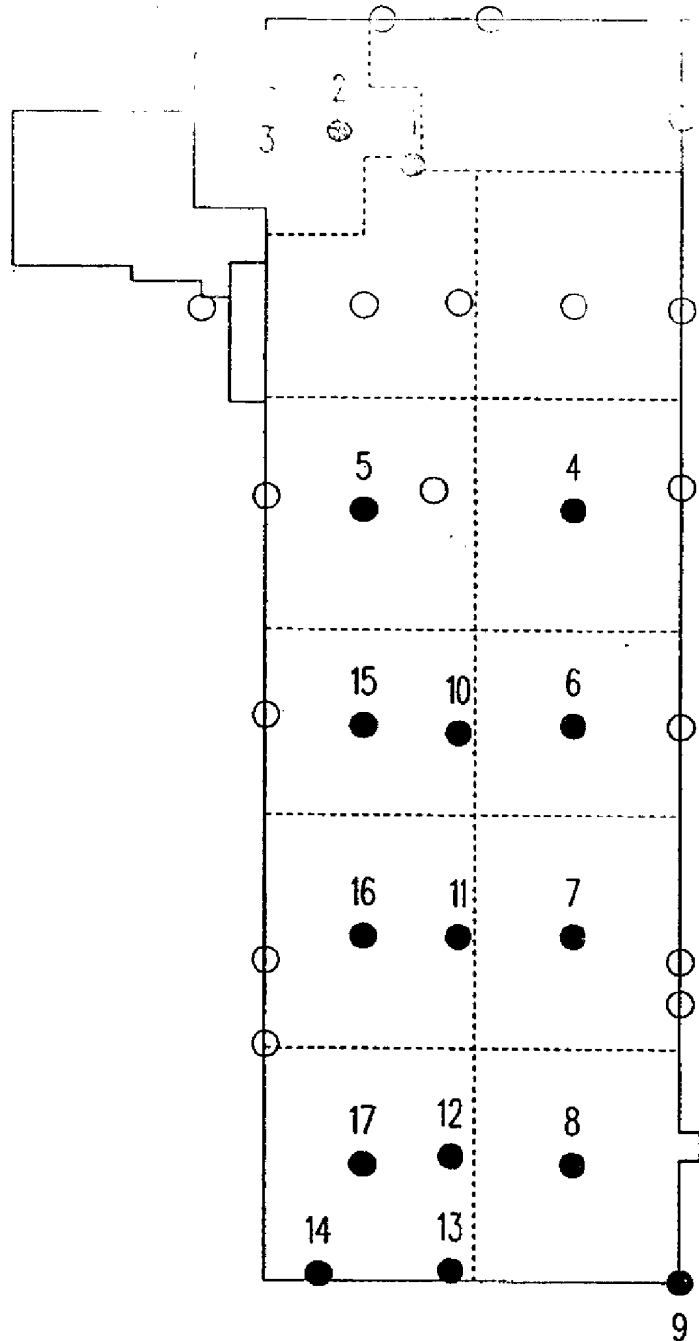


Figure 4 Locations of heave/settlement monuments during Stage A

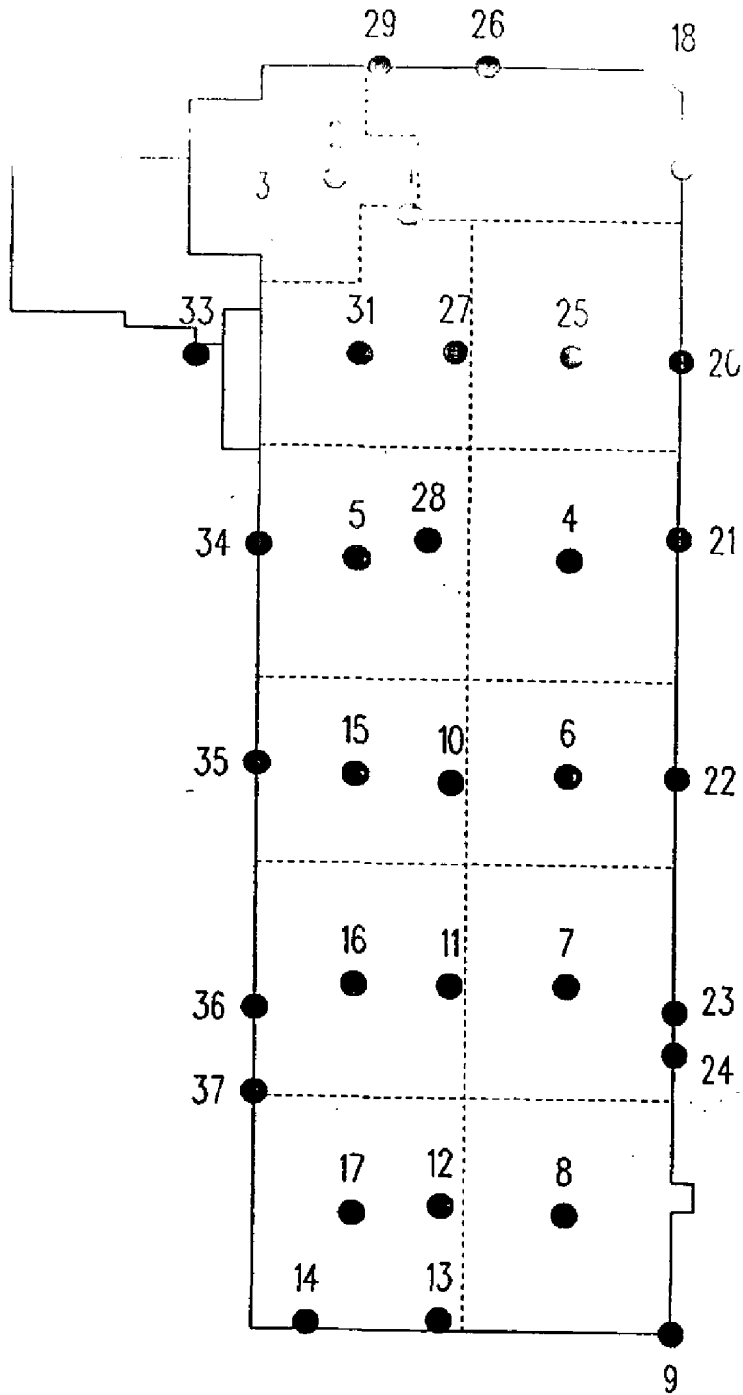


Figure 5 Locations of settlement monuments during Stage B

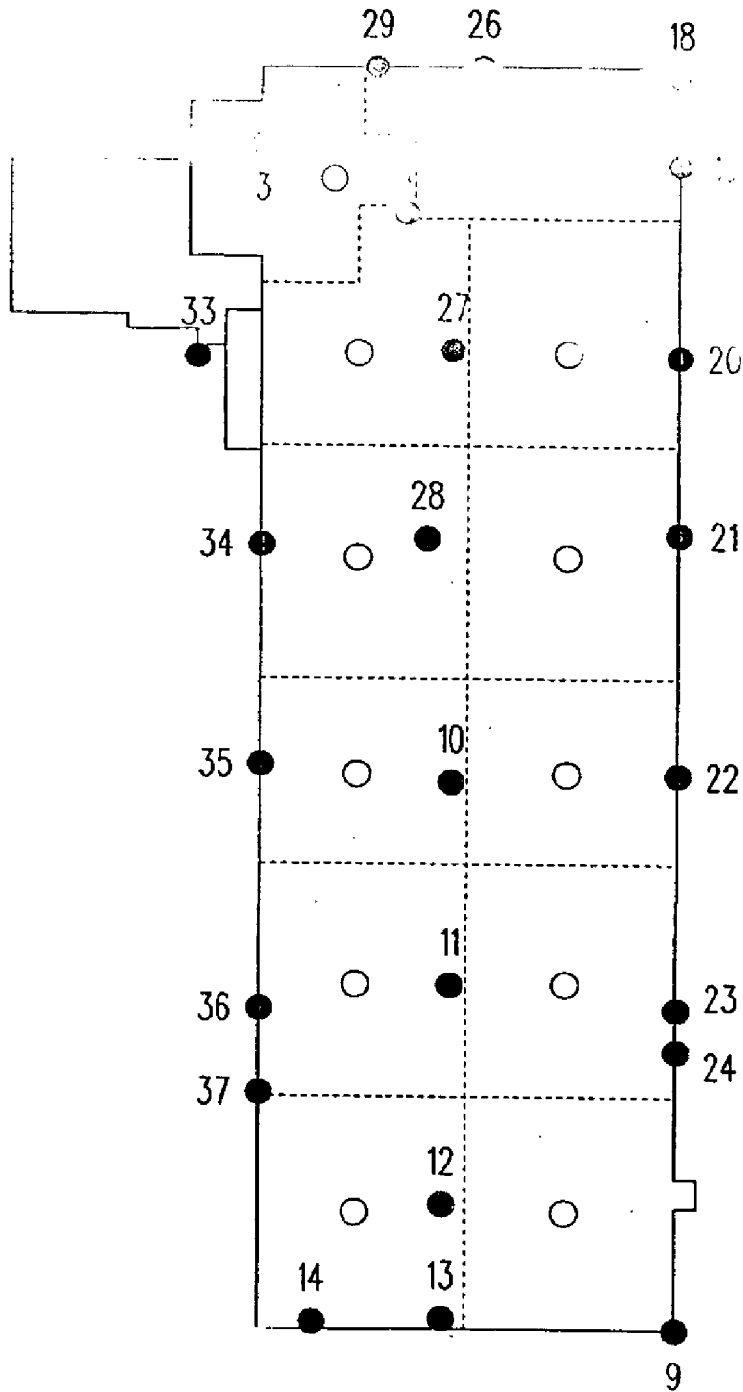


Figure 6 Locations of settlement monuments during Stage 0

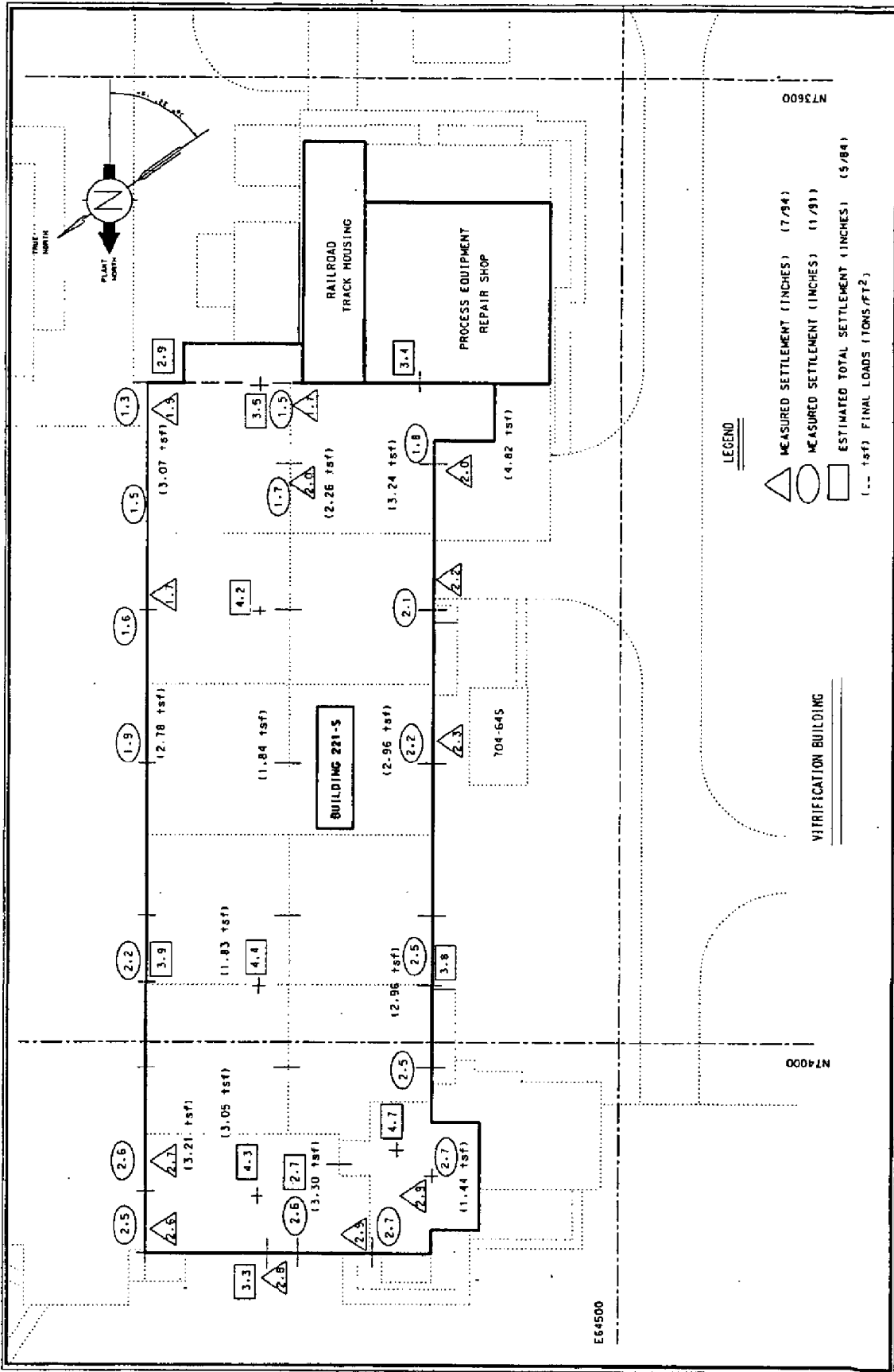


Figure 8. Plan View of Vittrification Building with Estimated and Actual Settlements.

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument: Point 4					
May 1, 1984	1	267.208			0.00
May 17, 1984	17	267.224			0.19
May 25, 1984	25	267.234			0.31
May 31, 1984	31	267.229	270.391	3.162	0.25
June 1, 1984	32	270.383			0.16
June 8, 1984	39	270.383			0.16
June 16, 1984	47	270.386			0.19
June 22, 1984	53	270.382			0.14
June 29, 1984	60	270.384			0.17
July 6, 1984	67	270.383			0.15
July 13, 1984	74	270.382			0.14
July 20, 1984	81	270.384			0.17
July 27, 1984	88	270.380			0.12
August 2, 1984	94	270.383			0.16
August 10, 1984	102	270.385			0.18
August 17, 1984	109	270.391			0.13
August 27, 1984	119	270.385			0.18
August 31, 1984	123	270.383			0.19
September 7, 1984	130	270.377			0.08
September 14, 1984	137	270.368			-0.02
September 21, 1984	144	270.376			0.07
September 28, 1984	151	270.373			0.04
October 1, 1984	154	270.368	281.409	11.103	-0.05
October 3, 1984	156	281.470			0.06
October 5, 1984	158	281.464			-0.11
October 12, 1984	165	281.468			-0.06
October 18, 1984	171	281.467			-0.07
October 26, 1984	179	281.462			-0.13
November 2, 1984	186	281.453			-0.18
November 7, 1984	191	281.462			-0.13
November 20, 1984	204	281.453			-0.24
November 26, 1984	210	281.454			-0.23
November 30, 1984	214	281.445			-0.34
December 7, 1984	221	281.448			-0.30
December 14, 1984	228	281.446			-0.32
December 28, 1984	242	281.443			-0.36
January 4, 1985	249	281.443			-0.36
January 11, 1985	256	281.445			-0.34
January 18, 1985	263	281.443	281.412	-0.031	-0.36
January 25, 1985	270	281.408			-0.41
February 1, 1985	277	281.408			-0.41
February 8, 1985	284	281.409			-0.40
February 15, 1985	291	281.407			-0.42
February 22, 1985	298	281.406			-0.43
March 1, 1985	305	281.411			-0.37
March 8, 1985	312	281.410			-0.38

T-CLC-2-00006, Rev. 0
 Savannah River Site
 Settlement of Defense Waste Processing Facility
 Vitrification Building (U)

313
 K-ESR-S-00002, Rev. 0
 September 30, 1998
 Page A-8

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation Difference (feet)	Settlement (inches)
		Monument	Point 5		
May 1, 1984	1	266.929			0.00
May 17, 1984	17	266.648			0.23
May 25, 1984	25	266.554			0.30
May 31, 1984	31	266.949	270.378	3.429	0.24
June 1, 1984	32	270.369			0.12
June 8, 1984	39	270.372			0.17
June 16, 1984	47	270.373			0.18
June 22, 1984	53	270.367			0.11
June 29, 1984	60	270.370			0.14
July 6, 1984	67	270.368			0.12
July 13, 1984	74	270.366			0.10
July 20, 1984	81	270.366			0.10
July 27, 1984	88	270.367			0.11
August 2, 1984	94	270.367			0.11
August 10, 1984	102	270.369			0.13
August 17, 1984	109	270.365			0.09
August 27, 1984	119	270.369			0.12
August 31, 1984	123	270.366			0.11
September 7, 1984	130	270.363			0.08
September 14, 1984	137	270.355			-0.04
September 21, 1984	144	270.359			0.01
September 26, 1984	151	270.351			-0.07
October 1, 1984	154	270.347			-0.13
October 3, 1984	156	270.375			0.20
October 5, 1984	158	270.349			-0.11
October 12, 1984	165	270.356			0.01
October 18, 1984	171	270.333			0.00
October 26, 1984	179	270.352			-0.05
November 2, 1984	186	270.358			-0.02
November 7, 1984	191	270.354			-0.05
November 15, 1984	199	270.352	281.163	10.809	-0.05
November 20, 1984	204	281.156			-0.10
November 26, 1984	210	281.156			-0.01
November 30, 1984	214	281.131			-0.19
December 7, 1984	221	281.141			-0.31
December 14, 1984	228	281.149			-0.23
December 28, 1984	242	281.147			-0.24
January 4, 1985	249	281.147			-0.24
January 11, 1985	256	281.145			-0.26
January 18, 1985	263	281.142	283.811	-0.331	-0.30
January 25, 1985	270	280.656			-0.36
February 1, 1985	277	280.657			-0.35
February 8, 1985	284	280.607			-0.35
February 15, 1985	291	280.605			-0.37
February 22, 1985	298	280.609			-0.40
March 1, 1985	305	280.609			-0.32

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 10					
May 1, 1984	1	267.900			0.00
May 17, 1984	17	267.943			0.52
May 23, 1984	25	267.945			0.54
May 31, 1984	31	267.941	270.370	2.429	0.49
June 1, 1984	32	270.357			0.46
June 5, 1984	39	270.352			0.40
June 16, 1984	47	270.357			0.46
June 22, 1984	53	270.364			0.42
June 29, 1984	60	270.368			0.47
July 6, 1984	67	270.367			0.46
July 13, 1984	74	270.366			0.44
July 20, 1984	81	270.366			0.44
July 27, 1984	88	270.367			0.46
August 2, 1984	94	270.351			0.38
August 10, 1984	102	270.357			0.46
August 17, 1984	109	270.365			0.49
August 27, 1984	119	270.364			0.42
August 31, 1984	123	270.361			0.38
September 7, 1984	130	270.354			0.30
September 14, 1984	137	270.347			0.22
September 21, 1984	144	270.360			0.37
September 28, 1984	151	270.354			0.30
October 1, 1984	154	270.361			0.38
October 3, 1984	156	270.378			0.59
October 5, 1984	158	270.354			0.30
October 12, 1984	165	270.364			0.42
October 18, 1984	171	270.368			0.47
October 26, 1984	179	270.363			0.41
November 2, 1984	186	270.362			0.40
November 7, 1984	191	270.359			0.36
November 19, 1984	203	270.347	278.839	0.492	0.22
November 20, 1984	204	278.832			0.13
November 21, 1984	205	278.832			0.13
November 30, 1984	214	278.828			0.08
December 7, 1984	221	278.827			0.07
December 14, 1984	228	278.828			0.08
December 28, 1984	242	278.821			0.00
January 4, 1985	249	278.822			0.01
January 11, 1985	256	278.815			-0.06
January 18, 1985	263	278.813			-0.10
January 25, 1985	270	278.810	278.356	-0.454	-0.13
February 1, 1985	277	278.358			-0.11
February 8, 1985	284	278.354			-0.16
February 15, 1985	291	278.353			-0.17
February 22, 1985	298	278.352			-0.18
March 1, 1985	305	278.357			-0.12
March 8, 1985	312	278.356			-0.13
April 5, 1985	340	278.359			-0.10
May 8, 1985	373	278.355			-0.14
June 8, 1985	404	278.356	278.395	0.039	-0.13
July 3, 1985	429	278.382	281.754	3.372	-0.29
July 19, 1985	445	281.754			-0.29
July 29, 1985	455	281.753			-0.30
August 12, 1985	469	281.750			-0.34
September 18, 1985	506	281.747			-0.37
October 17, 1985	535	281.747			-0.37
November 18, 1985	567	281.741			-0.44

T-CLC-2-00006, Rev. 0
 Savannah River Site
 Settlement of Defense Waste Processing Facility
 Vitrification Building (U)

315
 K-ESR-S-00002, Rev. 0
 September 30, 1998
 Page A-15

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 10 (continued)					
December 23, 1985	602	281.737			-0.49
January 28, 1986	638	281.733			-0.54
March 19, 1986	688	281.730			-0.58
April 18, 1986	718	281.730			-0.58
May 21, 1986	751	281.724			-0.65
June 19, 1986	780	281.723			-0.66
July 25, 1986	816	281.722			-0.67
August 26, 1986	848	281.723			-0.66
October 2, 1986	885	281.709			-0.83
October 28, 1986	911	281.702			-0.91
December 5, 1986	949	281.694			-1.01
December 22, 1986	966	281.687			-1.09
February 5, 1987	1,011	281.686			-1.10
February 23, 1987	1,029	281.685			-1.12
March 24, 1987	1,059	281.684			-1.13
May 26, 1987	1,121	281.682			-1.15
June 26, 1987	1,152	281.669			-1.31
July 27, 1987	1,183	281.665			-1.36
August 28, 1987	1,215	281.662			-1.39
September 28, 1987	1,246	281.657			-1.45
October 29, 1987	1,277	281.657	285.025	3.368	-1.45
November 25, 1987	1,304	285.021			-1.50
December 28, 1987	1,337	285.019			-1.52
March 31, 1988	1,431	285.013			-1.60
April 22, 1988	1,453	285.010			-1.63
May 23, 1988	1,484	285.013			-1.60
June 30, 1988	1,522	285.010			-1.63
August 1, 1988	1,554	285.010			-1.63
August 29, 1988	1,582	285.009			-1.64
September 29, 1988	1,613	285.009			-1.64
October 28, 1988	1,642	285.003			-1.72
November 28, 1988	1,673	284.995			-1.76
December 9, 1988	1,684	284.996			-1.80
January 9, 1989	1,715	284.998			-1.78
February 9, 1989	1,746	284.995			-1.81
March 9, 1989	1,774	284.997			-1.79
April 9, 1989	1,805	284.994			-1.82
May 9, 1989	1,835	284.997			-1.79
June 9, 1989	1,866	284.997			-1.79
July 9, 1989	1,896	284.985			-1.81
October 9, 1989	1,988	284.994			-1.82
January 17, 1990	2,036	284.989			-1.88
April 9, 1990	2,170	284.986			-1.92

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 11					
May 1, 1984	1	267.219			0.00
May 17, 1984	17	267.236			0.20
May 25, 1984	25	267.238			0.23
May 31, 1984	31	267.239	270.453	3.214	0.24
June 1, 1984	32	270.454			0.25
June 8, 1984	39	270.441			0.10
June 16, 1984	47	270.449			0.19
June 22, 1984	53	270.444			0.13
June 29, 1984	60	270.447			0.17
July 6, 1984	67	270.448			0.18
July 13, 1984	74	270.444			0.13
July 20, 1984	81	270.446			0.16
July 27, 1984	88	270.448			0.18
August 2, 1984	94	270.449			0.19
August 10, 1984	102	270.445			0.14
August 17, 1984	109	270.438			0.06
August 27, 1984	119	270.443			0.12
August 31, 1984	123	270.435			0.02
September 7, 1984	130	270.440			0.08
September 14, 1984	137	270.440	278.671	8.231	0.08
September 21, 1984	144	278.664			0.00
September 28, 1984	151	278.651			-0.16
October 1, 1984	154	278.659			-0.06
October 5, 1984	158	278.656			-0.10
October 12, 1984	165	278.664			0.00
October 18, 1984	171	278.664			0.00
October 24, 1984	177	278.653			-0.13
October 26, 1984	179	278.657			-0.08
November 2, 1984	186	278.658			-0.07
November 7, 1984	191	278.653			-0.13
November 20, 1984	204	278.655			-0.11
November 26, 1984	210	278.656			-0.10
November 30, 1984	214	278.637			-0.32
December 7, 1984	221	278.639			-0.30
December 14, 1984	228	278.641			-0.28
December 28, 1984	242	278.632			-0.38
January 4, 1985	249	278.635			-0.35
January 11, 1985	256	278.632			-0.38
January 18, 1985	263	278.631			-0.40
January 25, 1985	270	278.627	278.385	-0.242	-0.44
February 1, 1985	277	278.389			-0.40
February 8, 1985	284	278.385			-0.44
February 15, 1985	291	278.385			-0.44
February 22, 1985	298	278.384			-0.46
March 1, 1985	305	278.389			-0.40
March 8, 1985	312	278.388			-0.41
April 5, 1985	340	278.383			-0.40
May 8, 1985	373	278.387			-0.42
June 8, 1985	404	278.387	278.388	0.001	-0.42
July 3, 1985	429	278.386	281.631	3.245	-0.44
July 19, 1985	445	281.632			-0.43
July 29, 1985	455	281.630			-0.46
August 12, 1985	469	281.629			-0.47
September 18, 1985	506	281.626			-0.50
October 17, 1985	535	281.625			-0.52
November 18, 1985	567	281.620			-0.58
December 23, 1985	602	281.614			-0.65

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 11 (continued)					
January 28, 1986	638	281.613			-0.66
March 19, 1986	693	281.608			-0.72
April 18, 1986	718	281.608			-0.72
May 21, 1986	751	281.601			-0.80
June 19, 1986	780	281.599			-0.83
July 25, 1986	816	281.599			-0.83
August 26, 1986	848	281.593			-0.90
October 2, 1986	885	281.586			-0.98
October 28, 1986	911	281.578			-1.08
December 5, 1986	949	281.571			-1.16
December 22, 1986	966	281.566			-1.22
February 5, 1987	1,011	281.566			-1.22
February 23, 1987	1,029	281.565			-1.24
March 24, 1987	1,058	281.564			-1.25
May 26, 1987	1,121	281.563			-1.26
June 26, 1987	1,152	281.549			-1.50
July 27, 1987	1,183	281.544			-1.49
August 28, 1987	1,215	281.540			-1.54
September 28, 1987	1,246	281.537			-1.57
October 29, 1987	1,277	281.537	280.270	-1.267	-1.57
November 25, 1987	1,304	280.267			-1.61
December 28, 1987	1,337	280.267			-1.61
March 31, 1988	1,431	280.262			-1.67
April 22, 1988	1,453	280.259			-1.70
May 23, 1988	1,484	280.262			-1.67
June 30, 1988	1,522	280.258			-1.72
August 1, 1988	1,554	280.258			-1.72
August 29, 1988	1,562	280.258			-1.72
September 29, 1988	1,613	280.258			-1.72
October 28, 1988	1,642	280.254			-1.76
November 28, 1988	1,673	280.251			-1.80
December 9, 1988	1,684	280.249			-1.82
January 9, 1989	1,715	280.249			-1.82
February 9, 1989	1,745	280.247			-1.85
March 9, 1989	1,774	280.249			-1.82
April 9, 1989	1,805	280.245			-1.87
May 9, 1989	1,835	280.243			-1.84
June 9, 1989	1,866	280.243			-1.84
July 9, 1989	1,896	280.243			-1.84
October 9, 1989	1,988	280.247			-1.85
January 17, 1990	2,088	280.245			-1.87
April 9, 1990	2,179	280.244			-1.88

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 14					
May 1, 1984	1	267.671			0.00
May 17, 1984	17	267.679			0.10
May 25, 1984	25	267.674			0.04
June 1, 1984	32	267.681	270.404	2.723	0.12
June 8, 1984	39	270.403			0.11
June 16, 1984	47	270.412			0.22
June 22, 1984	53	270.404			0.12
June 29, 1984	60	270.411			0.20
July 6, 1984	67	270.403			0.11
July 13, 1984	74	270.400			0.07
July 20, 1984	81	270.410			0.19
July 27, 1984	88	270.404			0.12
August 2, 1984	94	270.400			0.07
August 10, 1984	102	270.404			0.12
August 17, 1984	109	270.396			0.03
August 27, 1984	119	270.402			0.10
August 31, 1984	123	270.398			0.05
September 12, 1984	135	270.397			0.04
September 14, 1984	137	270.397			0.04
September 21, 1984	144	270.401			0.08
September 28, 1984	151	270.378			-0.19
October 5, 1984	158	270.396			0.02
October 12, 1984	165	270.398			0.05
October 18, 1984	171	270.410			0.19
October 26, 1984	179	270.404			0.12
November 2, 1984	186	270.401	281.664	11.263	0.08
November 6, 1984	190	281.637			-0.24
November 7, 1984	191	281.665			0.10
November 20, 1984	204	281.659			0.02
November 26, 1984	210	281.670			0.16
November 30, 1984	214	281.643			-0.17
December 7, 1984	221	281.648			-0.11
December 14, 1984	228	281.653			-0.05
December 28, 1984	242	281.638			-0.23
January 4, 1985	249	281.642			-0.18
January 11, 1985	256	281.640			-0.20
January 18, 1985	263	281.641			-0.19
January 25, 1985	270	281.638			-0.23
February 1, 1985	277	281.639			-0.22
February 8, 1985	284	281.636			-0.25
February 15, 1985	291	281.633			-0.29
February 22, 1985	298	281.634			-0.28
March 1, 1985	305	281.635			-0.26
March 8, 1985	312	281.631			-0.31
April 5, 1985	340	281.634			-0.28
May 8, 1985	373	281.634	287.692	6.258	-0.28
June 8, 1985	404	287.890	287.394	-0.496	-0.30
July 3, 1985	429	287.393			-0.31
July 19, 1985	445	287.393			-0.31
July 29, 1985	455	287.391			-0.34
August 12, 1985	469	287.391			-0.34
September 18, 1985	506	287.393	287.385	-0.008	-0.31
October 17, 1985	535	287.383			-0.34
November 18, 1985	567	287.380			-0.37
December 23, 1985	602	287.382			-0.35
January 28, 1986	638	287.381			-0.36
March 19, 1986	688	287.371			-0.48

T-ELL-2-00006, Rev. 0

319

Savannah River Site
Settlement of
Defense Waste Processing Facility (U)

K-ESR-S-00005, Rev. 0
September 2002
Appendix F Page F- 22

Date	Days since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (inches)	Notes
221-S			Monument Point 14 (continued)			
April 18, 1986	748	287.370			-0.52	
May 21, 1986	751	287.363			-0.60	
June 19, 1986	780	287.360			-0.64	
July 25, 1986	816	287.358			-0.66	
August 26, 1986	848	287.361			-0.62	
October 2, 1986	885	287.353			-0.72	
October 28, 1986	911	287.350			-0.76	
December 5, 1986	949	287.347			-0.79	
December 22, 1986	966	287.346			-0.80	
February 5, 1987	1,011	287.341			-0.86	
February 23, 1987	1,029	287.342	286.498	-0.844	-0.85	
March 24, 1987	1,058	286.494			-0.90	
May 26, 1987	1,121	286.485			-1.01	
June 28, 1987	1,152	286.468	287.851	1.383	-1.21	
July 27, 1987	1,183	287.845			-1.28	
August 28, 1987	1,215	287.843			-1.31	
September 28, 1987	1,246	287.838			-1.37	
October 29, 1987	1,277	287.840			-1.34	
November 25, 1987	1,304	287.837			-1.38	
December 28, 1987	1,337	287.834			-1.42	
March 31, 1988	1,431	287.828			-1.49	
April 22, 1988	1,453	287.828			-1.51	
May 23, 1988	1,484	287.821			-1.57	
June 30, 1988	1,522	287.821			-1.57	
August 1, 1988	1,554	287.820			-1.58	
August 29, 1988	1,582	287.818			-1.61	
September 29, 1988	1,613	287.822			-1.56	
October 28, 1988	1,642	287.818			-1.61	
November 28, 1988	1,673	287.819			-1.60	
December 9, 1988	1,684	287.814			-1.66	
January 9, 1989	1,715	287.817			-1.62	
February 9, 1989	1,746	287.818			-1.63	
March 9, 1989	1,774	287.812			-1.68	
April 9, 1989	1,805	287.813			-1.67	
May 9, 1989	1,835	287.813			-1.67	
June 9, 1989	1,866	287.812			-1.68	
July 9, 1989	1,896	287.810			-1.70	
October 9, 1989	1,988	287.809			-1.72	
January 17, 1990	2,088	287.809			-1.72	
April 9, 1990	2,170	287.811			-1.69	
July 23, 1994	3,736	287.811			-1.69	
April 26, 1997	4,744	287.798			-1.85	
April 29, 1998	5,112	287.799			-1.84	
April 17, 1999	5,485	287.797			-1.86	
April 1, 2000	5,815	287.797			-1.86	
April 21, 2001	6,200	287.799			-1.84	
April 13, 2002	6,557	287.797			-1.86	

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 15					
May 1, 1984	1	266.897			0.00
May 17, 1984	17	266.920			0.28
May 25, 1984	25	266.920			0.28
May 31, 1984	31	266.919	270.453	3.534	0.26
June 1, 1984	32	270.444			0.16
June 8, 1984	39	270.439			0.10
June 16, 1984	47	270.445			0.17
June 22, 1984	53	270.439			0.10
June 29, 1984	60	270.443			0.14
July 6, 1984	67	270.443			0.14
July 13, 1984	74	270.438			0.08
July 20, 1984	81	270.440			0.11
July 27, 1984	88	270.450			0.23
August 2, 1984	94	270.435			0.05
August 10, 1984	102	270.442			0.13
August 17, 1984	109	270.439			0.10
August 27, 1984	119	270.442			0.13
August 31, 1984	123	270.454			0.04
September 7, 1984	130	270.428			-0.04
September 14, 1984	137	270.421			-0.12
September 21, 1984	144	270.432			0.01
September 28, 1984	151	270.427			-0.05
October 1, 1984	154	270.434			0.04
October 3, 1984	156	270.450			0.23
October 5, 1984	158	270.431			0.00
October 12, 1984	165	270.362			-0.83
October 18, 1984	171	270.432			0.01
October 26, 1984	179	270.435			0.05
November 2, 1984	186	270.436			0.06
November 7, 1984	191	270.435			0.05
November 20, 1984	204	270.426			-0.06
November 26, 1984	210	270.436			0.06
November 30, 1984	214	270.422			-0.11
December 7, 1984	221	270.420	281.036	10.616	-0.13
December 12, 1984	226	281.031			-0.19
December 14, 1984	228	281.031			-0.19
December 28, 1984	242	281.027			-0.24
January 4, 1985	249	281.025			-0.26
January 11, 1985	256	281.019			-0.34
January 18, 1985	263	281.017			-0.36
January 25, 1985	270	281.014	280.829	-0.185	-0.40
February 1, 1985	277	280.831			-0.37
February 8, 1985	284	280.831			-0.37
February 15, 1985	291	280.830			-0.38
February 22, 1985	298	280.826			-0.43
March 1, 1985	305	280.831			-0.37
March 8, 1985	312	280.830			-0.38

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 16					
May 1, 1984	1	266.701			0.00
May 17, 1984	17	266.719			0.22
May 25, 1984	25	266.717			0.19
May 30, 1984	30	266.714	270.406	3.692	0.16
June 1, 1984	32	270.400			0.08
June 8, 1984	39	270.389			-0.05
June 16, 1984	47	270.393			0.00
June 22, 1984	53	270.391			-0.02
June 29, 1984	60	270.397			0.05
July 6, 1984	67	270.394			0.01
July 13, 1984	74	270.392			-0.01
July 20, 1984	81	270.390			-0.04
July 27, 1984	88	270.401			0.10
August 2, 1984	94	270.395			0.02
August 10, 1984	102	270.392			-0.01
August 17, 1984	109	270.404			0.14
August 27, 1984	119	270.388			-0.06
August 31, 1984	123	270.384			-0.11
September 7, 1984	130	270.388			-0.08
September 14, 1984	137	270.386	281.051	10.665	-0.08
September 21, 1984	144	281.048			-0.12
September 28, 1984	151	281.030			-0.34
October 1, 1984	154	281.039			-0.23
October 5, 1984	158	281.036			-0.26
October 12, 1984	165	281.045			-0.16
October 18, 1984	171	281.046			-0.14
October 26, 1984	179	281.037			-0.25
November 2, 1984	186	281.037			-0.25
November 7, 1984	191	281.037			-0.25
November 20, 1984	204	281.033			-0.30
November 28, 1984	210	281.037			-0.25
November 30, 1984	214	281.020			-0.46
December 7, 1984	221	281.024			-0.41
December 14, 1984	228	281.025			-0.40
December 28, 1984	242	281.015			-0.52
January 4, 1985	249	281.019			-0.47
January 11, 1985	256	281.017			-0.49
January 18, 1985	263	281.015			-0.52
January 25, 1985	270	281.011	280.831	-0.180	-0.56
February 1, 1985	277	280.835			-0.52
February 8, 1985	284	280.832			-0.55
February 15, 1985	291	280.832			-0.55
February 22, 1985	298	280.831			-0.56
March 1, 1985	305	280.835			-0.52
March 8, 1985	312	280.834			-0.53

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 18					
November 8, 1984	192	279.553			0.00
November 12, 1984	196	279.529			-0.29
November 20, 1984	204	279.532			-0.25
November 26, 1984	210	279.530			-0.28
November 30, 1984	214	279.533			-0.24
December 7, 1984	221	279.547			-0.07
December 14, 1984	228	279.540			-0.16
December 28, 1984	242	279.533			-0.24
January 4, 1985	249	279.538			-0.18
January 11, 1985	256	279.525			-0.34
January 18, 1985	263	279.526			-0.32
January 25, 1985	270	279.527			-0.31
February 1, 1985	277	279.517			-0.43
February 8, 1985	284	279.515			-0.46
February 15, 1985	291	279.516			-0.44
February 22, 1985	298	279.512			-0.49
March 1, 1985	305	279.511			-0.50
March 8, 1985	312	279.512			-0.49
April 5, 1985	340	279.509			-0.53
May 8, 1985	373	279.505	284.696	5.391	-0.58
June 8, 1985	404	284.892	284.356	-0.536	-0.62
July 3, 1985	429	284.354			-0.65
July 19, 1985	445	284.351			-0.68
July 29, 1985	455	284.351			-0.68
August 12, 1985	469	284.351			-0.68
September 18, 1985	506	284.351	287.435	3.084	-0.68
October 17, 1985	535	287.436			-0.67
November 18, 1985	567	287.434			-0.70
December 23, 1985	602	287.441			-0.61
January 28, 1986	638	287.433			-0.71
March 19, 1986	688	287.422			-0.84
April 18, 1986	718	287.418			-0.89
May 21, 1986	751	287.412			-0.96
June 19, 1986	780	287.407			-1.02
July 25, 1986	816	287.405			-1.04
August 26, 1986	848	287.408			-1.00
October 2, 1986	885	287.406			-1.03
October 28, 1986	911	287.409			-1.00
December 5, 1986	949	287.410			-0.98
December 22, 1986	966	287.405			-1.04
February 5, 1987	1,011	287.398			-1.13
February 23, 1987	1,029	287.398			-1.13
March 24, 1987	1,058	287.390			-1.22
May 26, 1987	1,121	287.378			-1.37
June 26, 1987	1,152	287.357			-1.62
July 27, 1987	1,183	287.354			-1.66
August 28, 1987	1,215	287.351	288.836	1.485	-1.69
September 28, 1987	1,246	288.834			-1.72
October 29, 1987	1,277	288.831			-1.75
November 25, 1987	1,304	288.828			-1.79
December 28, 1987	1,337	288.823			-1.85
March 31, 1988	1,431	288.792			-2.22
April 22, 1988	1,453	288.790			-2.24
May 23, 1988	1,484	288.784			-2.32
June 30, 1988	1,522	288.778			-2.39
August 1, 1988	1,554	288.775			-2.42
August 29, 1988	1,582	288.772			-2.46

T-CLC-2-00006, Rev. 0

323

Savannah River Site
Settlement of
Defense Waste Processing Facility (U)

K-ESR-S-00005, Rev. 0
September 2002
Appendix F Page F- 27

Date	Days since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)	Notes
221-S Monument Point 18 (continued)						
September 29, 1988	1,513	288.772			-2.46	
October 28, 1988	1,642	288.771			-2.47	
November 28, 1988	1,673	288.769			-2.50	
December 9, 1988	1,684	288.767			-2.52	
January 9, 1989	1,715	288.767			-2.52	
February 9, 1989	1,746	288.764			-2.56	
March 9, 1989	1,774	288.782			-2.58	
April 9, 1989	1,805	288.761			-2.59	
May 9, 1989	1,835	288.761			-2.59	
June 9, 1989	1,866	288.759			-2.62	
July 9, 1989	1,898	288.755			-2.66	
October 9, 1989	1,988	288.756			-2.65	
January 17, 1990	2,088	288.751			-2.71	
April 9, 1990	2,170	288.751			-2.71	
October 9, 1990	2,353	288.747			-2.76	
April 12, 1991	2,538	288.742			-2.82	
July 23, 1994	3,736	288.733			-2.93	
April 28, 1997	4,744	288.720			-3.08	
April 29, 1998	5,112	288.723			-3.05	
April 17, 1999	5,465	288.718	288.719	0.001	-3.11	based on historical curve
April 1, 2000	5,815	288.722			-3.06	
April 21, 2001	6,200	288.715			-3.13	
April 13, 2002	6,557	288.715			-3.15	

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 25					
December 12, 1984	226	281.381			0.00
December 14, 1984	228	281.381			0.00
December 28, 1984	242	281.367			-0.17
January 4, 1985	249	281.368			-0.16
January 11, 1985	256	281.361			-0.24
January 18, 1985	263	281.360			-0.25
January 25, 1985	270	281.357	280.848	-0.509	-0.29
February 1, 1985	277	280.850			-0.26
February 8, 1985	284	280.850			-0.26
February 15, 1985	291	280.849			-0.28
February 22, 1985	298	280.847			-0.30
March 1, 1985	305	280.851			-0.25
March 8, 1985	312	280.848			-0.29

T-CLC-2 - 00006, Rev. 0

325

Savannah River Site
Settlement of Defense Waste Processing Facility
Vitrification Building (U)

K-ESR-S-00002, Rev. 0
September 30, 1998
Page A-42

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 26					
November 8, 1984	192	279.522			0.00
November 12, 1984	196	279.510			-0.14
November 20, 1984	204	279.504			-0.22
November 26, 1984	210	279.506			-0.19
November 30, 1984	214	279.502			-0.24
December 7, 1984	221	279.516			-0.07
December 14, 1984	228	279.514			-0.10
December 28, 1984	242	279.513			-0.11
January 4, 1985	249	279.515			-0.08
January 11, 1985	256	279.505			-0.20
January 18, 1985	263	279.504			-0.22
January 25, 1985	270	279.502			-0.24
February 1, 1985	277	279.500			-0.26
February 8, 1985	284	279.497			-0.30
February 15, 1985	291	279.498			-0.29
February 22, 1985	298	279.497			-0.30
March 1, 1985	305	279.497			-0.30
March 8, 1985	312	279.496			-0.31
April 5, 1985	340	279.494			-0.34
May 8, 1985	373	279.492	279.358	-0.134	-0.36
June 8, 1985	404	279.358	284.421	5.063	-0.36
July 3, 1985	429	284.420			-0.37
July 19, 1985	445	284.420			-0.37
August 12, 1985	469	284.420	287.389	2.969	-0.37
September 18, 1985	506	287.388			-0.41
October 17, 1985	535	287.386			-0.41
November 18, 1985	567	287.385			-0.42
December 23, 1985	602	287.383			-0.44
January 28, 1986	638	287.380			-0.48
March 19, 1986	688	287.370			-0.60
April 18, 1986	718	287.368			-0.62
May 21, 1986	751	287.360			-0.72
June 19, 1986	780	287.357			-0.76
July 25, 1986	816	287.356			-0.77
October 2, 1986	885	287.353			-0.80
October 28, 1986	911	287.351			-0.83
December 5, 1986	949	287.350			-0.84
December 22, 1986	966	287.345			-0.90
February 5, 1987	1,011	287.341			-0.95
February 23, 1987	1,029	287.337			-1.00
March 24, 1987	1,058	287.333			-1.04
May 26, 1987	1,121	287.319			-1.21
June 26, 1987	1,152	287.303			-1.40
July 27, 1987	1,183	287.298			-1.46
August 28, 1987	1,215	287.294			-1.51
September 28, 1987	1,246	287.288			-1.58
October 29, 1987	1,277	287.285			-1.62
November 25, 1987	1,304	287.283			-1.64
December 28, 1987	1,337	287.276			-1.73
March 31, 1988	1,431	287.252			-2.02
April 22, 1988	1,453	287.251			-2.03
May 23, 1988	1,484	287.244			-2.11
June 30, 1988	1,522	287.238			-2.18
August 1, 1988	1,554	287.233			-2.24
August 29, 1988	1,582	287.230			-2.28
September 29, 1988	1,613	287.230			-2.28
October 28, 1988	1,642	287.226			-2.33

T-LL-2-00006, Rev. 0

326

Savannah River Site
Settlement of
Defense Waste Processing Facility (U)

K-ESR-S-00005, Rev. 0
September 2002
Appendix F Page F- 40

Date	Days since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)	Notes
		221-S	Monument	Point 26 (continued)		
November 28, 1988	1,673	287.226			-2.38	
December 9, 1988	1,684	287.222			-2.42	
January 9, 1989	1,715	287.222			-2.42	
February 9, 1989	1,746	287.220			-2.45	
March 9, 1989	1,774	287.220			-2.45	
April 9, 1989	1,805	287.218			-2.47	
May 9, 1989	1,835	287.218			-2.47	
June 9, 1989	1,866	287.215			-2.51	
July 9, 1989	1,896	287.213			-2.53	
October 9, 1989	1,988	287.213			-2.53	
January 17, 1990	2,088	287.206			-2.62	
April 9, 1990	2,170	287.207			-2.60	
October 9, 1990	2,353	287.207			-2.60	
April 12, 1991	2,538	287.199			-2.70	
July 23, 1994	3,736	287.193			-2.77	
April 26, 1997	4,744	287.176			-2.98	
April 29, 1998	5,112	287.179			-2.94	
April 17, 1999	5,465	287.175			-2.99	
April 1, 2000	5,815	287.178			-2.96	
April 21, 2001	6,200	287.173			-3.01	
April 13, 2002	6,557	287.171			-3.03	

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 28					
October 1, 1984	154	281.018			0.00
October 3, 1984	156	281.018			0.00
October 5, 1984	158	281.000			-0.22
October 12, 1984	165	281.006			-0.14
October 18, 1984	171	281.005			-0.16
October 26, 1984	179	281.001			-0.20
November 2, 1984	186	280.999			-0.23
November 7, 1984	191	281.001			-0.20
November 15, 1984	199	281.001			-0.20
November 20, 1984	204	280.991			-0.32
November 26, 1984	210	281.002			-0.19
November 30, 1984	214	280.990			-0.34
December 7, 1984	221	280.985			-0.40
December 14, 1984	228	280.988			-0.36
December 23, 1984	242	280.986			-0.38
January 4, 1985	249	280.988			-0.38
January 11, 1985	256	280.984			-0.41
January 18, 1985	263	280.982			-0.43
January 25, 1985	270	280.976	280.804	-0.172	-0.50
February 1, 1985	277	280.807			-0.47
February 8, 1985	284	280.807			-0.47
February 15, 1985	291	280.804			-0.50
February 22, 1985	298	280.804			-0.50
March 1, 1985	305	280.809			-0.44
March 8, 1985	312	280.807			-0.47
April 5, 1985	340	280.809			-0.44
May 8, 1985	373	280.810			-0.43
June 8, 1985	404	280.810	278.314	-2.496	-0.49
July 3, 1985	429	278.313	281.616	3.303	-0.44
July 19, 1985	445	281.618			-0.42
July 29, 1985	455	281.616			-0.44
August 12, 1985	469	281.613			-0.48
September 18, 1985	506	281.610			-0.52
October 17, 1985	535	281.609			-0.53
November 18, 1985	567	281.602			-0.61
December 23, 1985	602	281.598			-0.66
January 28, 1986	638	281.594			-0.71
March 19, 1986	688	281.592			-0.73
April 18, 1986	718	281.593			-0.72
May 21, 1986	751	281.586			-0.80
June 19, 1986	780	281.583			-0.84
July 25, 1986	816	281.587			-0.79
August 26, 1986	848	281.583			-0.84
October 2, 1986	885	281.572			-0.97
October 28, 1986	911	281.564			-1.07
December 5, 1986	949	281.556			-1.16
December 22, 1986	966	281.547			-1.27
February 5, 1987	1,011	281.547			-1.27
February 23, 1987	1,029	281.544			-1.31
March 24, 1987	1,058	281.543			-1.32
May 26, 1987	1,121	281.542			-1.33
June 26, 1987	1,152	281.529			-1.49
July 27, 1987	1,183	281.521			-1.58
August 28, 1987	1,215	281.517			-1.63
September 28, 1987	1,246	281.517	280.267	-1.250	-1.63
October 29, 1987	1,277	280.257			-1.75
November 25, 1987	1,304	280.252			-1.81

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 28 (continued)					
December 26, 1987	1,337	280.247			-1.87
March 31, 1988	1,431	280.237			-1.99
April 22, 1988	1,453	280.232			-2.05
May 23, 1988	1,484	280.236			-2.00
June 30, 1988	1,522	280.230			-2.08
August 1, 1988	1,554	280.234			-2.03
August 29, 1988	1,582	280.229			-2.09
September 29, 1988	1,613	280.229			-2.09
October 28, 1988	1,642	280.222			-2.17
November 28, 1988	1,673	280.220			-2.20
December 9, 1988	1,684	280.216			-2.24
January 9, 1989	1,715	280.217			-2.23
February 9, 1989	1,746	280.214			-2.27
March 9, 1989	1,774	280.215			-2.26
April 9, 1989	1,805	280.210			-2.32
May 9, 1989	1,835	280.213			-2.28
June 9, 1989	1,866	280.217			-2.23
July 9, 1989	1,896	280.213			-2.28
October 9, 1989	1,988	280.209			-2.33
January 17, 1990	2,088	280.204			-2.39
April 9, 1990	2,170	280.203			-2.40

Date	Day since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)
Monument Point 37					
November 2, 1984	186	281.315			0.00
November 6, 1984	190	281.288			-0.32
November 7, 1984	191	281.317			0.02
November 20, 1984	204	281.304			-0.13
November 26, 1984	210	281.316			0.01
November 30, 1984	214	281.291			-0.29
December 7, 1984	221	281.292			-0.28
December 14, 1984	228	281.297			-0.22
December 28, 1984	242	281.282			-0.40
January 4, 1985	249	281.286			-0.35
January 11, 1985	256	281.287			-0.34
January 18, 1985	263	281.287			-0.34
January 25, 1985	270	281.285			-0.36
February 22, 1985	298	281.282			-0.40
March 1, 1985	305	281.283			-0.38
March 8, 1985	312	281.281			-0.41
April 5, 1985	340	281.282			-0.40
May 8, 1985	373	281.282	284.694	3.612	-0.40
June 8, 1985	404	284.805	287.404	2.509	-0.38
July 3, 1985	429	287.404			-0.38
July 19, 1985	445	287.404			-0.38
July 29, 1985	455	287.401			-0.42
August 12, 1985	469	287.400			-0.43
September 18, 1985	506	287.400			-0.43
October 17, 1985	535	287.397			-0.47
November 18, 1985	567	287.394			-0.50
December 23, 1985	602	287.393			-0.52
January 28, 1986	638	287.392			-0.53
March 19, 1986	698	287.382			-0.65
April 18, 1986	718	287.381			-0.66
May 21, 1986	751	287.376			-0.72
June 19, 1986	780	287.373			-0.76
July 25, 1986	816	287.373			-0.76
August 26, 1986	848	287.372			-0.77
October 2, 1986	885	287.365			-0.85
October 28, 1986	911	287.361			-0.90
December 5, 1986	949	287.357			-0.95
December 22, 1986	966	287.355			-0.97
February 5, 1987	1,011	287.351			-1.02
February 23, 1987	1,029	287.352			-1.01
March 24, 1987	1,058	287.349			-1.04
May 26, 1987	1,121	287.342			-1.13
June 26, 1987	1,152	287.325	288.788	1.463	-1.33
July 27, 1987	1,183	288.786			-1.36
August 28, 1987	1,215	288.786			-1.36
September 28, 1987	1,246	288.780			-1.43
October 29, 1987	1,277	288.779			-1.44
November 25, 1987	1,304	288.777			-1.46
December 28, 1987	1,337	288.772			-1.52
March 31, 1988	1,431	288.764			-1.62
April 22, 1988	1,453	288.763			-1.63
May 23, 1988	1,484	288.762			-1.64
June 30, 1988	1,522	288.762			-1.64
August 1, 1988	1,554	288.759			-1.68
August 29, 1988	1,582	288.760			-1.67
September 29, 1988	1,613	288.760			-1.67
October 28, 1988	1,642	288.756			-1.72

T-CLC-2-00006, Rev. 0

330

Savannah River Site
Settlement of
Defense Waste Processing Facility (U)

K-ESR-S-00005, Rev. 0
September 2002
Appendix F Page F- 56

Date	Days since May 1, 1984	Monument elevation (feet MSL)	Transferred elevation (feet MSL)	Elevation difference (feet)	Settlement (Inches)	Notes
		221-S	Monument	Point 37 (continued)		
November 28, 1988	1,673	288.755			-1.73	
December 9, 1988	1,684	288.752			-1.76	
January 9, 1989	1,715	288.755			-1.73	
February 9, 1989	1,746	288.755			-1.73	
March 9, 1989	1,774	288.752			-1.76	
April 9, 1989	1,805	288.751			-1.78	
May 9, 1989	1,835	288.750			-1.79	
June 9, 1989	1,866	288.748			-1.81	
July 9, 1989	1,896	288.749			-1.80	
October 9, 1989	1,988	288.748			-1.81	
January 17, 1990	2,088	288.748			-1.81	
April 9, 1990	2,170	288.748			-1.81	
October 9, 1990	2,353	288.742			-1.88	
April 12, 1991	2,538	288.739			-1.92	
July 23, 1994	3,736	288.734			-1.98	
April 26, 1997	4,744	288.730			-2.03	
April 28, 1998	5,112	288.733			-1.99	
April 17, 1999	5,465	288.731	288.729	-0.002	-2.02	based on point 14 & 35
April 1, 2000	5,815	288.731			-2.02	
April 21, 2001	6,200	288.728			-2.03	
April 13, 2002	6,557	288.727			-2.05	

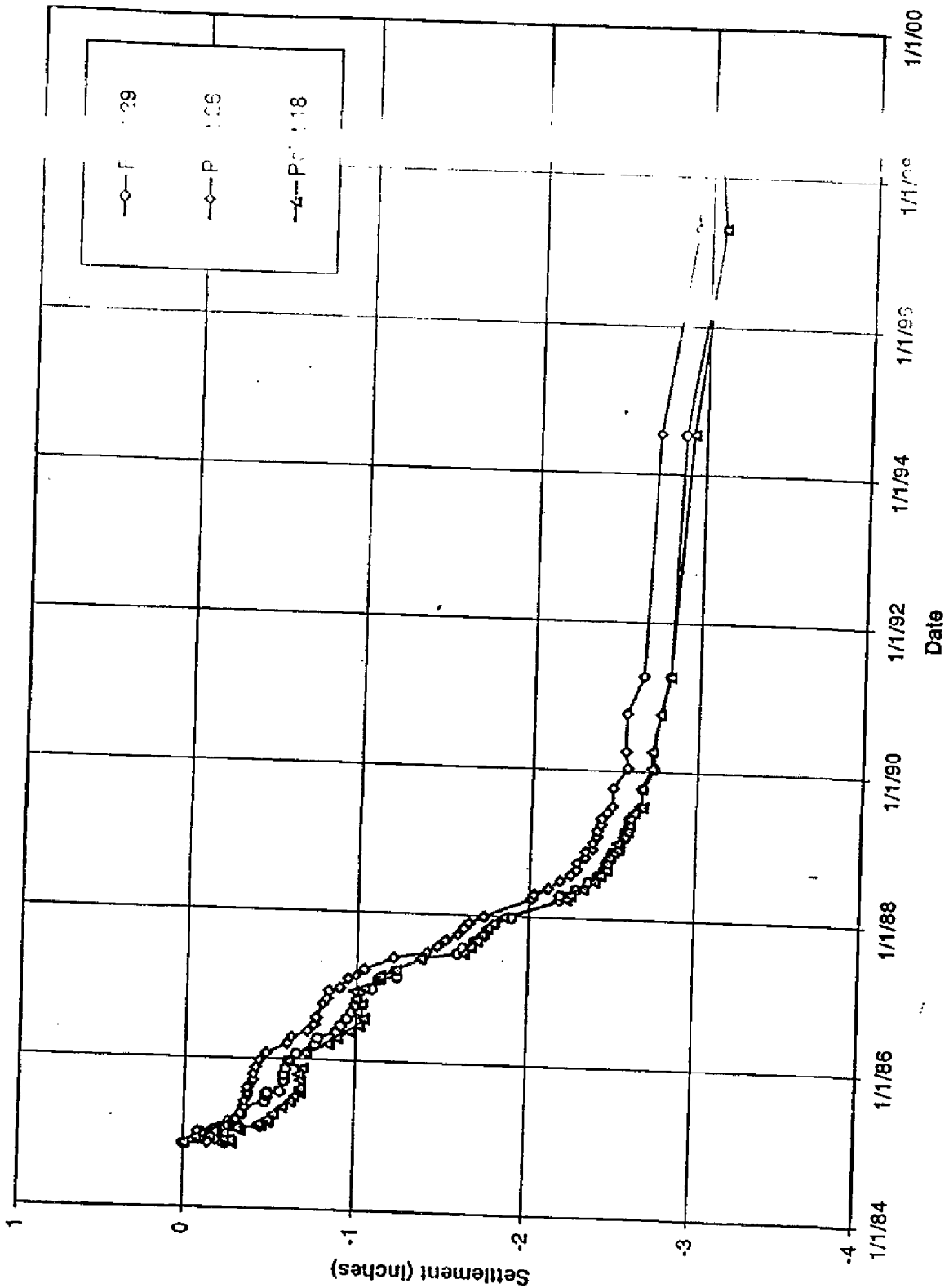


Figure 8 Settlement at the north end

T-CUC-2-0000e, Rev. 0

332

Savannah River Site
Settlement of Defense Waste Processing Facility
Vitrification Building (U)

K-ESR-S-00002, Rev. 0
September 1998
Page 18

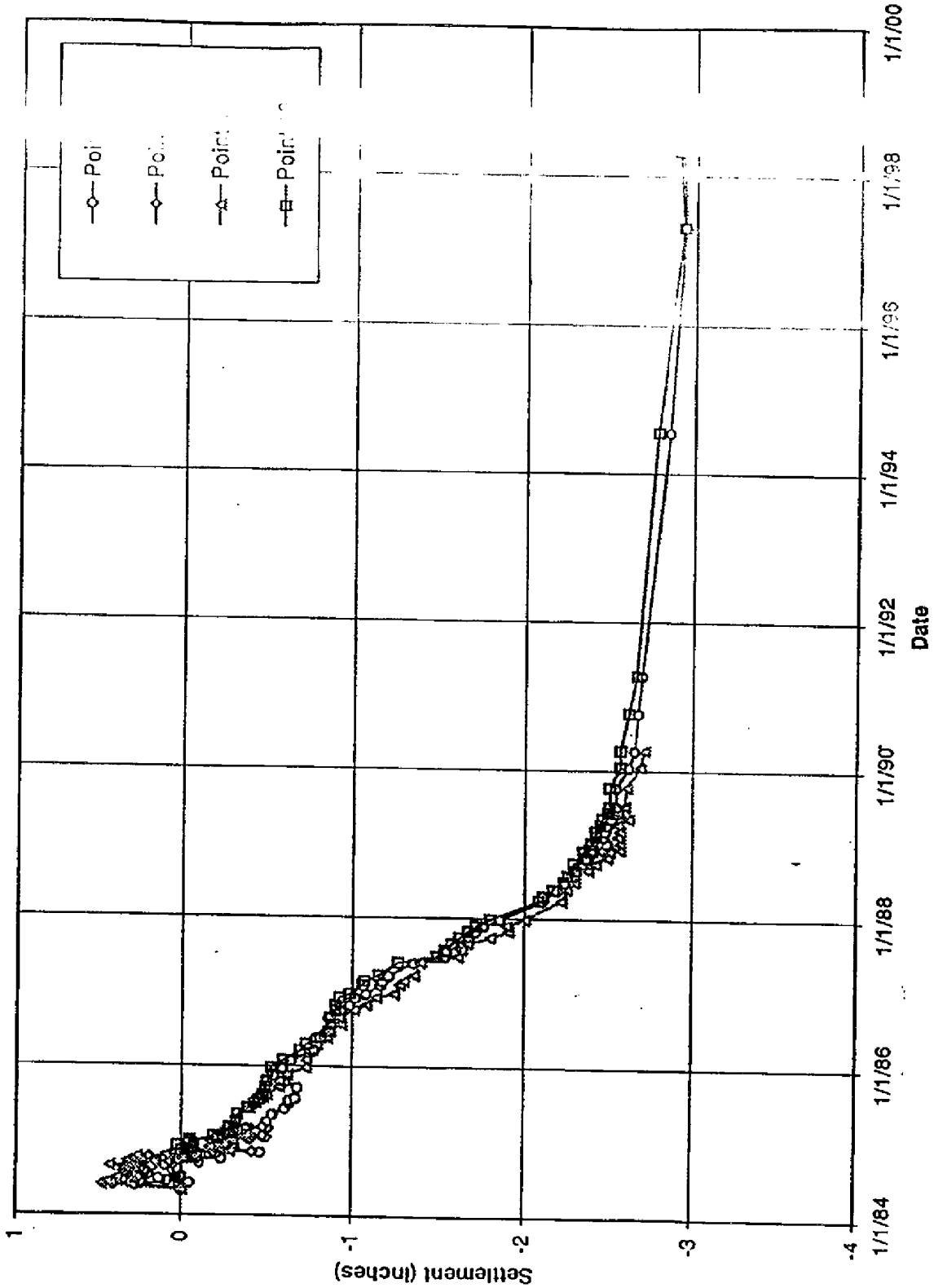


Figure 9 Settlement at 30 feet from the north end

T-CLL-2-00006, Rev. 0

333

Savannah River Site
Settlement of Defense Waste Processing Facility
Vitrification Building (U)

K-ESR-S-00002, Rev. 0
September 1998
Page 19

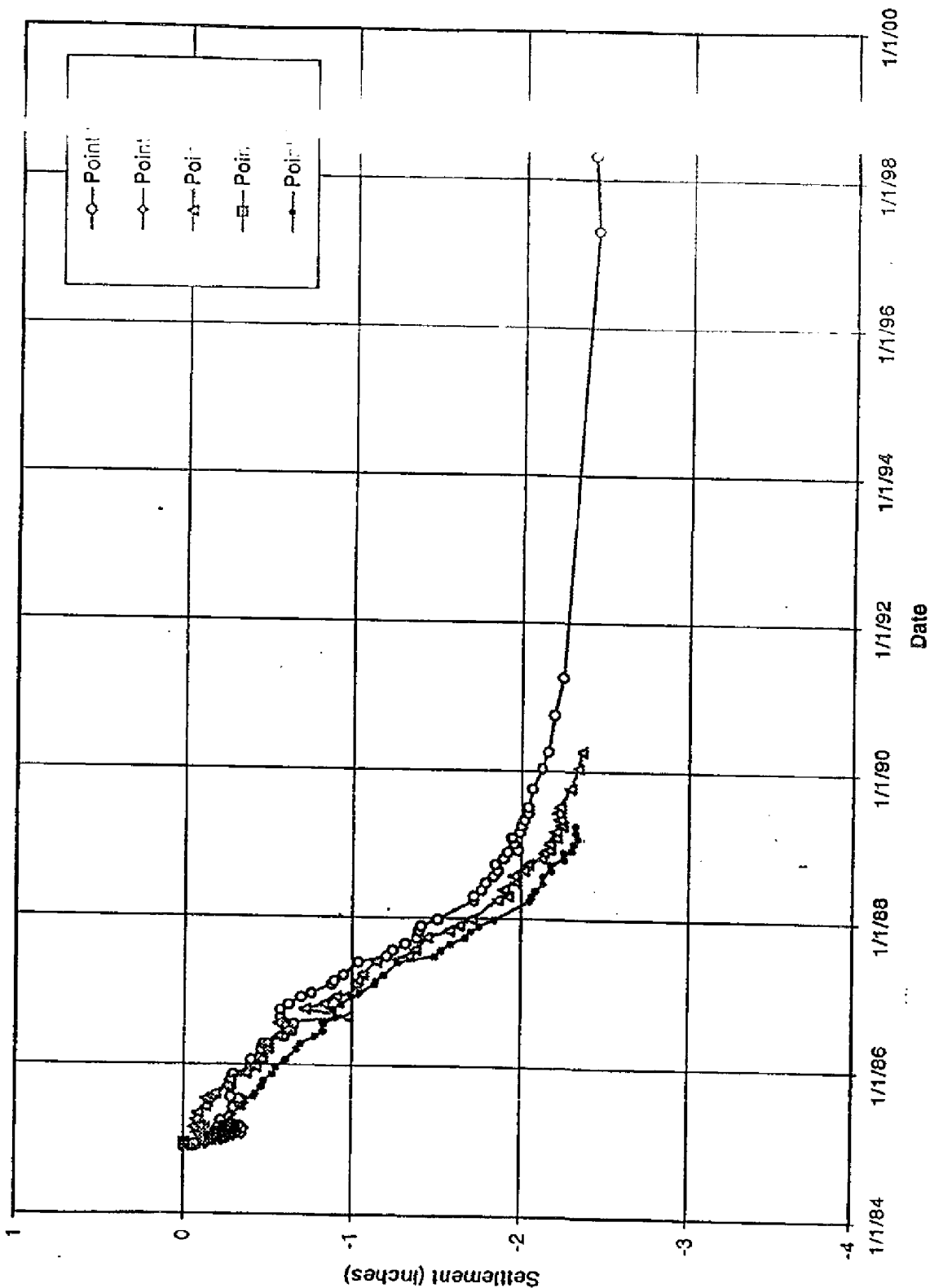


Figure 10 Settlement at 80 feet from the north end

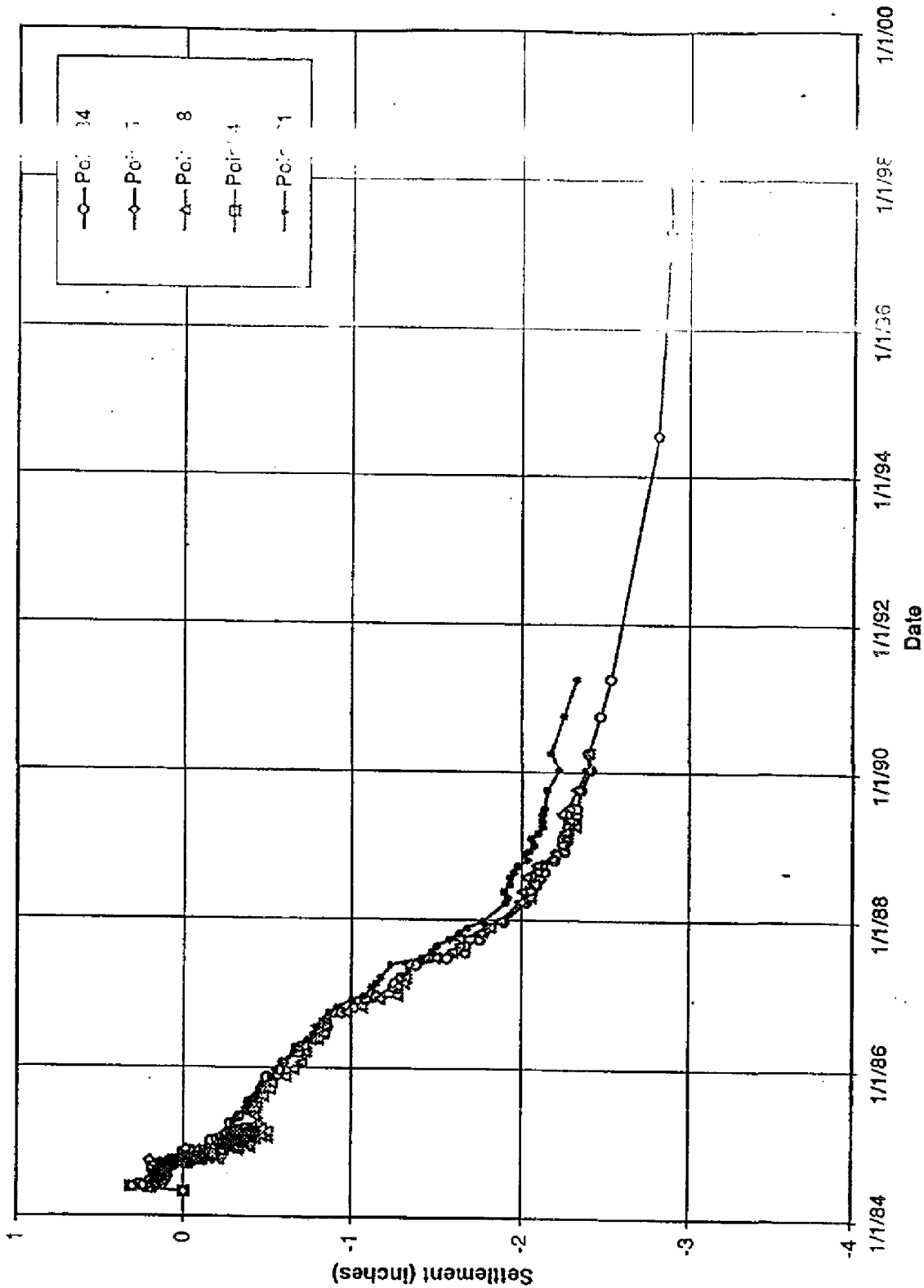


Figure 11 Settlement at 140 feet from the north end

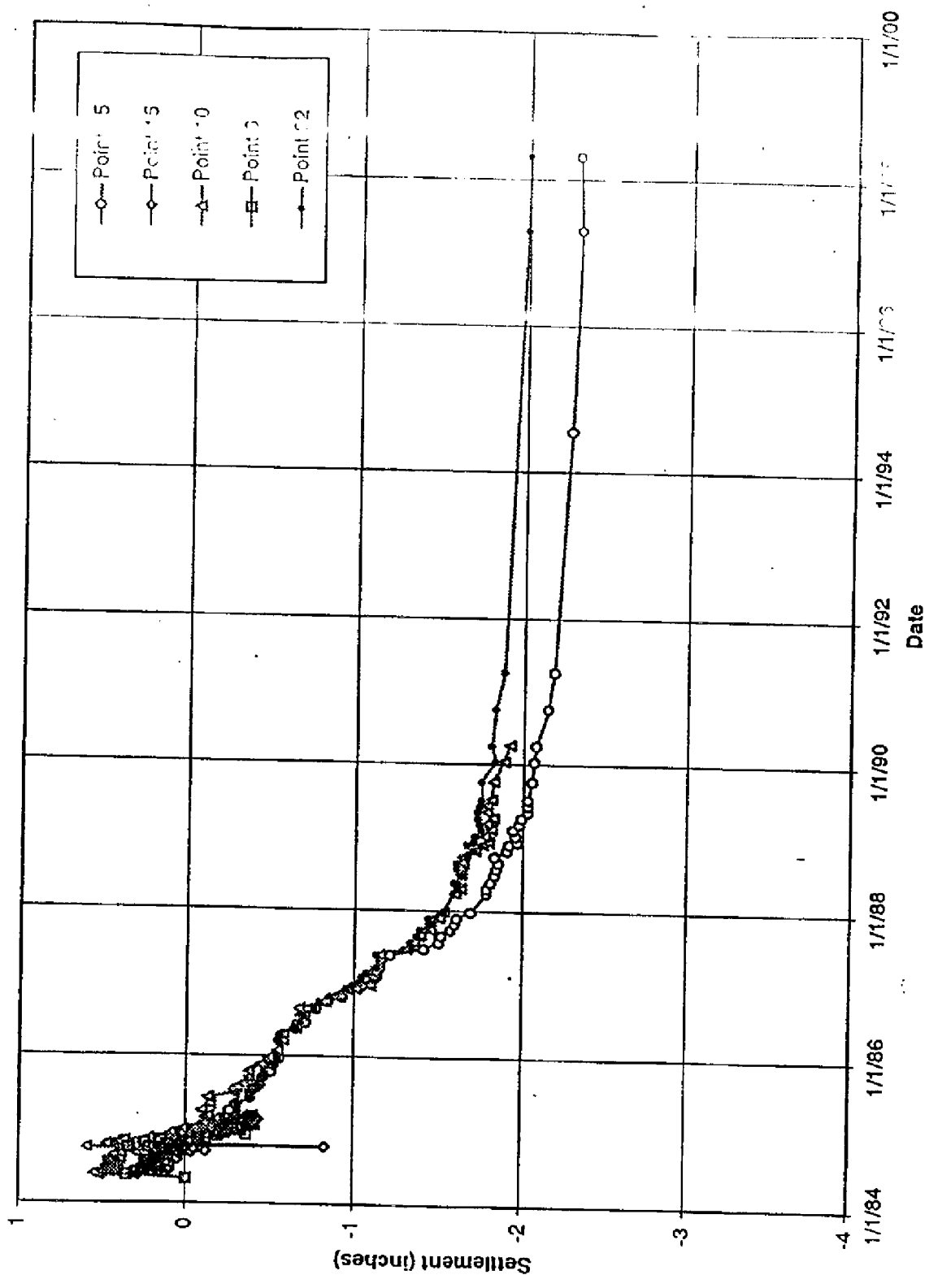


Figure 12 Settlement at 160 feet from the south end

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 336	Rev. 0
----------------------------------	------------------	-----------

APPENDIX C

Closure Cap Configuration

**Saltstone Disposal Facility (SDF) Closure Cap Configuration
Vault Loading Information, Revision 2
Mark A. Phifer
April 2, 2003**

This revision is based upon the closure cap, drainage system configuration shown in Figure 1, which was selected as the base case configuration during the April 2, 2003 Saltstone PA Core Team meeting.

A typical Saltstone vault is 600 ft long by 200 ft wide with an assumed distance of 50 ft between vaults in each row. The apex of the vault roof runs lengthwise (i.e. 600 ft) down its center, and the roof is sloped at 2 percent from the apex to the vault side, which results in a slope length of 100 ft over the vault itself. The vault roof slope and slope length will propagate upward from the vault roof to the first backfill layer overlaying the roof. This backfill layer will be used to change the direction of slope by 90 degrees, to produce the closure cap apex which runs widthwise (i.e. 200 ft) down its center, to increase the slope length to 300 ft, and to increase the slope to 3 percent over the vault itself. The slope and slope length of this backfill layer will propagate upward to the ground surface (WSRC 2000 and WSRC 2002a).

Table 1 provides the current Saltstone Disposal Facility (SDF) kaolin closure cap configuration (WSRC 2000; WSRC 2002a; WSRC 2002b) along with the replacement geosynthetic clay layer (GCL) closure cap configuration that will be used in the revised Performance Assessment. Only the replacement GCL closure cap will be considered further. Table 1 provides the thickness of each layer and the overall total minimum thickness. As indicated above the thickness of the first backfill layer overlaying the vault roof will vary to accommodate the 2 percent slope of the vault roof and the 3 percent slope of the closure cap top surface.

Table 2 and Figure 2, together, provide information on the variation in the first backfill layer's thickness relative to its position over the top of the vault. See Figure 2 for the location relative to the top of the vault, and Table 2 provides the thickness of the first backfill layer. This results in the total closure cap thicknesses over the vault as shown in Table 3. See Figure 2 for the location relative to the top of the vault

Table 4 provides recommended wet bulk densities for use in conjunction with the layer thicknesses to determine the soil loading on top of the Saltstone Vault. The geotextile fabric and GCL wet bulk densities are given in pounds per square foot, since both materials come in rolls which are unrolled in place during installation.

Figure 1

**Saltstone Facility Layout
Conceptual Drainage System Configuration #2**

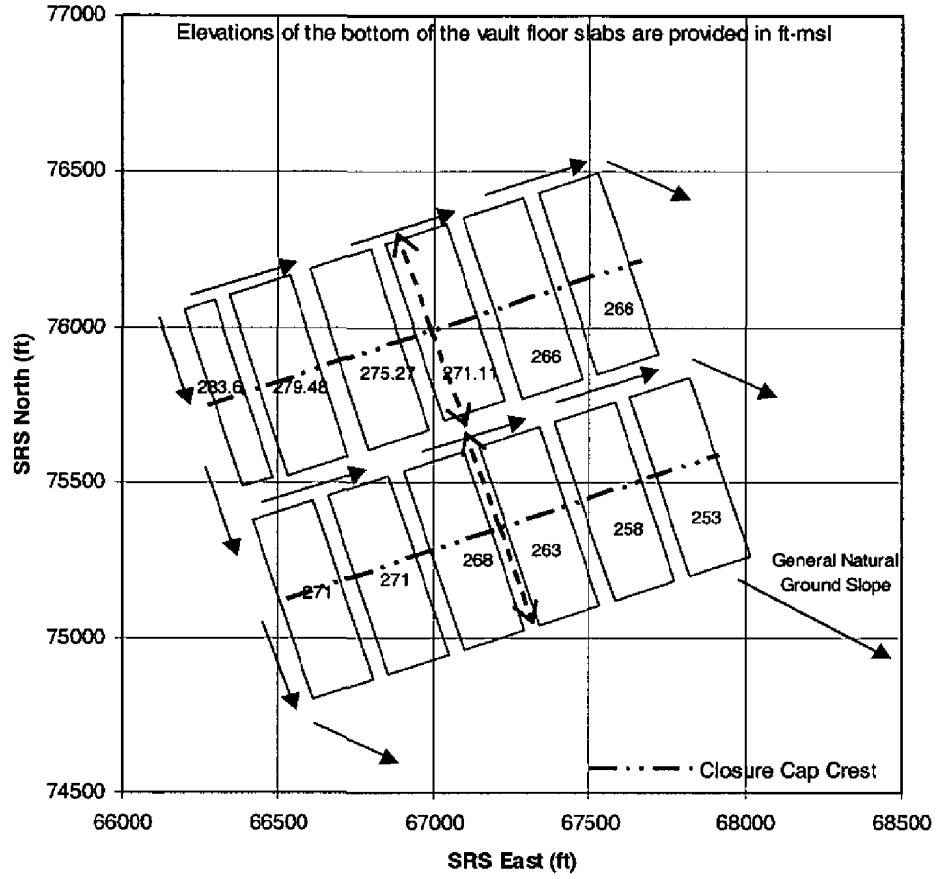


Table 1
Closure Cap Layer Thicknesses

Current Kaolin Closure Cap		Replacement GCL Closure Cap	
Layer	Thickness, feet (meters)	Layer	Thickness, feet (meters)
Topsoil	0.5 (0.15)	Topsoil	0.5 (0.15)
Backfill	2.5 (0.76)	Backfill	2.5 (0.76)
Drainage Layer	1 (0.3)	Erosion Barrier	1 (0.3)
Kaolin Layer	2.5 (0.76)	Drainage Layer ²	1 (0.3)
Backfill (i.e. first backfill layer)	Variable thickness ¹ ; minimum: 1 (0.3)	GCL	0.0167 (0.005)
Drainage Layer	0.5 (0.15)	Backfill (i.e. first backfill layer)	variable thickness ¹ ; minimum: 7.467 (2.28)
Kaolin Layer	1.67 (0.5)	Drainage Layer ²	0.5 (0.15)
Grout	3.33 (1.0)	GCL	0.0167 (0.005)
Total Minimum Thickness	13.0 (3.92)	Total Minimum Thickness	13.0 (3.92)

¹ See Table 2 and Figure 1

² A geotextile fabric will be placed above the drainage layers to prevent the infiltration of fines into the layer.

Table 2
Thickness of First Backfill Layer

Location Over Vault (see Figure 1)	First Backfill Layer Thickness, feet (meters)
1 & 3	9.467 (2.88)
2	7.467 (2.28)
4 & 6	18.467 (5.63)
5	16.467 (5.02)

Figure 2
Position Over Vault

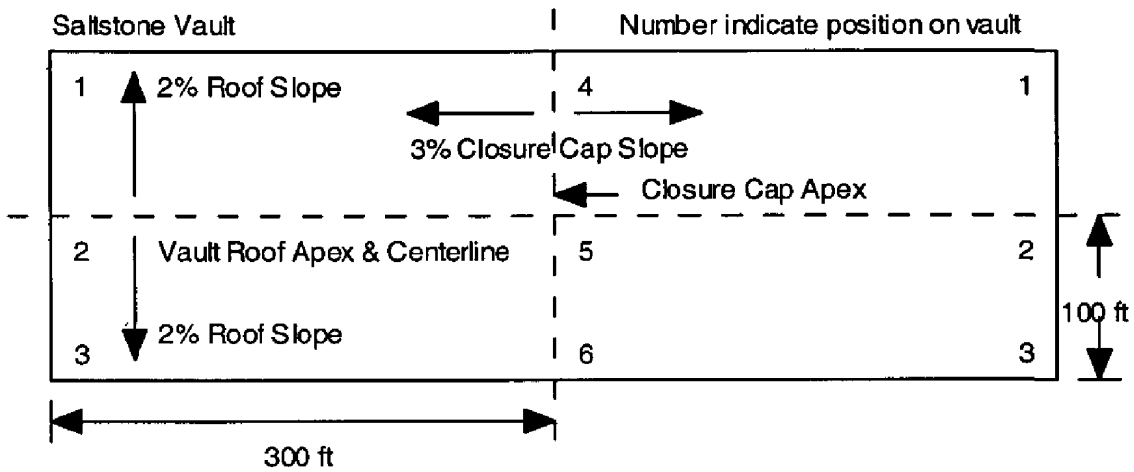


Table 3
Total Closure Cap Thickness

Location Over Vault (see Figure 1)	Total Closure Cap Thickness, feet (meters)
1 & 3	15.00 (4.57)
2	13.0 (3.92)
4 & 6	24.0 (7.32)
5	22.0 (6.70)

Table 4
Recommended Wet Bulk Densities
(Data derived from WSRC 2002c, WSRC 2002d, and)

Layer	Dry Bulk Density (pcf)	Volumetric Moisture Content ⁴ (V/V)	Gravimetric Moisture Content (M _w /M _s)	Wet Bulk Density (pcf)
Topsoil ¹	90	0.2757	0.1912	107.2
Backfill ¹	104	0.2982	0.1789	122.6
Erosion Barrier ²	105	0.0941	0.0559	110.9
Geotextile Fabric ³	-	-	-	0.07 psf
Drainage Layer ¹	105	0.1764	0.1048	116.0
GCL ³	-	0.75	-	2 psf

¹ Derived from WSRC 2002c and WSRC 2002d

² Default Soil Texture Class # 21 (poorly graded gravel per the USCS) from EPA 1994

³ Obtained from the following GSE web sites:

- www.gseworld.com/global/UnitedStates/Products/NonwovenGeotextile/index.htm for GSE Nonwoven Geotextile NW10
- www.gseworld.com/global/UnitedStates/Products/Bentofix/Index.htm for GSE Bentofix[®] NS

⁴ Obtained from HELP Model Run of Saltstone Closure Cap per Table 1

References:

EPA 1994. The Hydrologic Evaluation of Landfill Performance (HELP) Model Engineering Documentation for Version 3, (EPA/600/R-94/168b). United States Environmental Protection Agency, Office of Research and Development, Washington, DC. September 1994.

WSRC 2000. *Closure Plan for the Z-Area Saltstone Disposal Facility (U)*, Rev. 0 (WSRC-RP-2000-00426). Westinghouse Savannah River Company, Aiken, South Carolina. September 29, 2000.

WSRC 2002a. *Saltstone Landfill Design Equivalency Demonstration (U)*, Rev. 0 (WSRC-TR-2002-00236). Westinghouse Savannah River Company, Aiken, South Carolina. August 30, 2002.

WSRC 2002b. *Special Analysis: Reevaluation of the Inadvertent Intruder, Groundwater, Air, and Radon Analyses for the Saltstone Disposal Facility*, Draft (WSRC-TR-2002-00456). Westinghouse Savannah River Company, Aiken, South Carolina. October 2002.

WSRC 2002c. *Closure Plan for the E-area Low-Level Waste Facility*, Rev. 2, (WSRC-RP-2000-00425). Westinghouse Savannah River Company, Aiken, SC 29808. September 2, 2002.

WSRC 2002d. *Corrosion and Potential Subsidence Scenarios for Buried B-25 Waste Containers (U)*, (WSRC-TR-2002-00354). Westinghouse Savannah River Company, Aiken, SC 29808. September 2002.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 342	Rev. 0
----------------------------------	------------------	-----------

APPENDIX D

SGS Geotechnical Data for Differential Settlement



T-CLC-Z-00006, Rev. 2

343

WESTINGHOUSE SAVANNAH RIVER COMPANY
INTEROFFICE MEMORANDUM

FIELD SUPPORT SERVICES
GEOTECHNICAL ENGINEERING DEPARTMENT

May 1, 2003

FSS-GED-2003-00005

TO: W. L. Peregoy, 730-1B-3078
G. E. Mertz, 730-1B-314

FROM: M. D. McHood, 730-2B-1070 *MDM*

GEOTECHNICAL INPUT FOR SALTSTONE VAULT NO. 4 STRUCTURAL ANALYSIS

Geotechnical Engineering has estimated dynamic settlement for Saltstone Vault No. 4 due to Performance Category 3 (PC3) and Performance Category 4 (PC4) earthquakes. Site specific geotechnical data used for the seismic evaluation includes six Seismic Piezocone Penetrometer (SCPTu) soundings performed in June of 2002. In addition, historical geotechnical data and reports were reviewed to provide estimated static settlement due to primary consolidation (within years of construction) and secondary consolidation (long term creep). This memo summarizes our work.

Dynamic settlement due to seismic loading is documented in calculation K-CLC-Z-0004. Both the PC3 and PC4 event were evaluated at six SCPTu locations around the perimeter of Vault No. 4. The six SCPTu were pushed to refusal (between elevations 185 and 160 ft msl). Standard Penetration Test data collected beneath Vault No. 4 show that the Santee Formation is very dense (top of Santee at approximately elevation 185 ft msl). Therefore, no softzone settlement is expected during a seismic event. Any dynamic settlement would be due to liquefaction or partial liquefaction. Calculated dynamic settlements (rounded to the nearest 1/4 inch) at the six SCPTu locations are summarized below.

SCPTu ID	PC3 Settlement (inch)	PC4 Settlement (inch)
ZCP-22	1/2	3
ZCP-23	1/4	1 1/2
ZCP-24	1/2	2 1/4
ZCP-25	1/4	1 1/2
ZCP-26	1/2	2
ZCP-27	1	4

Settlement due to liquefaction and partial liquefaction for the PC3 (2,500 year) earthquake ranges from ¼ to 1 inch. Settlement due to liquefaction and partial liquefaction for the PC4 (10,000 year) earthquake ranges from 1½ to 4 inches. Differential dynamic settlement can be taken as the maximum minus the minimum for a given earthquake. The differential settlement is expected to occur over the width of the facility.

Static settlement due to primary consolidation was calculated by Mueser Rutledge Consulting Engineers (MRCE) in their report titled "Saltstone Disposal Z-Area Savannah River Plant," #6329, dated October 14, 1986. The MRCE static settlement calculations assume the vaults are filled with saltstone and capped with about 20 feet of feet of soil, resulting in a final vault subgrade loading of 3.2 tons per square foot. Static settlements vary between 4.3 inches at the center and 2.5 inches at the end of the short side.

Static settlement due to secondary consolidation is estimated based on data collected at the Defense Waste Processing Facility (DWPF). Average loading for DWPF is about 2.5 to 2.8 tons per square foot. The settlement summary report titled "Settlement of Defense Waste Processing Facility," Report No. K-ESR-S-00005, dated September 30, 2002 gives a current rate of settlement of ½ to 1 inch of settlement per log cycle of time (time in days). Based on the settlement data, the rate of settlement due to secondary consolidation, or current rate of settlement, started between 2,000 and 4,000 days. The settlement due to secondary consolidation at 10,000 years (3,650,000 days) would be about 3 log cycles [$\log(3,650,000 \text{ days}) - \log(3,650 \text{ days})$], or 1½ to 3 inches. Settlement due to secondary consolidation is expected to be relatively even across the vault.

If you have any questions please call me at ext. 2-6949 or Mike Lewis at ext. 2-6847.

c: M. R. Lewis, 730-2B-116
GED Files, 730-2B-1102



DRAFT

**WESTINGHOUSE SAVANNAH RIVER COMPANY
INTEROFFICE MEMORANDUM
FIELD SUPPORT SERVICES
GEOTECHNICAL ENGINEERING DEPARTMENT**

April ??, 2003

FSS-GED-2003-DRAFT

TO: W. L. Peregoy, 730-1B-3078
G. E. Mertz, 730-1B-314

FROM: M. D. McHood, 730-2B-1070

GEOTECHNICAL INPUT FOR SALTSTONE VAULT NO. 4 STRUCTURAL ANALYSIS

Geotechnical Engineering has estimated dynamic settlement for Saltstone Vault No. 4 due to Performance Category 3 (PC3) and Performance Category 4 (PC4) earthquakes. Site specific geotechnical data used for the seismic evaluation includes six Seismic Piezocone Penetrometer (SCPTu) soundings performed in June of 2002. In addition, historical geotechnical data and reports were reviewed to provide estimated static settlement due to primary consolidation (within years of construction) and secondary consolidation (long term creep). This memo summarizes our work.

Dynamic settlement due to seismic loading is documented in calculation K-CLC-Z-0004. Both the PC3 and PC4 event were evaluated at six SCPTu locations around the perimeter of Vault No. 4. The six SCPTu were pushed to refusal (between elevations 185 and 160 ft msl). Standard Penetration Test data collected beneath Vault No. 4 show that the Santee Formation is very dense (top of Santee at approximately elevation 185 ft msl). Therefore, no softzone settlement is expected during a seismic event. Any dynamic settlement would be due to liquefaction or partial liquefaction. Calculated dynamic settlements at the six SCPTu locations are summarized below.

SCPTu ID	PC3 Settlement (inch)	PC4 Settlement (inch)
ZCP-22	0.60	3.04
ZCP-23	0.28	1.60
ZCP-24	0.41	2.33
ZCP-25	0.25	1.46
ZCP-26	0.38	1.99
ZCP-27	0.96	3.97

$3.97 - 1.46 = 2.51$
use $2\frac{3}{4}$ "

$0.96 - 0.25 = 0.71$
use $\frac{3}{4}$ "

Settlement due to liquefaction and partial liquefaction for the PC3 (2,500 year) earthquake ranges from ¼ to 1 inch. Settlement due to liquefaction and partial liquefaction for the PC4 (10,000 year) earthquake ranges from 1½ to 4 inches. Differential dynamic settlement would be the maximum minus the minimum for a given earthquake. The differential settlement is expected to occur over the width of the facility.

Static settlement due to primary consolidation was calculated by Mueser Rutledge Consulting Engineers (MRCE) in their report titled "Saltstone Disposal Z-Area Savannah River Plant," #6329, dated October 14, 1986. The MRCE static settlement calculations assume the vaults are filled with saltstone and capped with about 20 feet of soil, resulting in a final vault subgrade loading of 3.2 tons per square foot. Static settlements vary between 4.3 inches at the center and 2.5 inches at the end of the short side.

Static settlement due to secondary consolidation is estimated based on data collected at the Defense Waste Processing Facility (DWPF). Average loading for DWPF is about 2.5 to 2.8 tons per square foot. The settlement summary report titled "Settlement of Defense Waste Processing Facility," Report No. K-ESR-S-00005, dated September 30, 2002 gives a current rate of settlement of ½ to 1 inch of settlement per log cycle of time (time in days). Based on the settlement data, the rate of settlement due to secondary consolidation, or current rate of settlement, started between 2,000 and 4,000 days. The settlement due to secondary consolidation at 10,000 years (3,650,000 days) would be about 3 log cycles [log(3,650,000 days) - log(3,650 days)], or 1½ to 3 inches. Settlement due to secondary consolidation is expected to be relatively even across the vault.

If you have any questions please call me at ext. 2-6949 or Mike Lewis at ext. 2-6847.

c: M. R. Lewis, 730-2B-116
GED Files, 730-2B-1102

PC - 3 use ¾"
PC - 4 use 2¾" (rounded up)

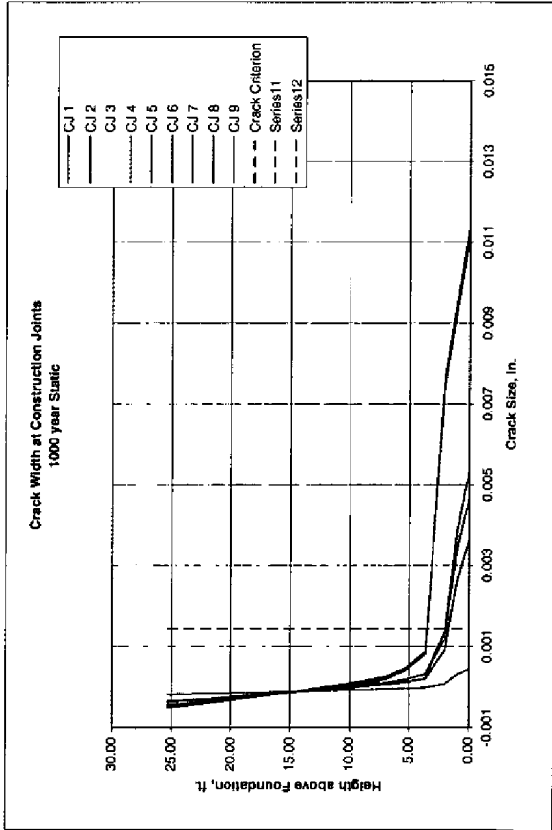
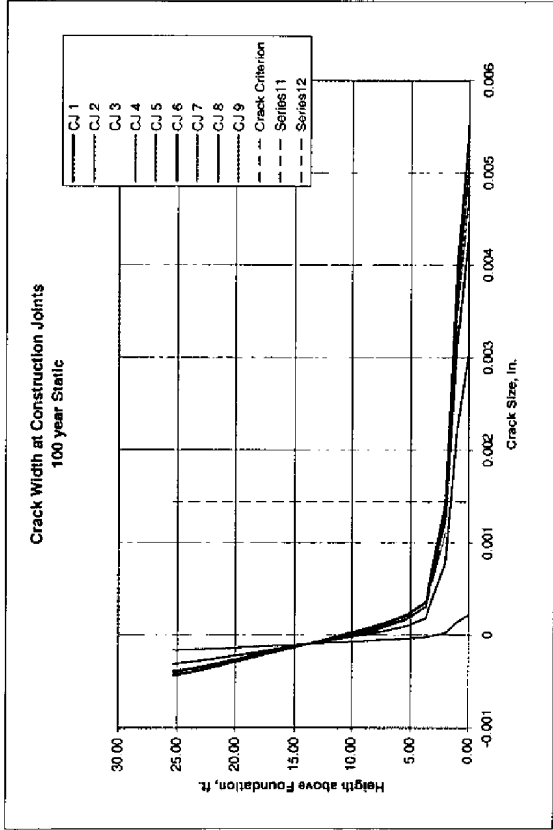
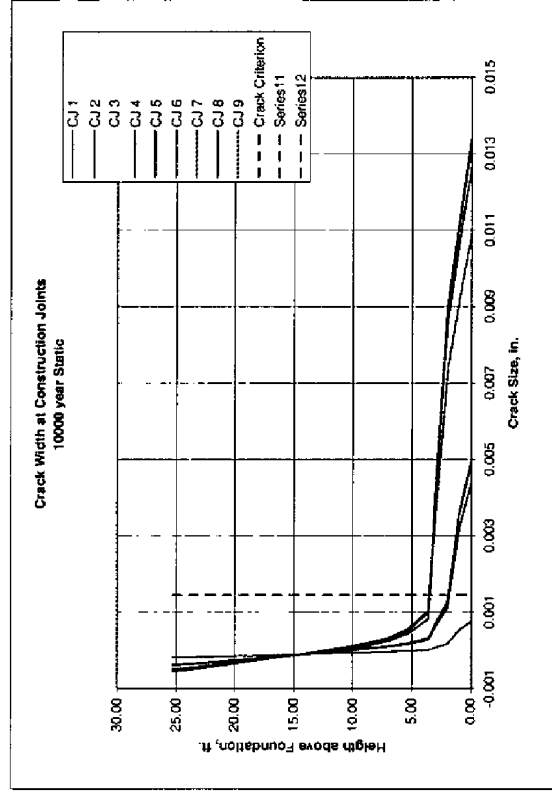
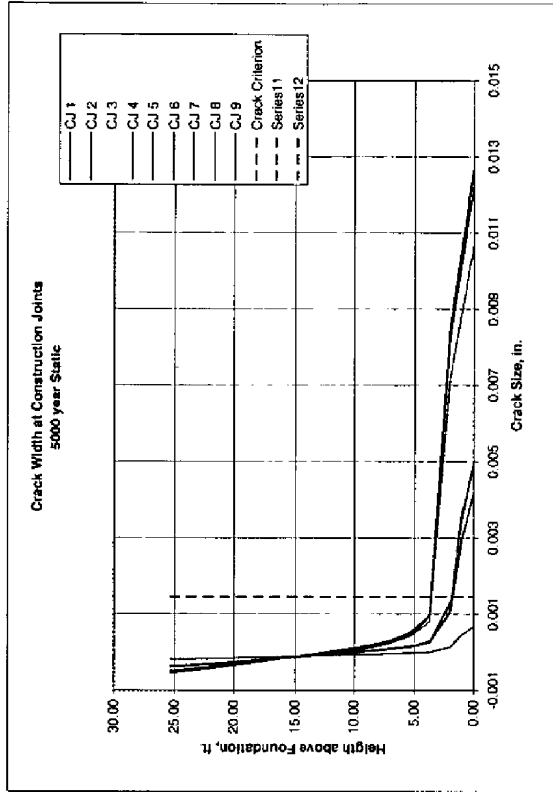
Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 347	Rev. 0
----------------------------------	------------------	-----------

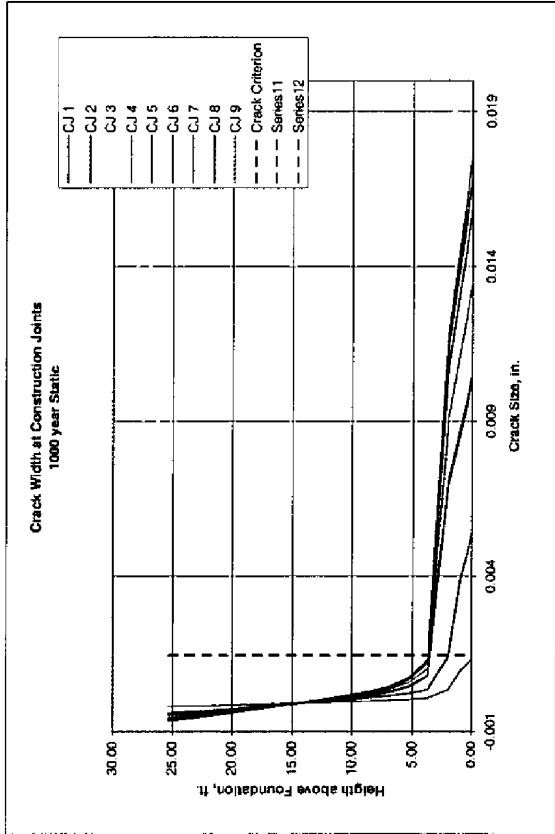
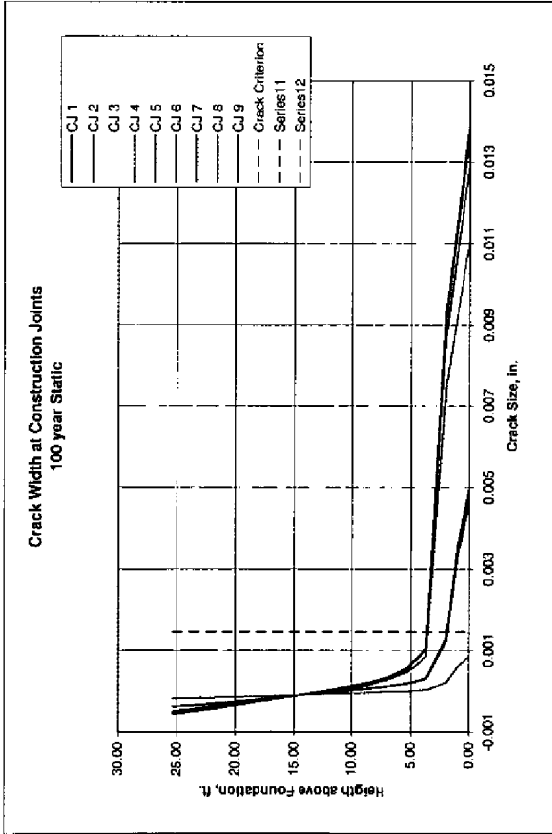
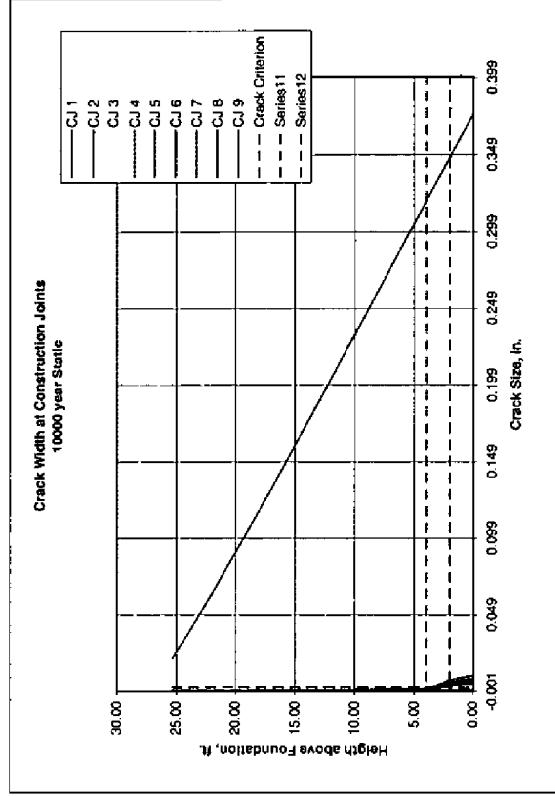
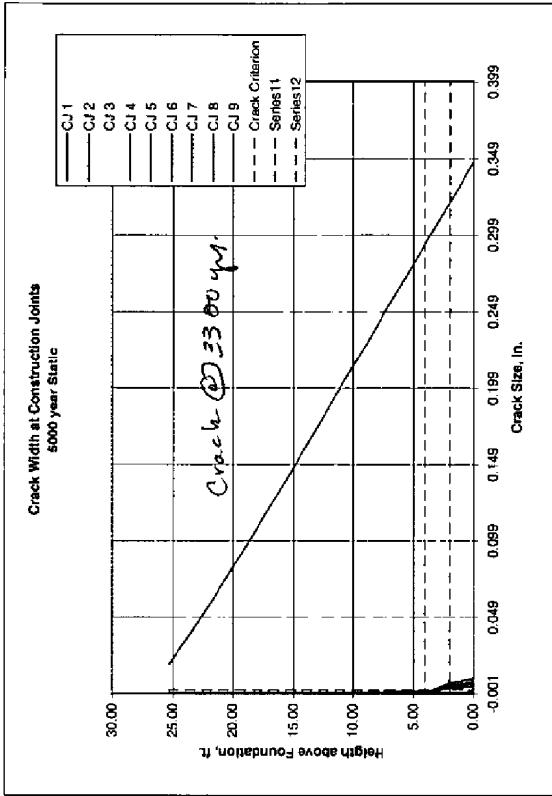
APPENDIX E

Structural Analysis Results

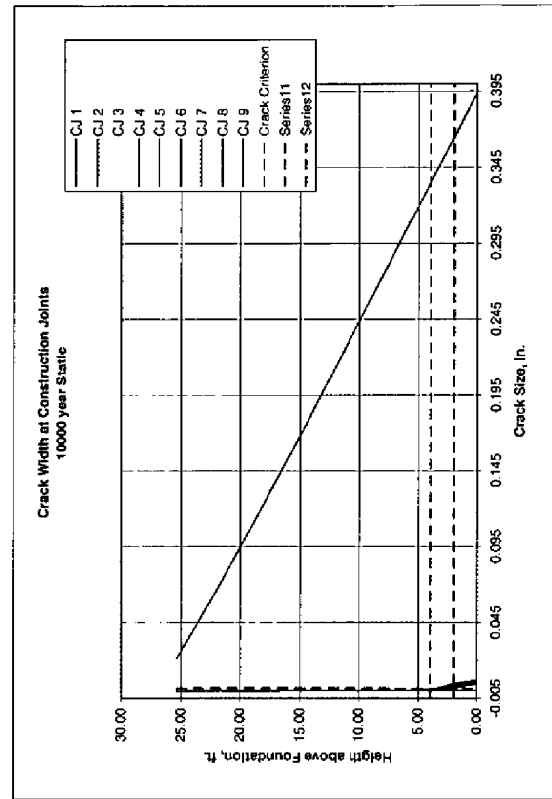
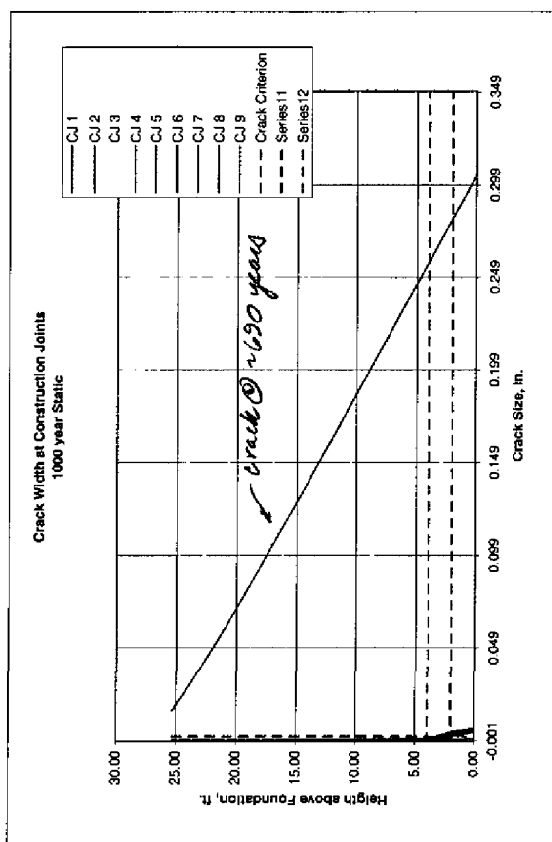
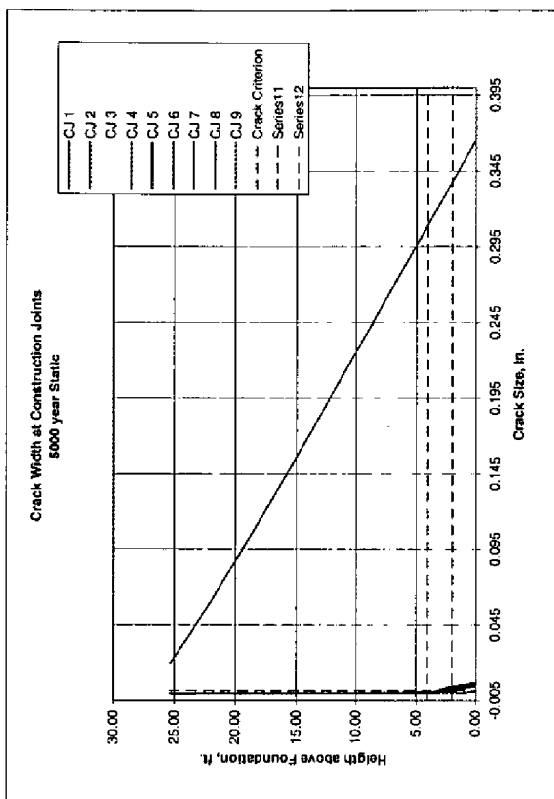
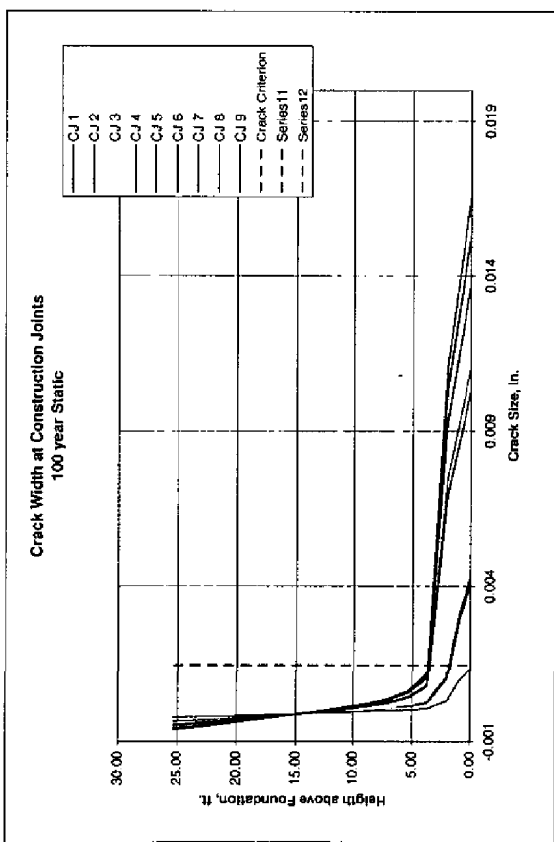
Static Settlement
Low Soil Creep Properties



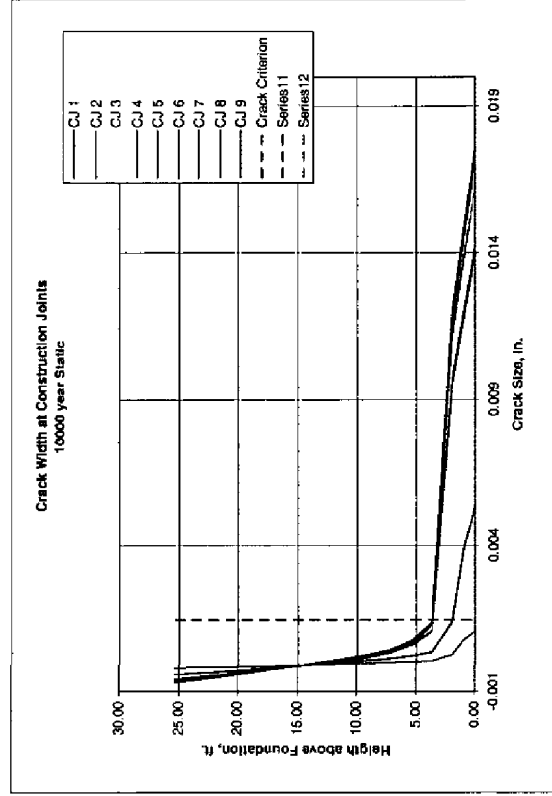
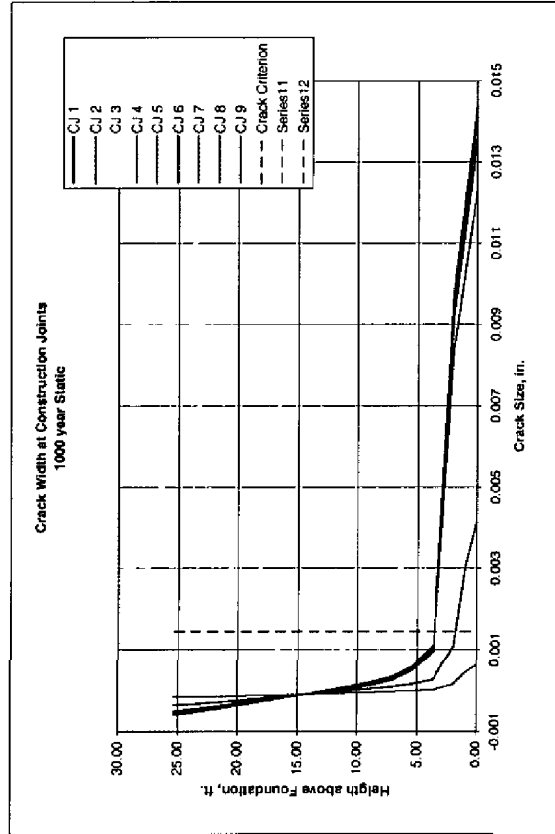
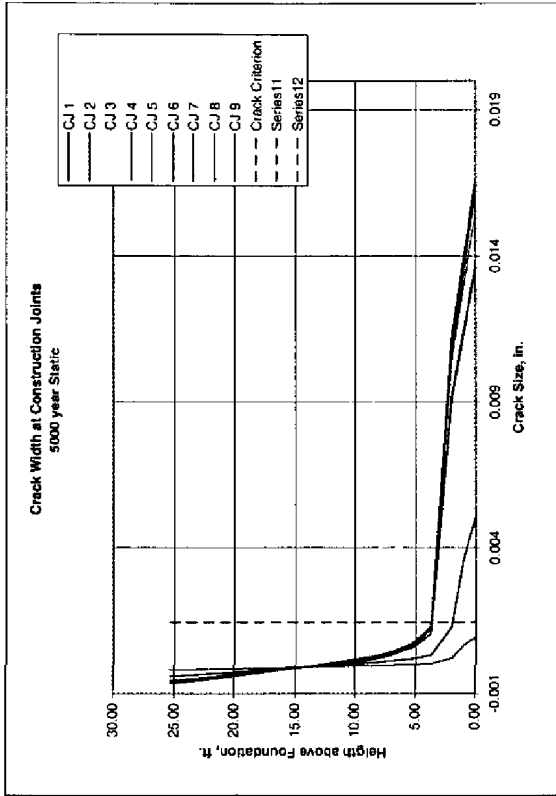
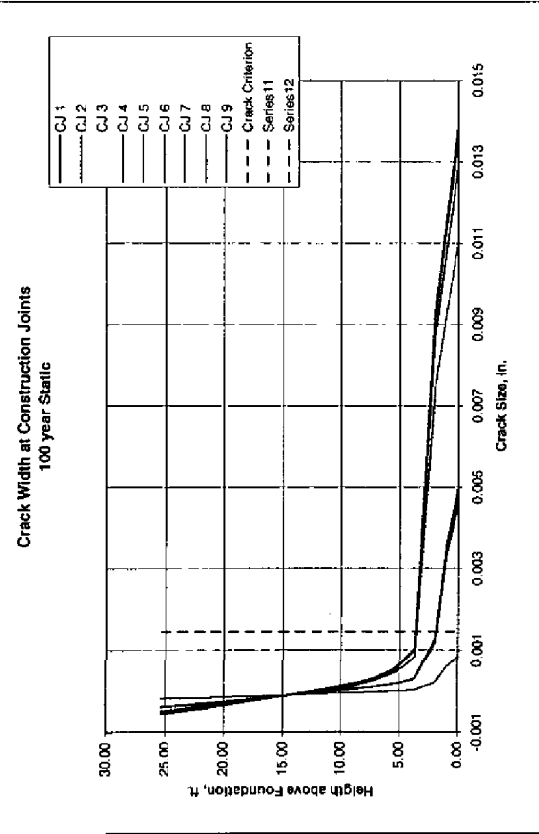
Static Settlement
Mean Soil Modulus



Static Settlement
High Soil Modulus

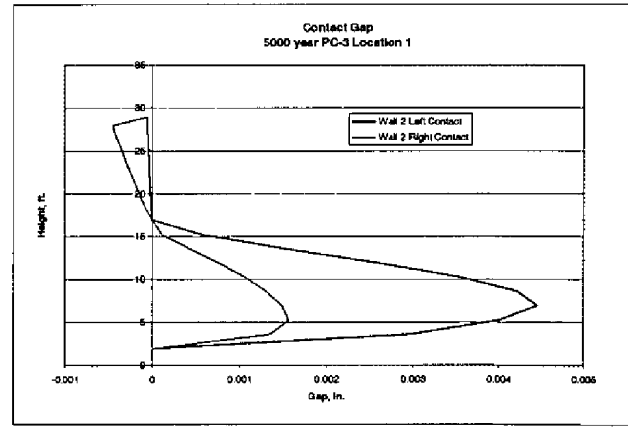
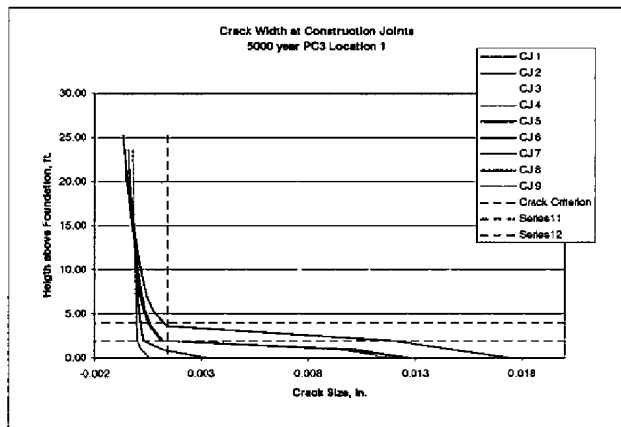
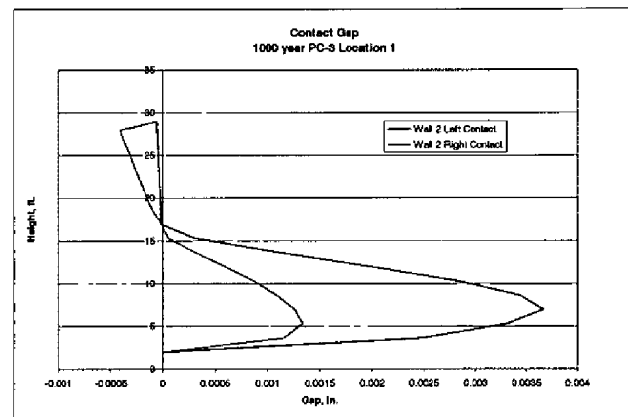
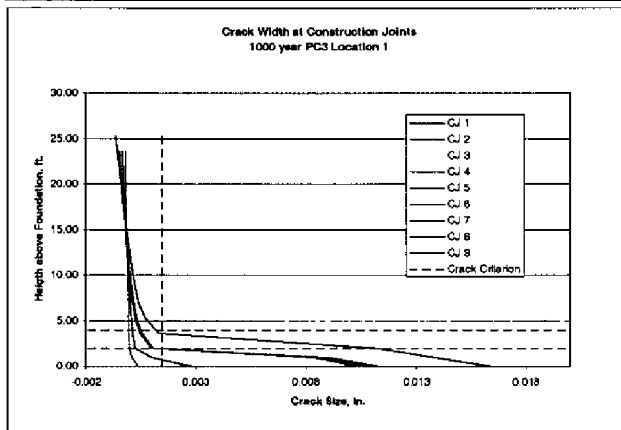
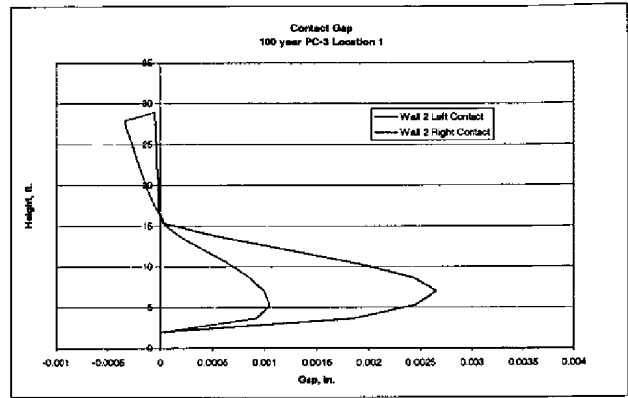
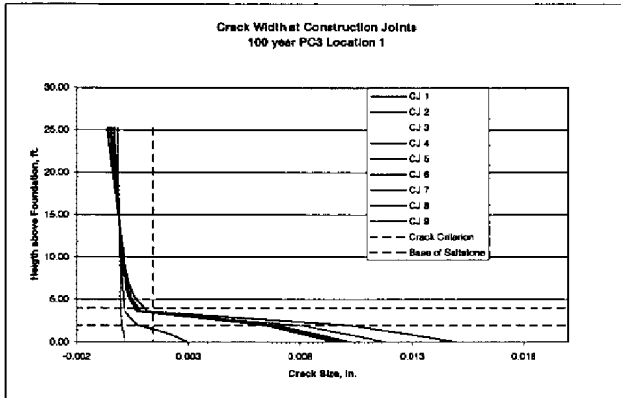


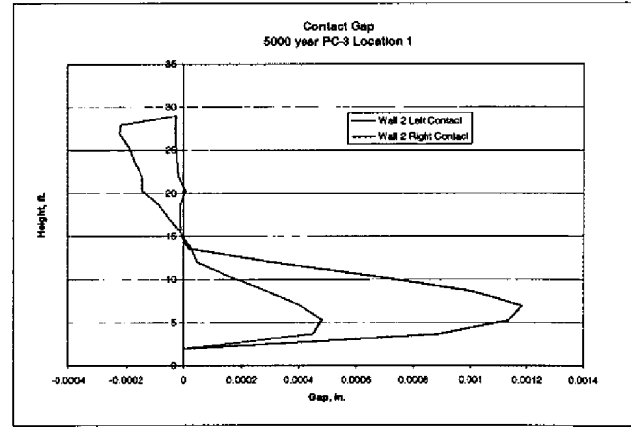
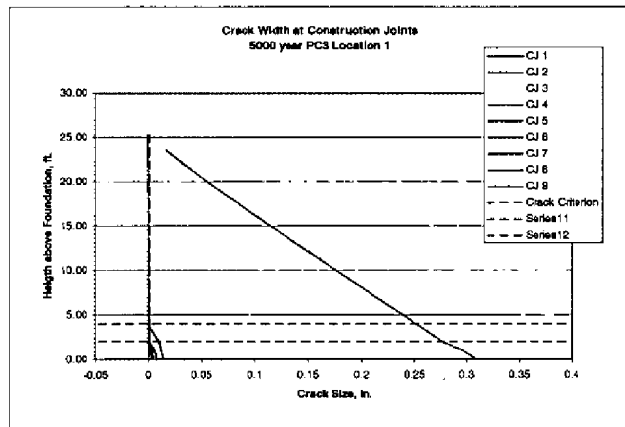
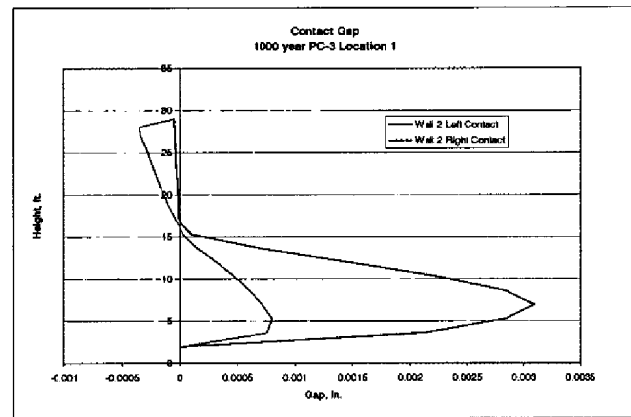
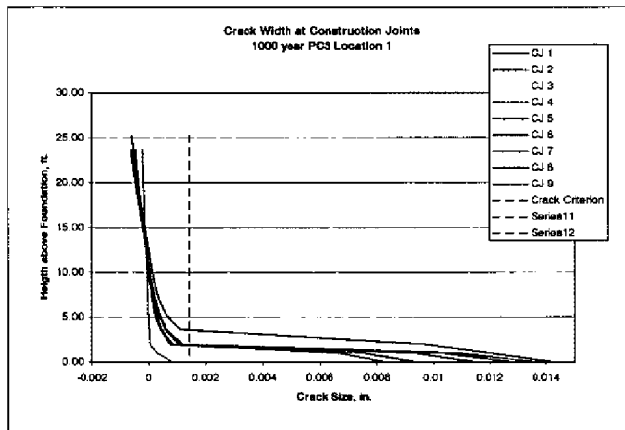
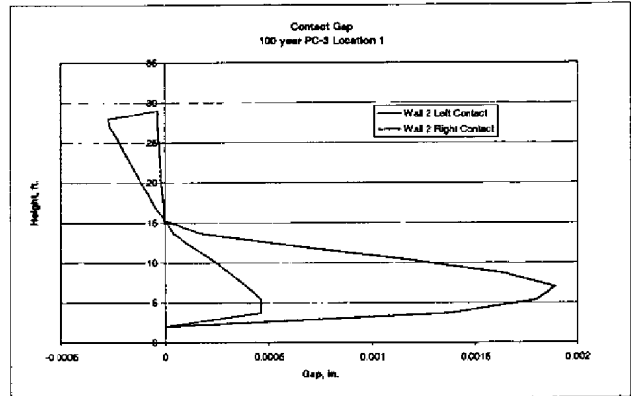
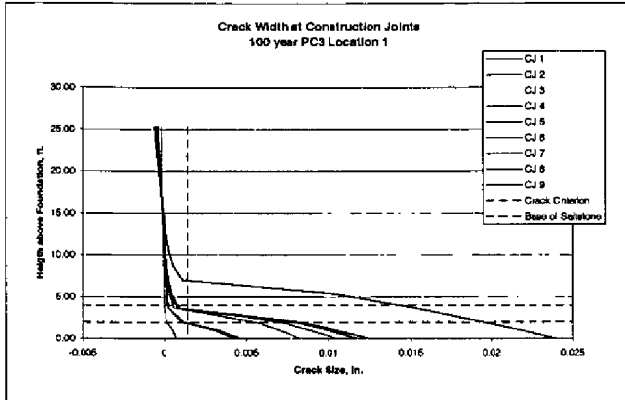
Static Settlement
Low Soil Modulus

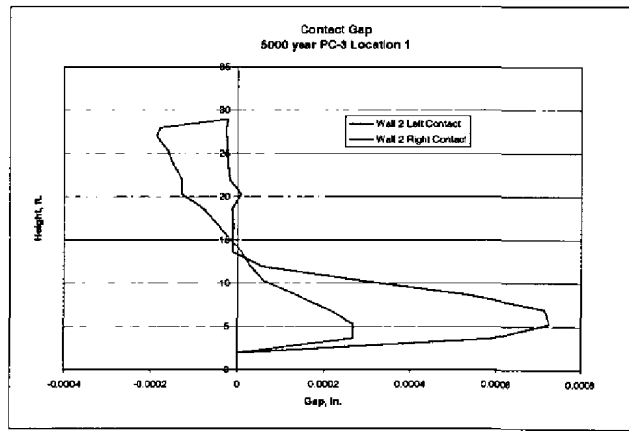
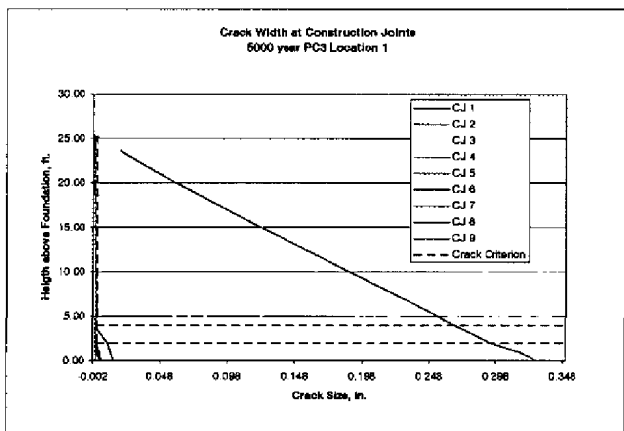
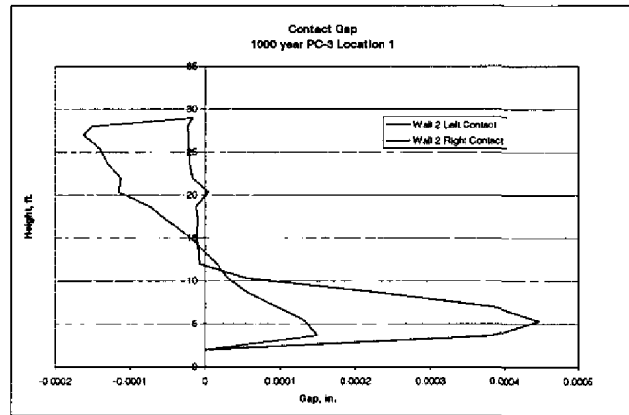
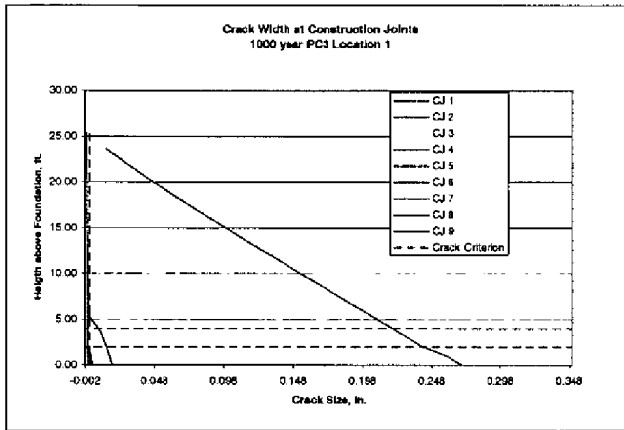
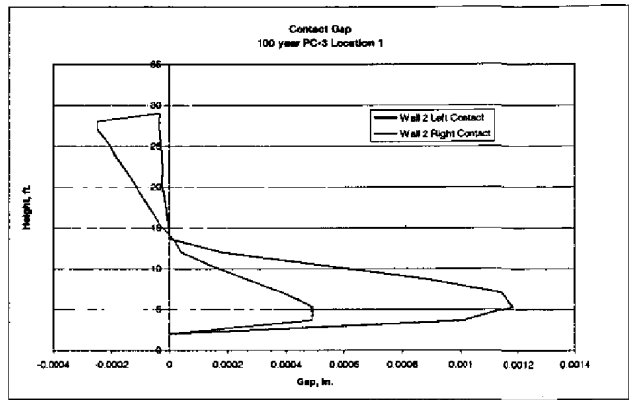
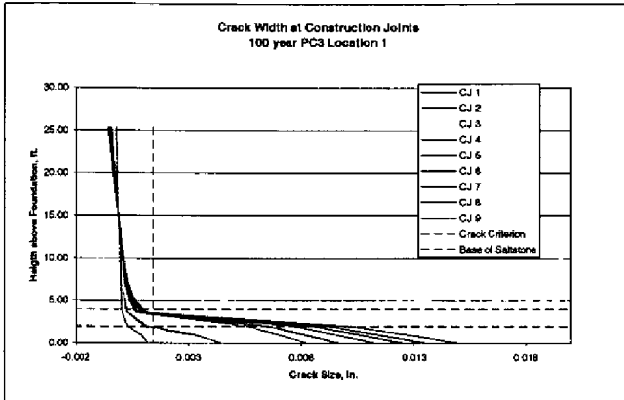


T-LLC-2-00006, Rev. 0

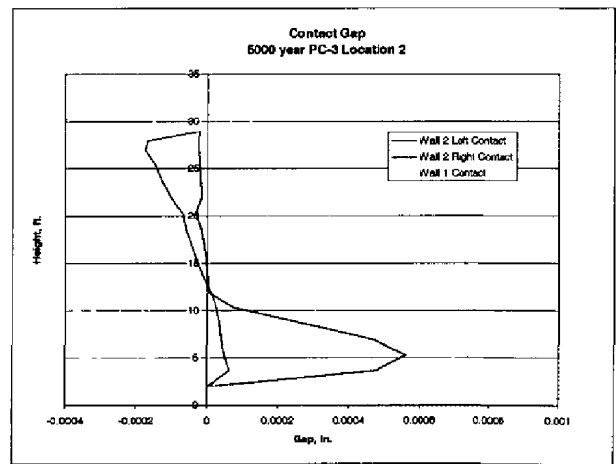
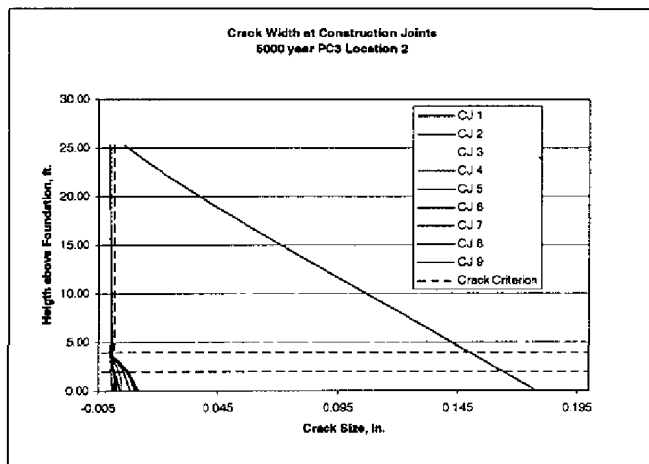
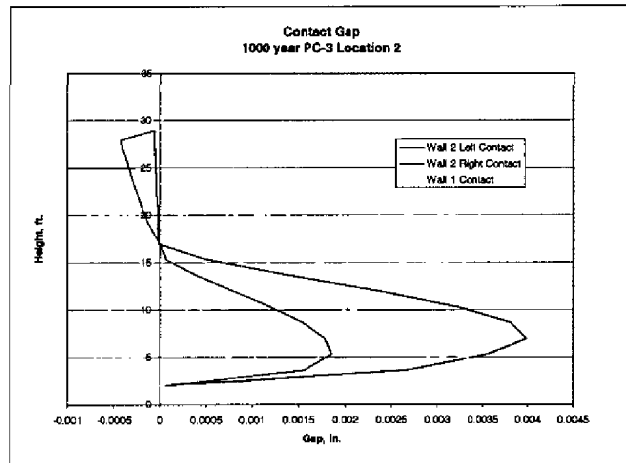
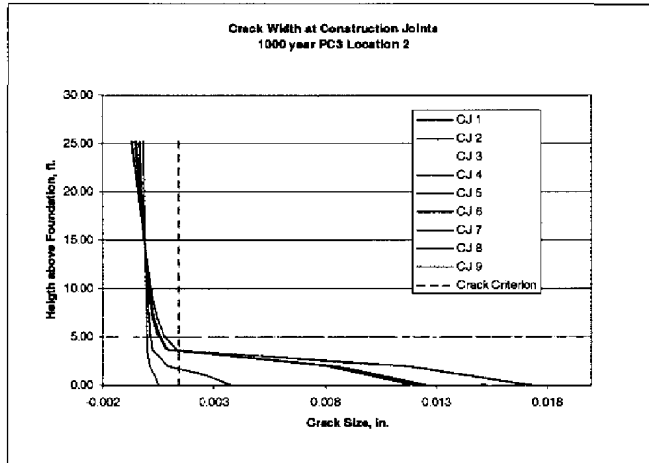
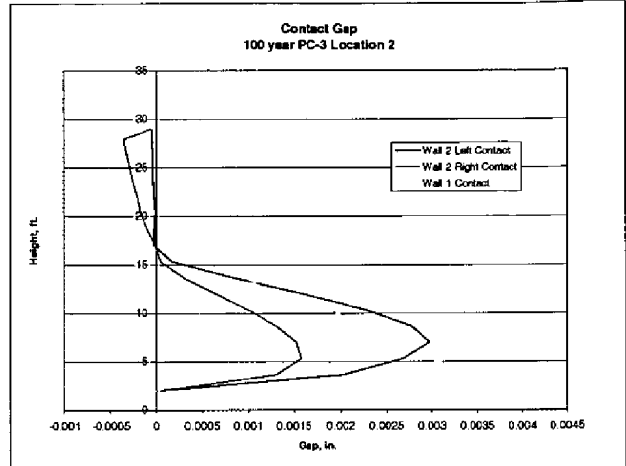
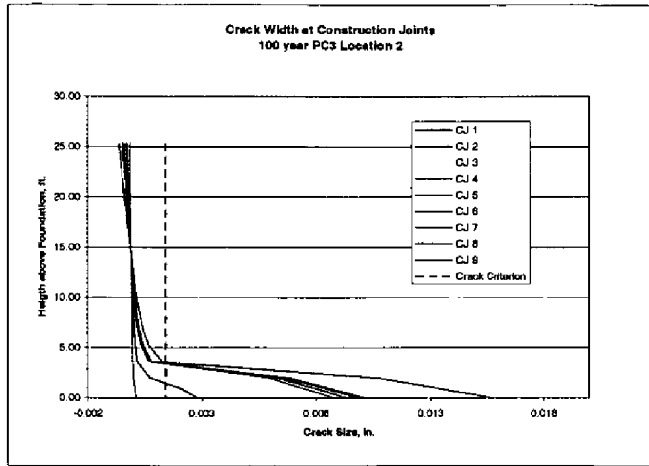
351



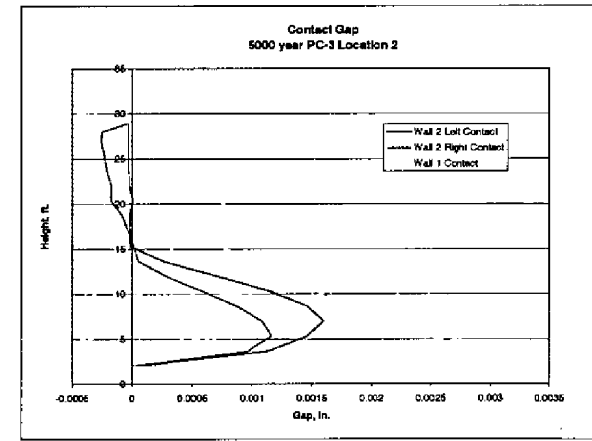
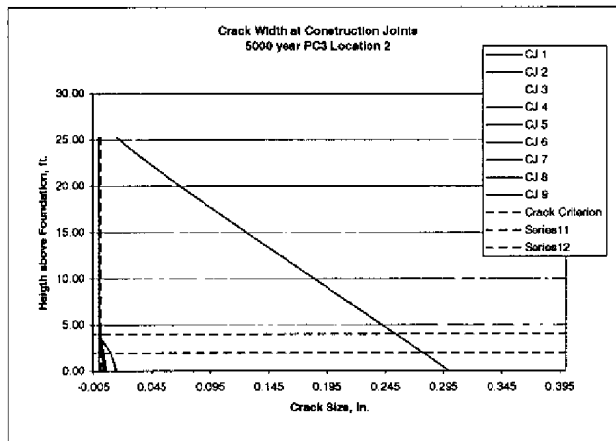
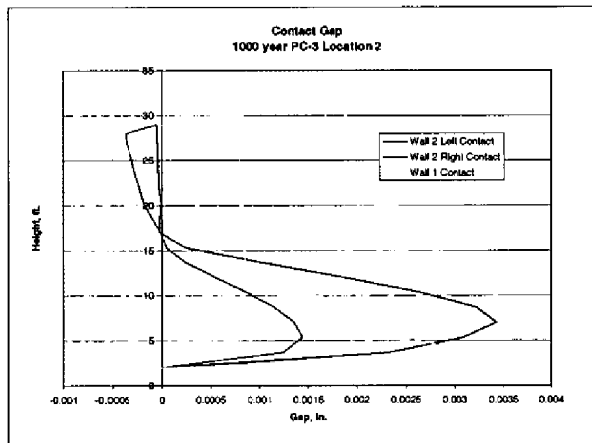
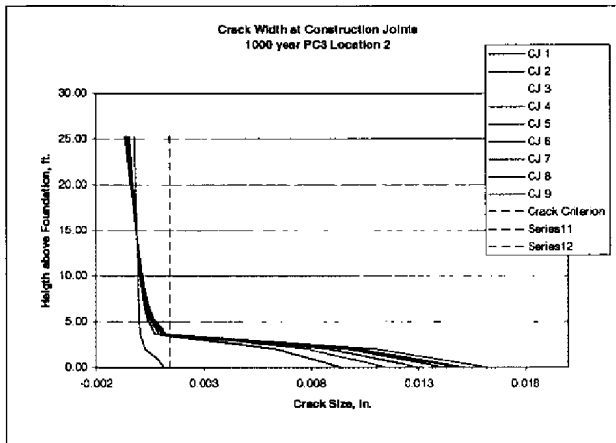
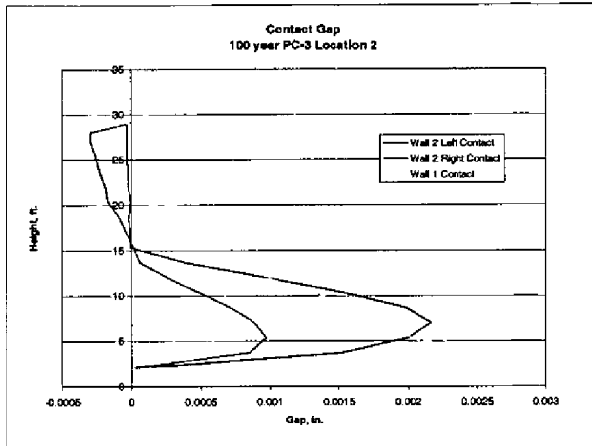
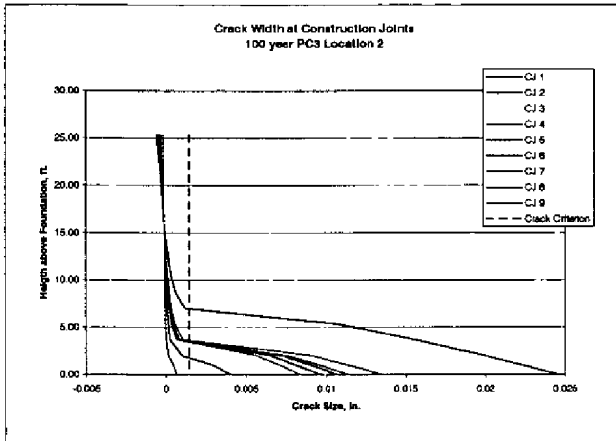




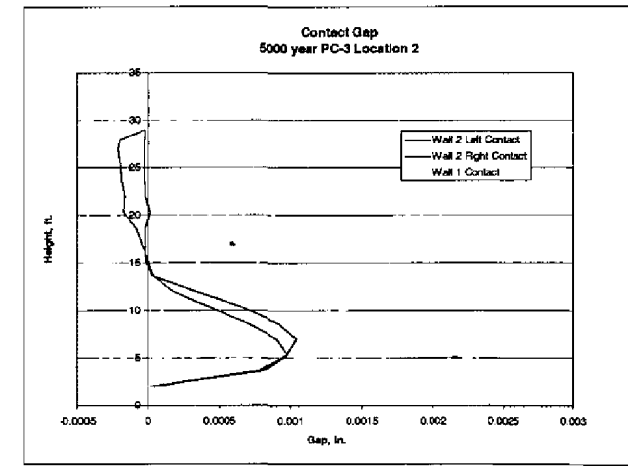
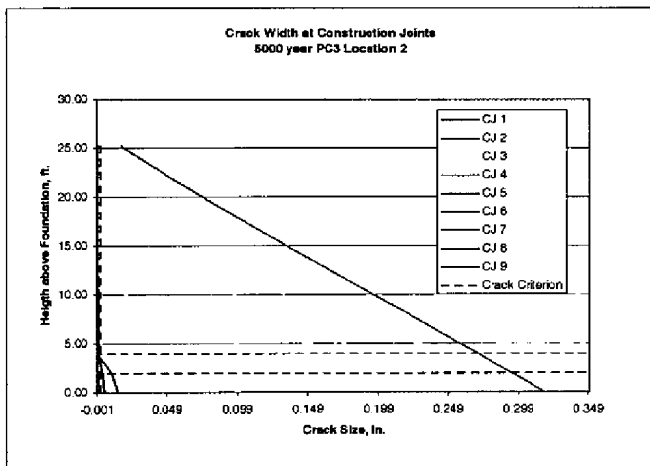
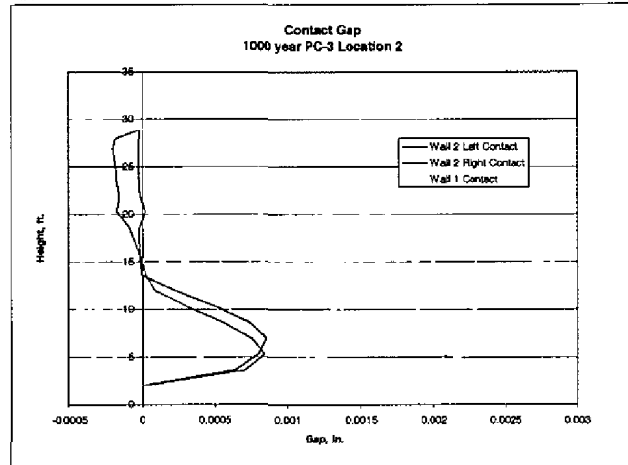
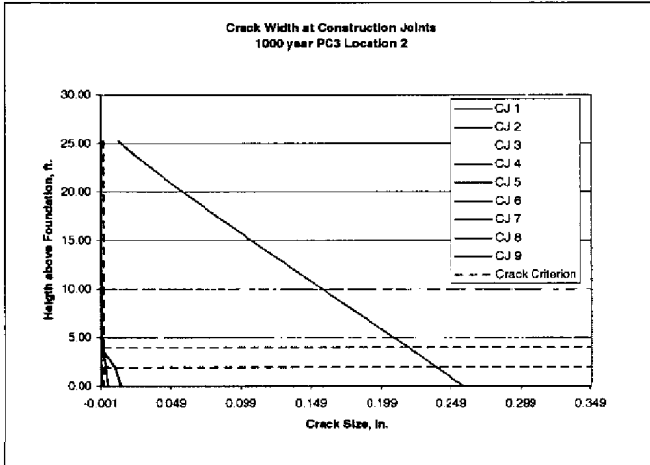
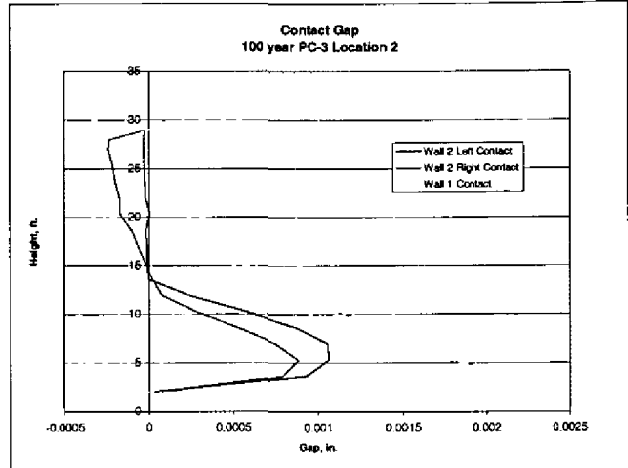
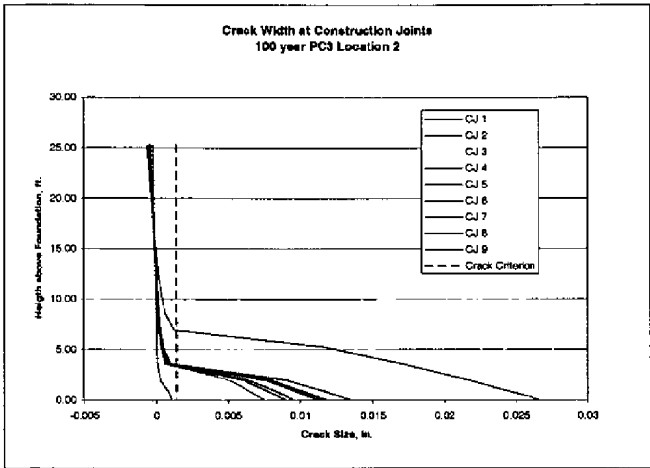
PC-3 Differential Settlement - Location 2
Low Soil

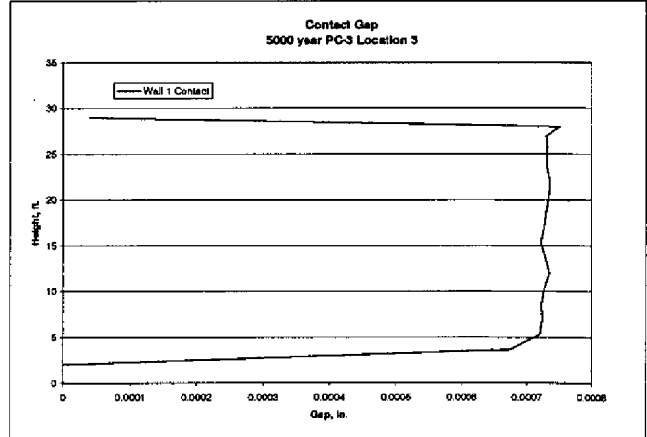
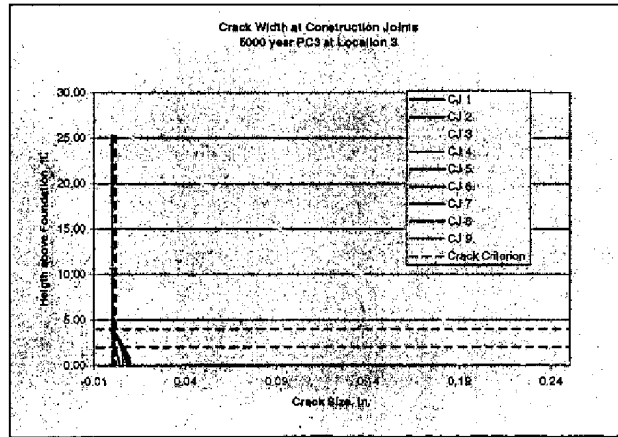
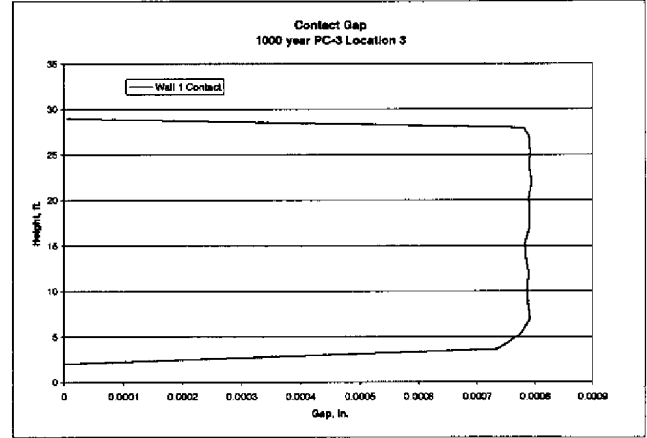
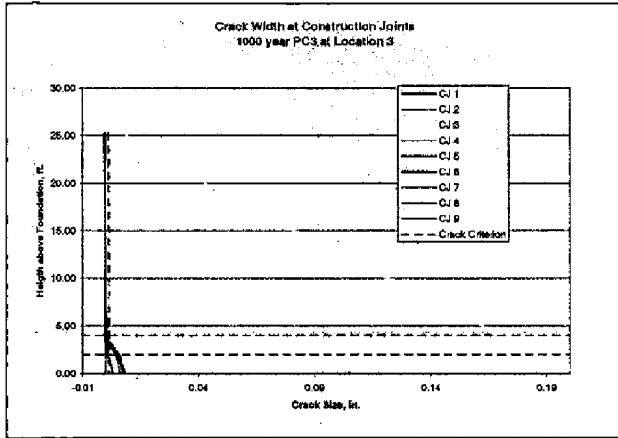
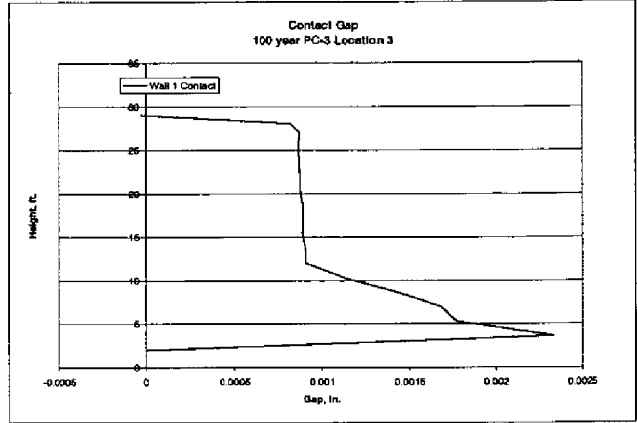
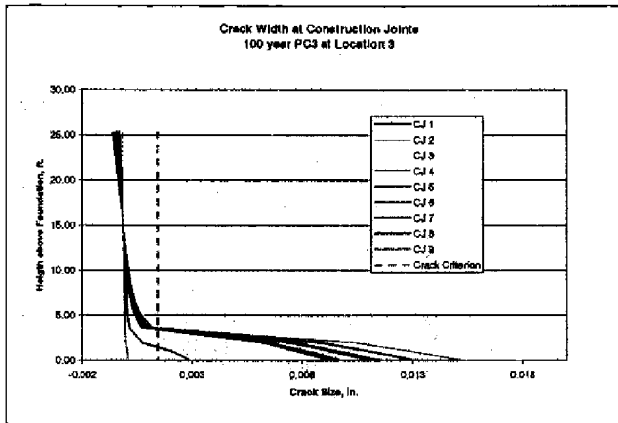


PC-3 Differential Settlement - Location 2
Mean Soil

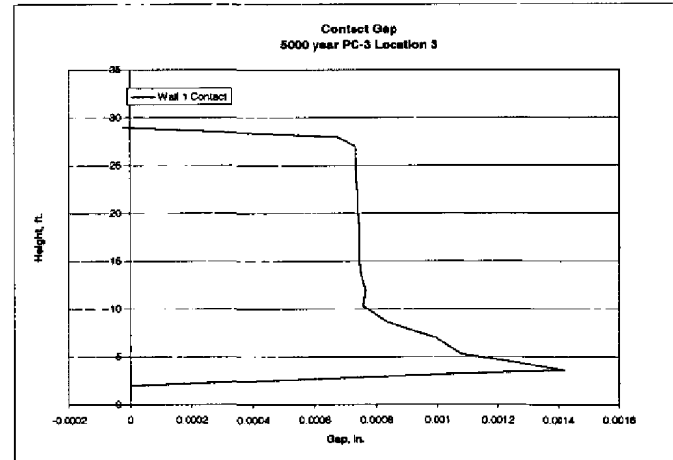
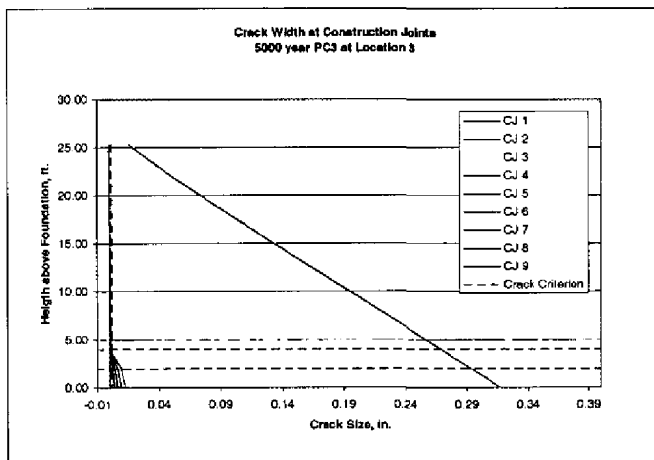
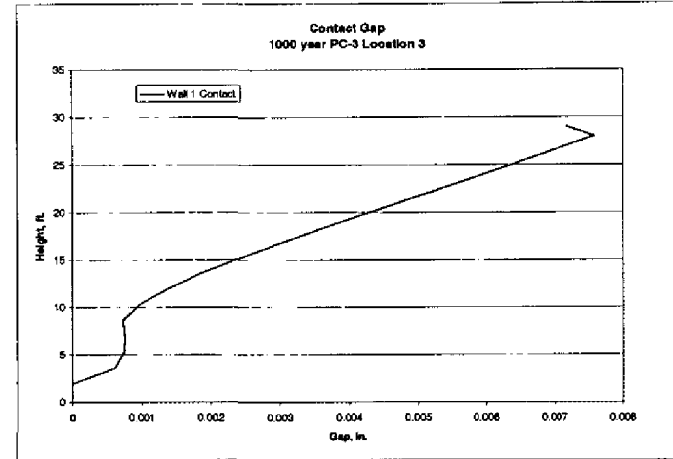
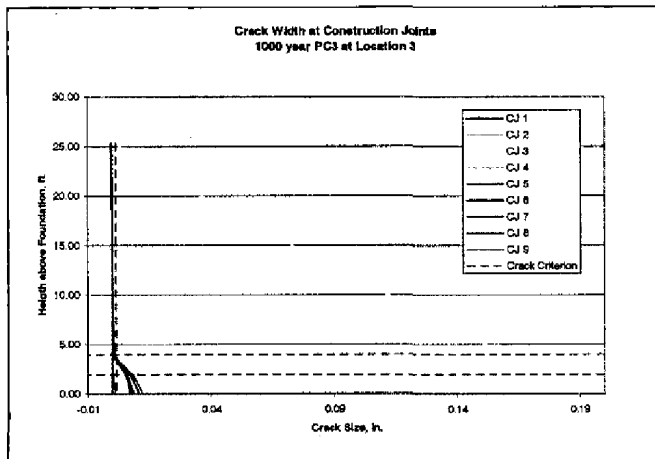
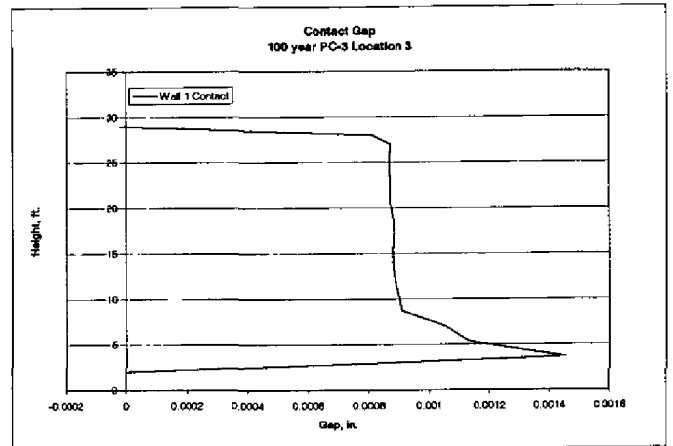
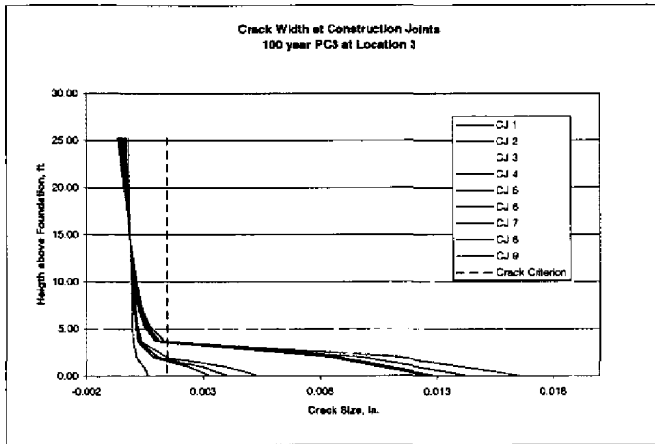


PC-3 Differential Settlement - Location 2
High Soil

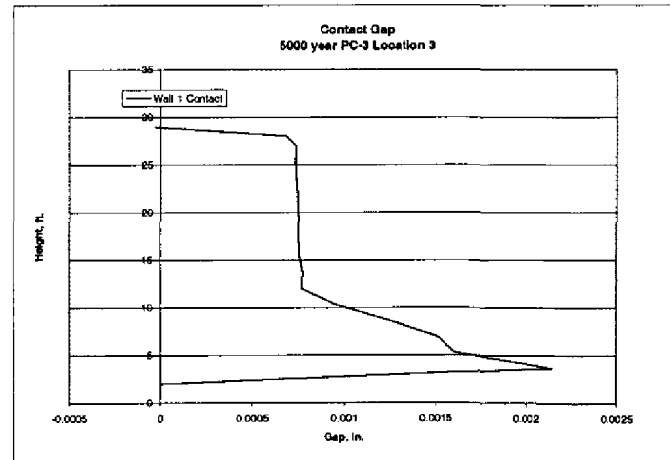
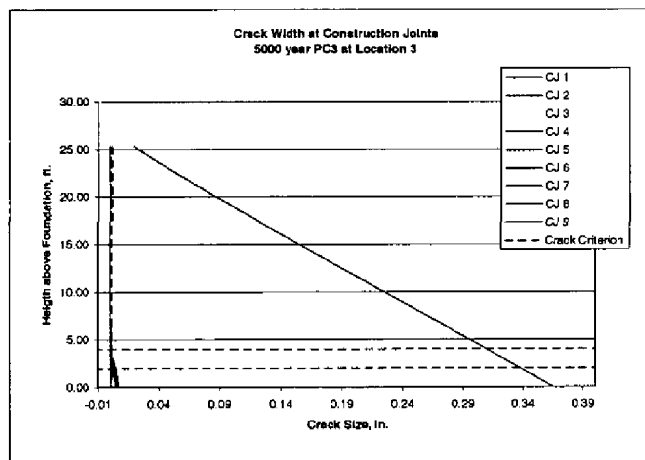
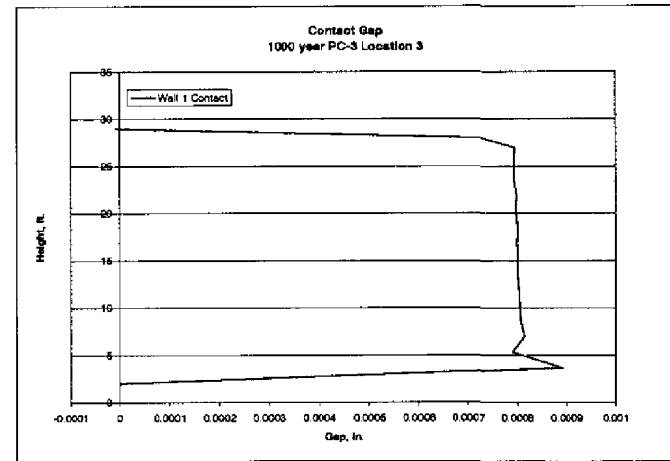
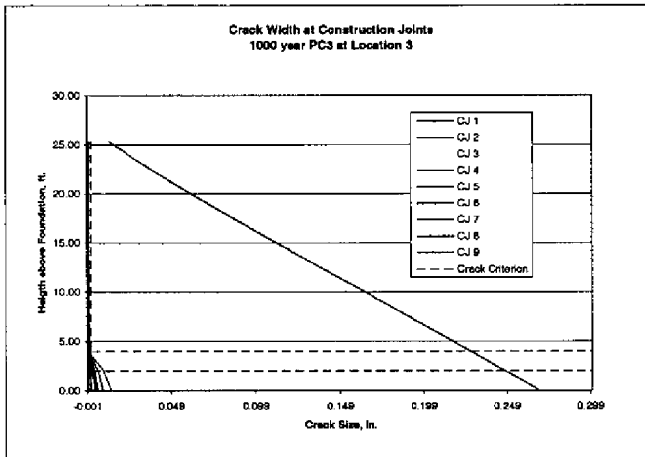
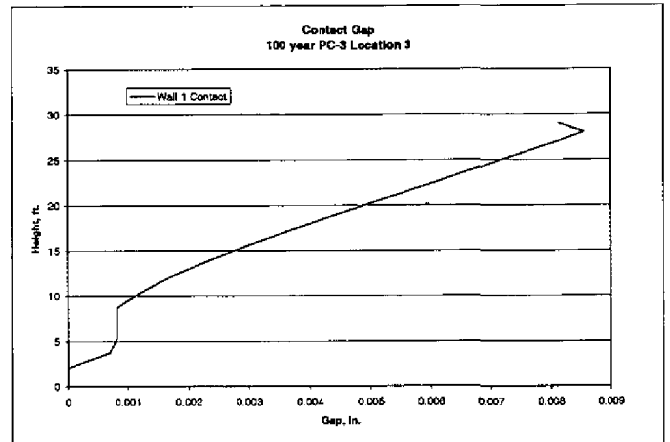
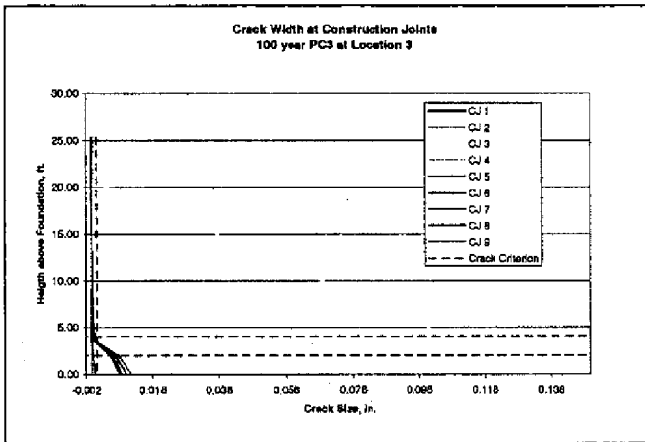




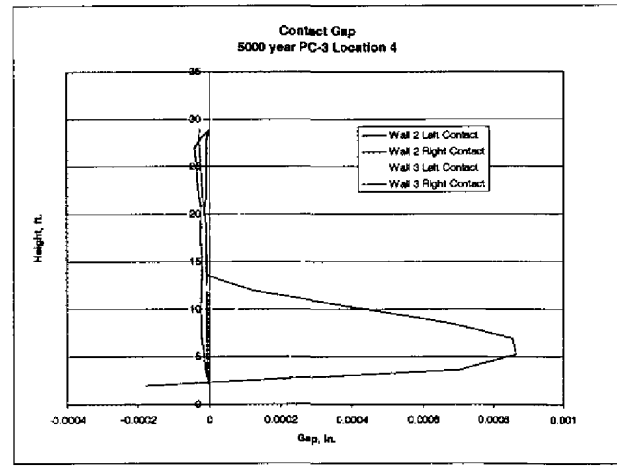
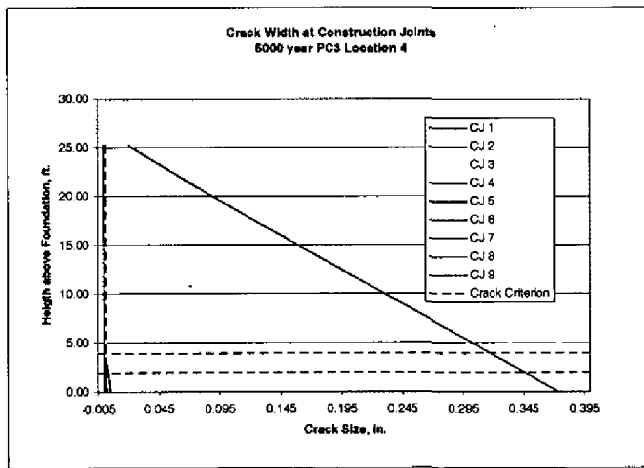
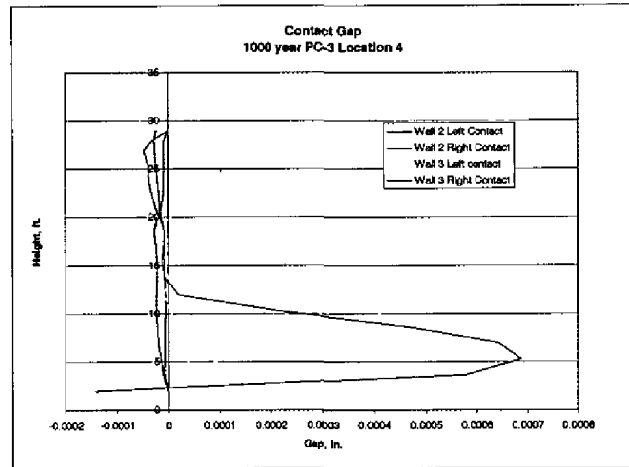
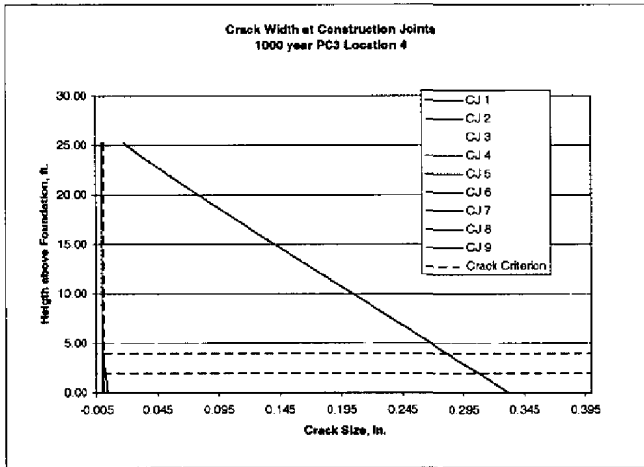
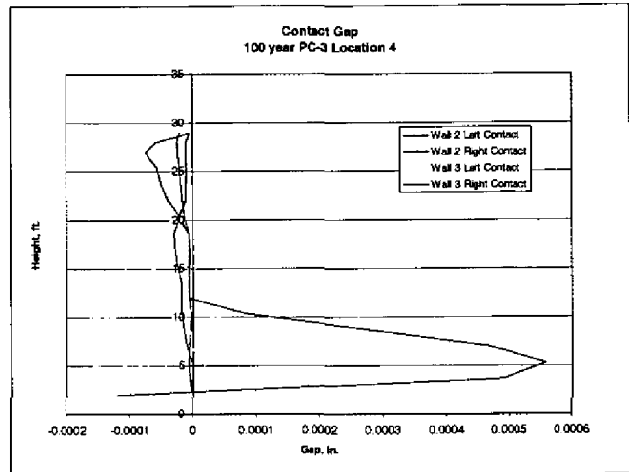
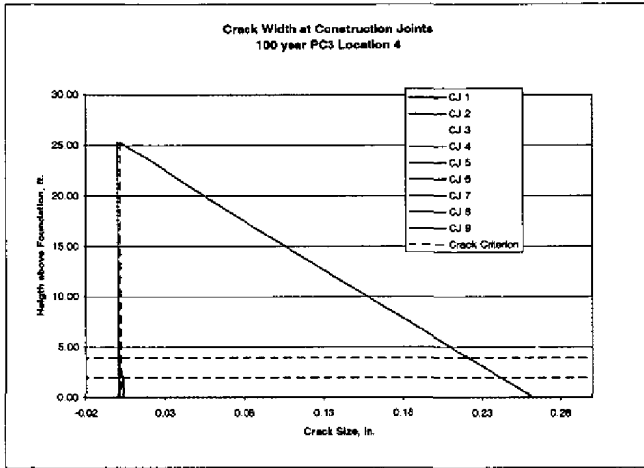
PC-3 Differential Settlement - Location 3
Mean Soil



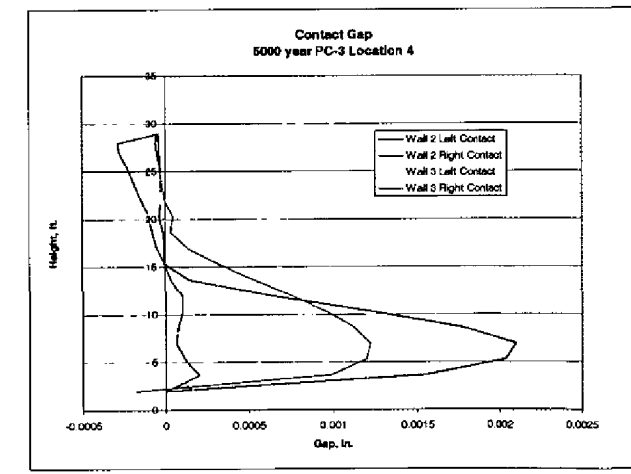
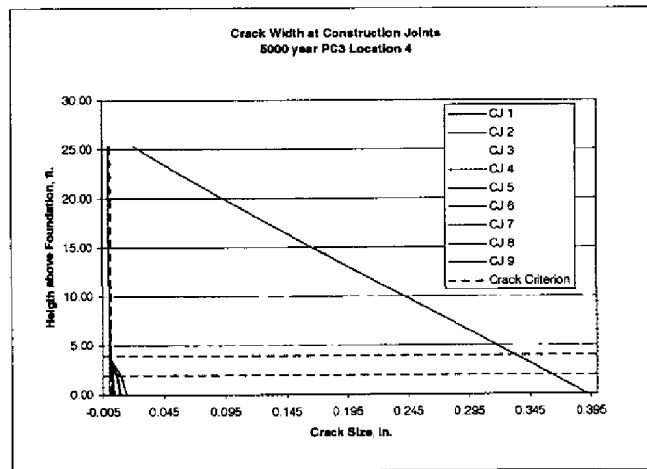
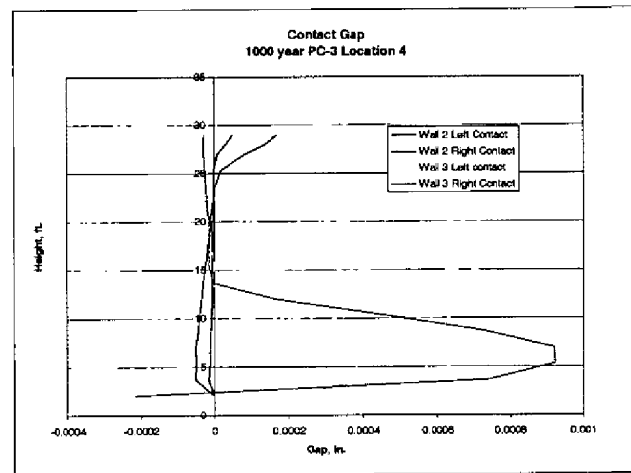
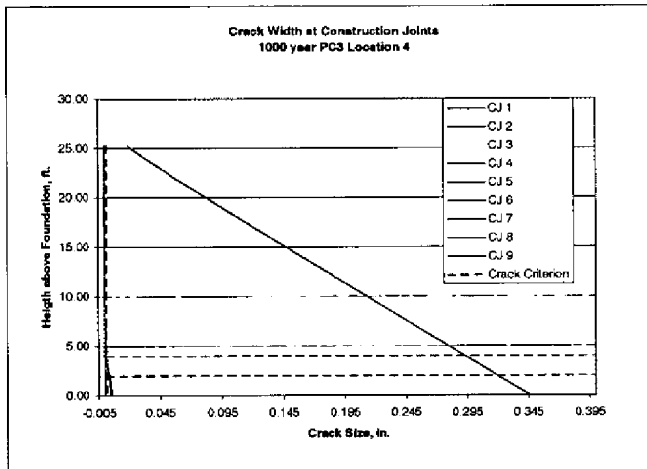
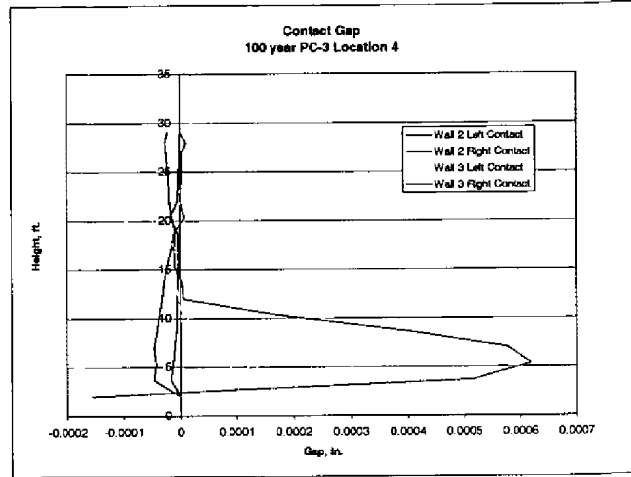
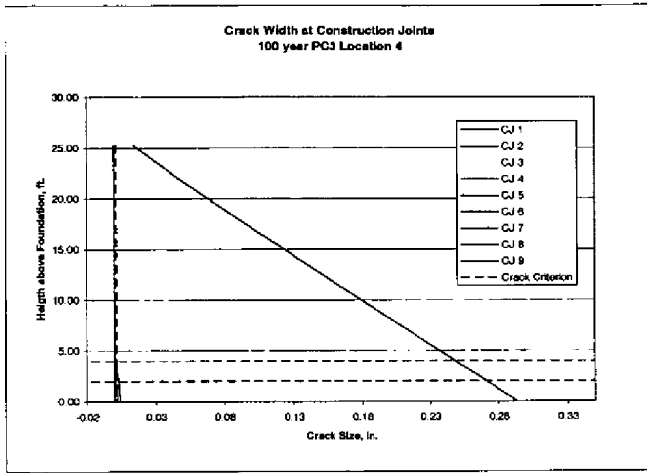
PC-3 Differential Settlement - Location 3
High Soil



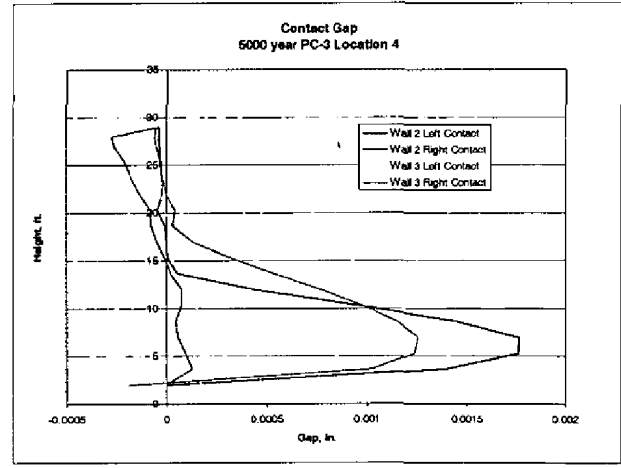
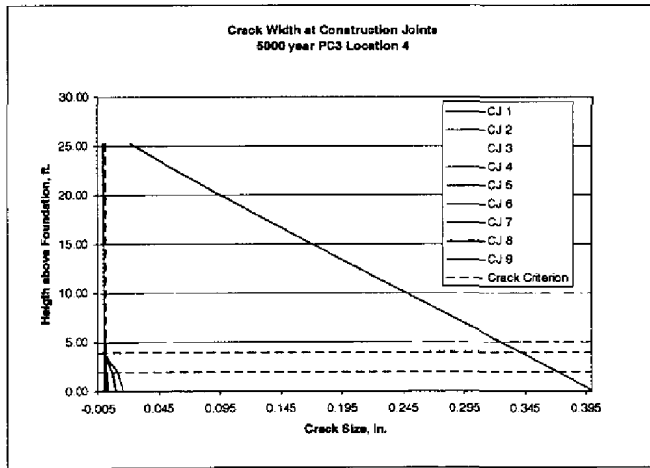
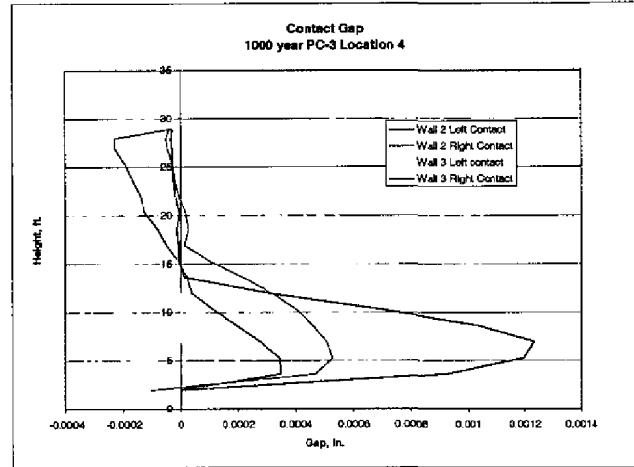
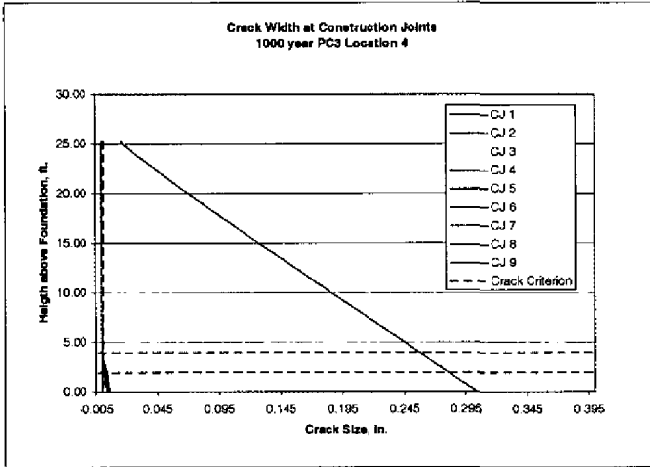
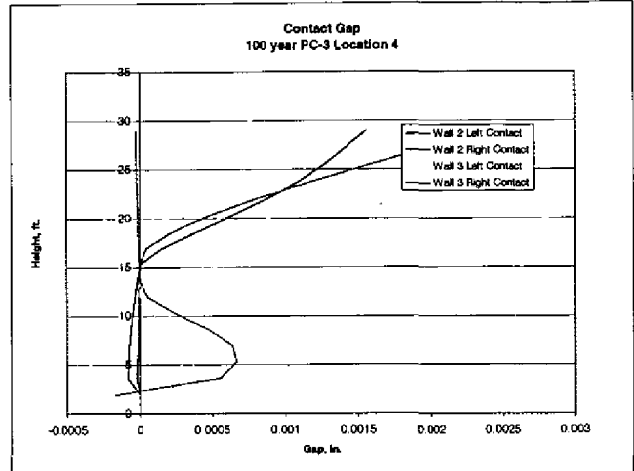
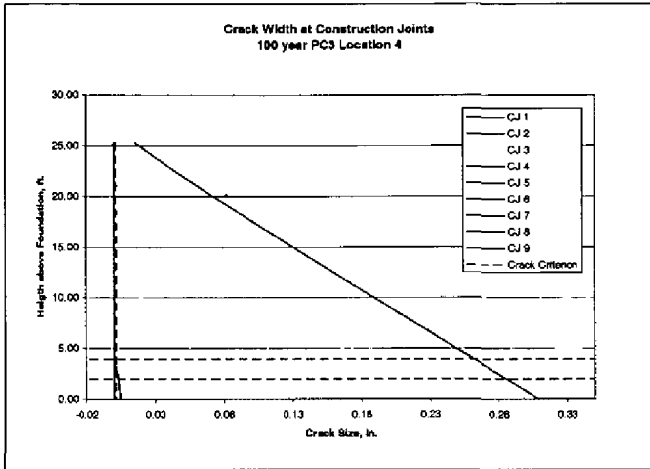
PC-3 Differential Settlement - Location 4
Low Soil



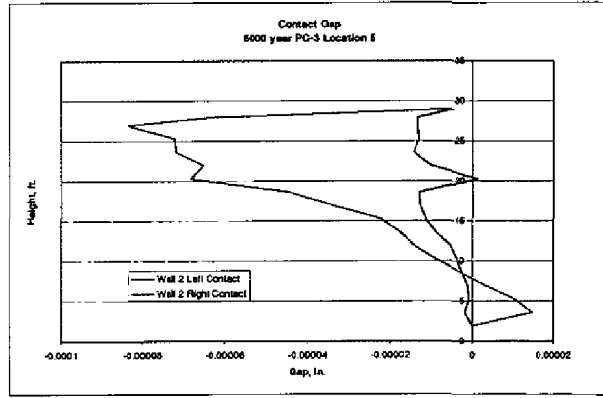
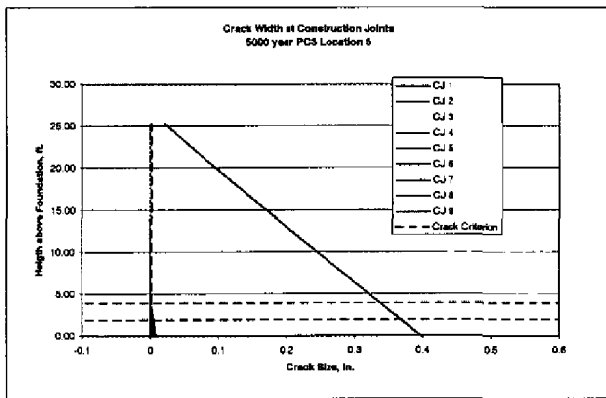
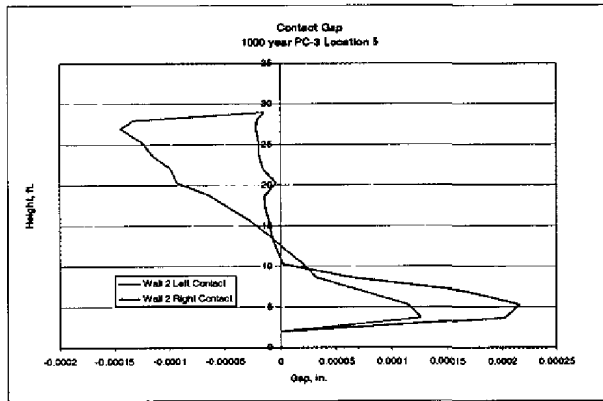
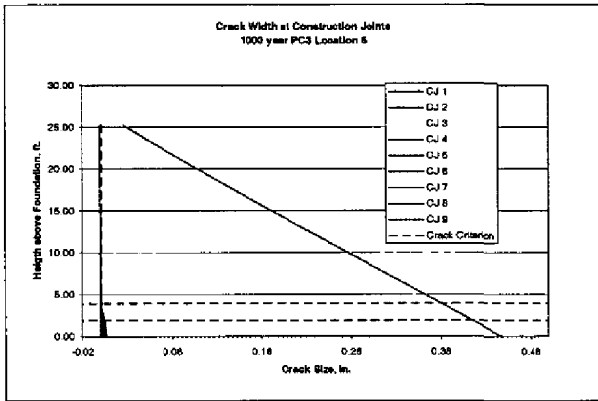
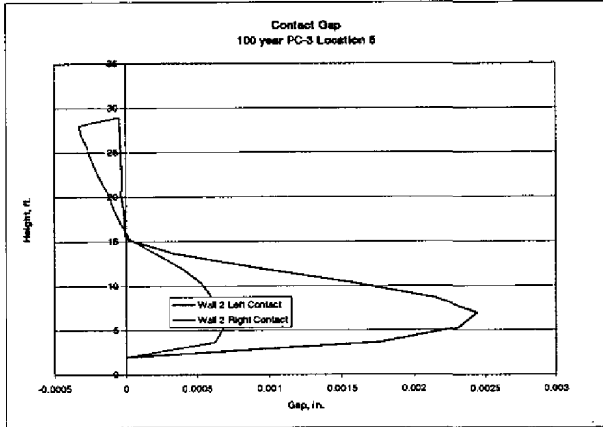
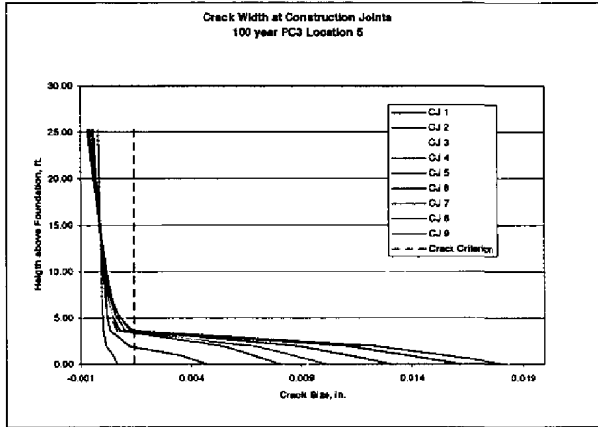
PC-3 Differential Settlement - Location 4
Mean Soil



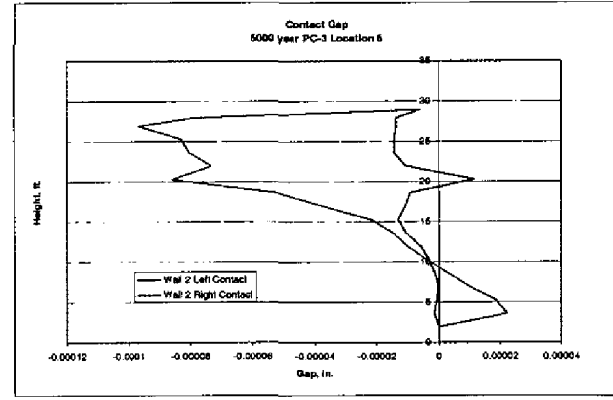
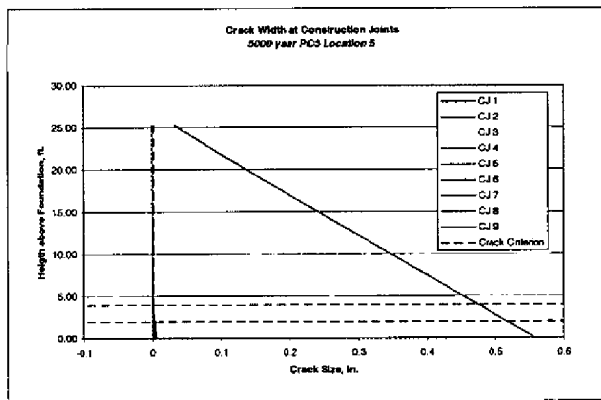
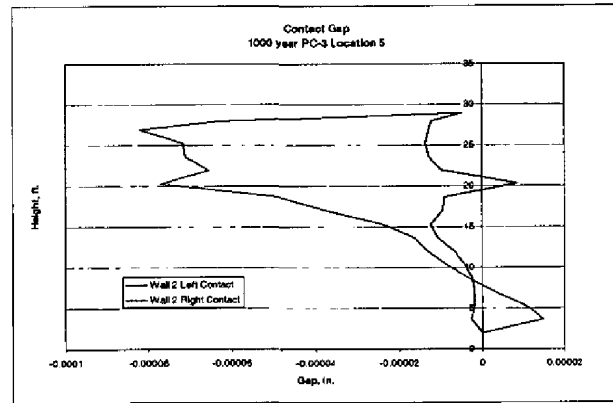
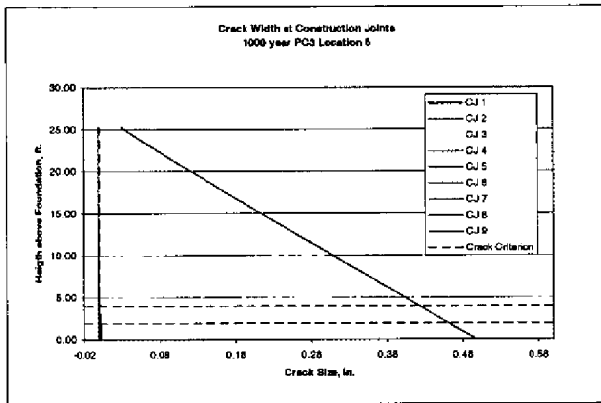
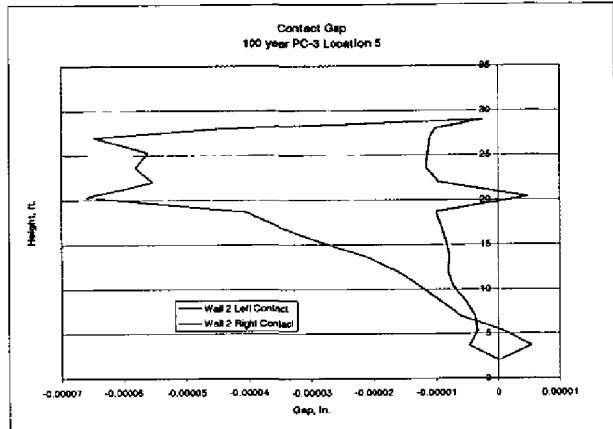
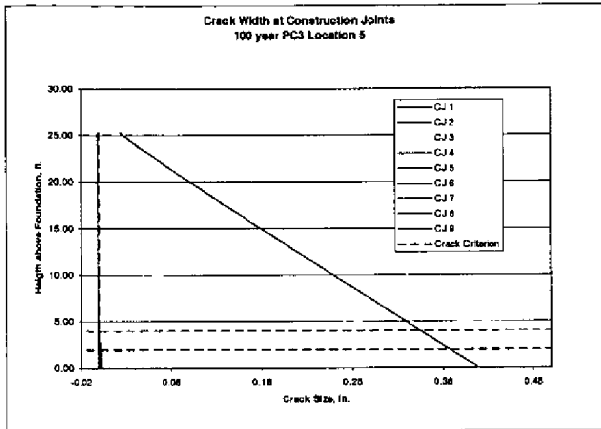
PC-3 Differential Settlement - Location 4
High Soil



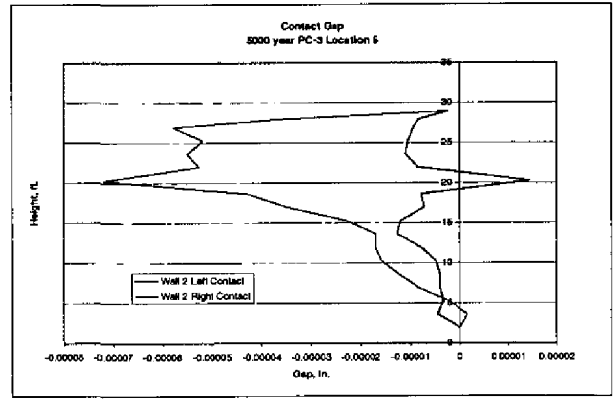
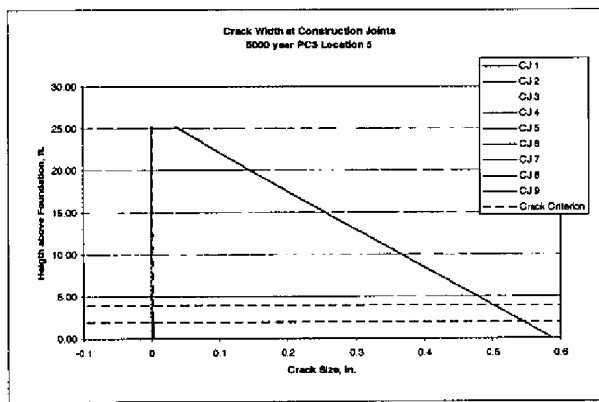
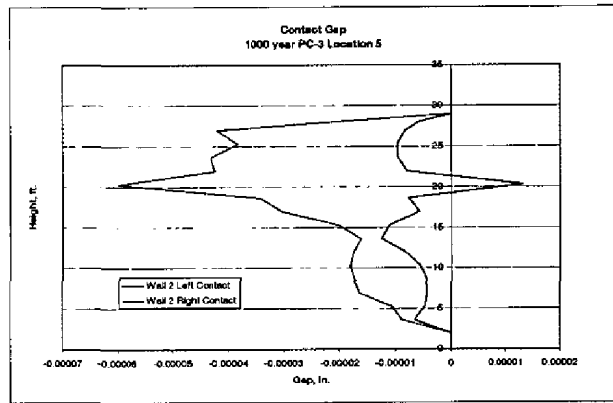
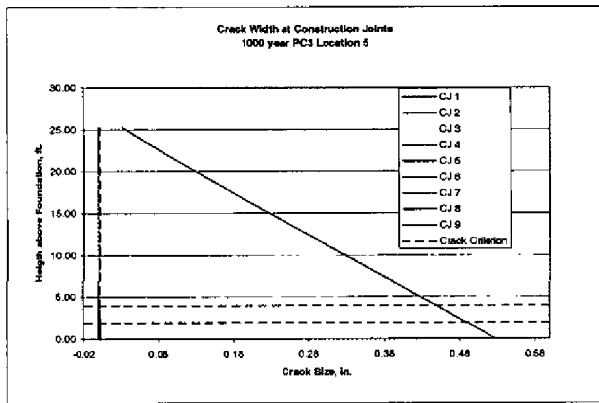
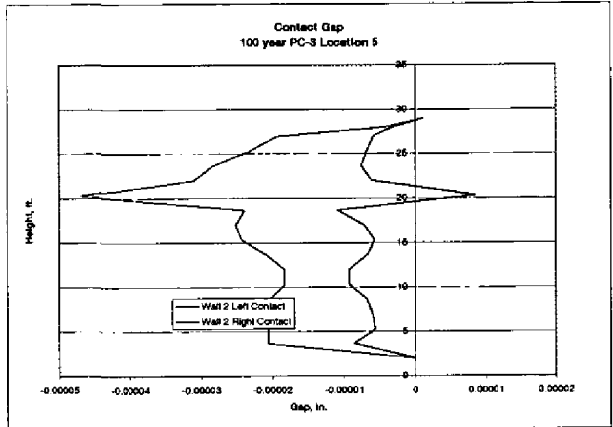
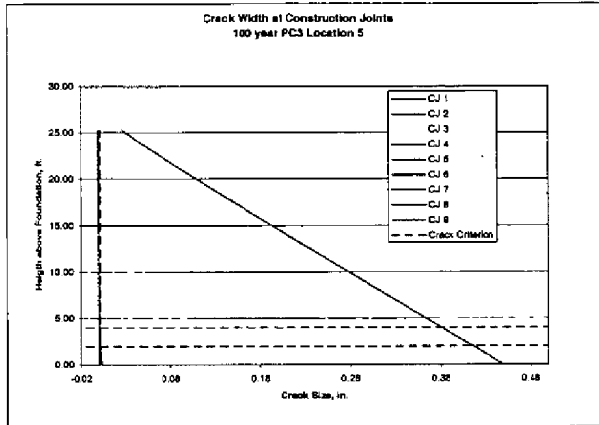
PC-3 Differential Settlement - Location 5
Low Soil



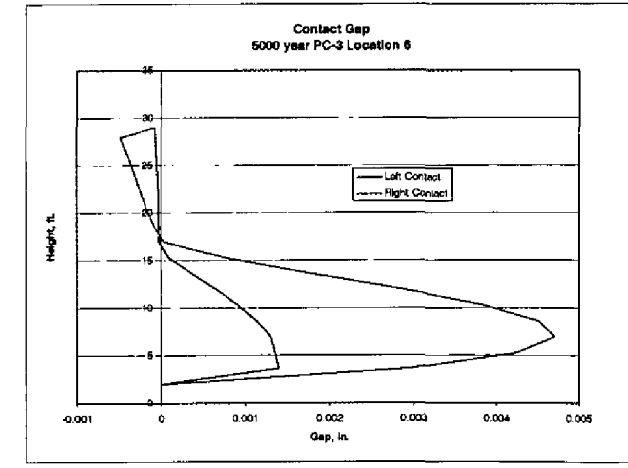
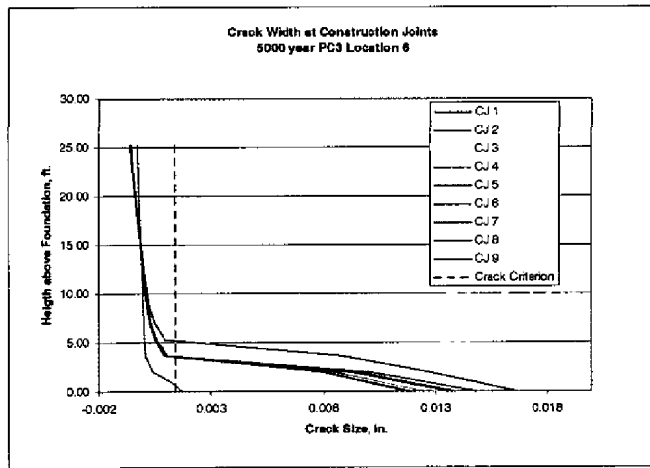
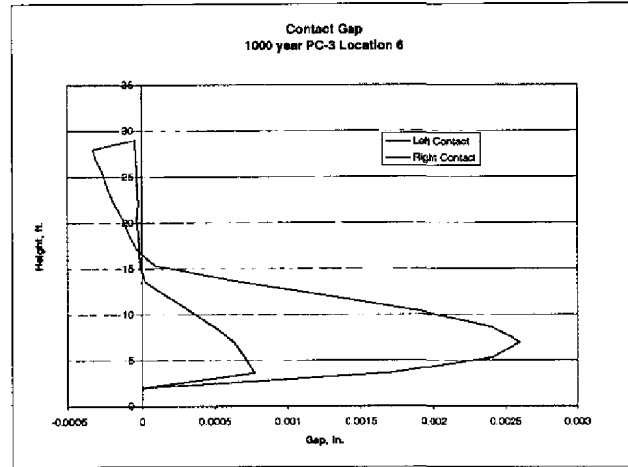
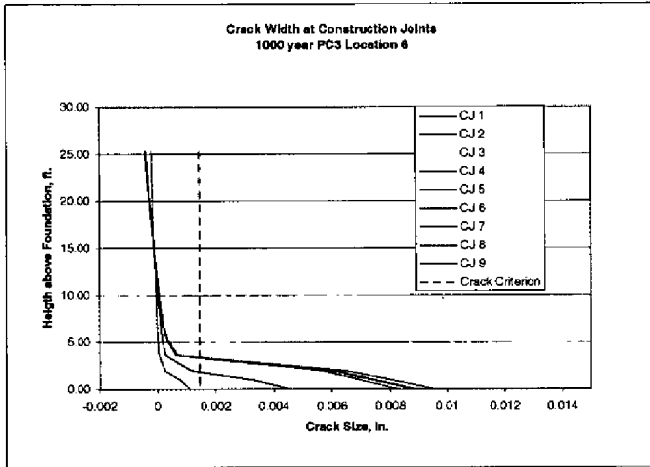
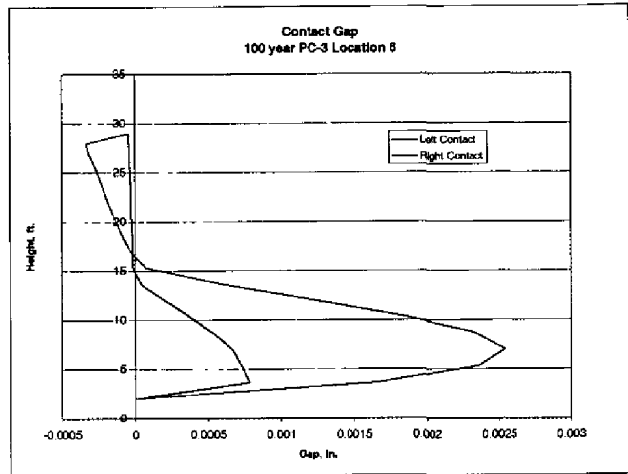
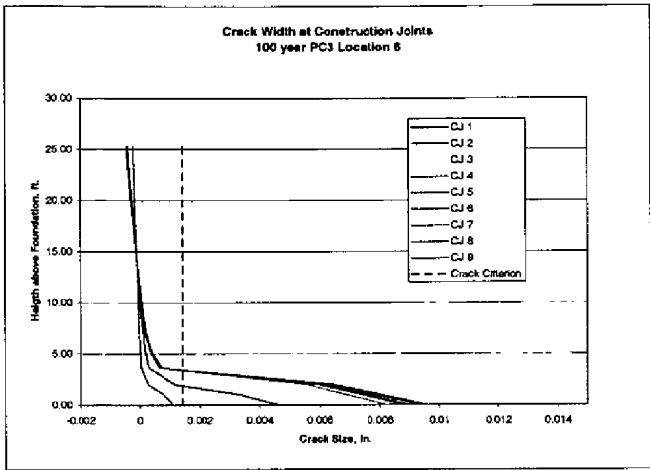
PC-3 Differential Settlement - Location 5
Mean Soil



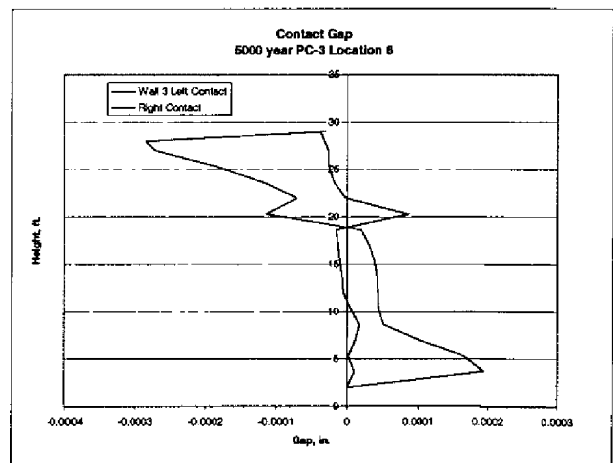
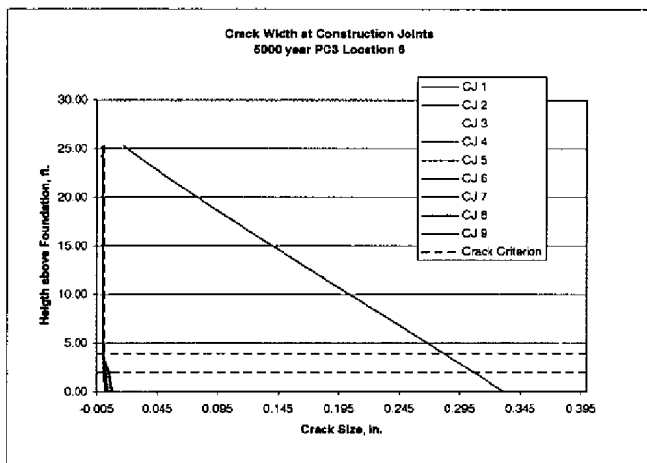
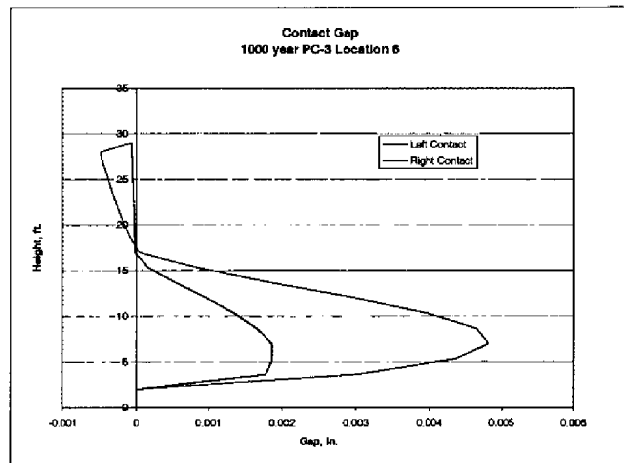
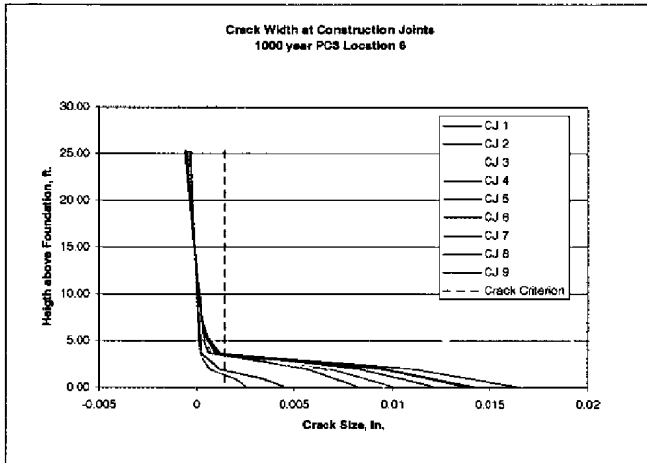
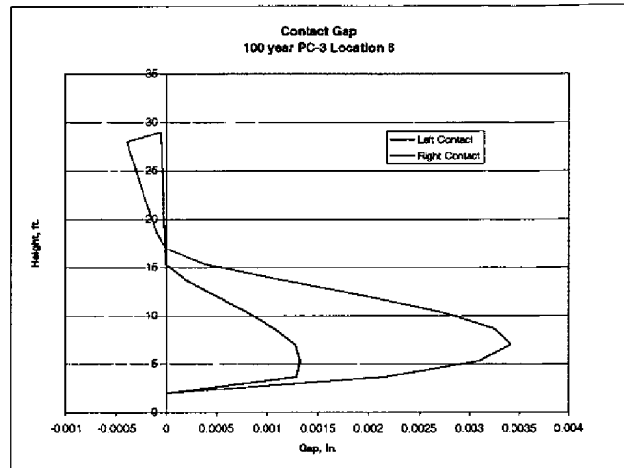
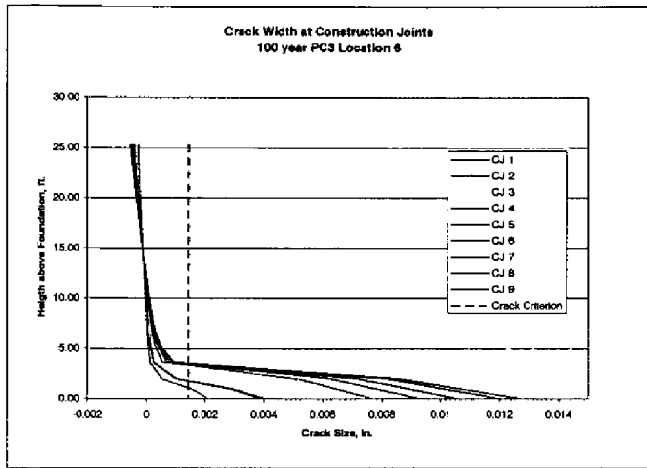
PC-3 Differential Settlement - Location 5
High Soil



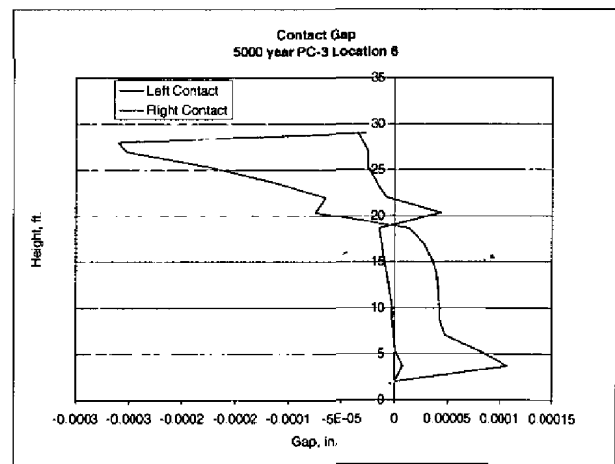
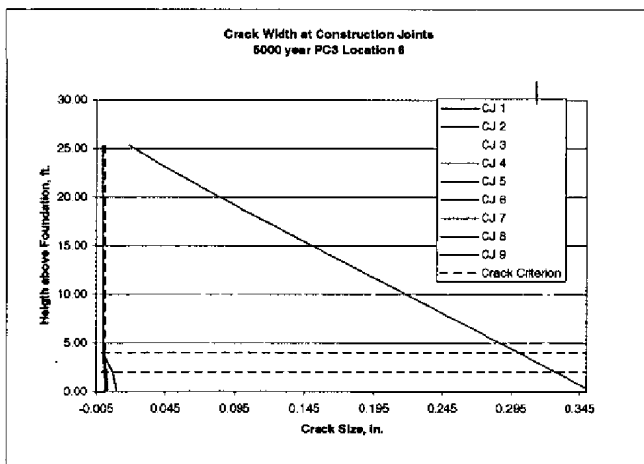
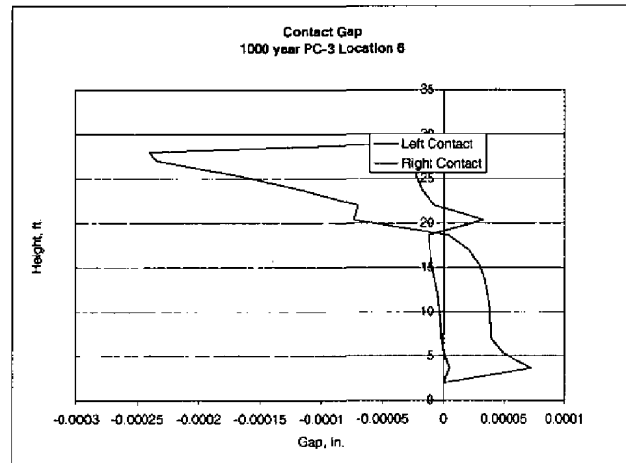
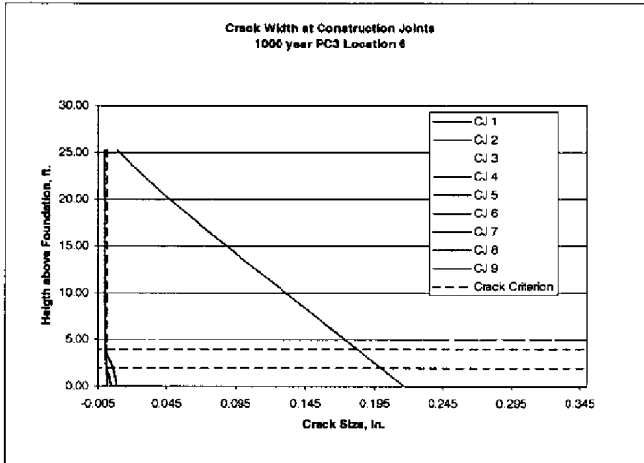
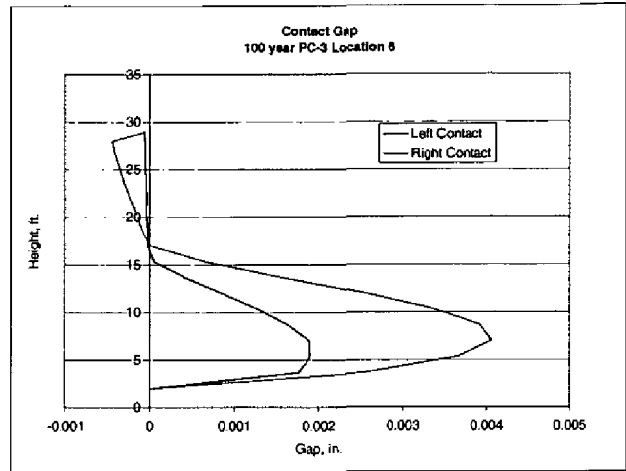
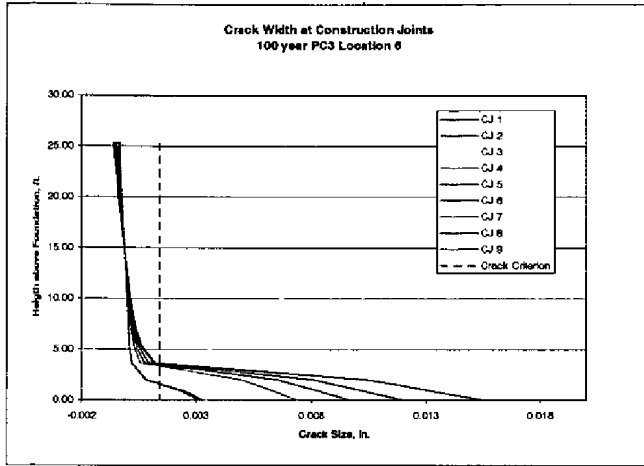
PC-3 Differential Settlement - Location 6
Low Soil



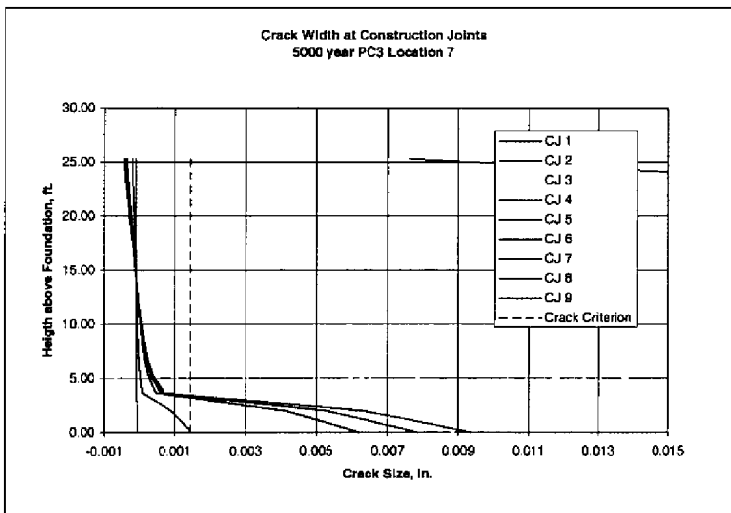
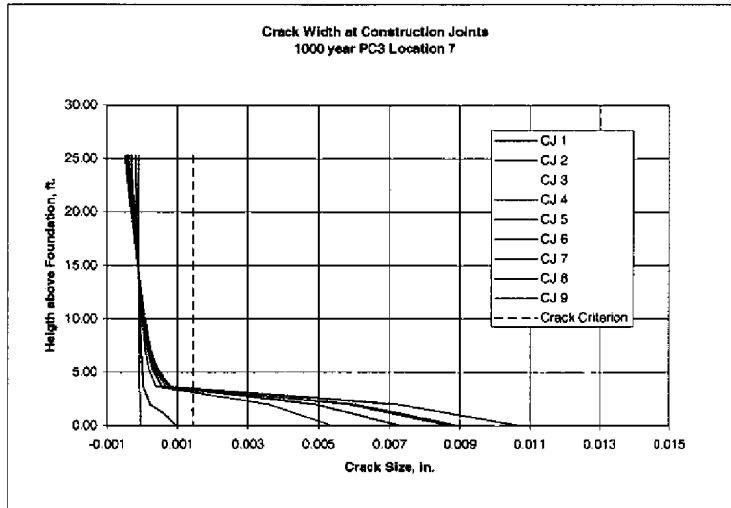
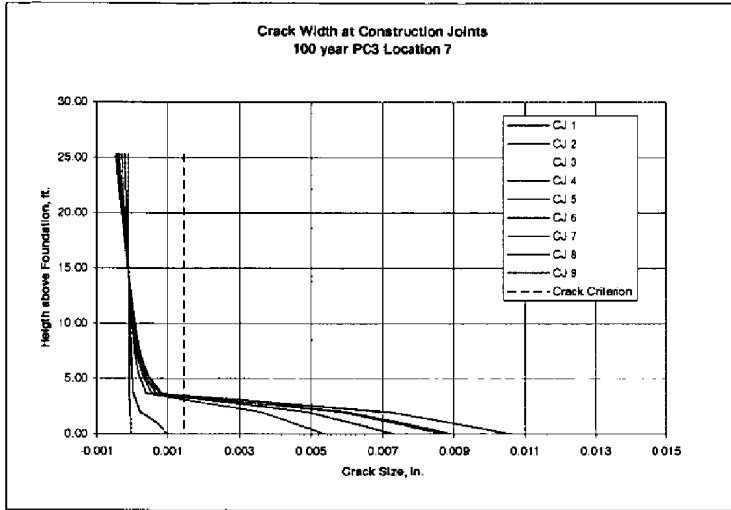
PC-3 Differential Settlement - Location 6
Mean Soil



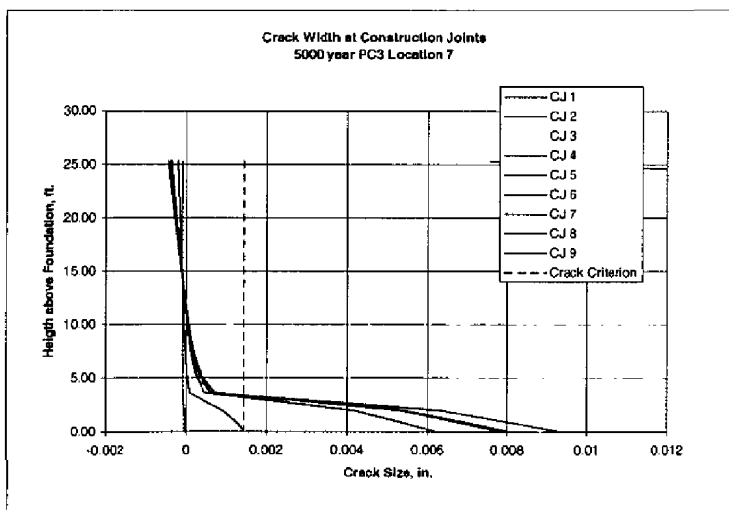
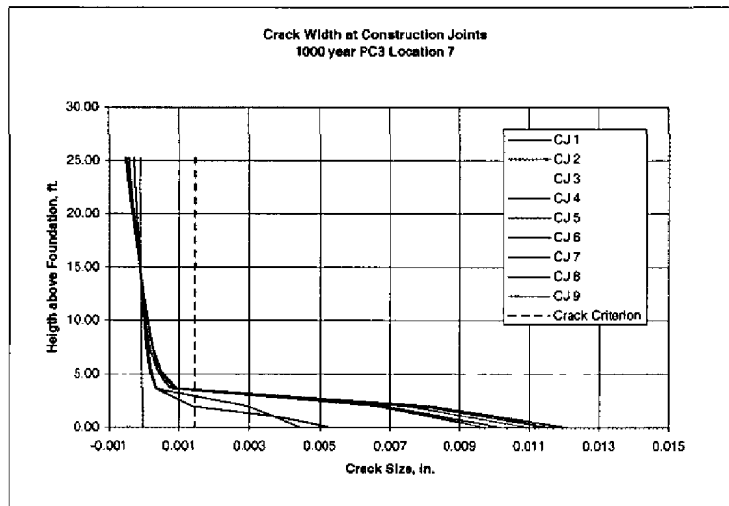
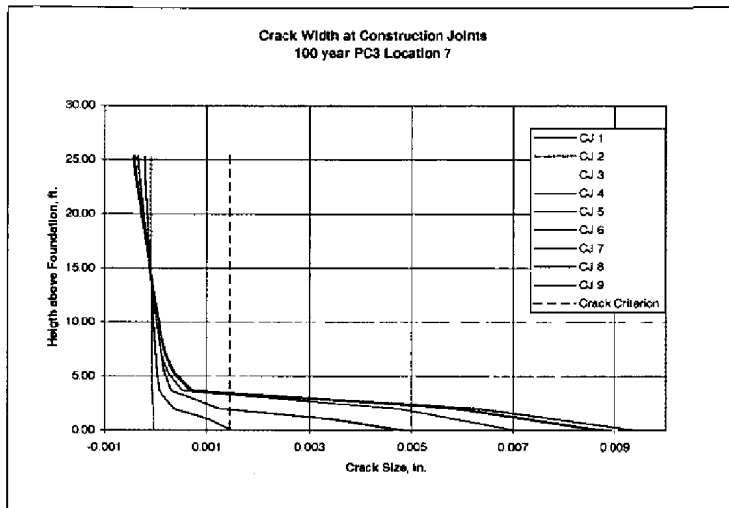
PC-3 Differential Settlement - Location 6
High Soil



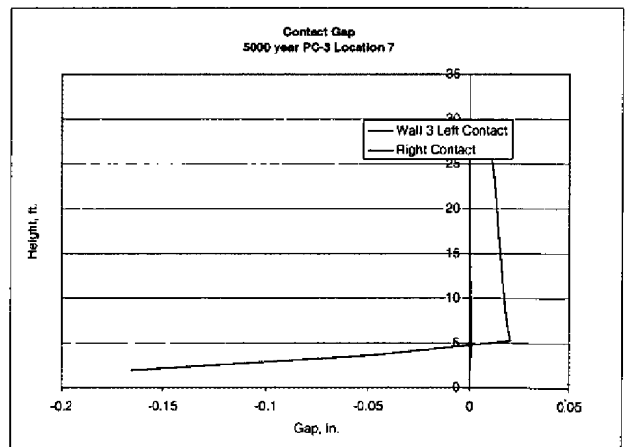
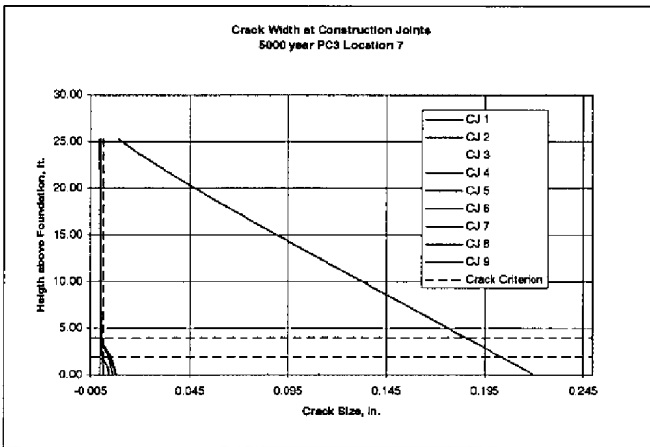
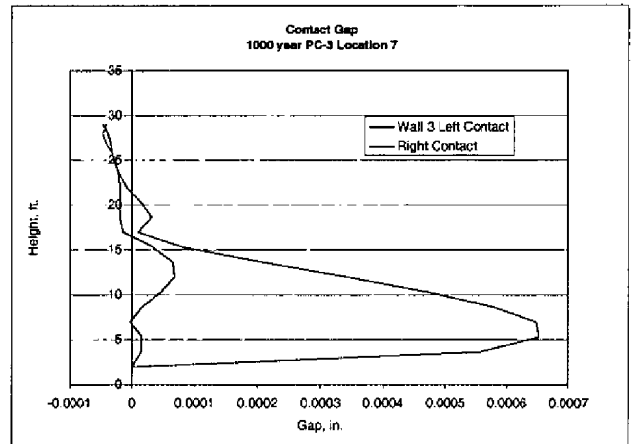
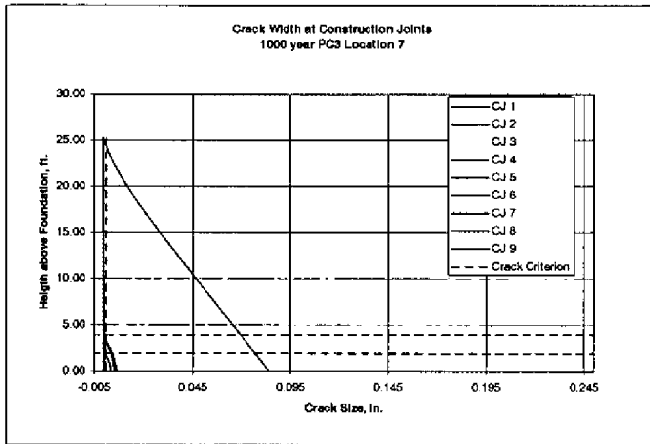
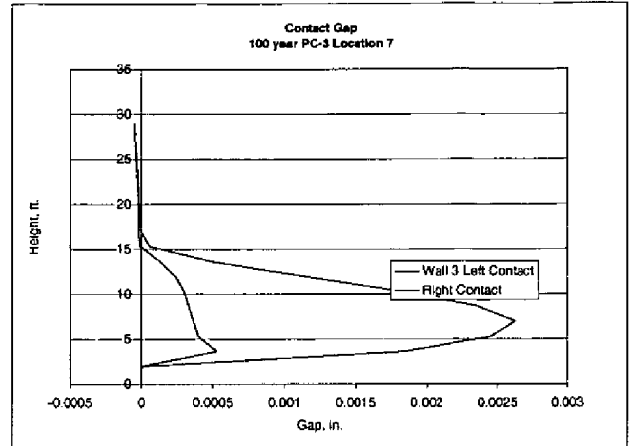
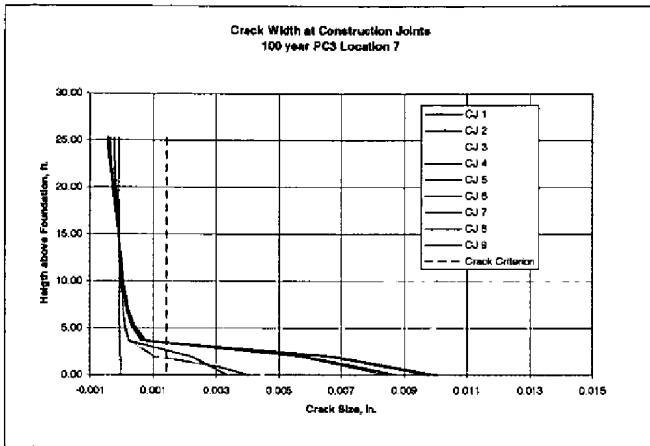
PC-3 Differential Settlement - Location 7
Low Soil



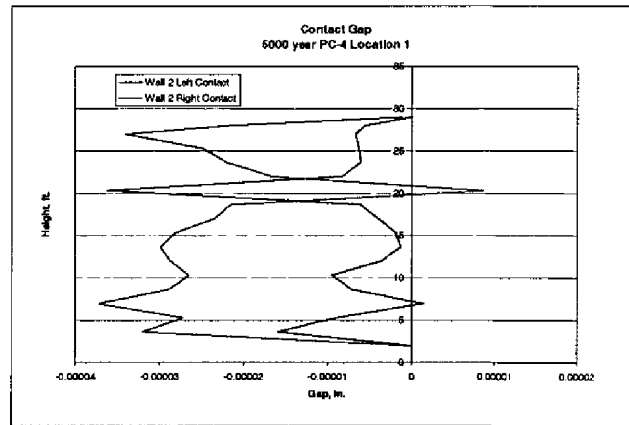
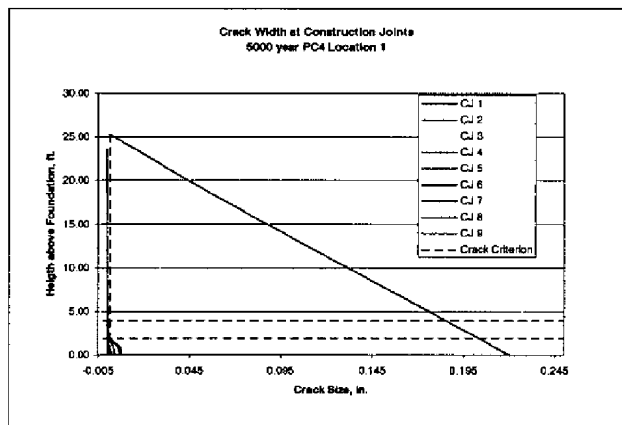
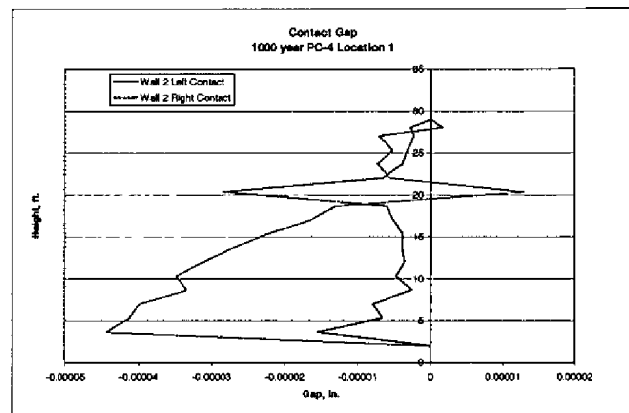
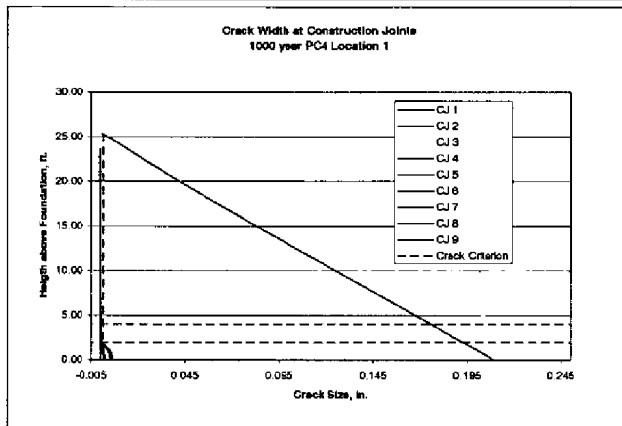
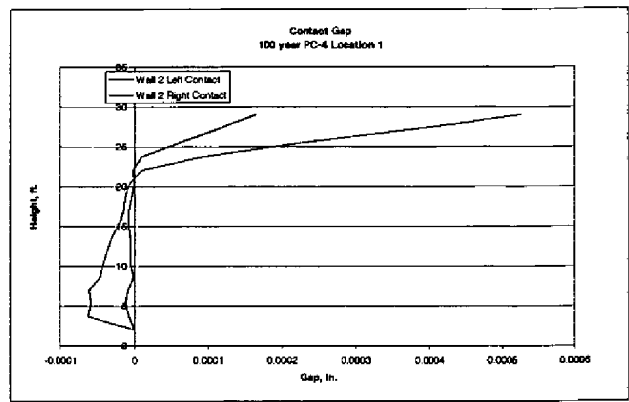
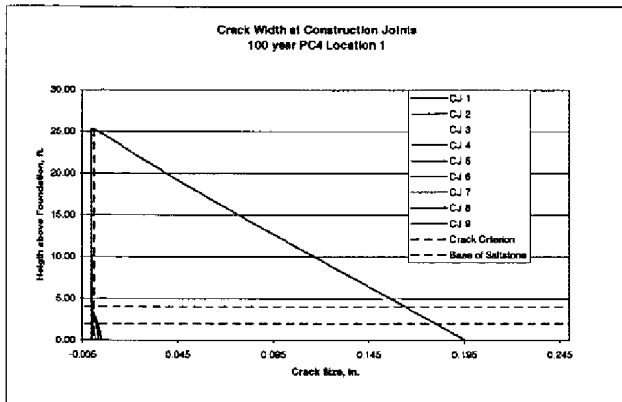
PC-3 Differential Settlement - Location 7
Mean Soil



PC-3 Differential Settlement - Location 7
High Soil



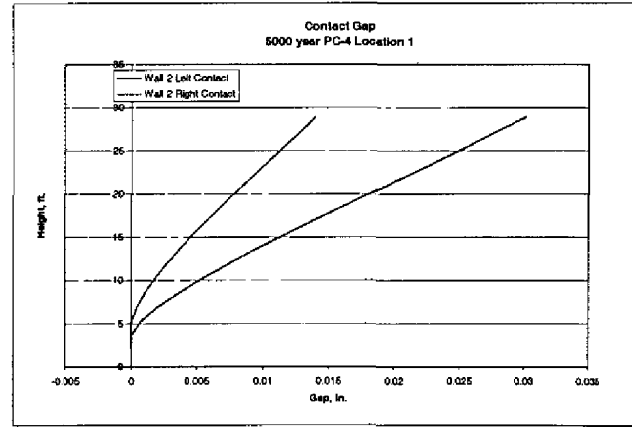
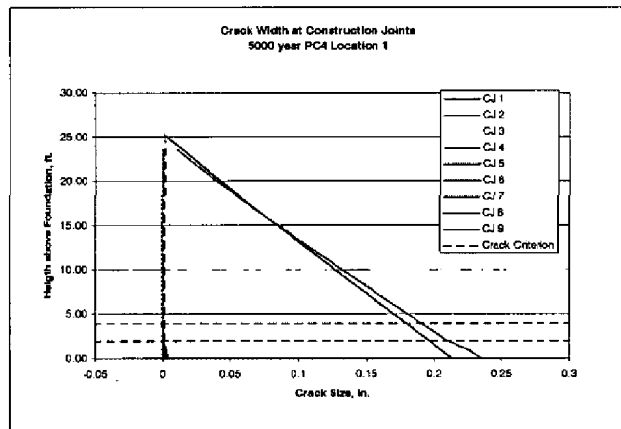
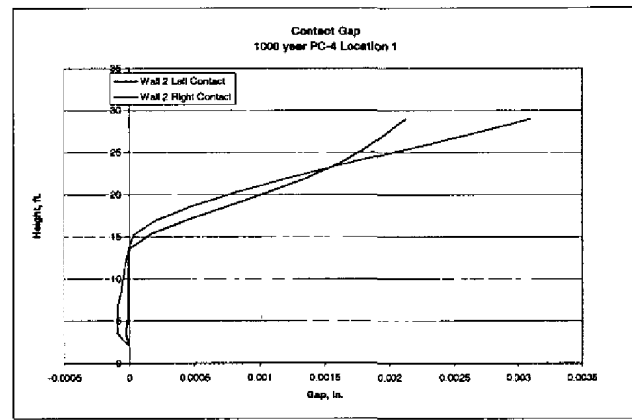
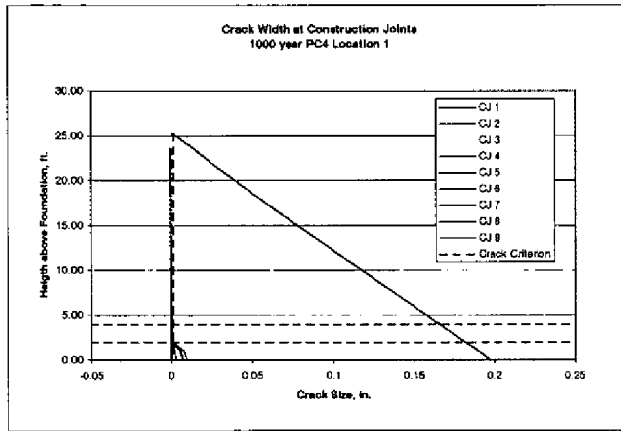
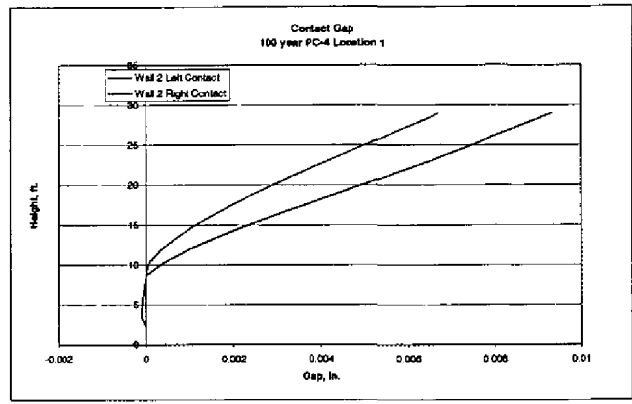
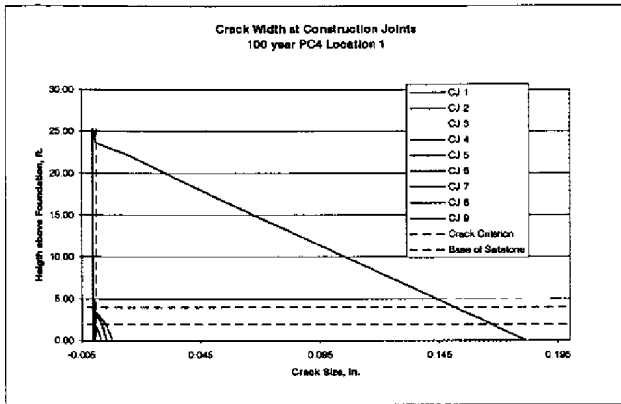
PC-4 Differential Settlement - Location 1
Low Soil



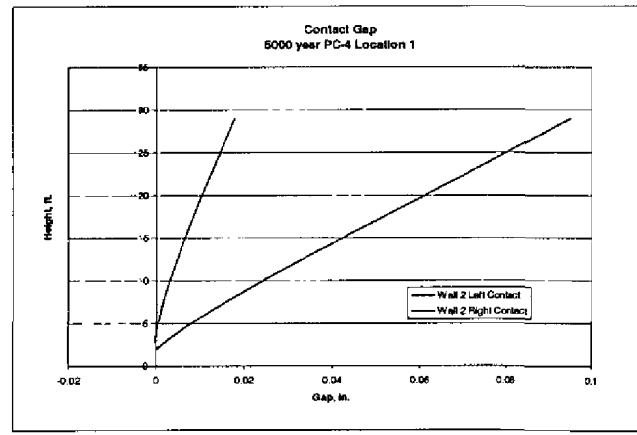
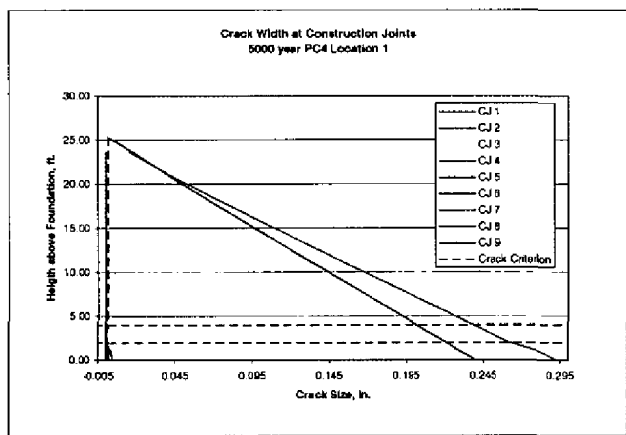
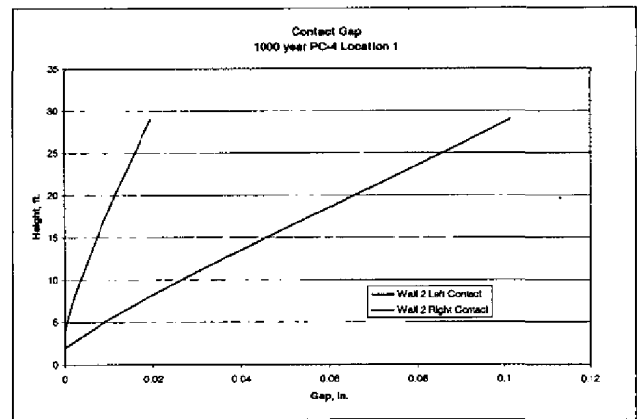
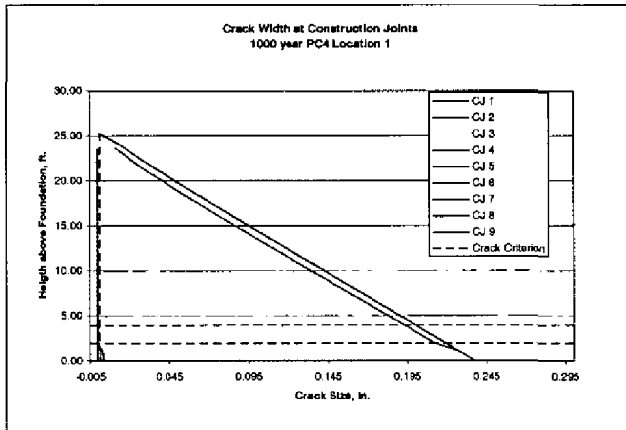
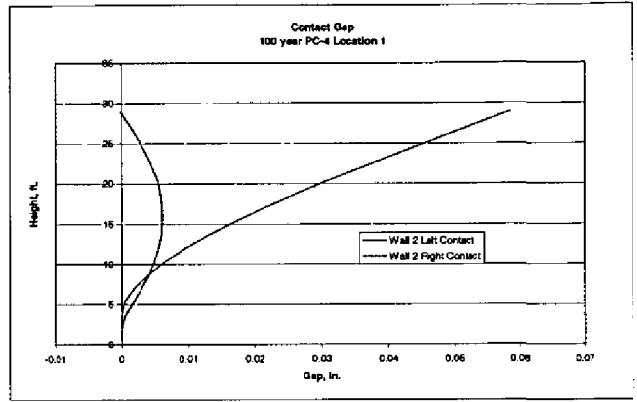
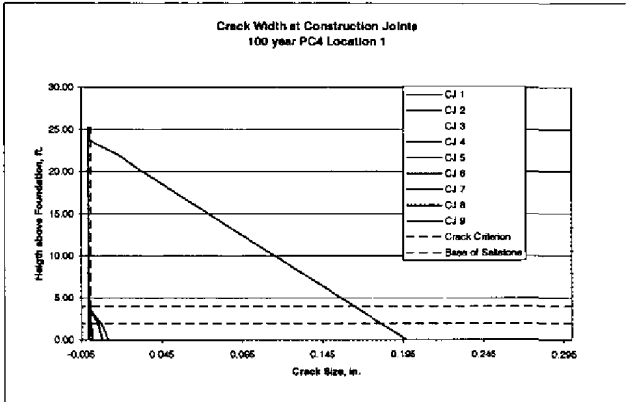
T-CLC-2 - 00006, Rev. 0

PC-4 Differential Settlement - Location 1
Mean Soil

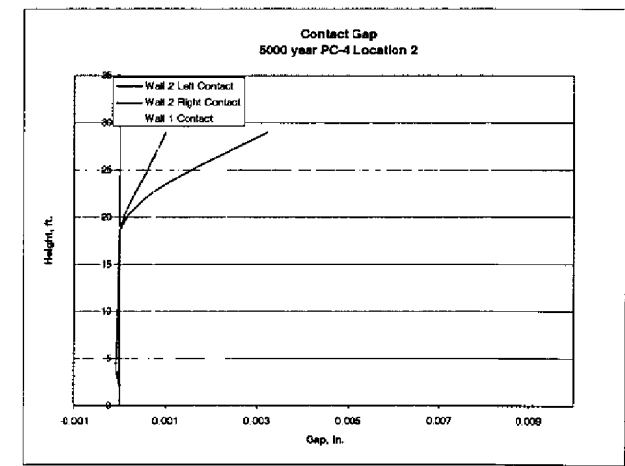
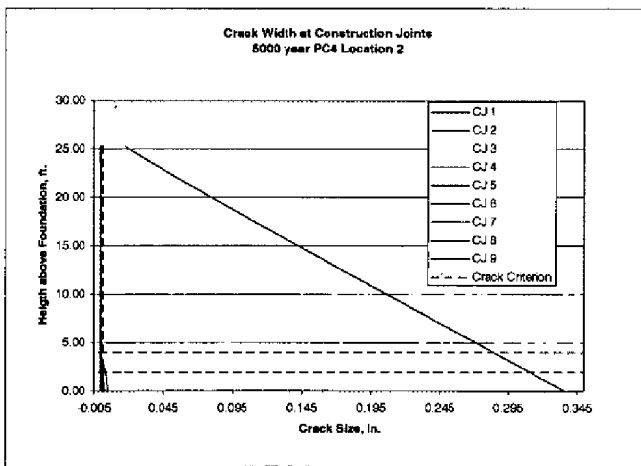
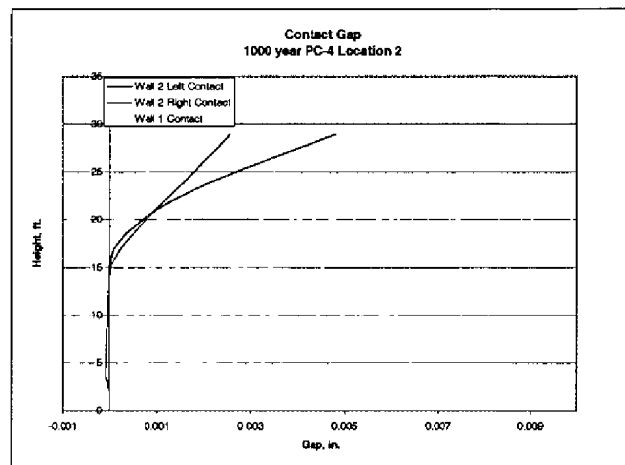
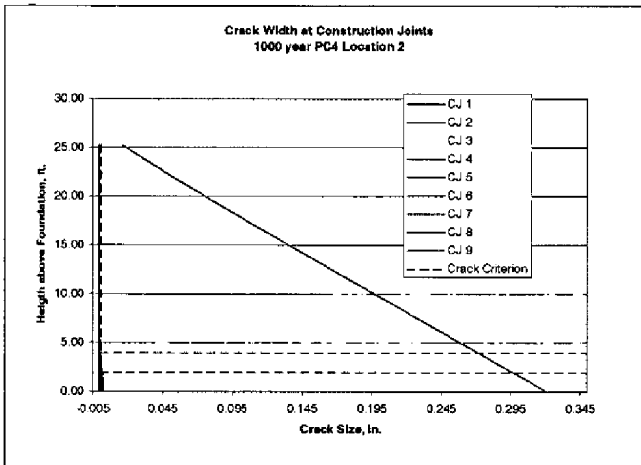
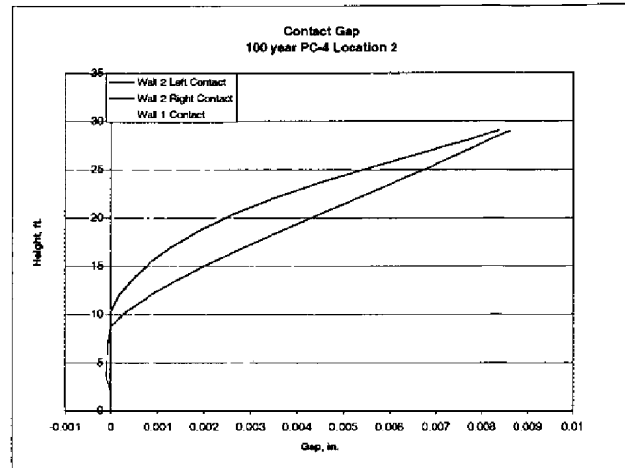
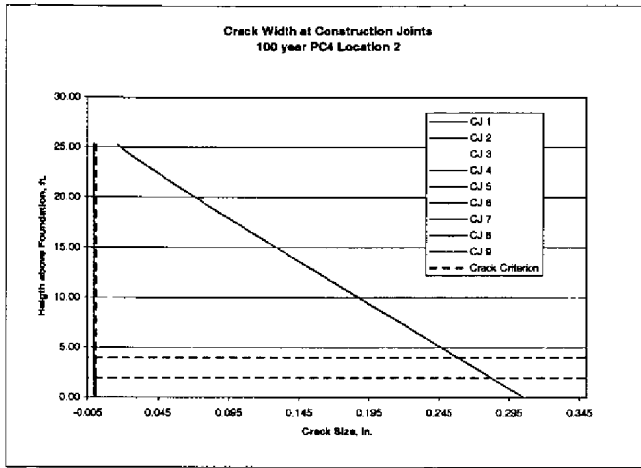
374

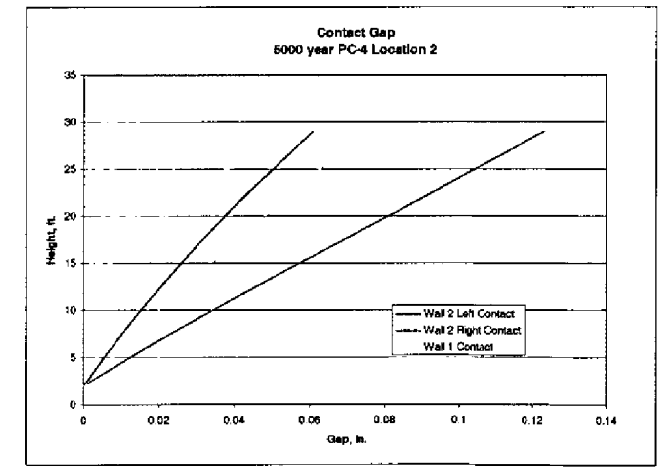
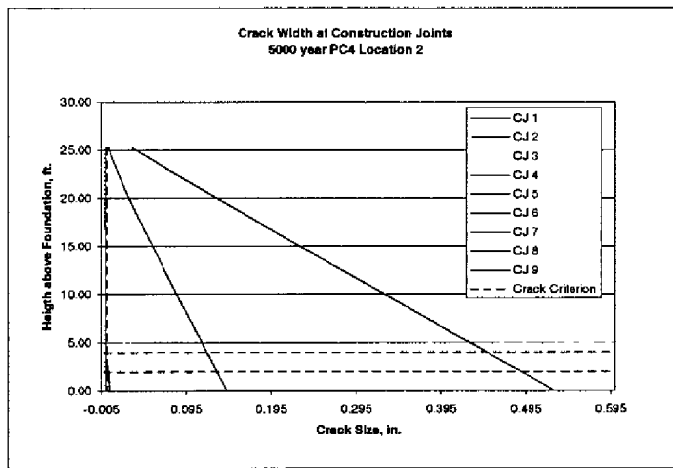
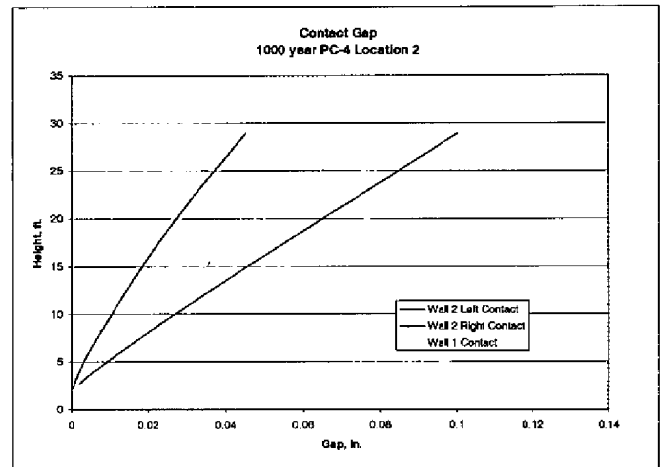
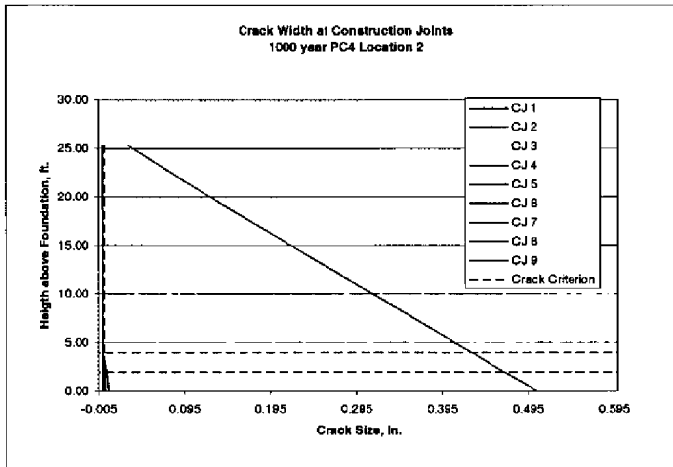
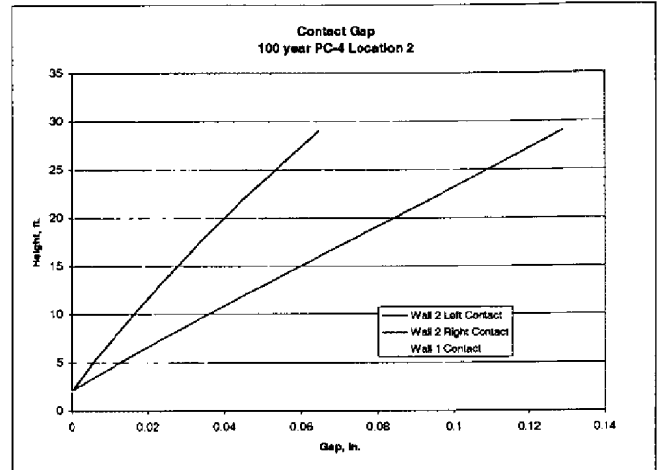
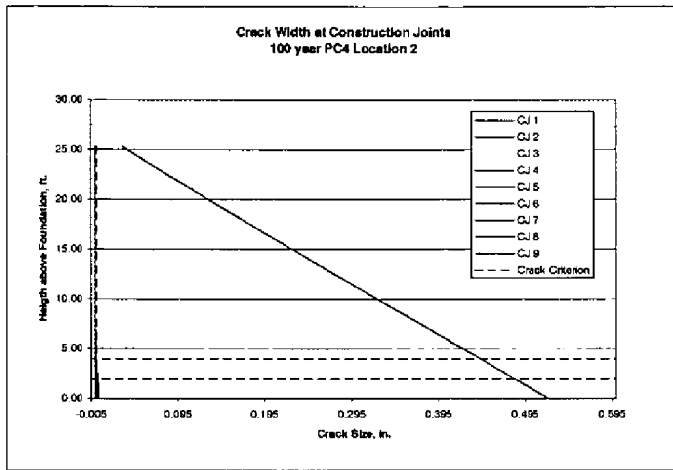


PC-4 Differential Settlement - Location 1
High Soil

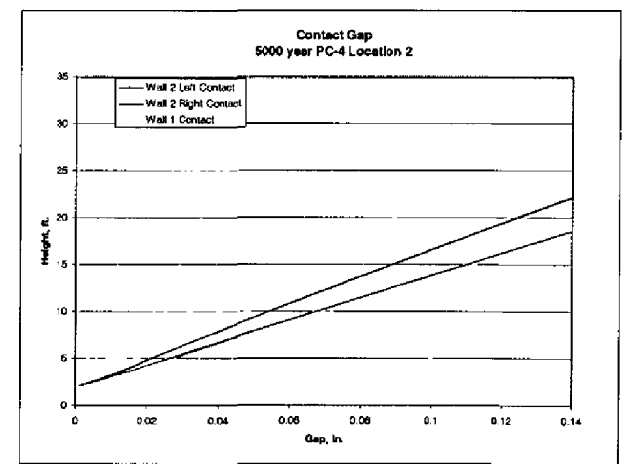
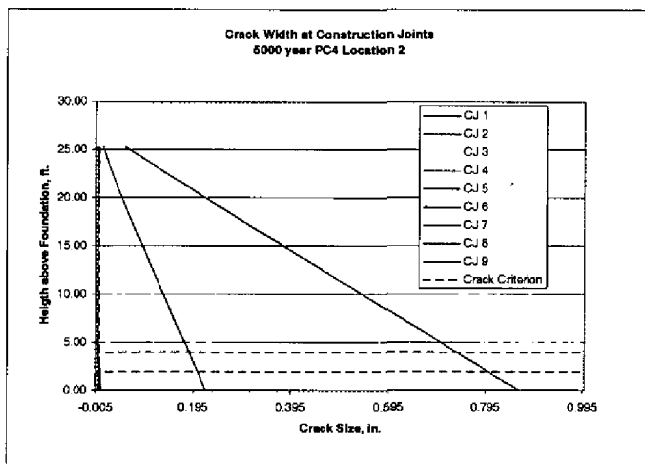
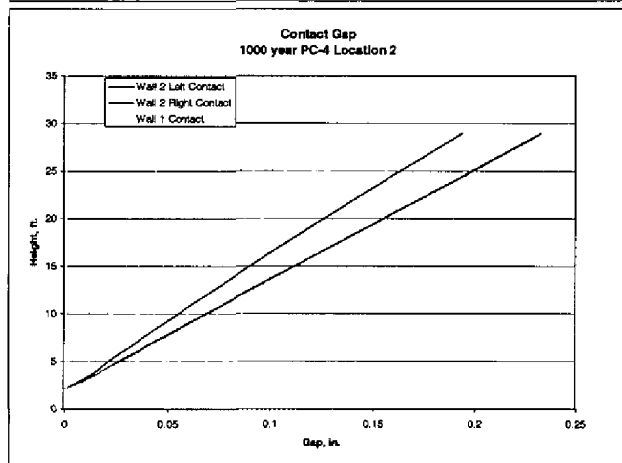
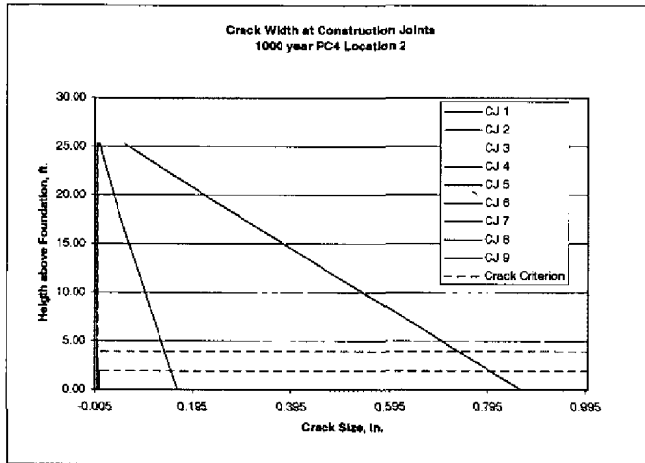
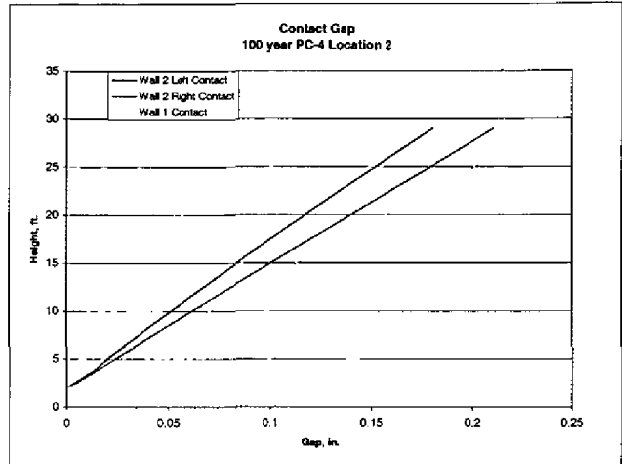
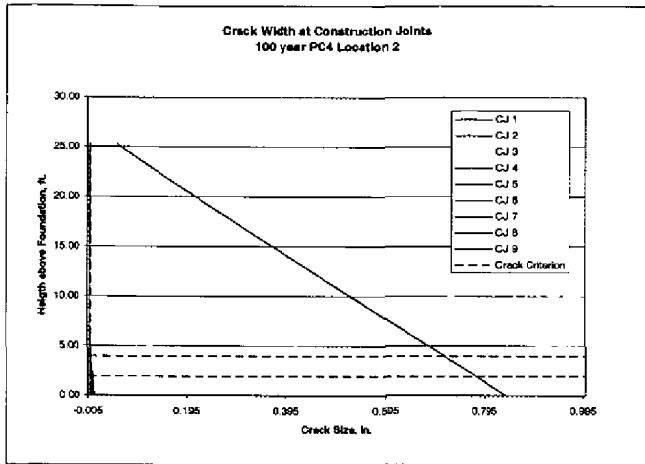


PC-4 Differential Settlement - Location 2
Low Soil

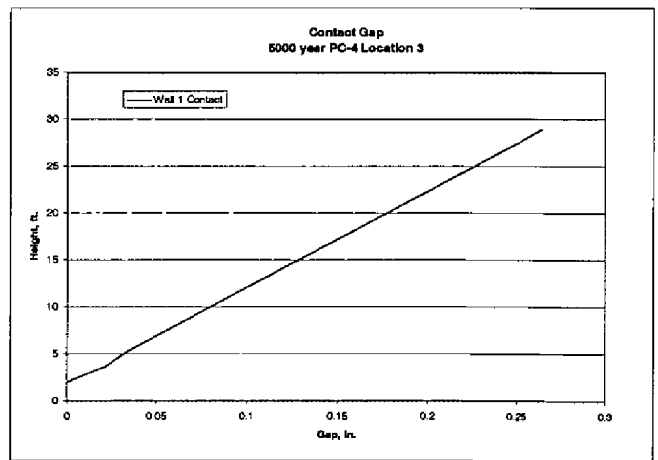
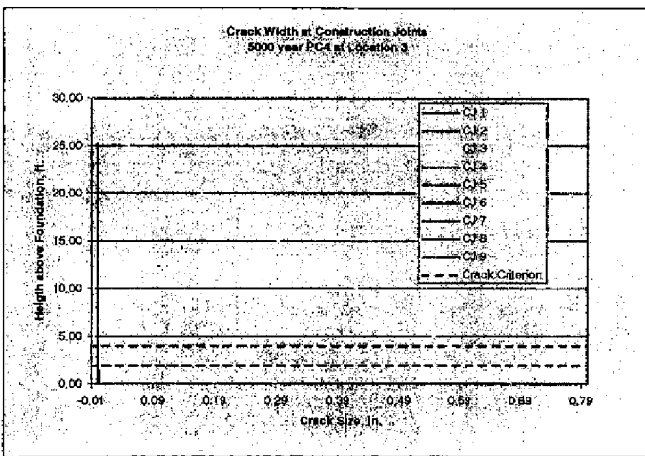
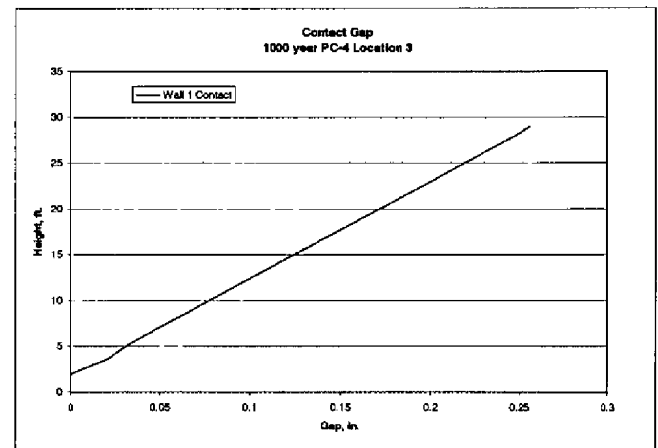
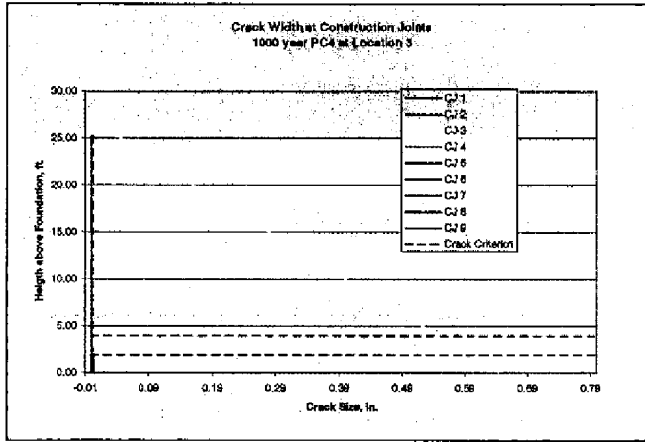
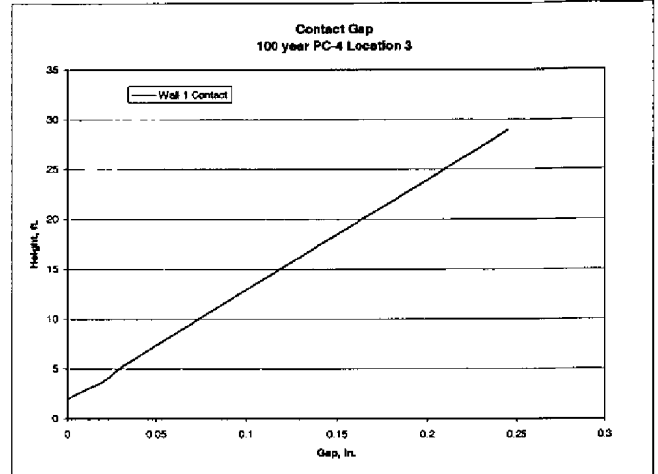
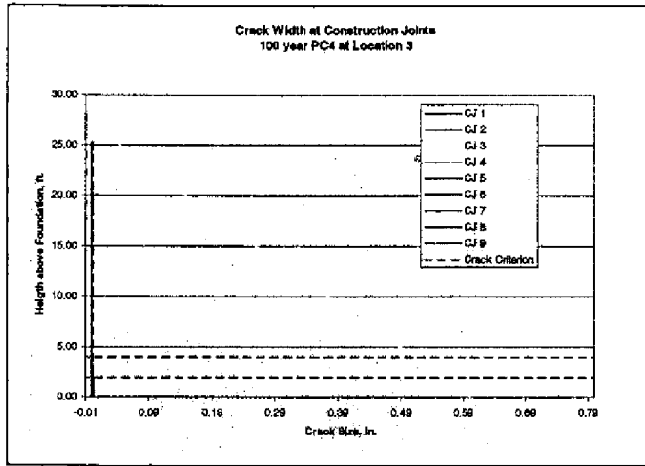




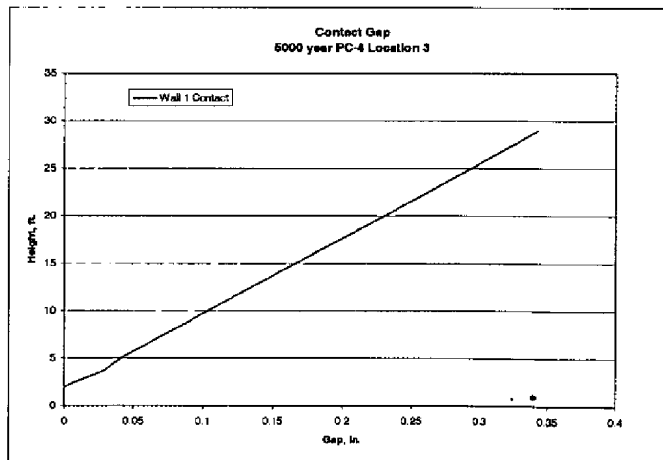
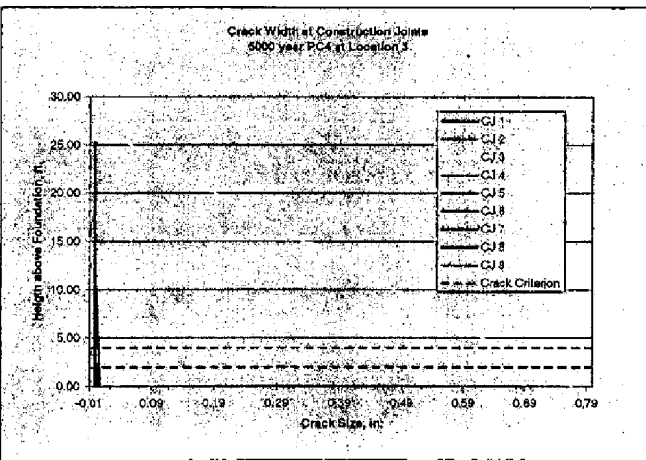
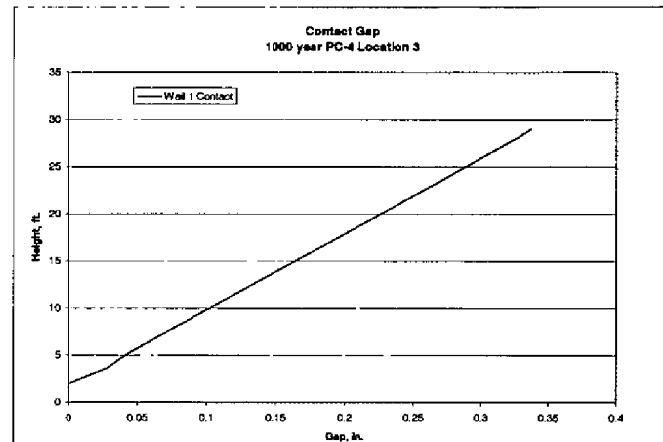
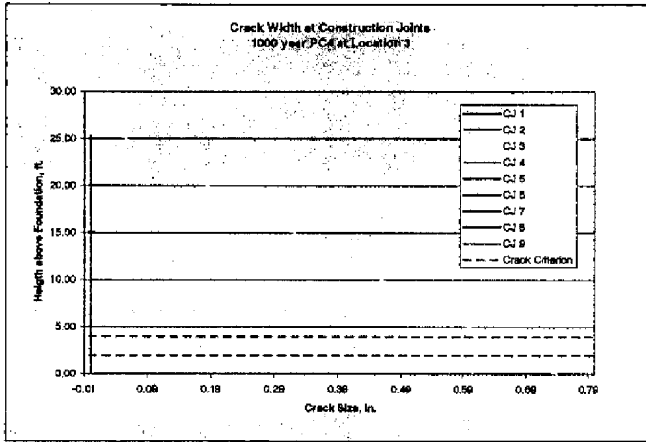
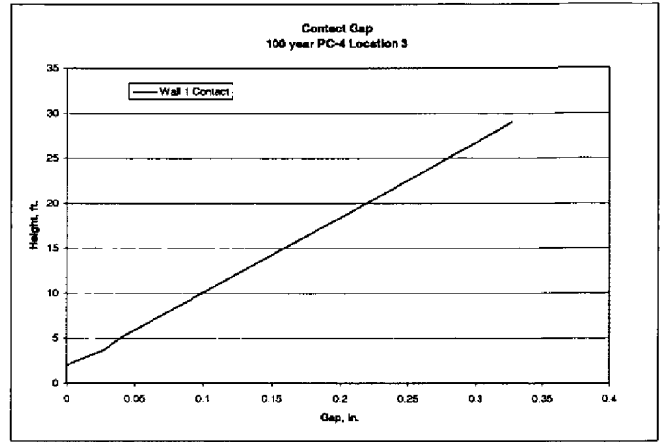
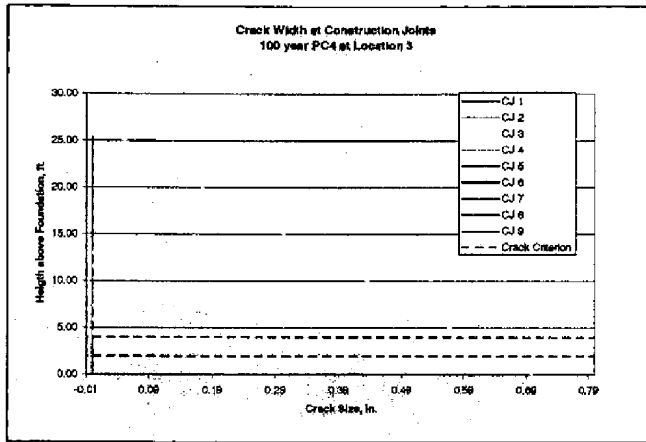
PC-4 Differential Settlement - Location 2
High Soil

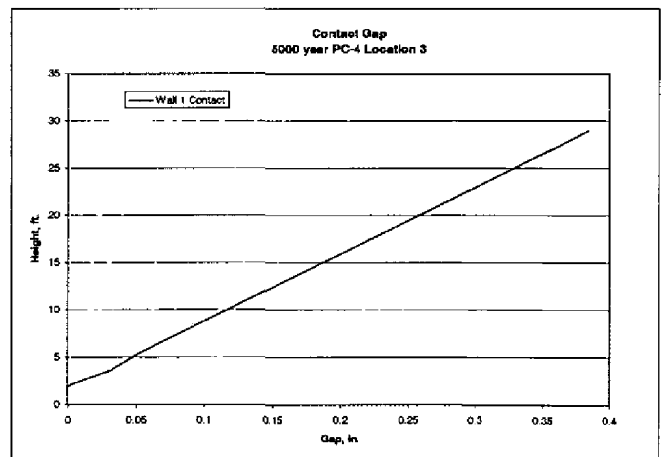
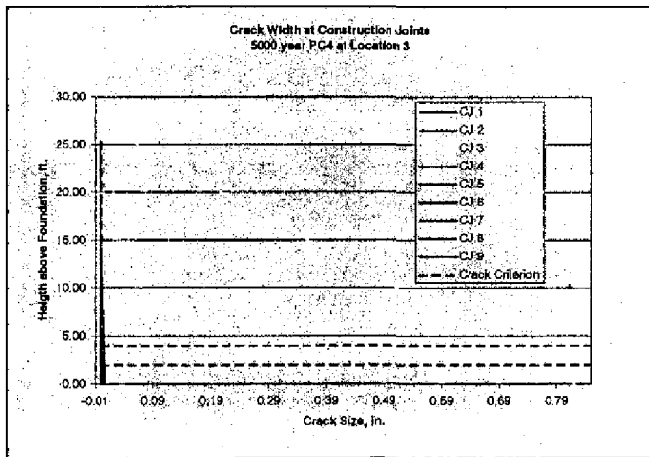
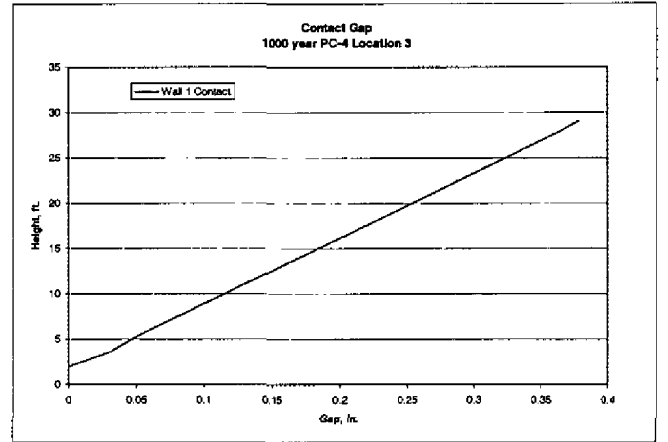
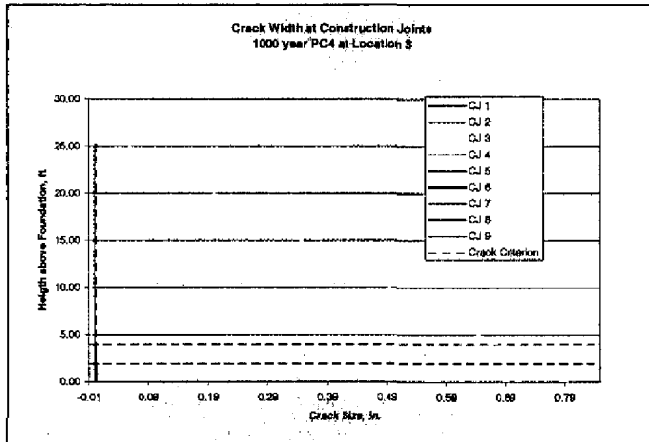
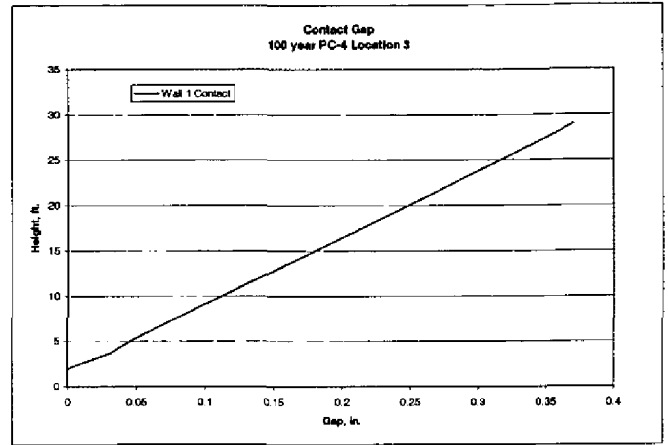
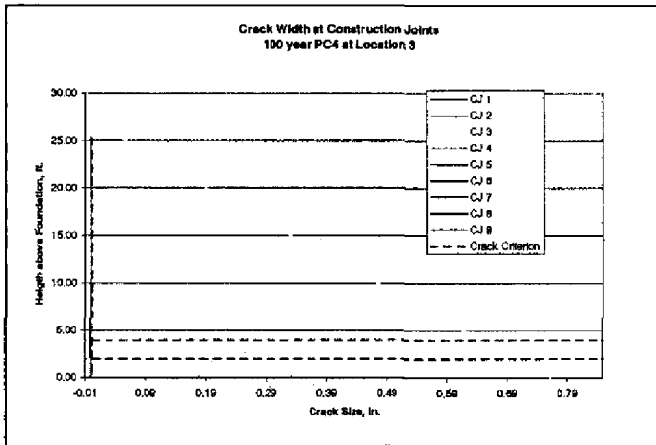


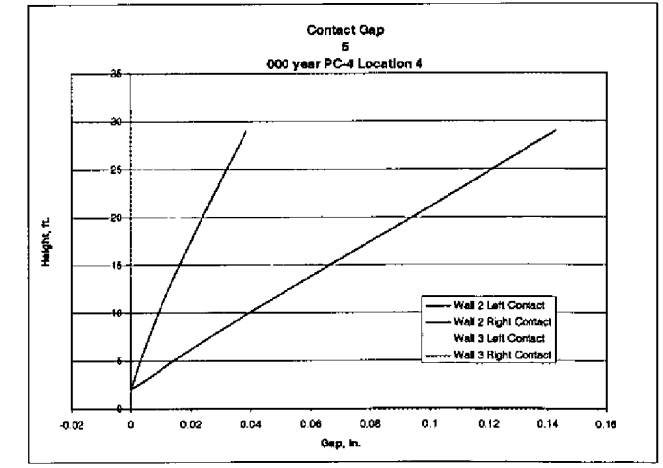
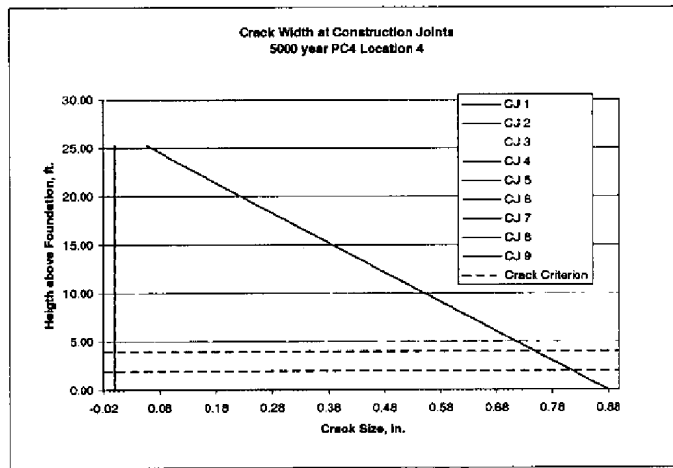
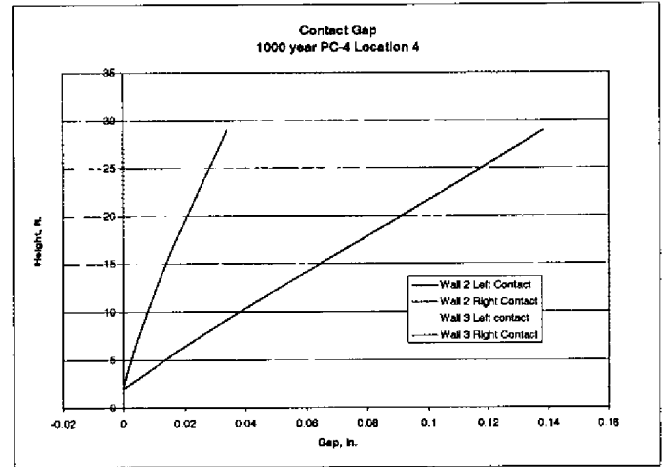
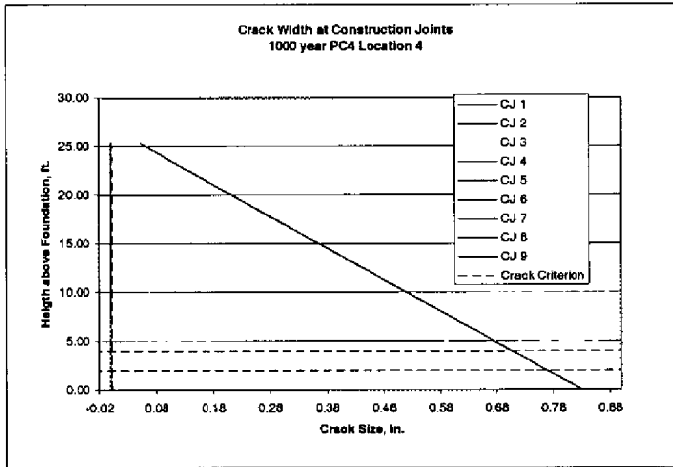
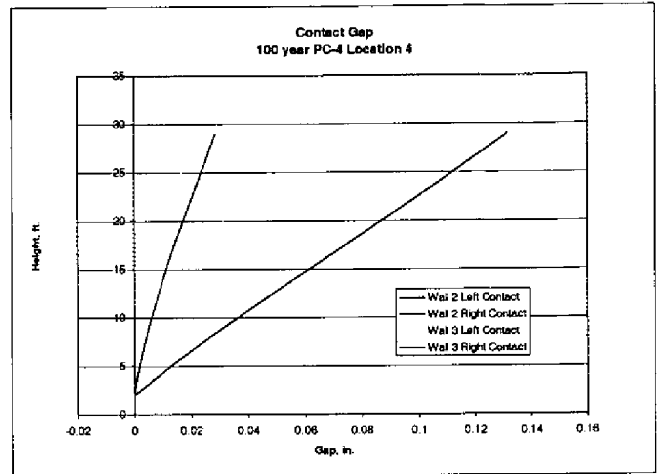
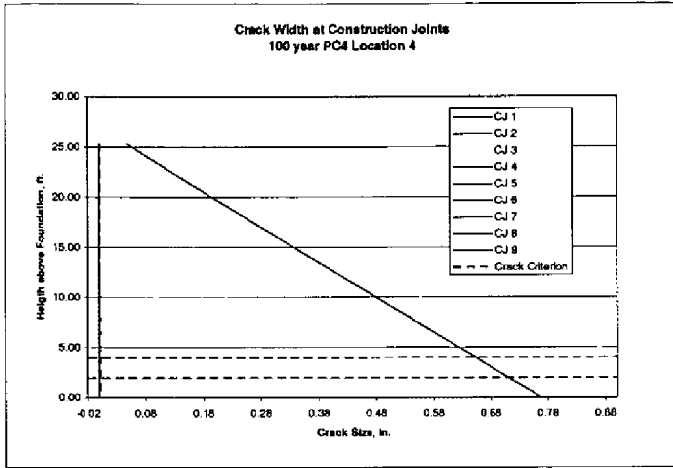
PC-4 Differential Settlement - Location 3
Low Soil

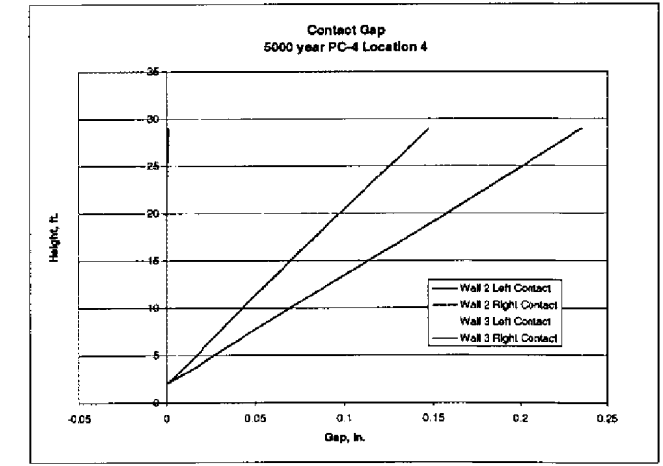
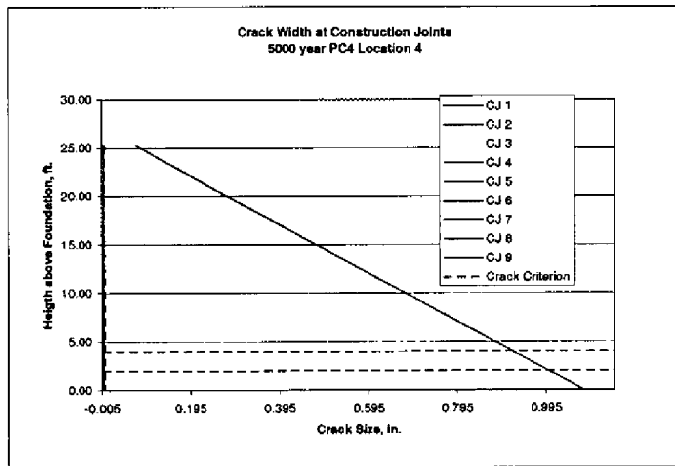
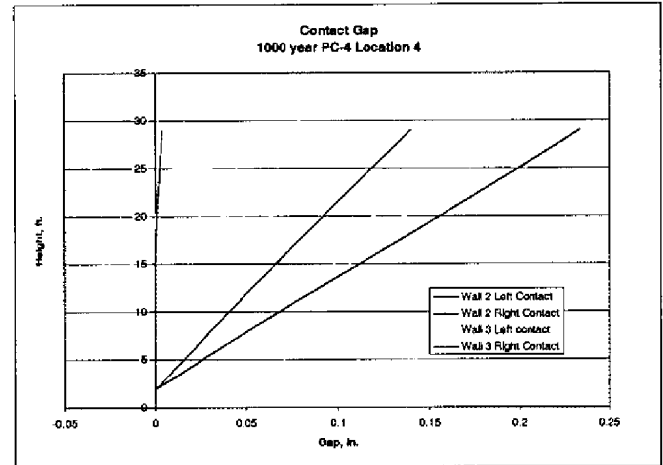
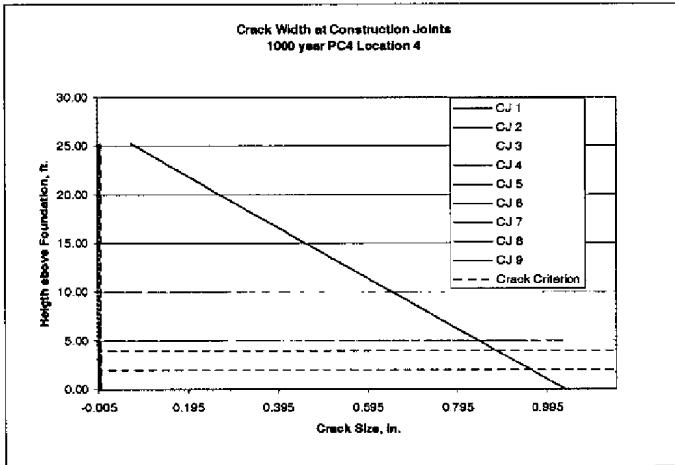
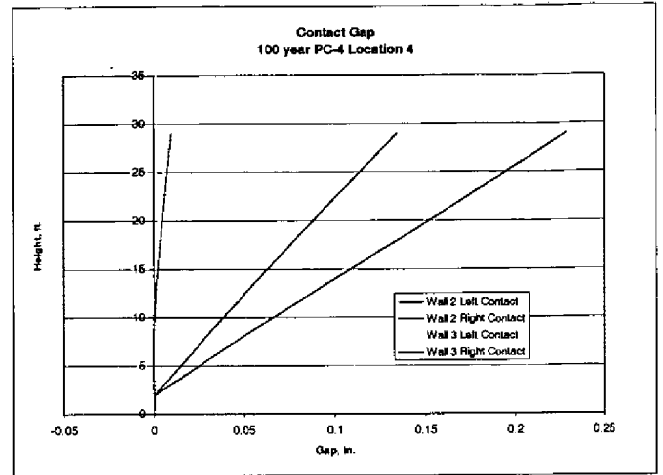
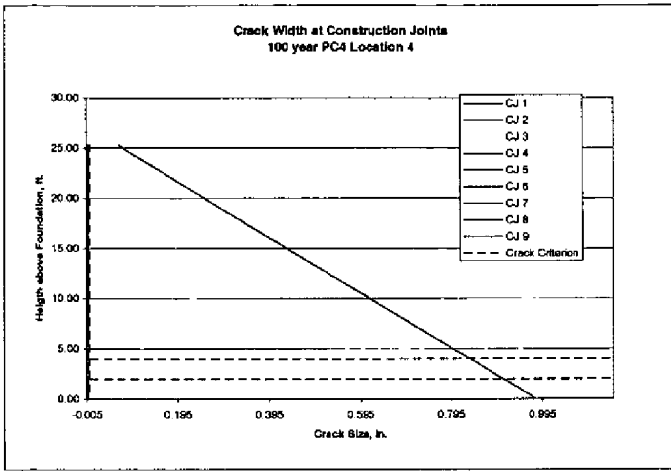


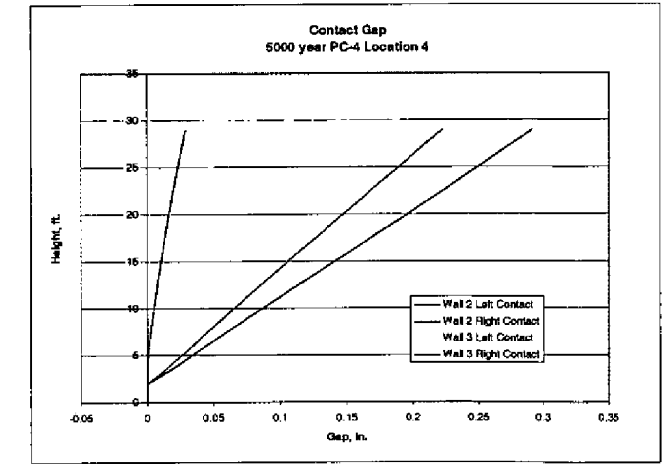
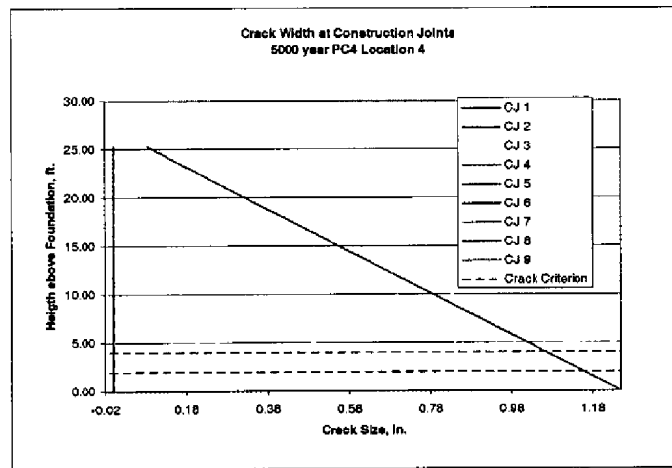
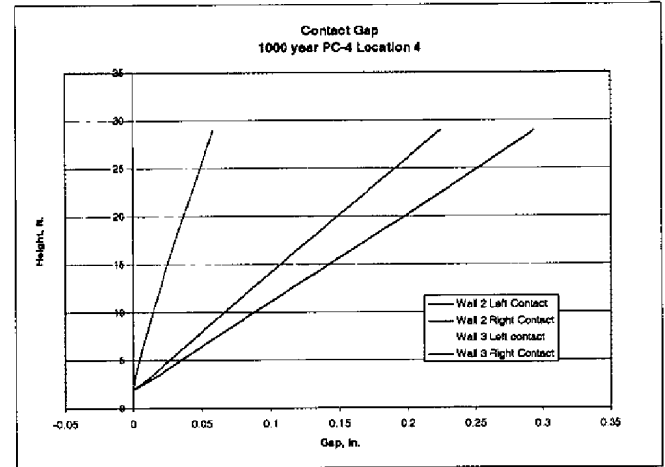
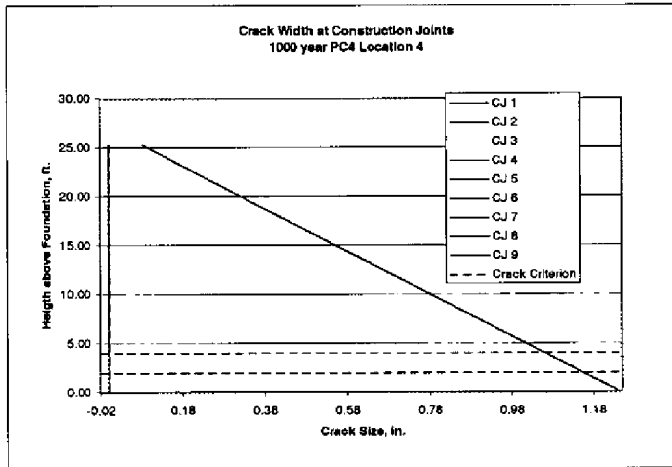
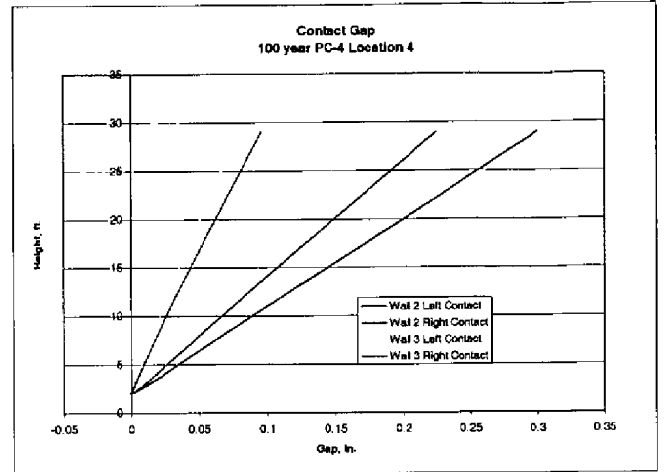
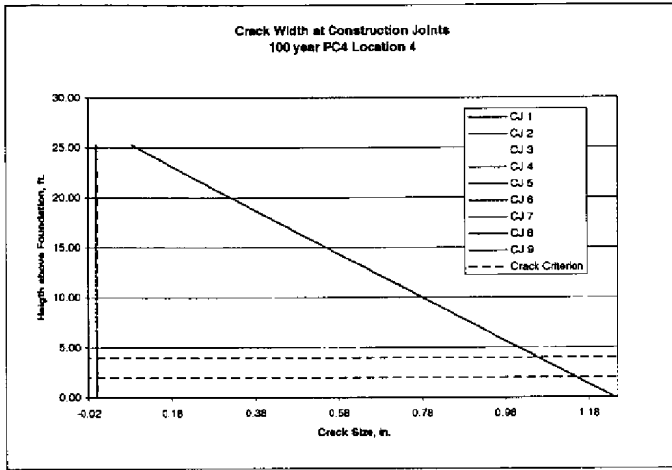
PC-4 Differential Settlement - Location 3
Mean Soil



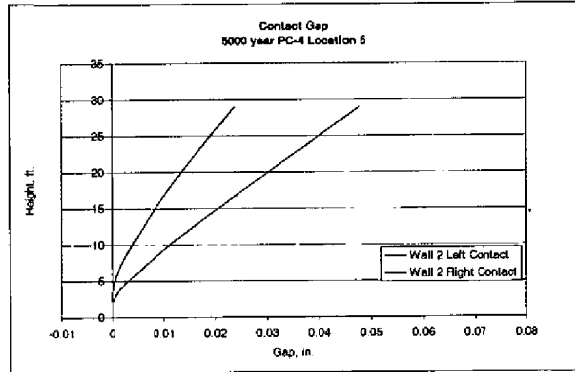
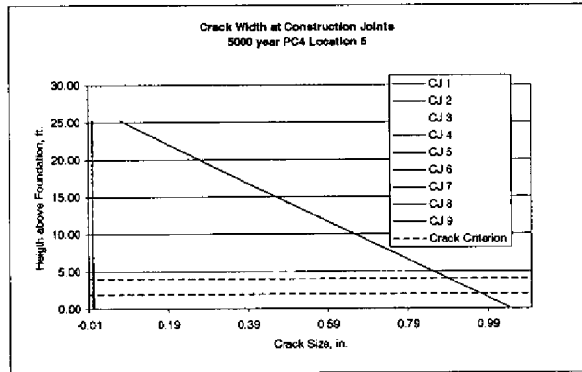
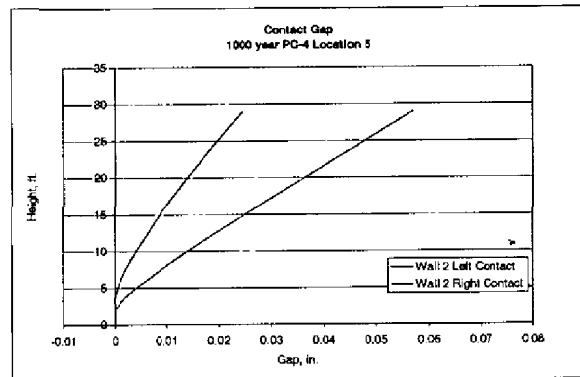
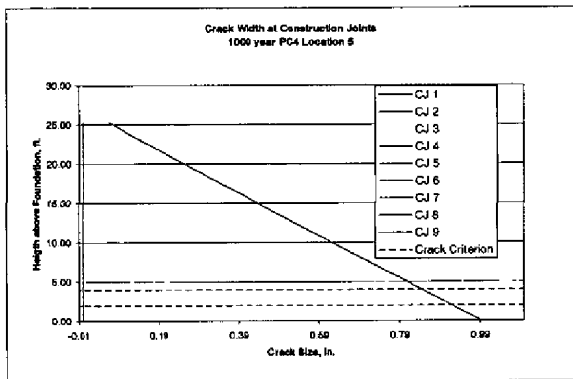
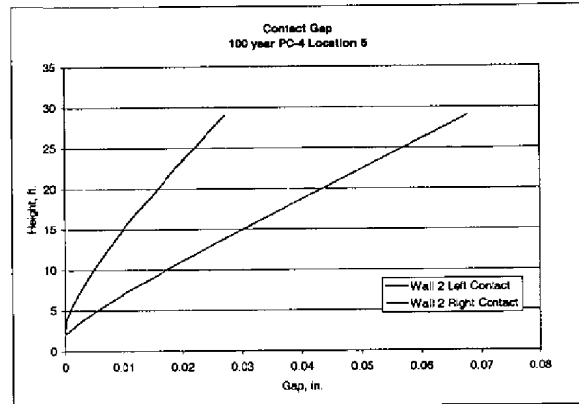
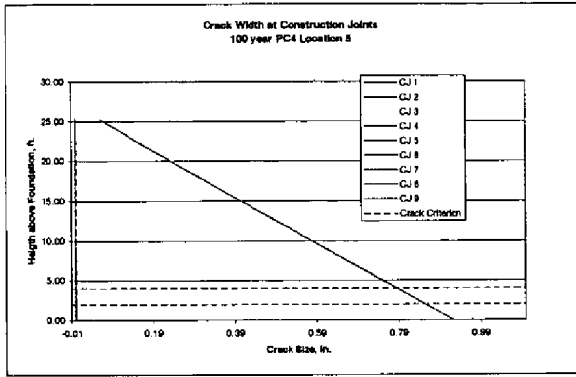




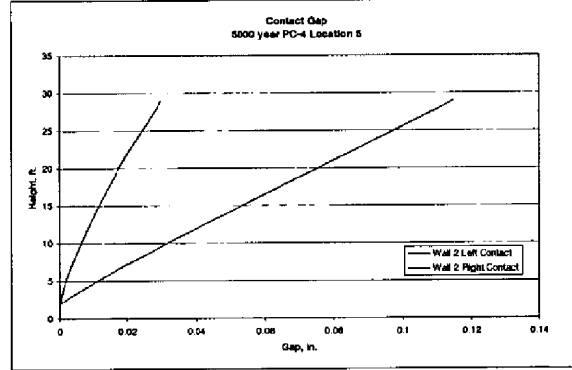
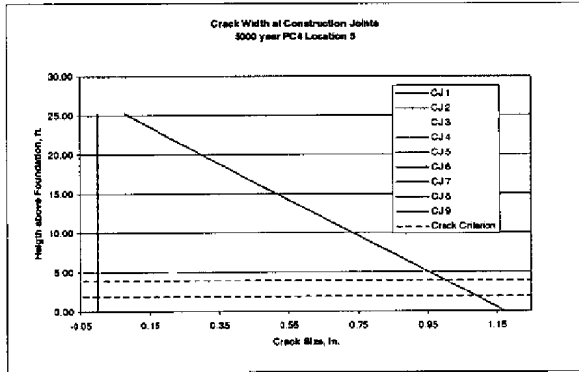
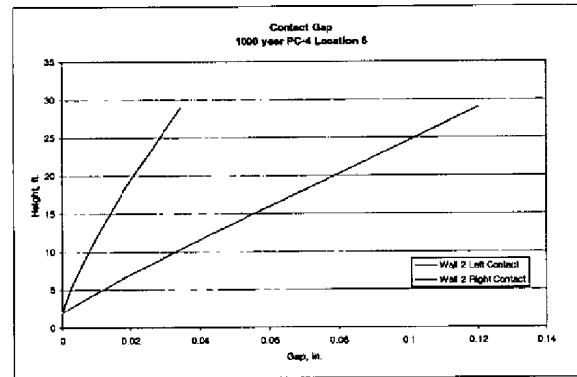
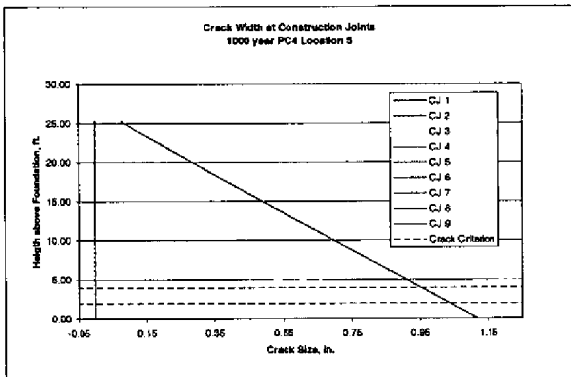
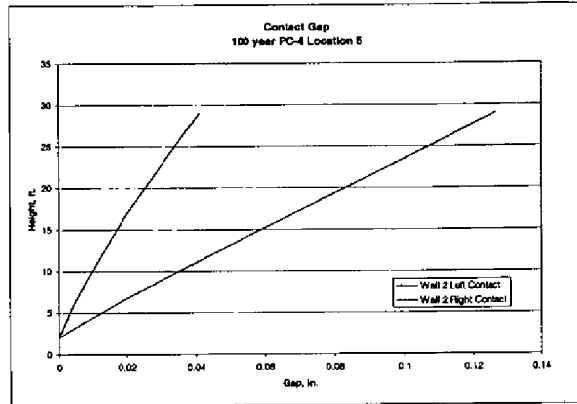
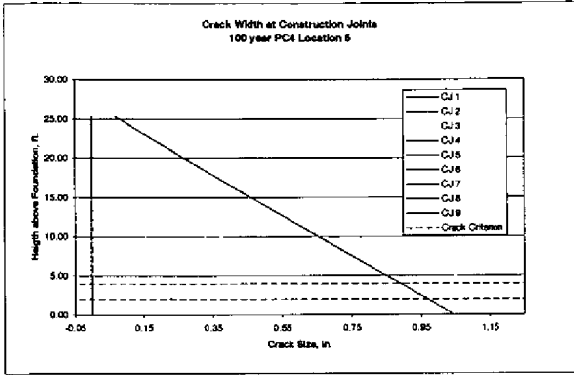




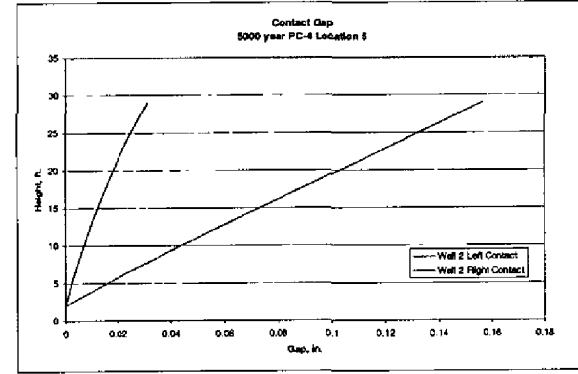
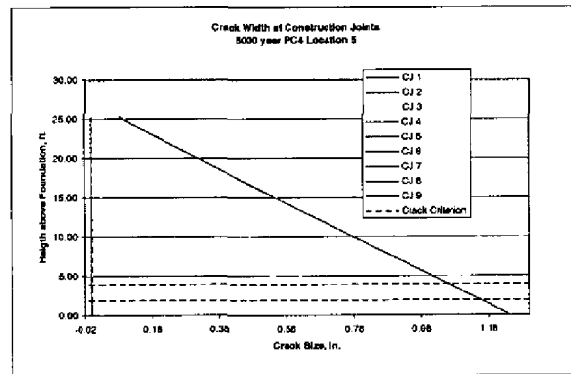
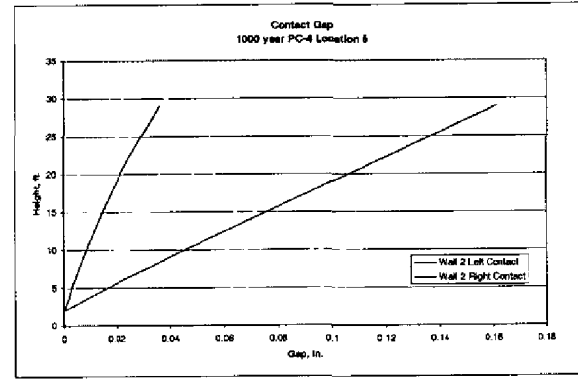
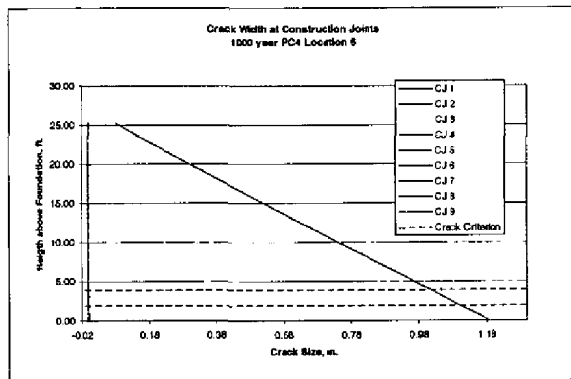
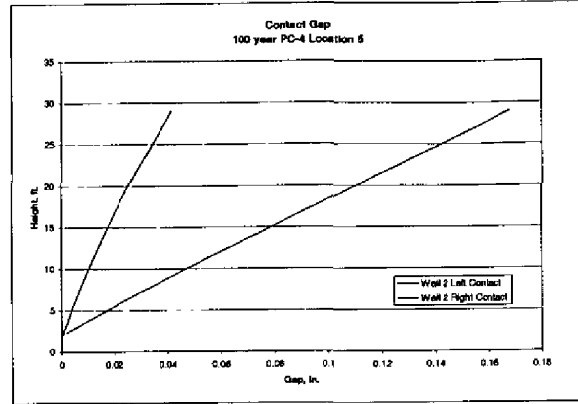
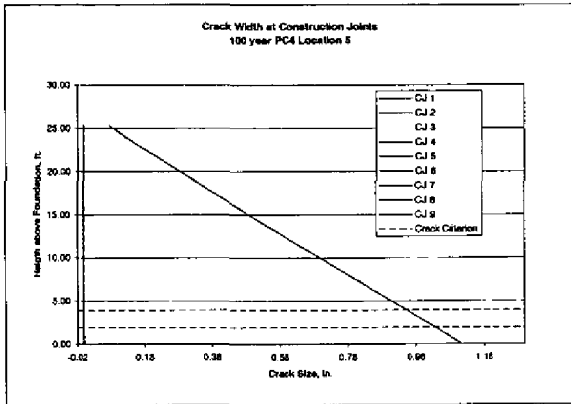
PC-4 Differential Settlement - Location 5
Low Soil



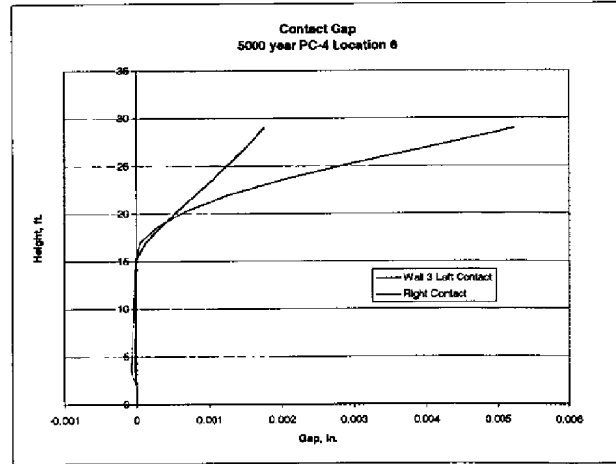
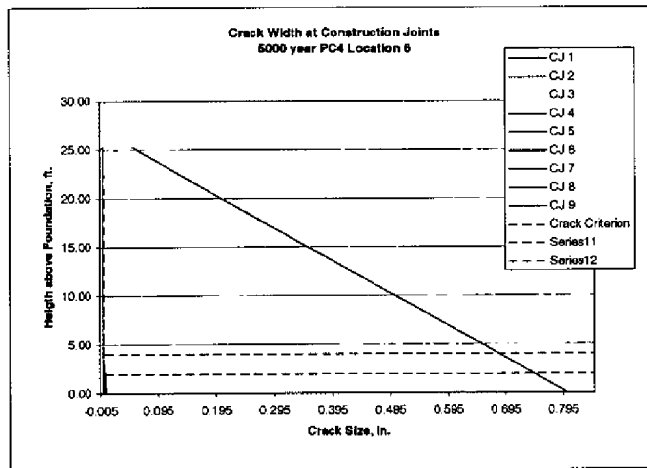
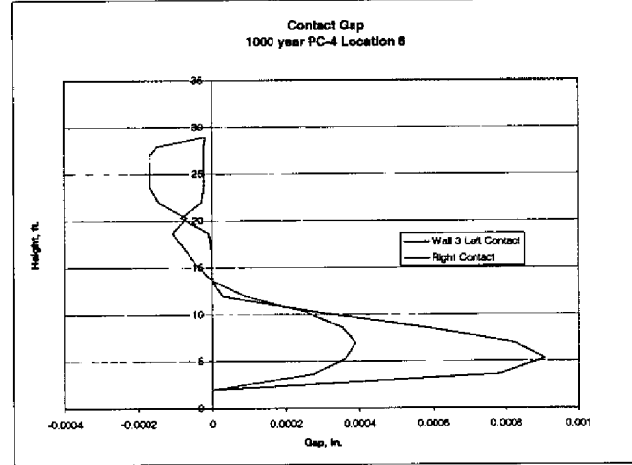
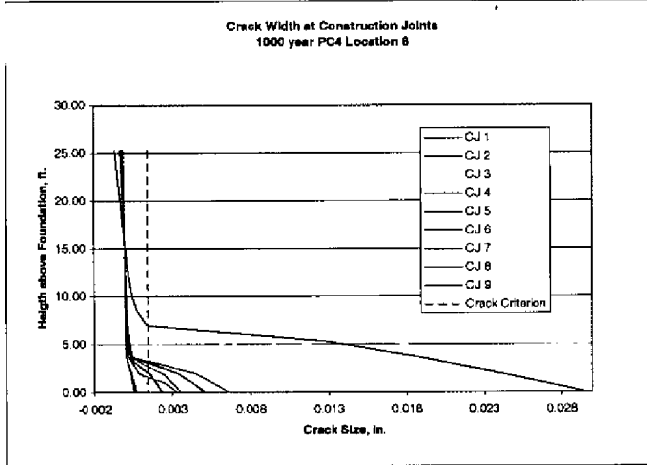
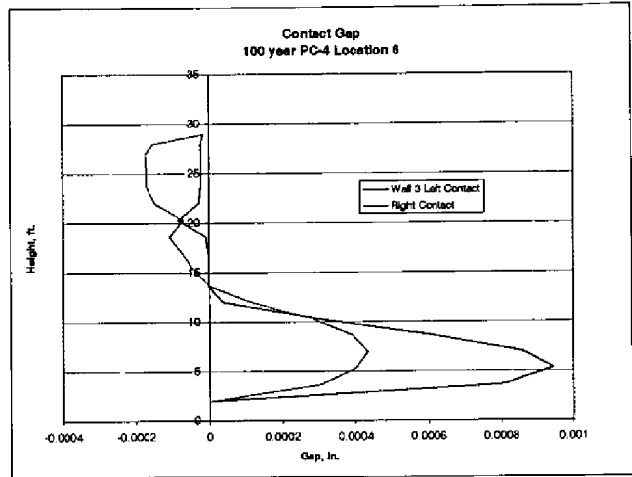
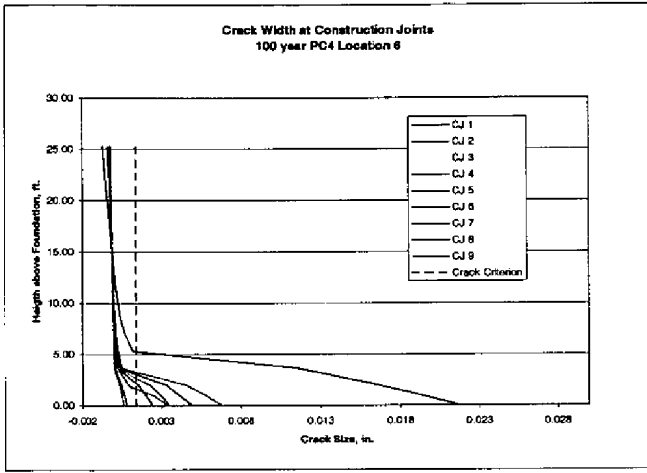
PC-4 Differential Settlement - Location 5
Mean Soil

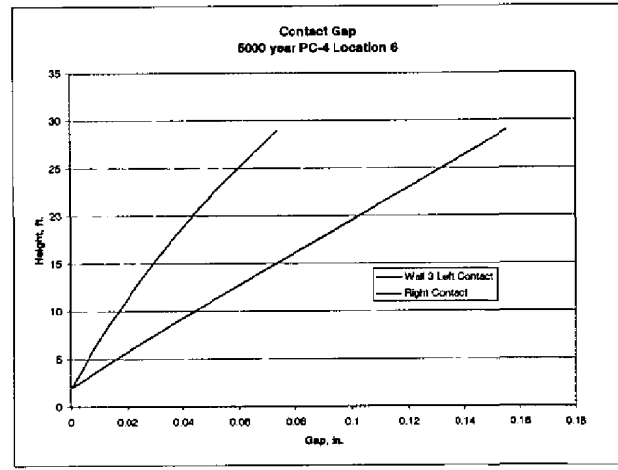
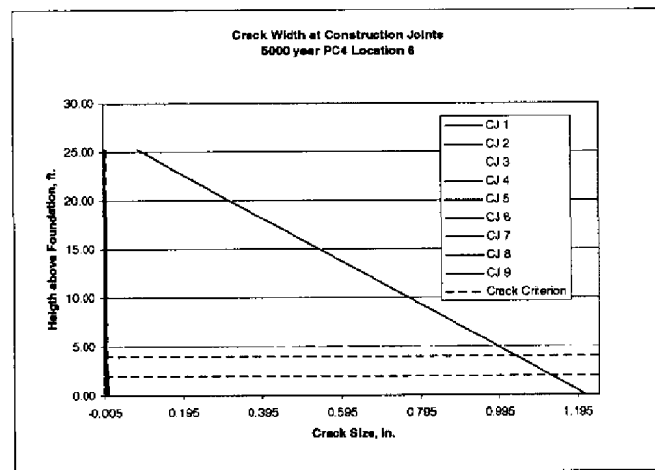
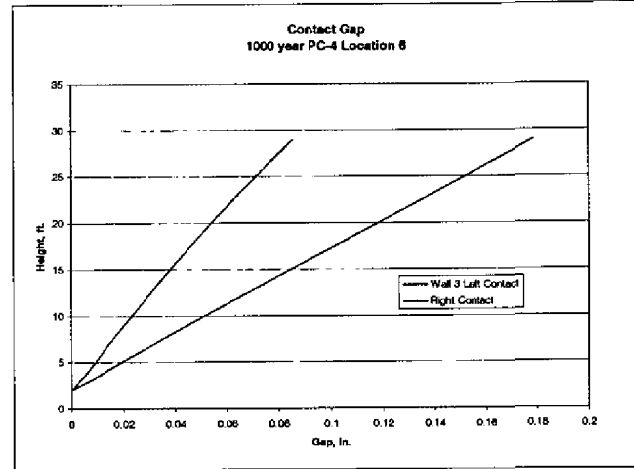
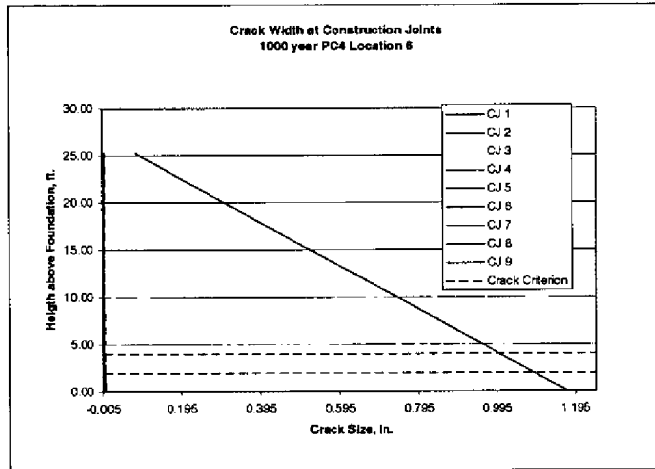
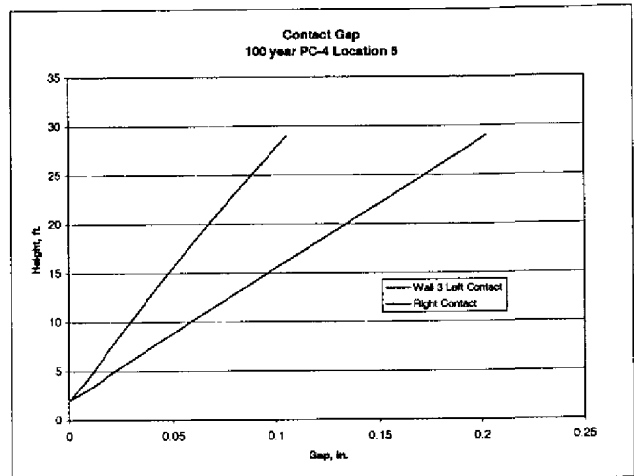
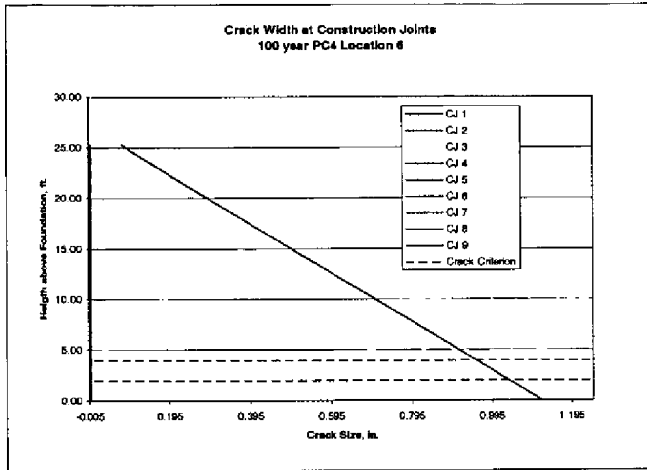


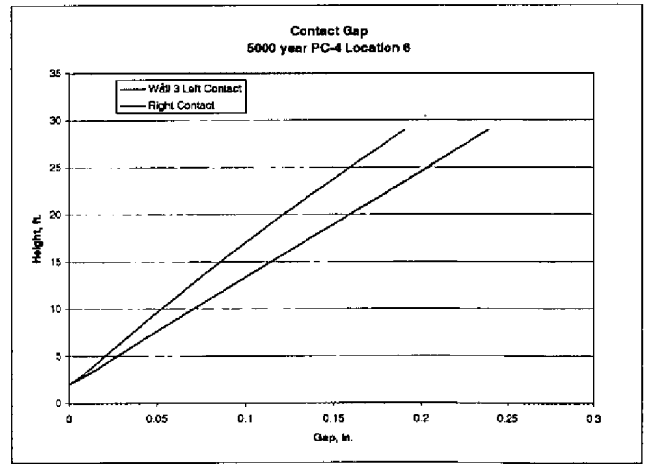
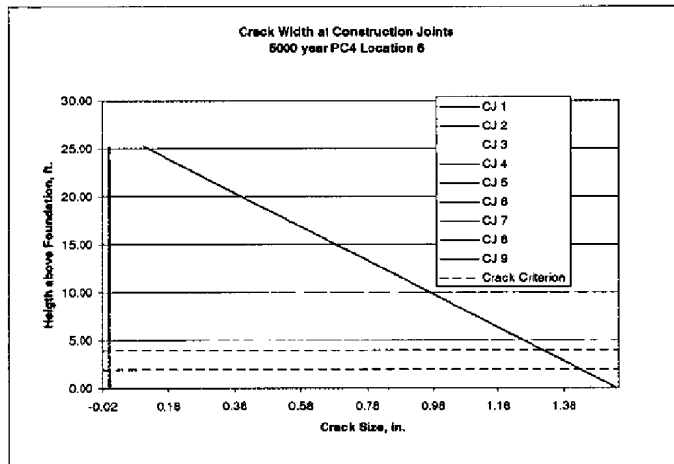
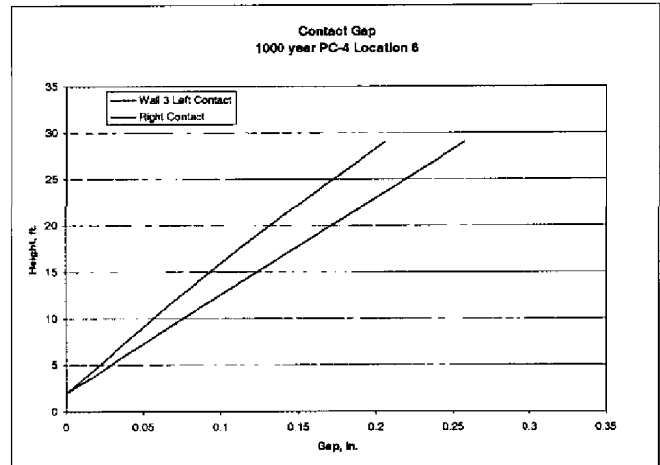
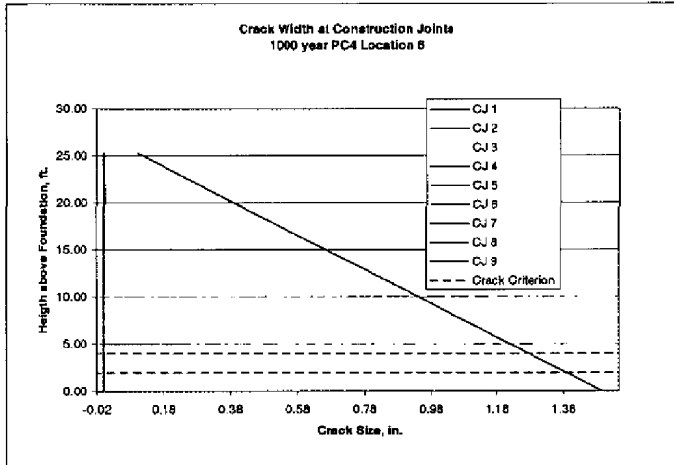
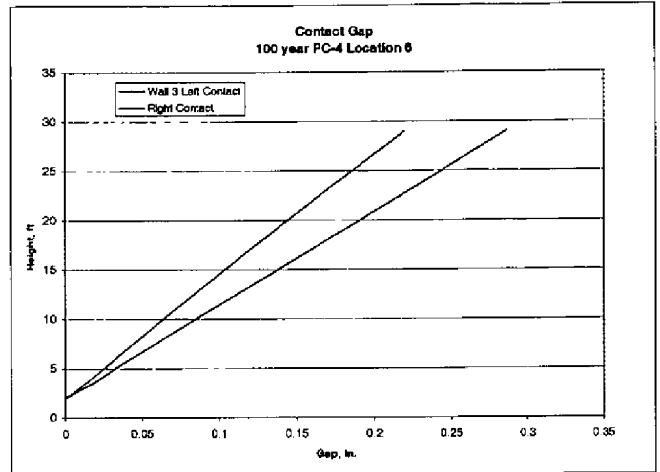
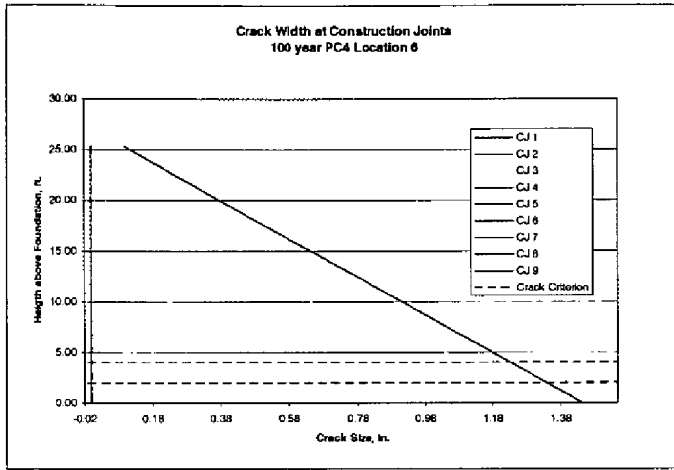
PC-4 Differential Settlement - Location 5
High Soil



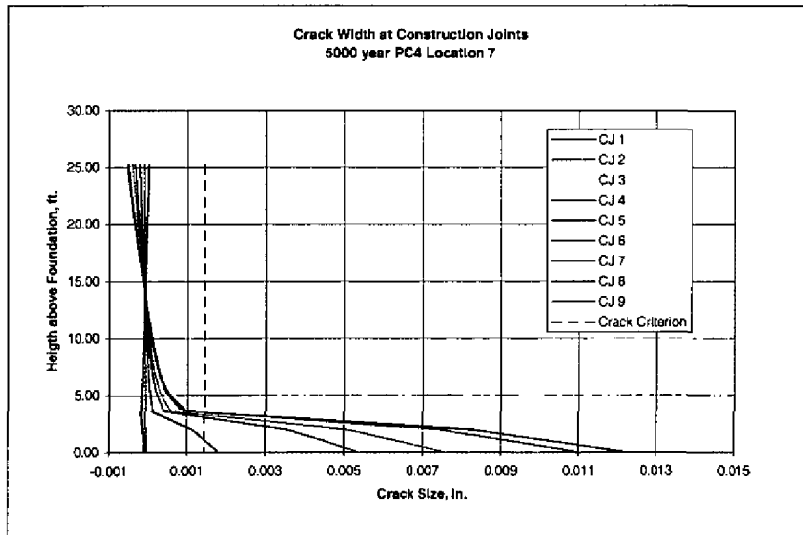
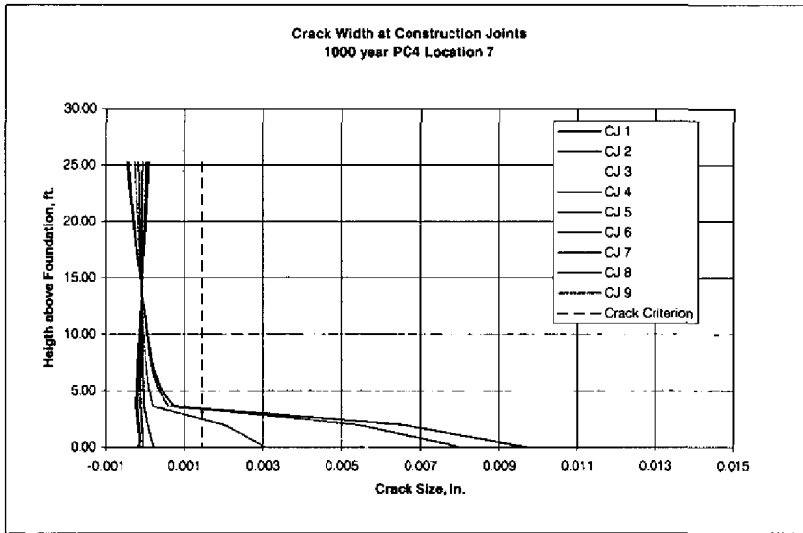
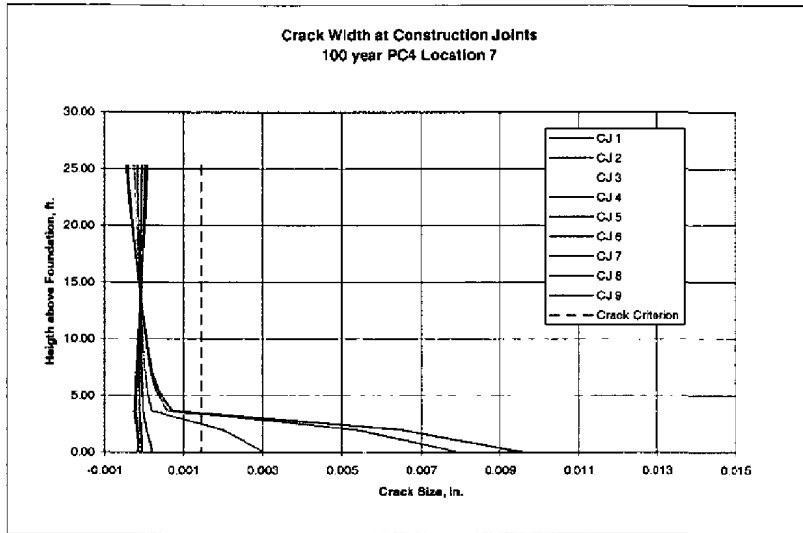
PC-4 Differential Settlement - Location 6
Low Soil



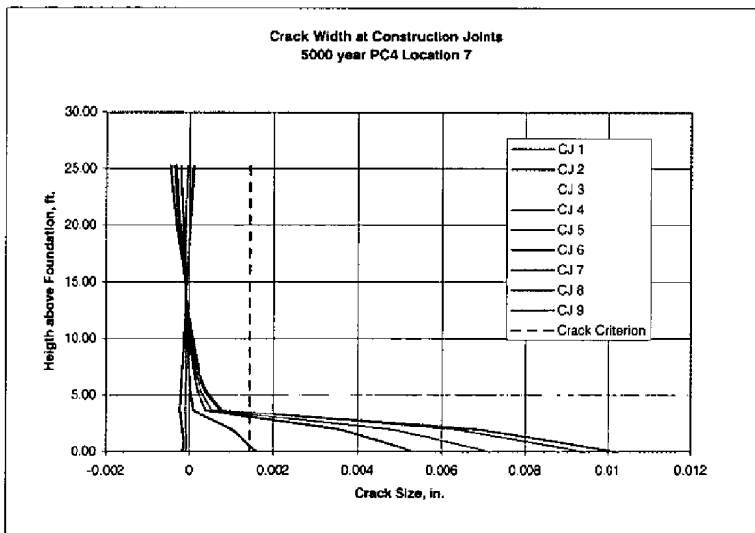
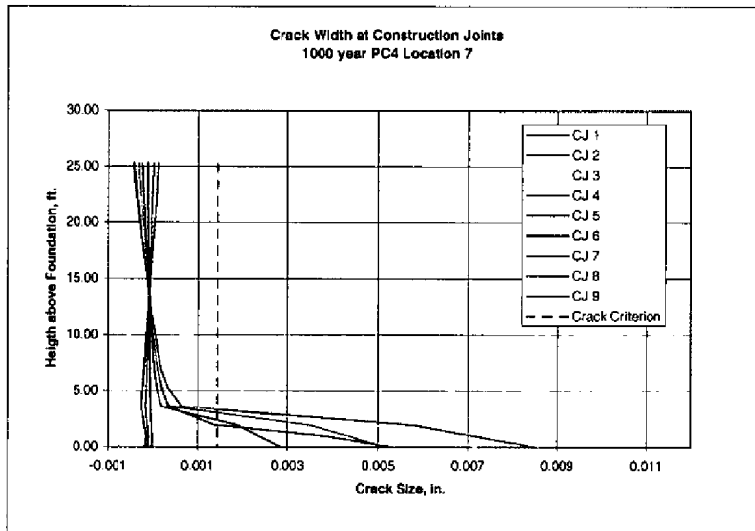
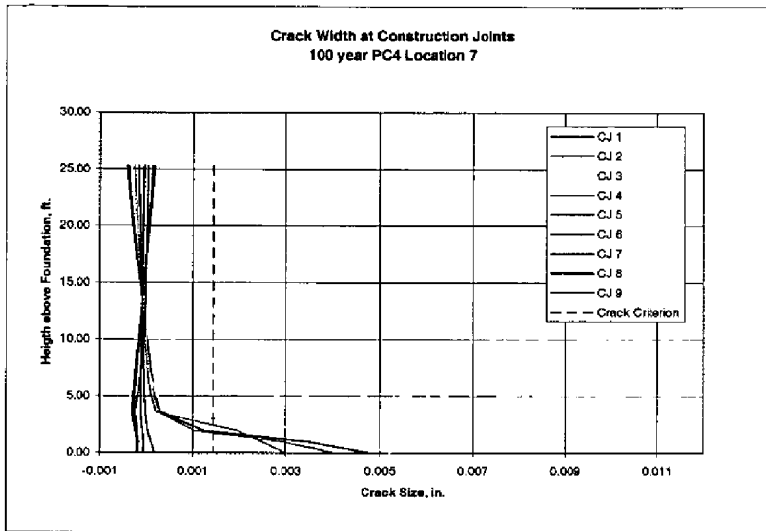




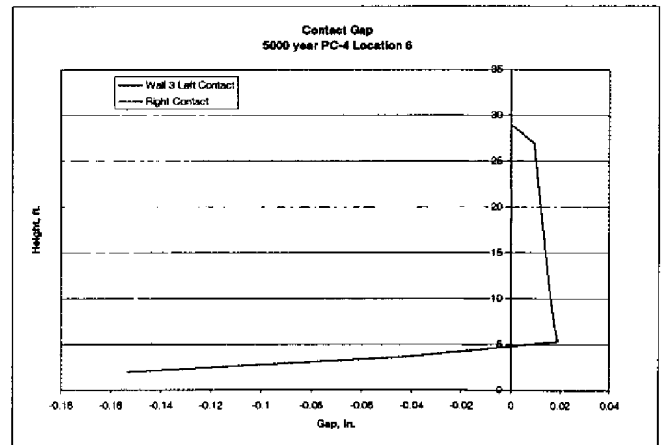
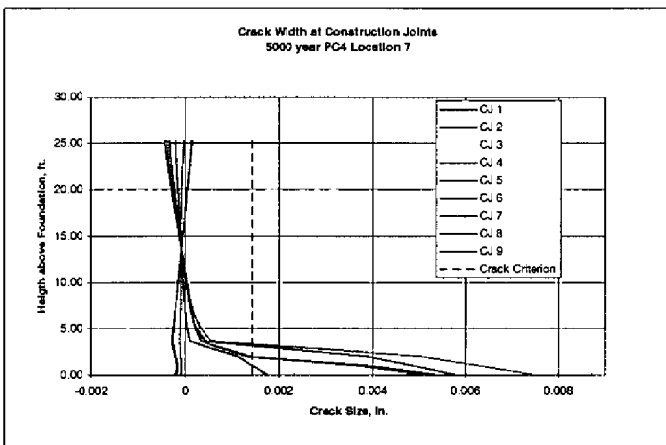
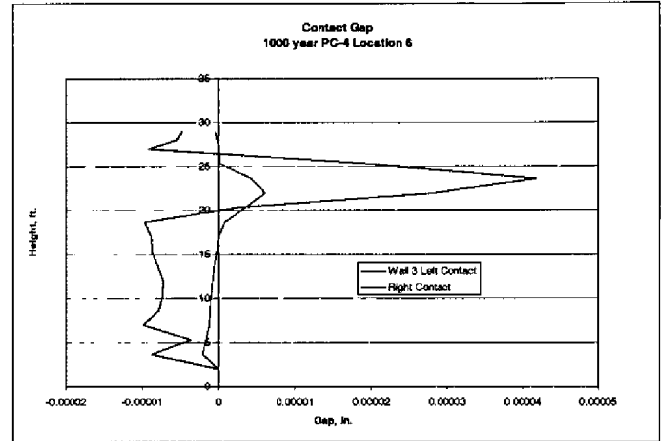
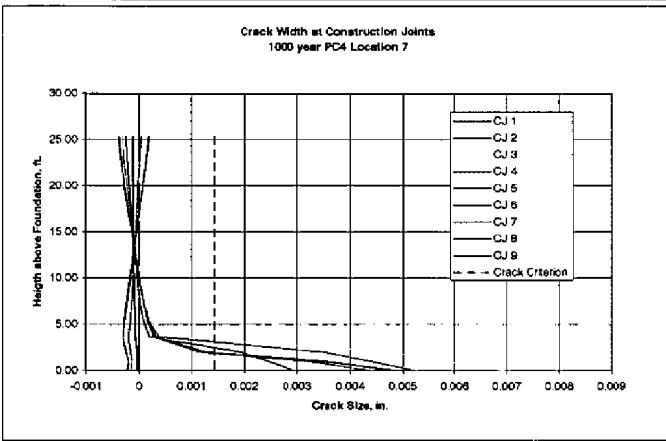
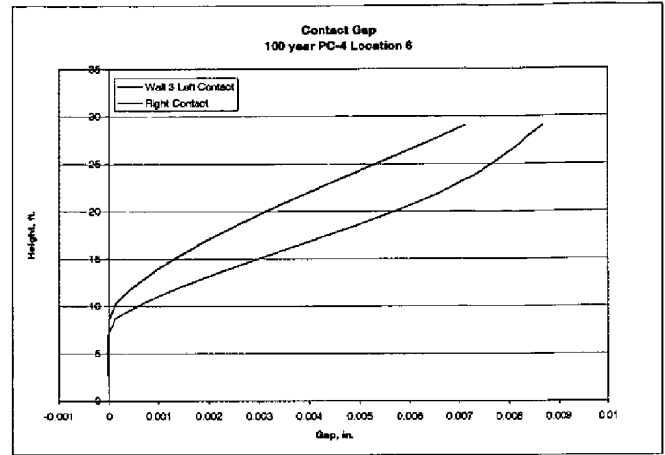
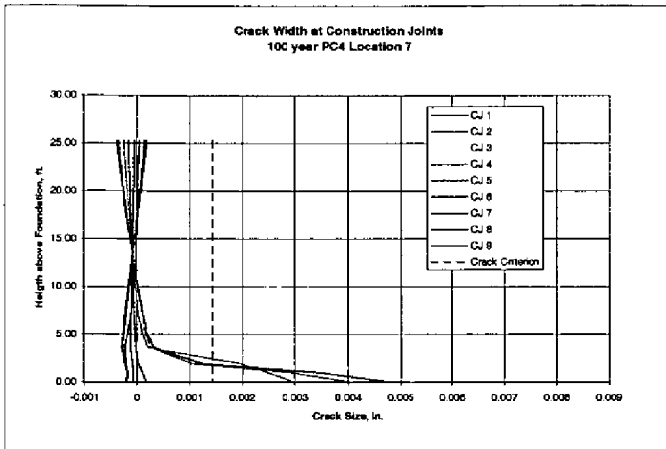
PC-4 Differential Settlement - Location 7
Low Soil

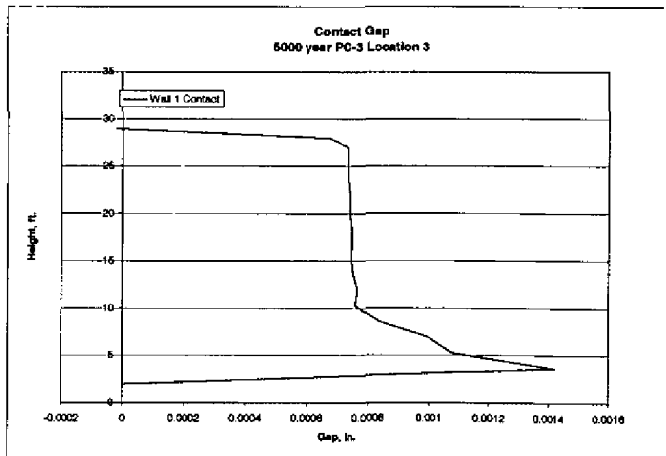
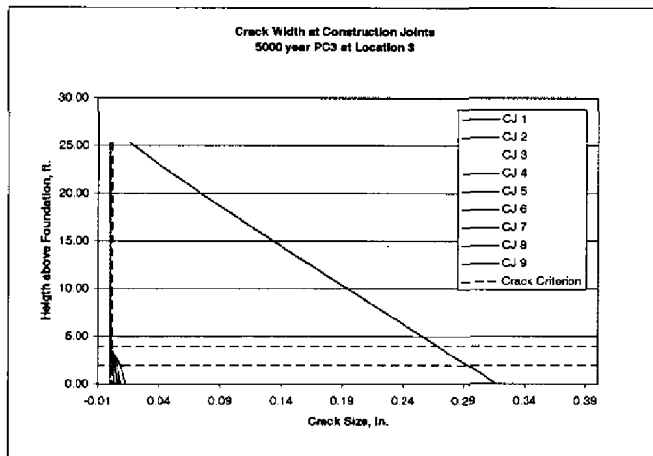
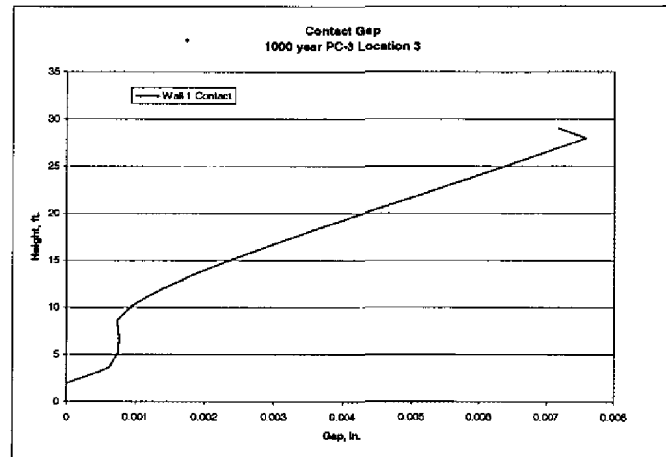
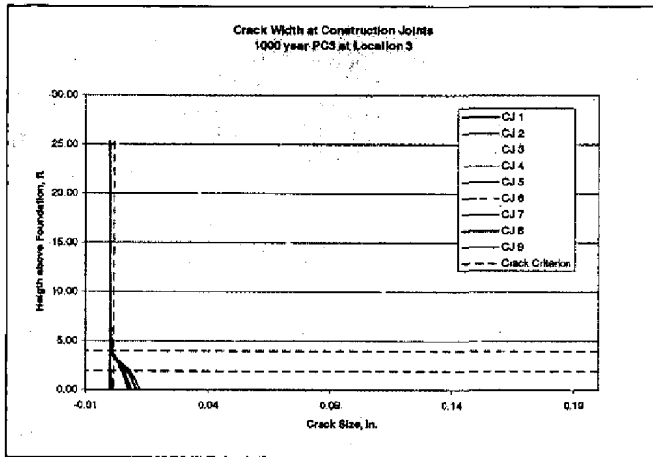
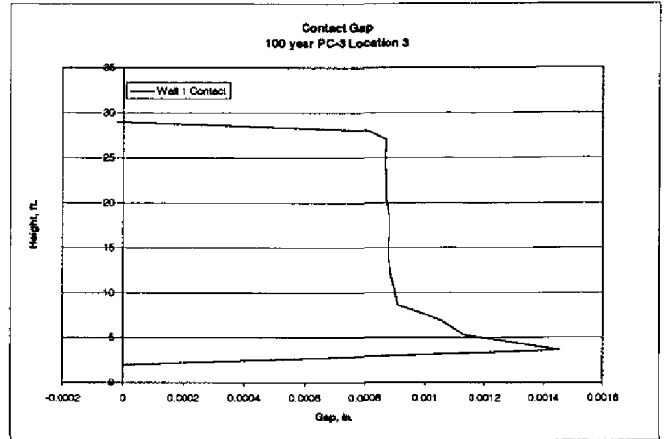
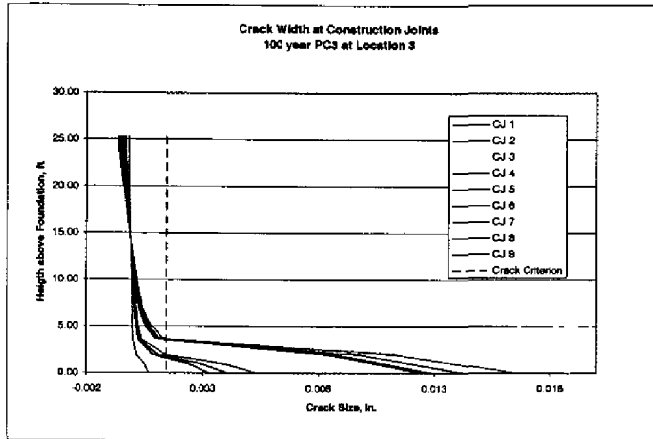


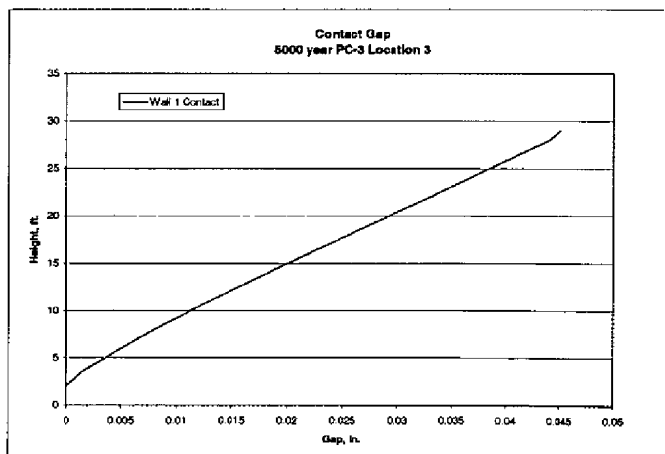
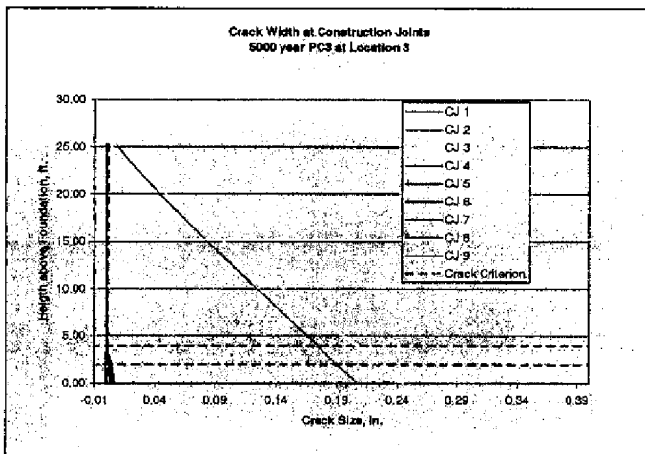
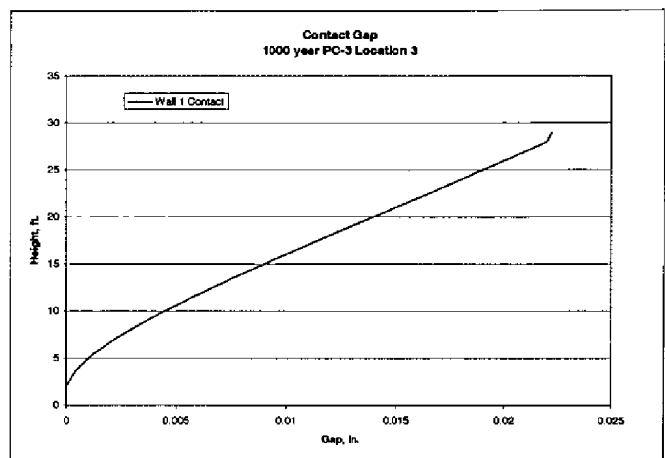
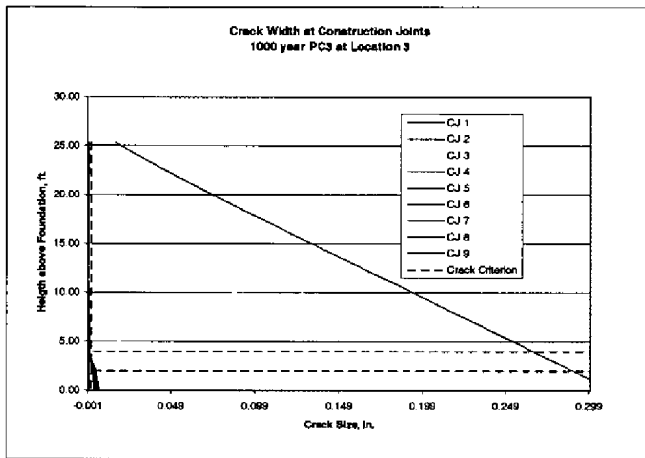
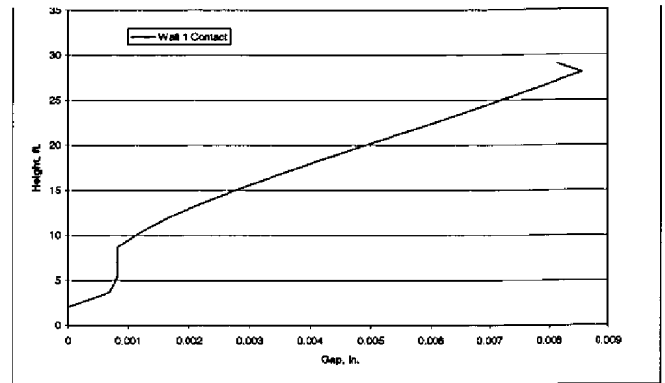
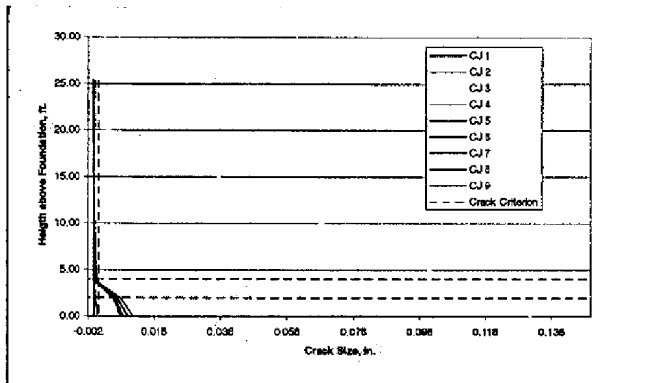
PC-4 Differential Settlement - Location 7
Mean Soil

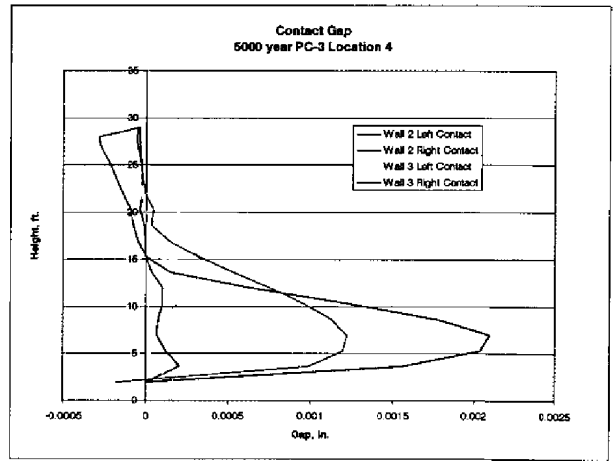
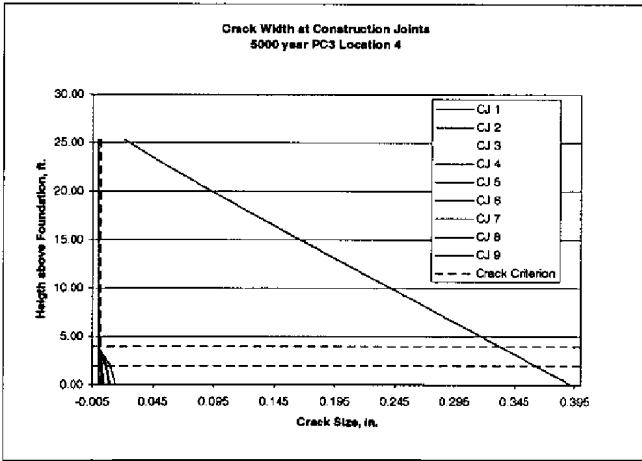
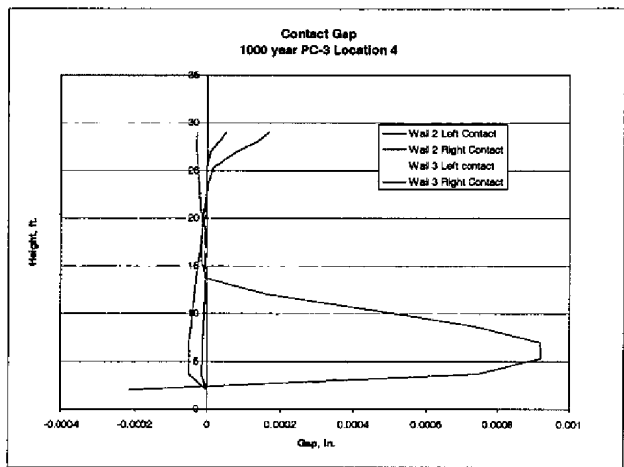
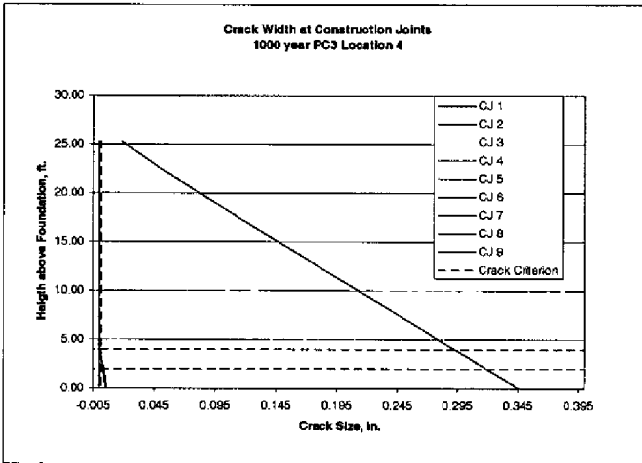
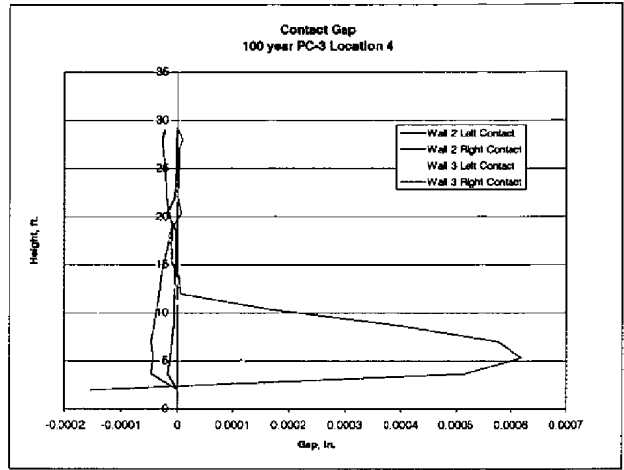
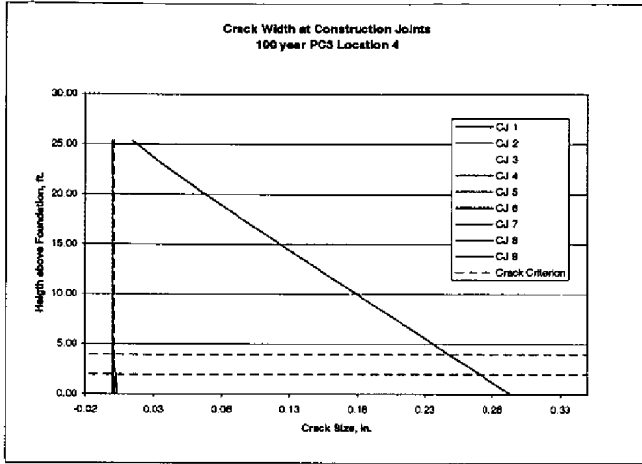


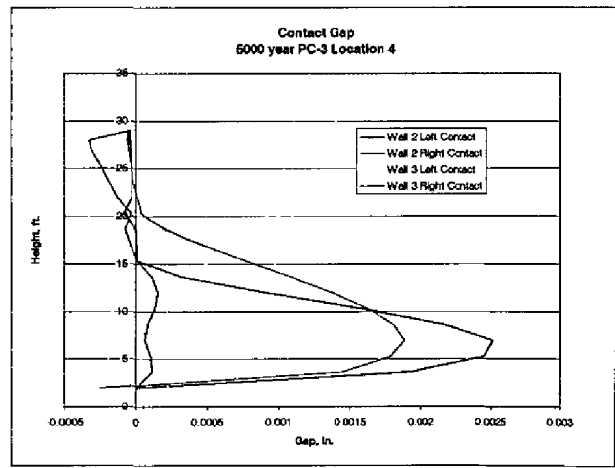
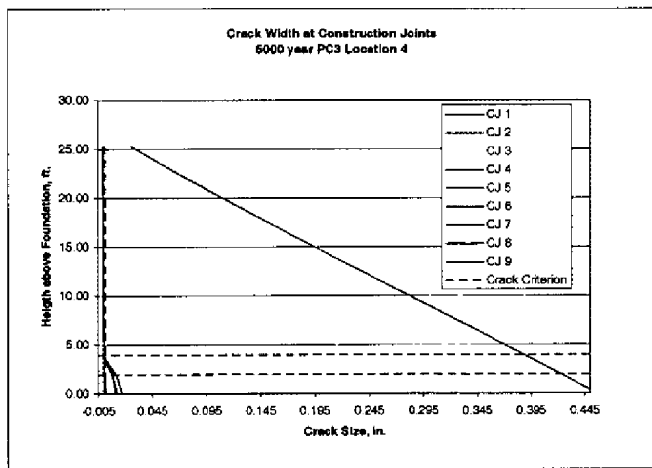
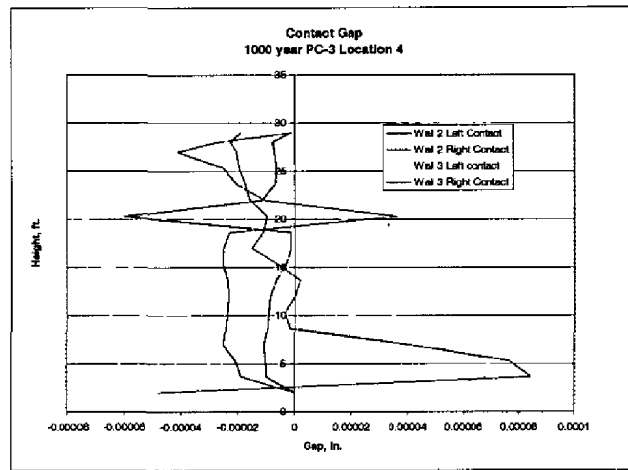
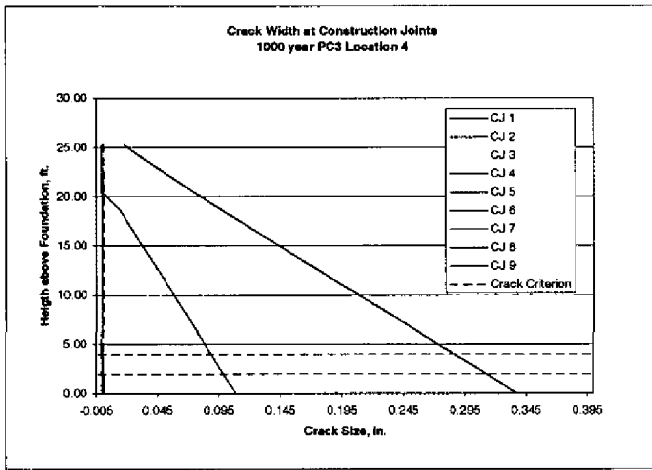
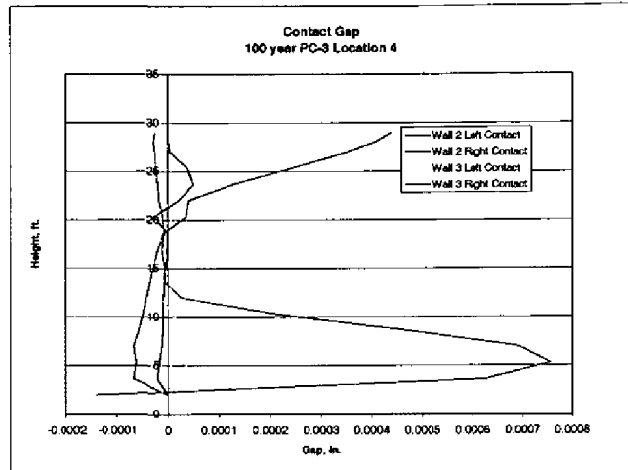
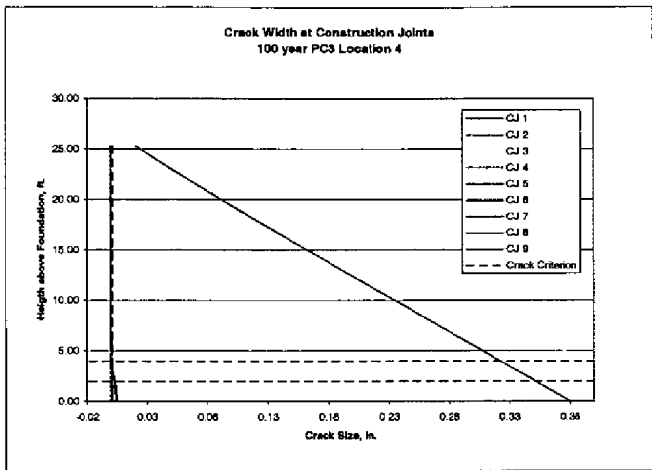
PC-4 Differential Settlement - Location 7
High Soil







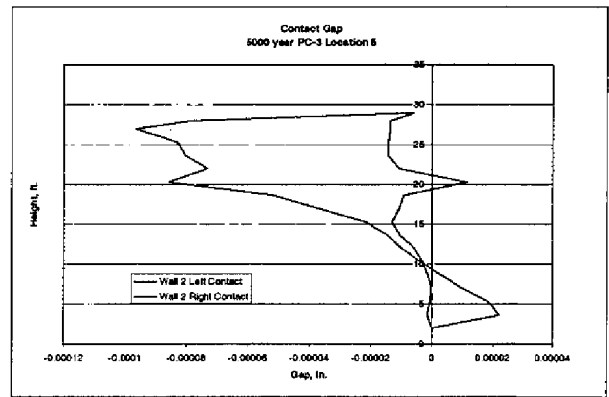
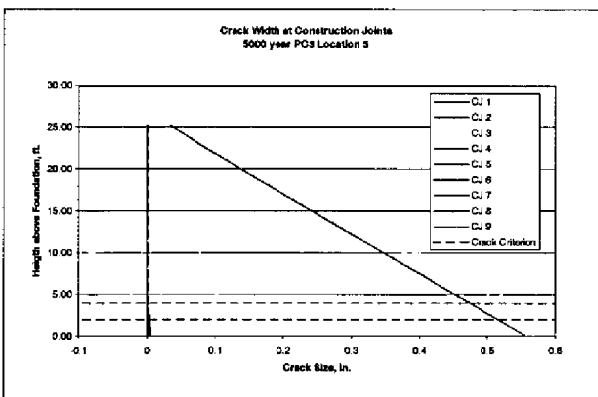
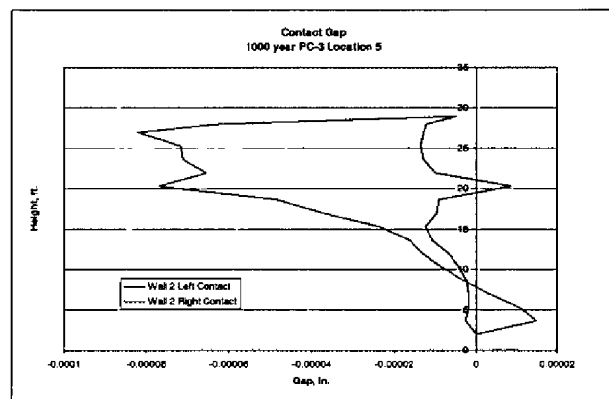
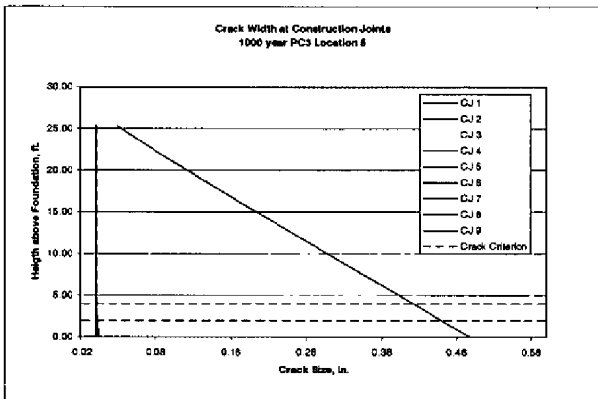
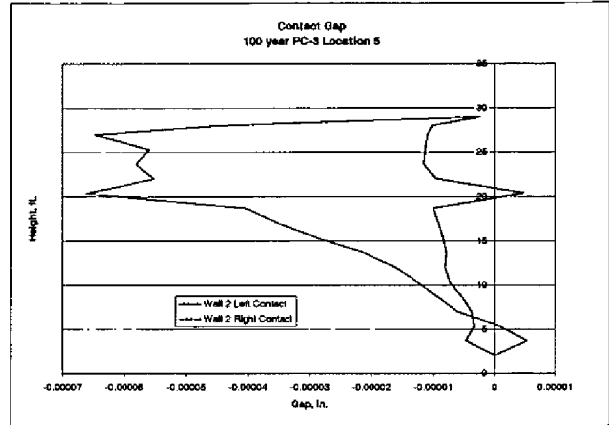
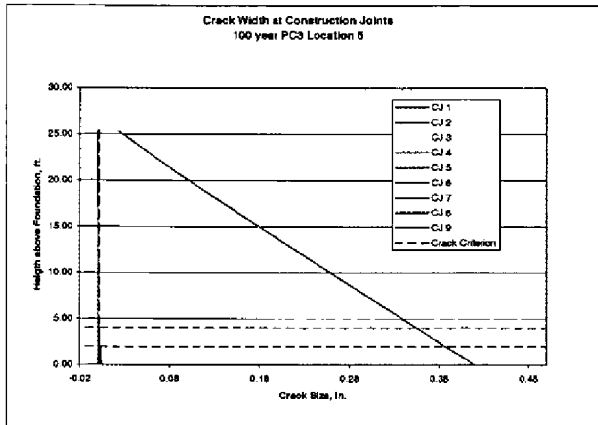


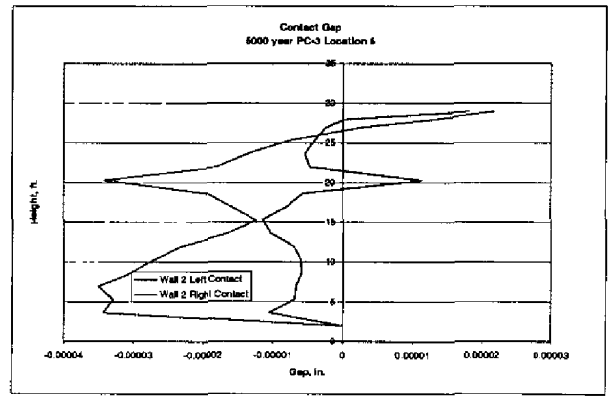
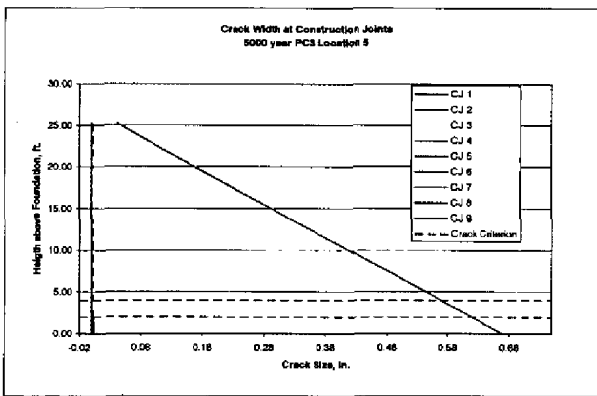
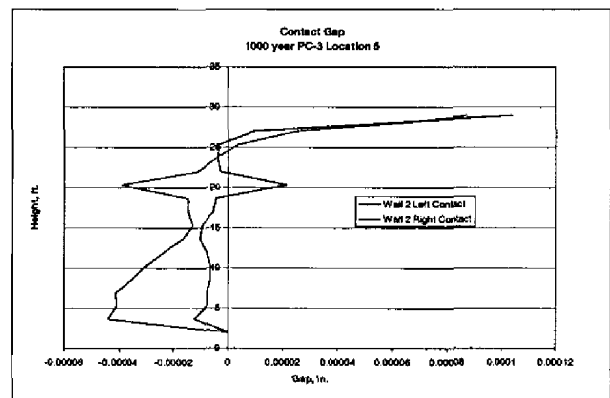
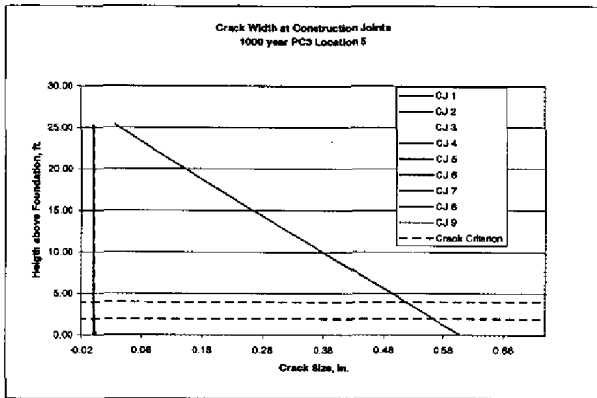
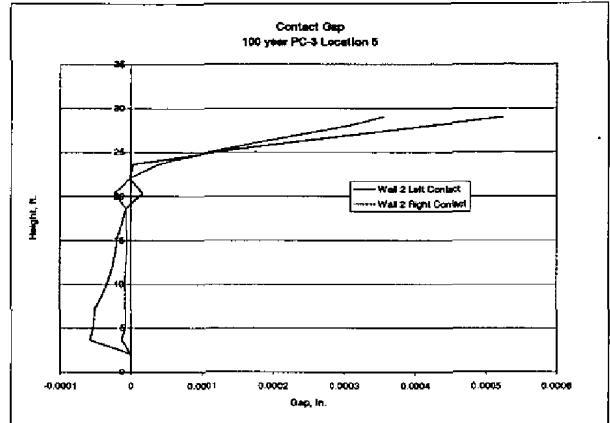
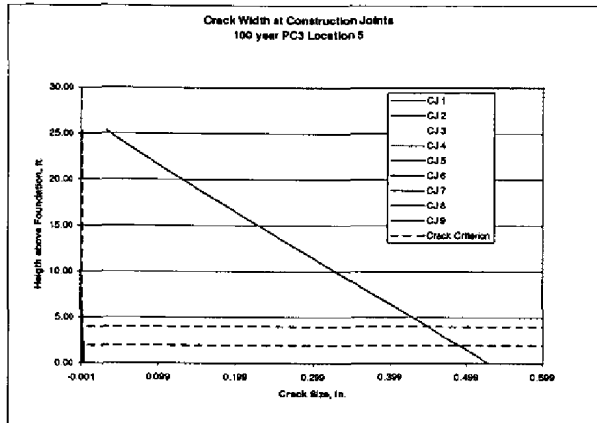


T-CLC-2-00006, Rev. 0

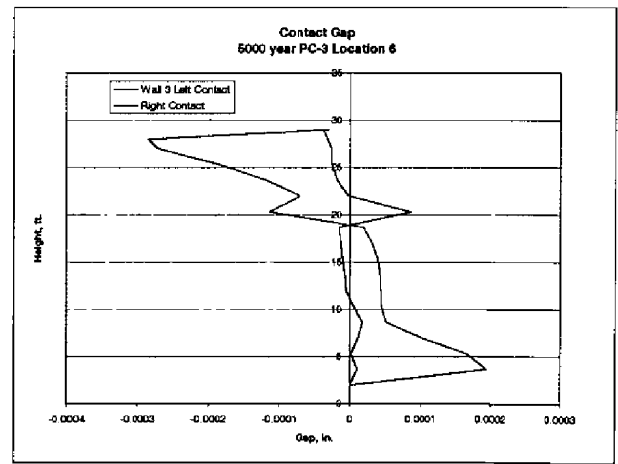
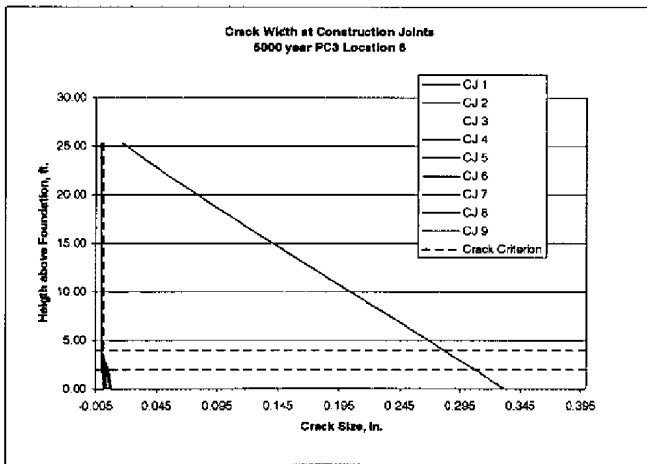
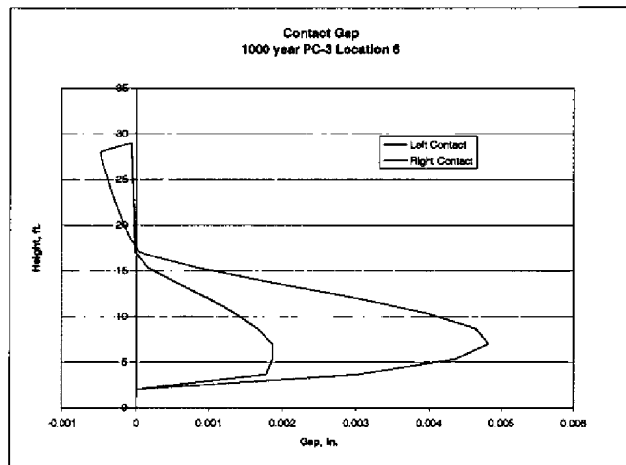
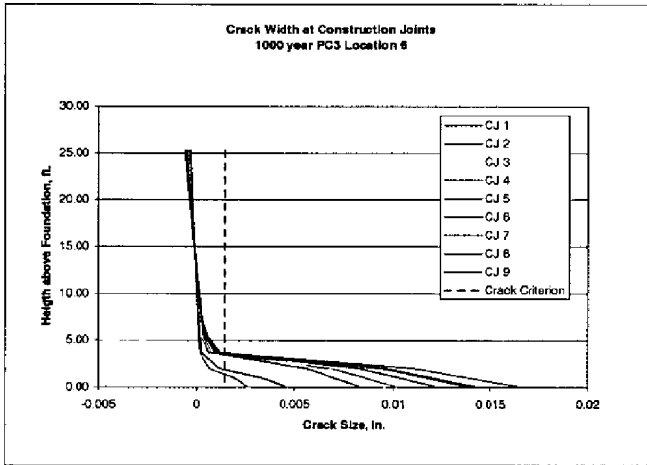
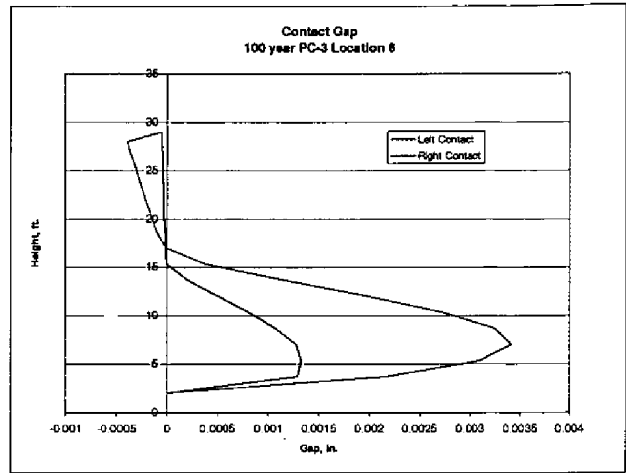
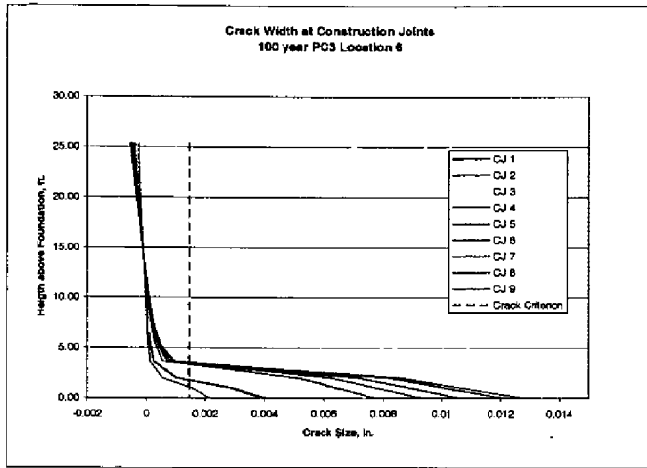
PC-3 Differential Settlement - Location 5
R = 62 ft.

398





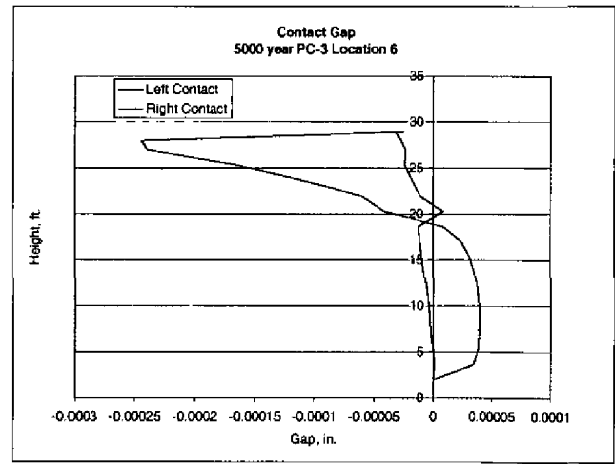
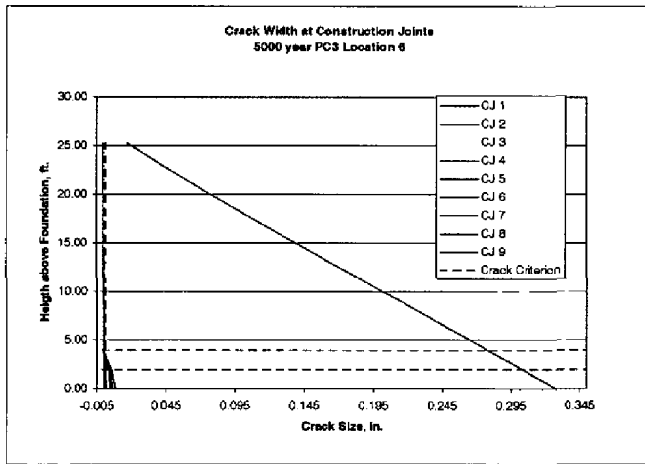
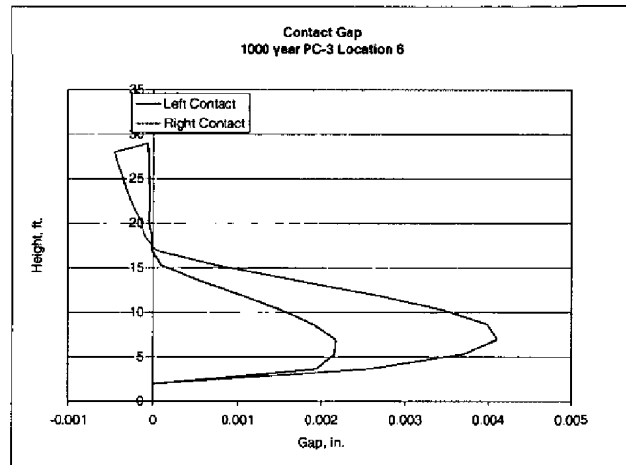
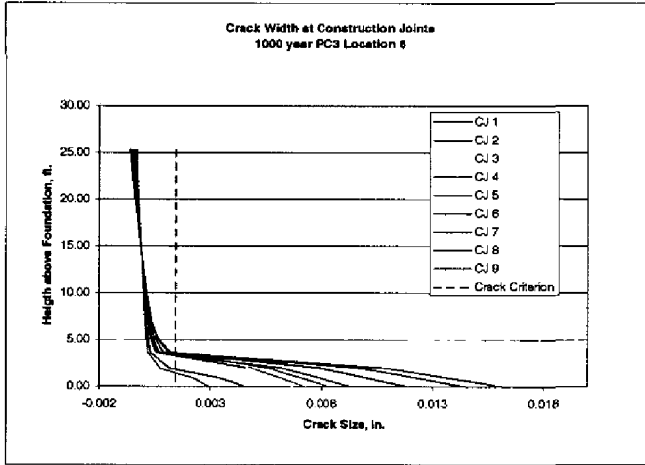
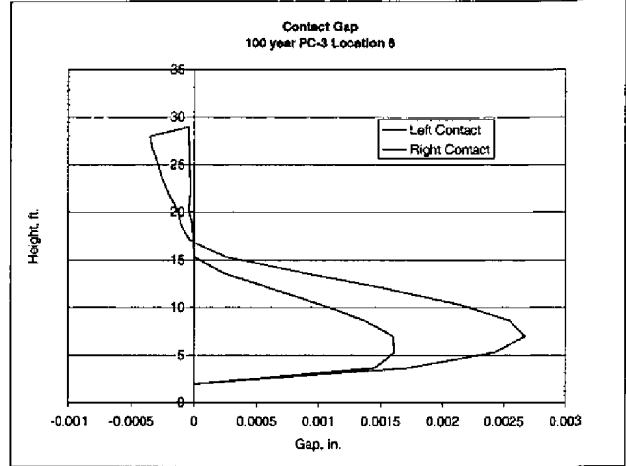
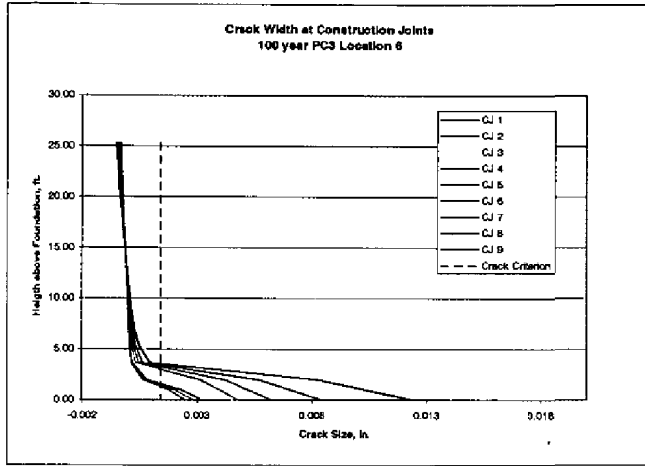
PC-3 Differential Settlement - Location 6
R = 62 ft.



T-CLC-2-00006, Rev. 0

PC-3 Differential Settlement - Location 6
R = 124 ft.

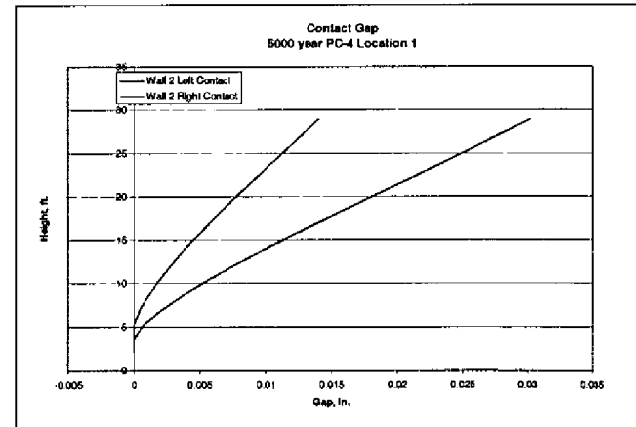
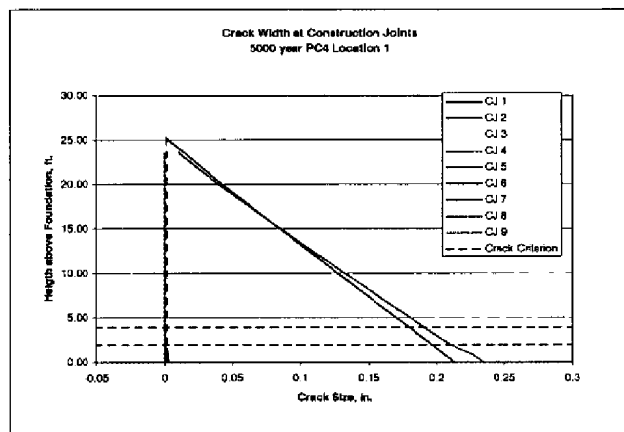
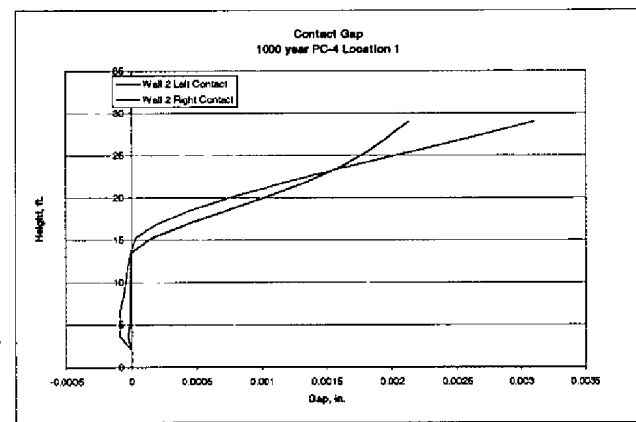
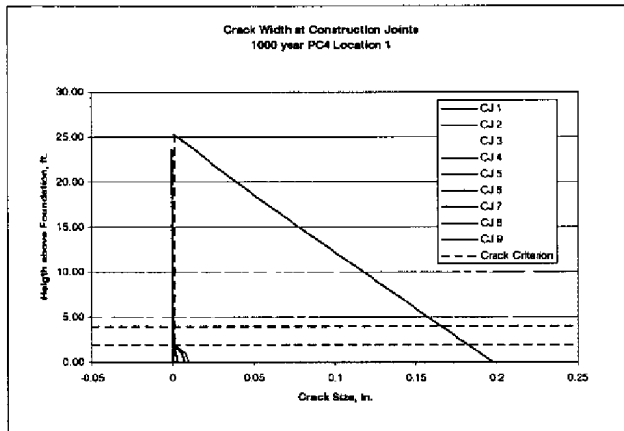
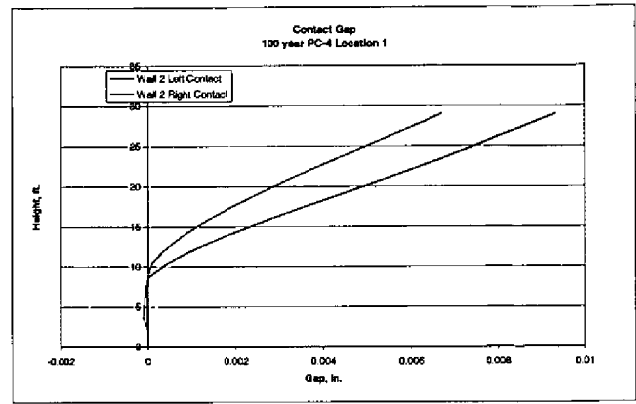
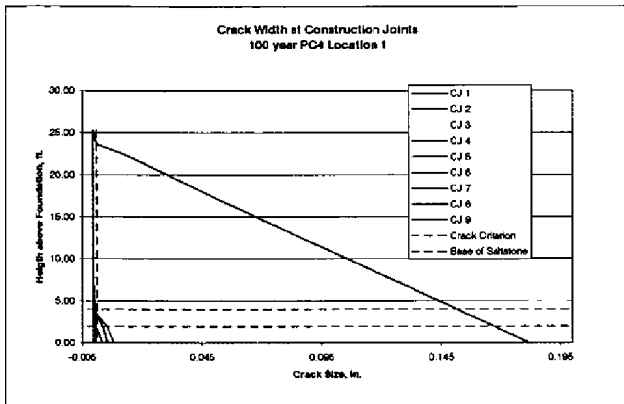
401

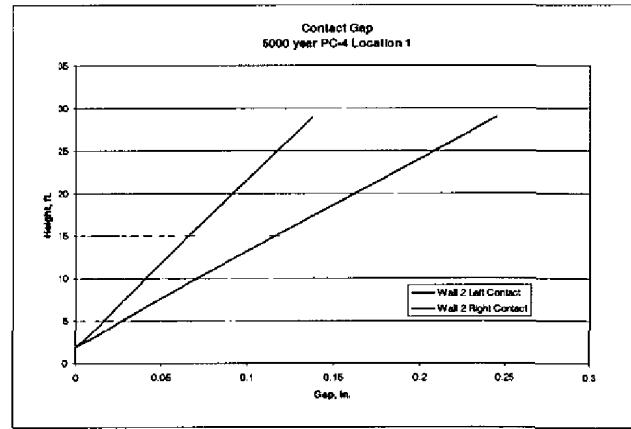
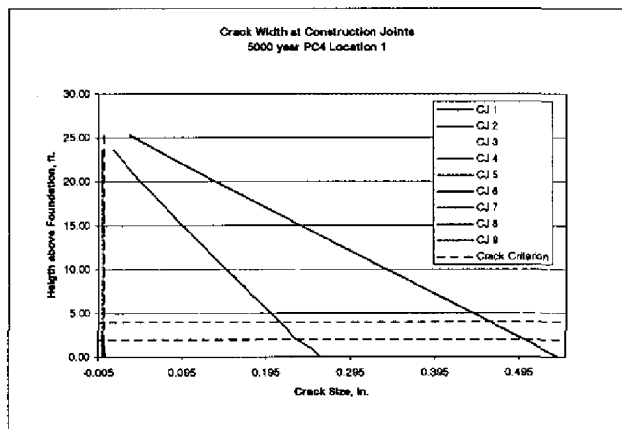
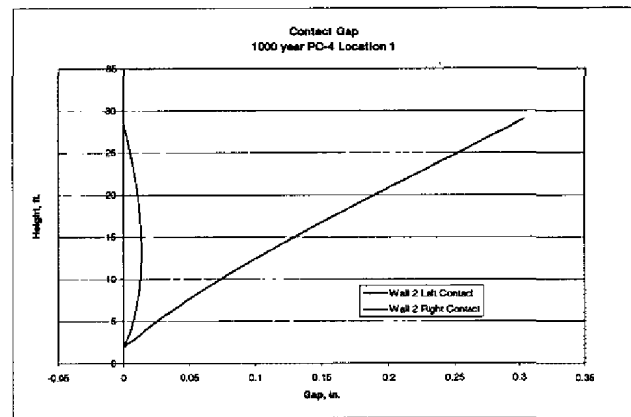
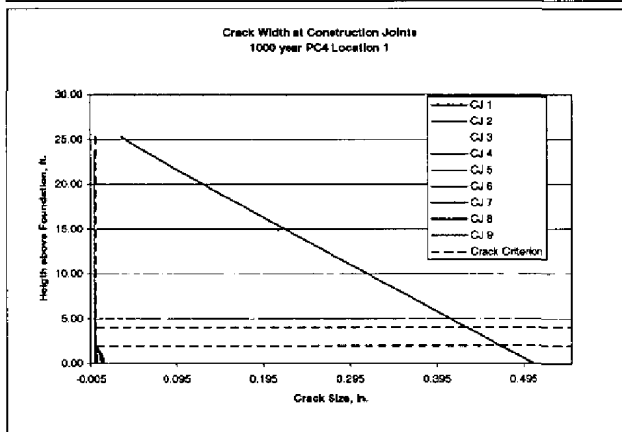
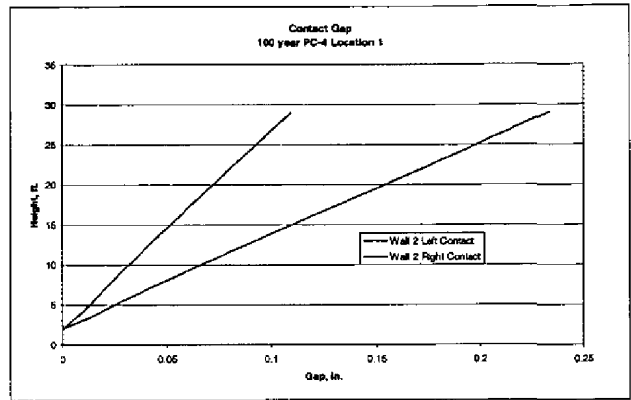
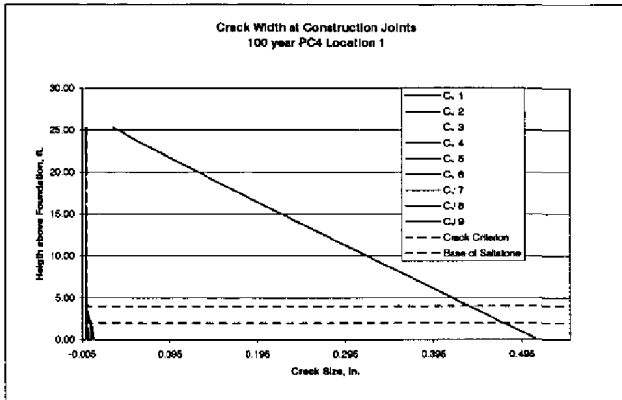


T-CLC-2-00000, Rev. 0

402

PC-4 Differential Settlement - Location 1
R = 62 ft.

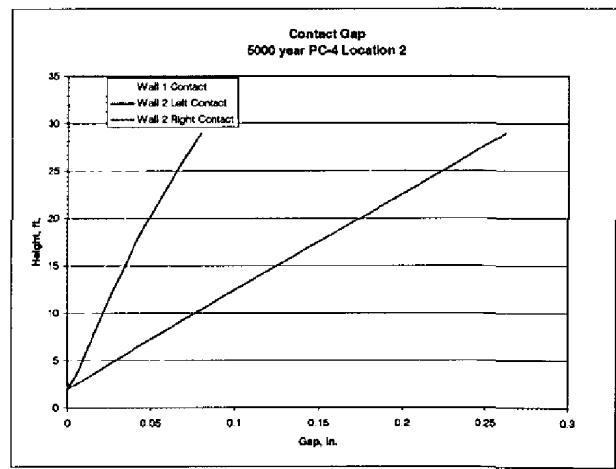
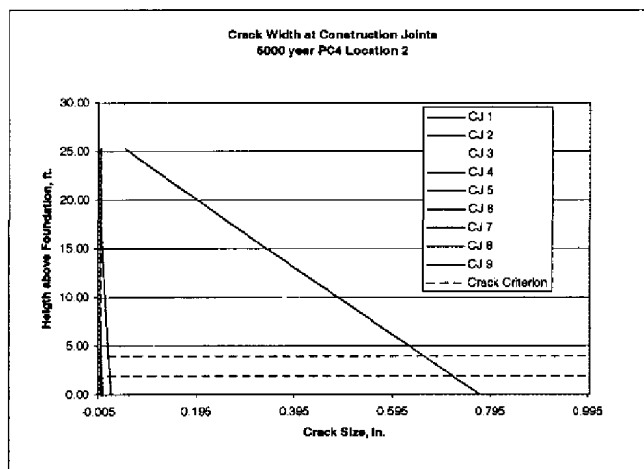
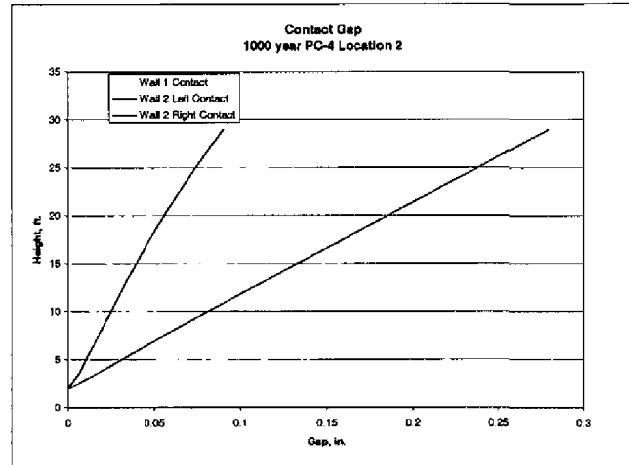
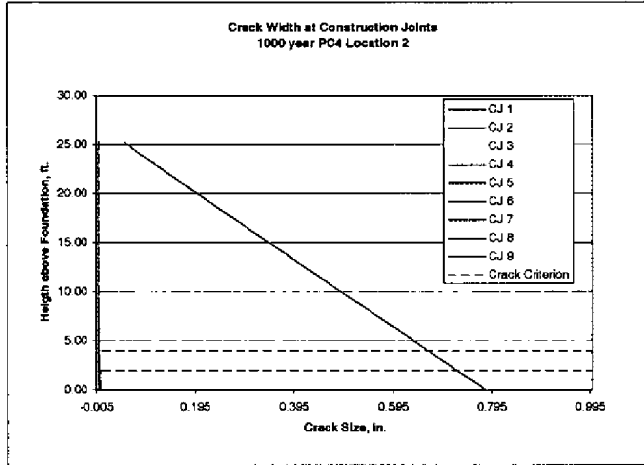
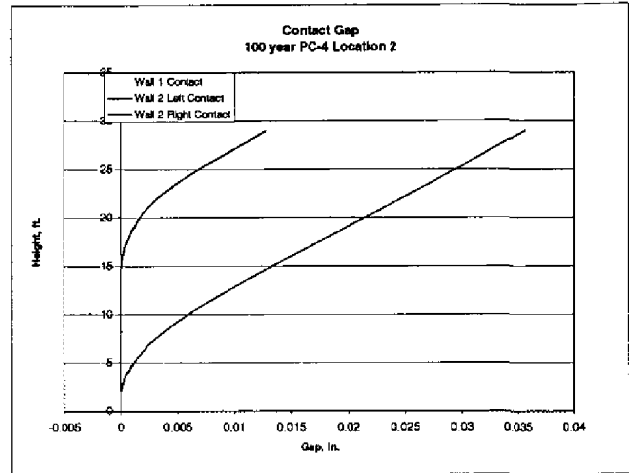
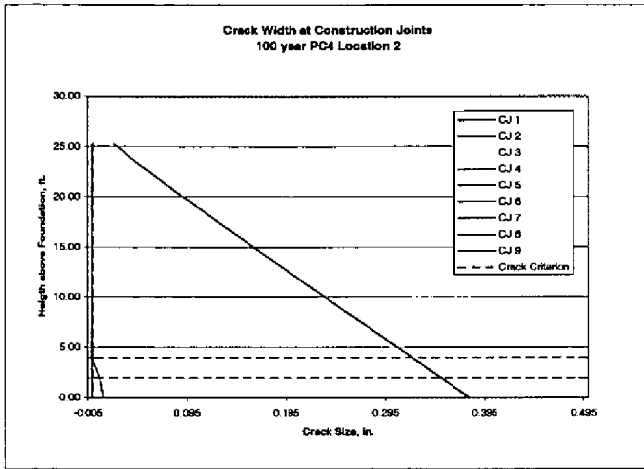


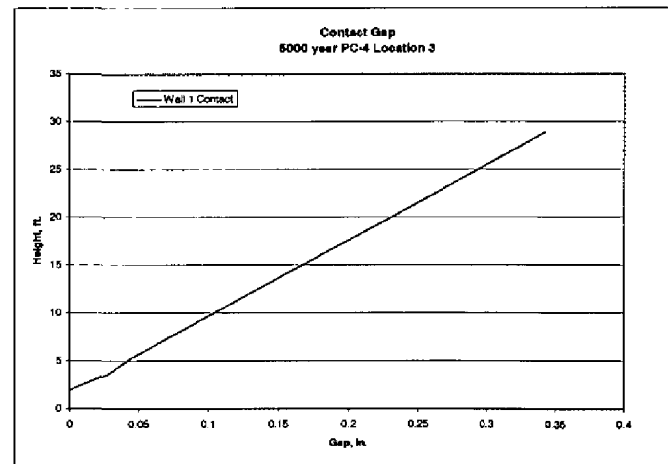
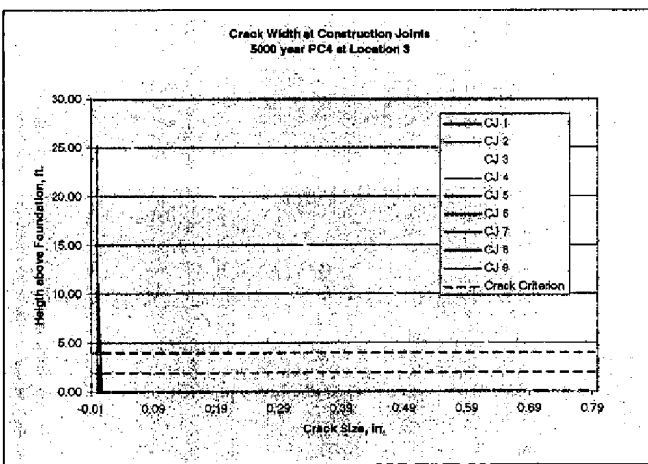
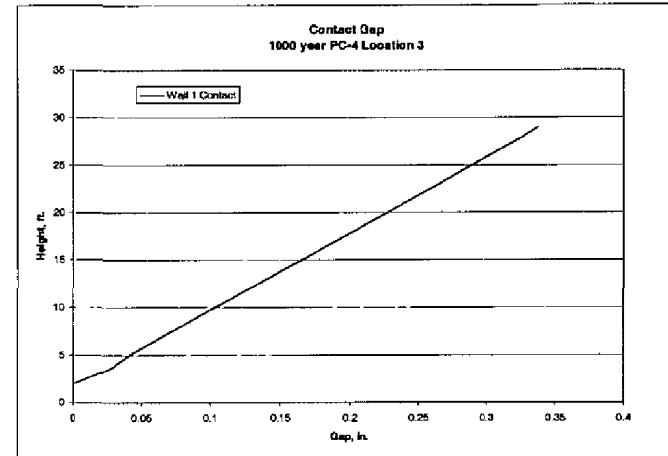
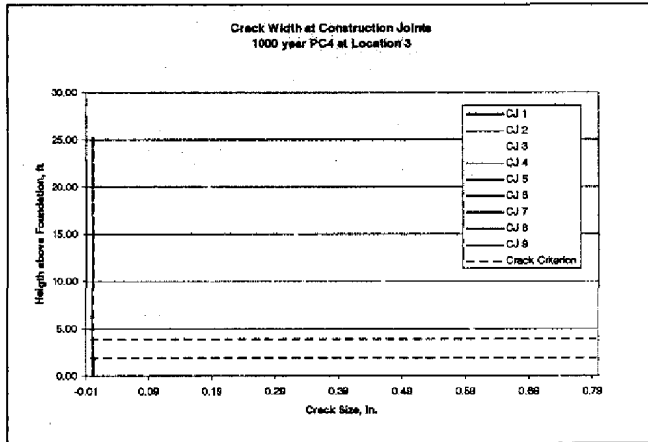
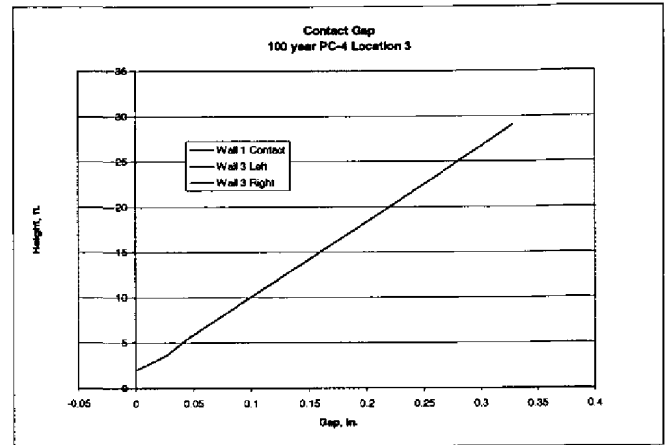
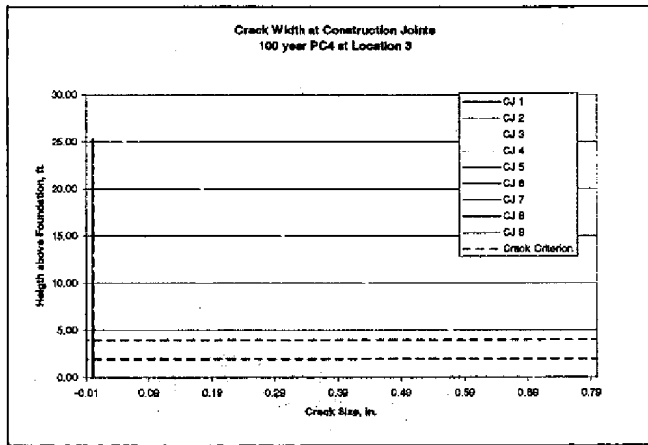


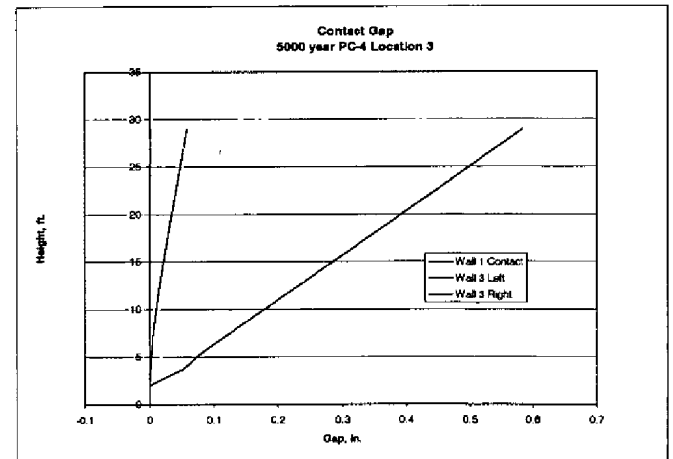
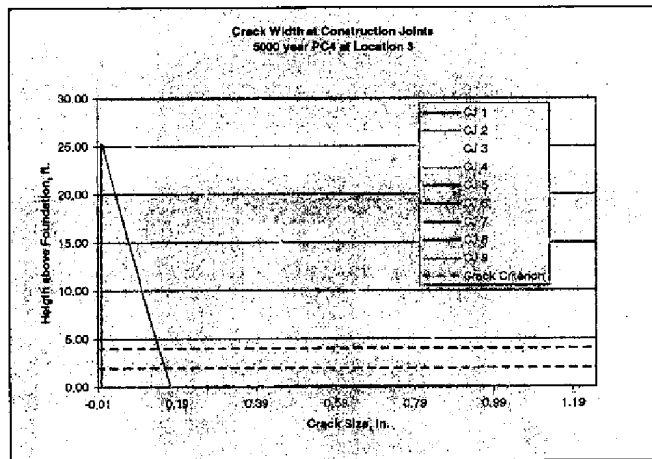
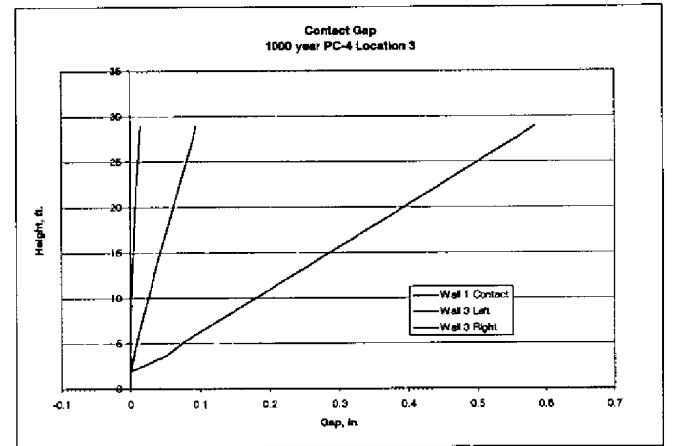
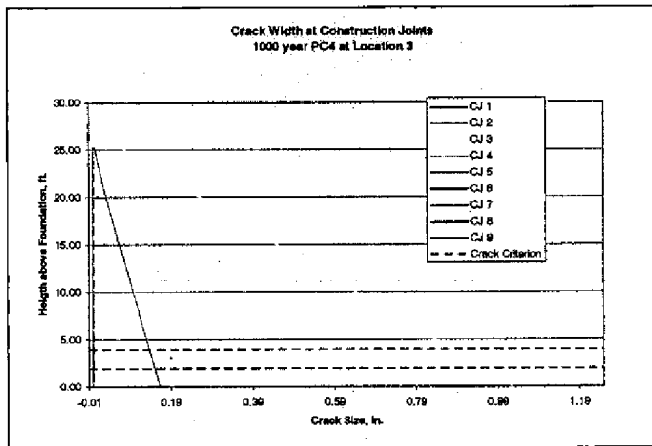
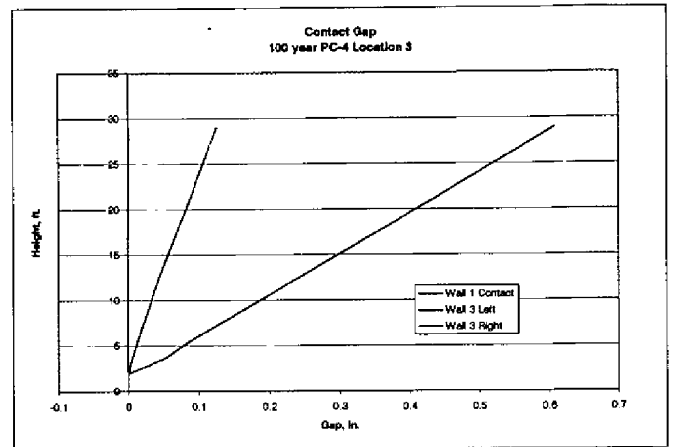
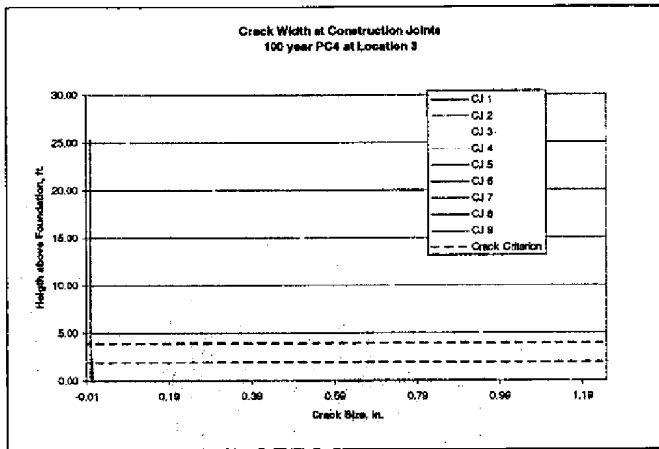
T-CLC-8-00006, Rev. 0

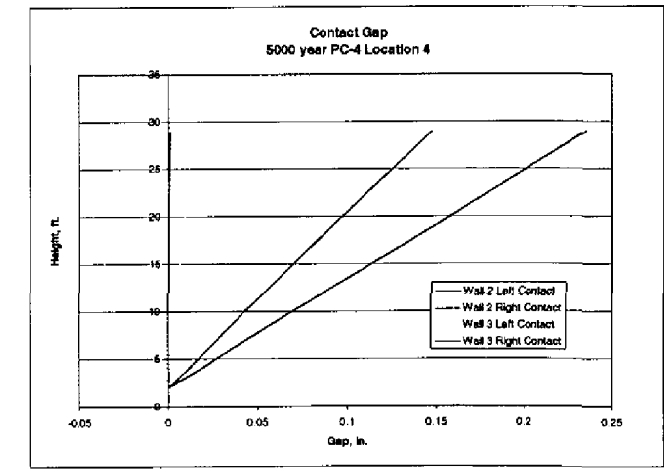
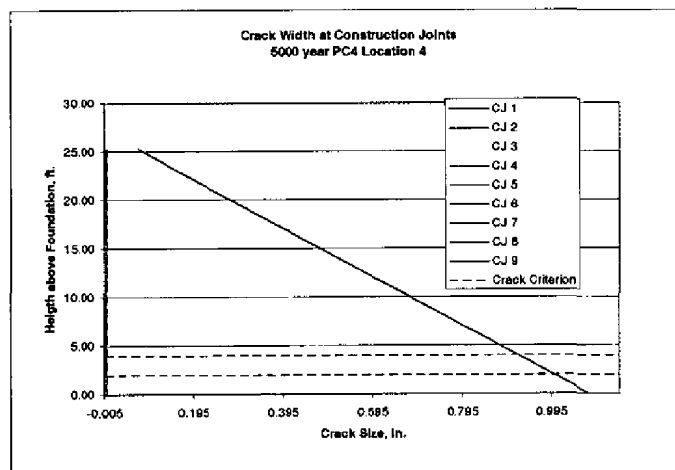
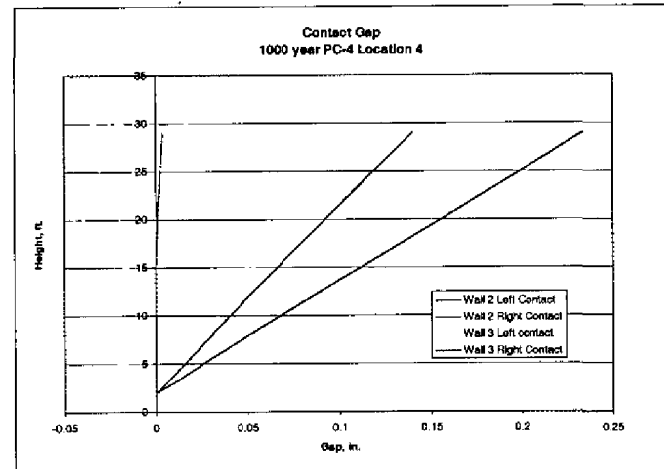
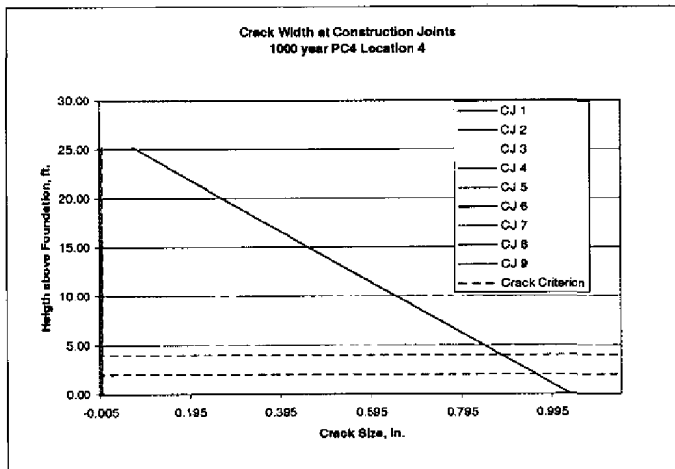
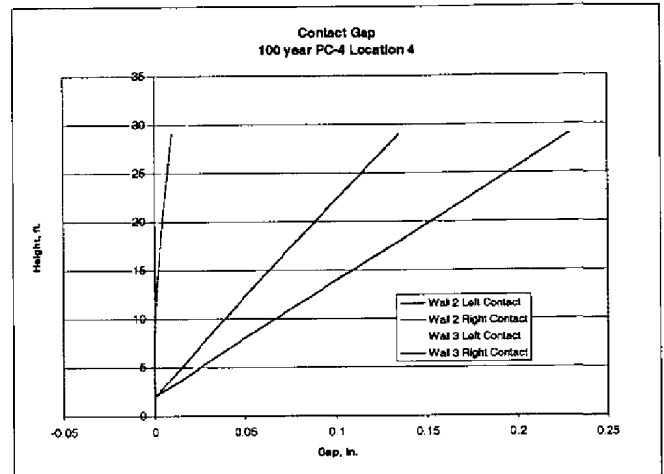
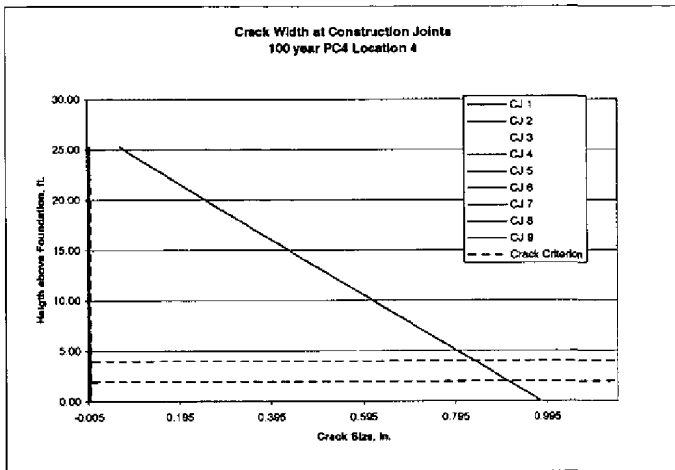
PC-4 Differential Settlement - Location 2
R = 124 ft.

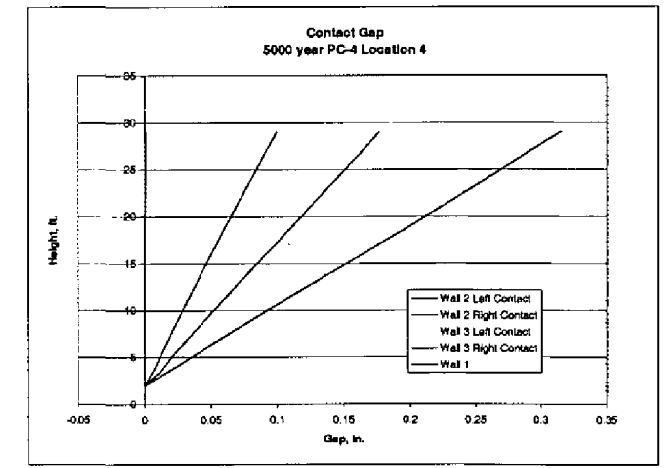
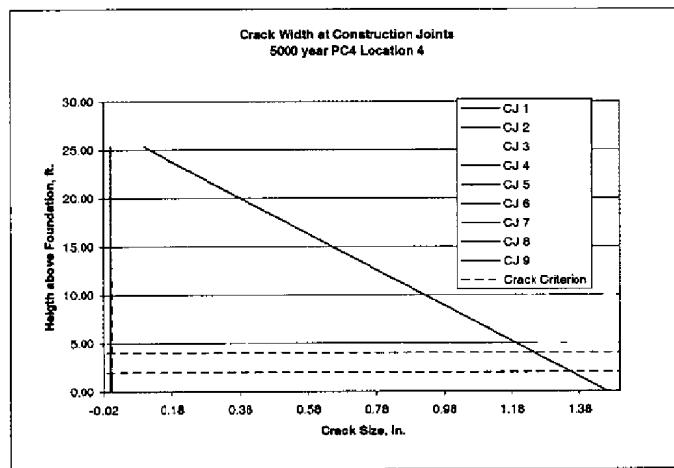
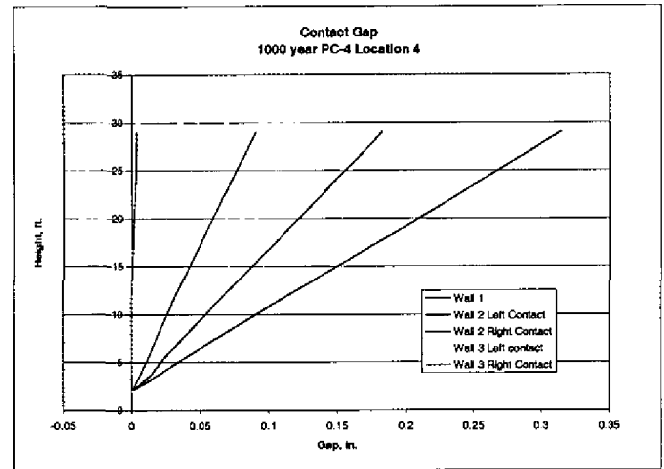
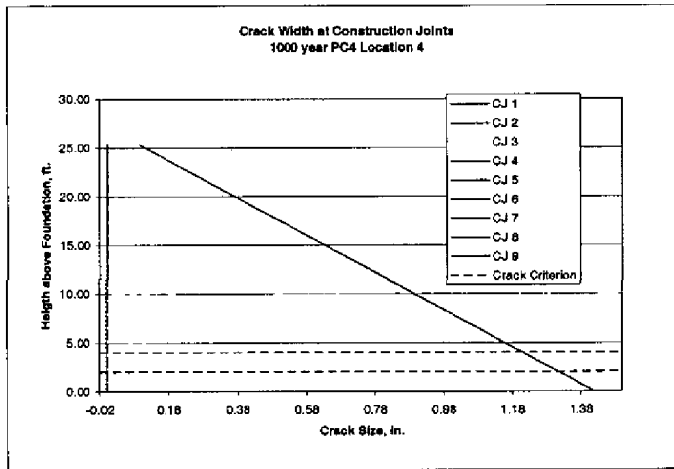
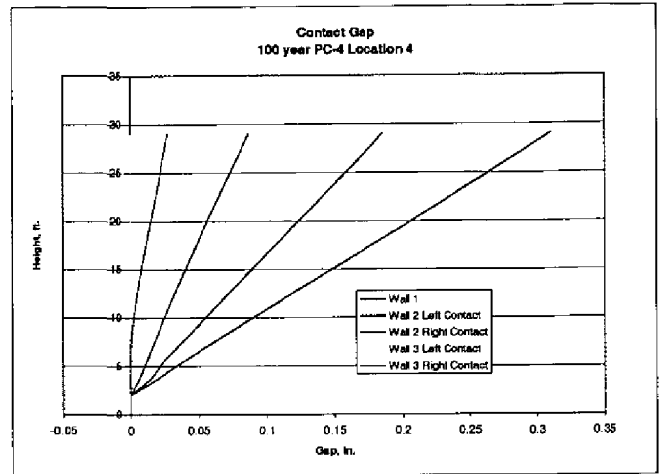
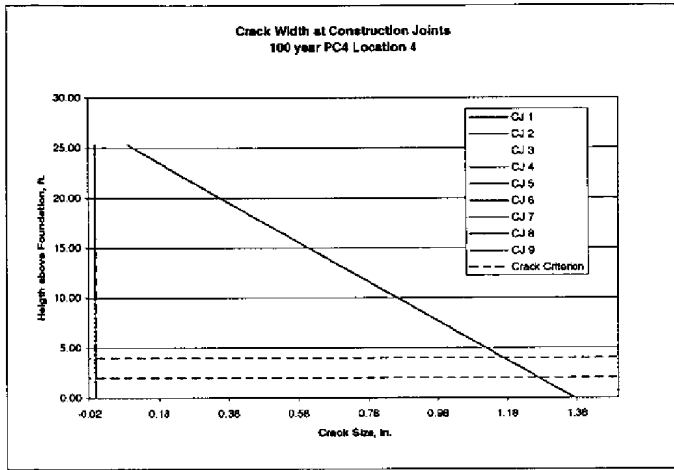
404



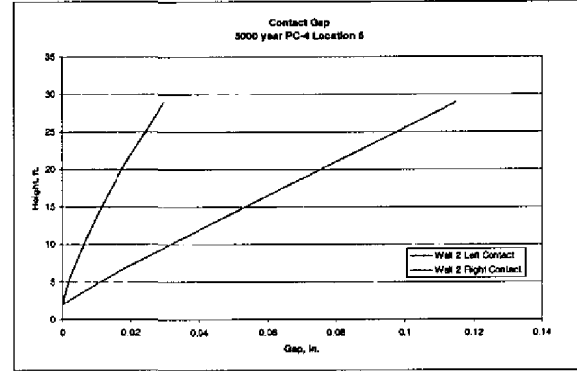
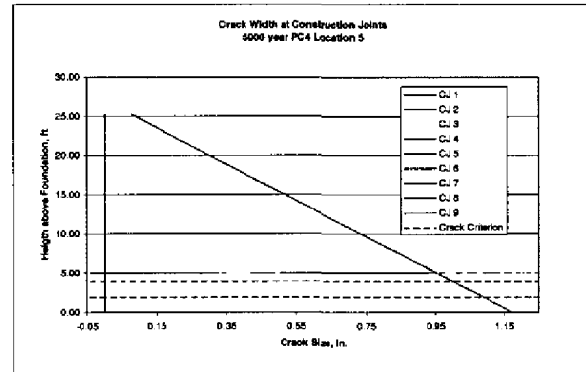
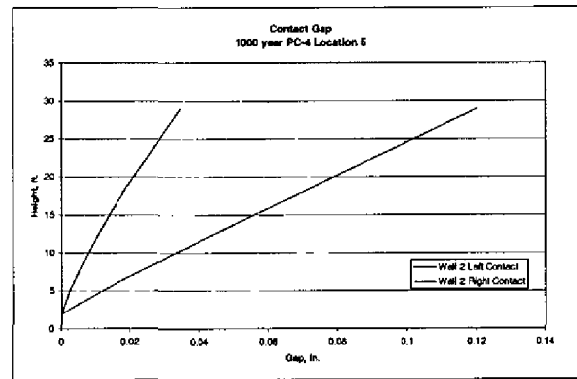
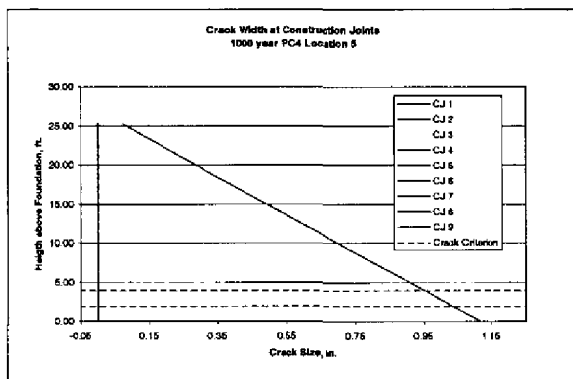
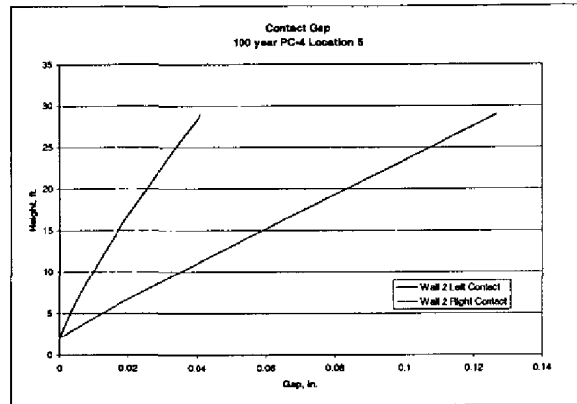
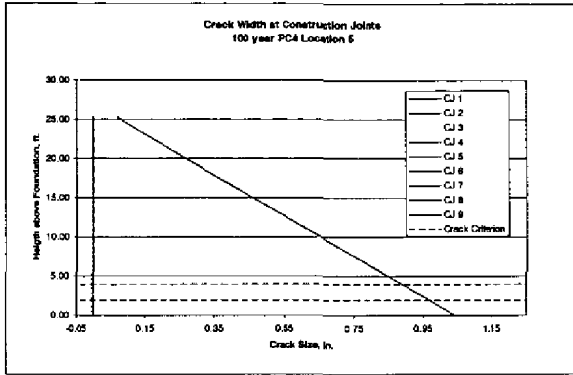




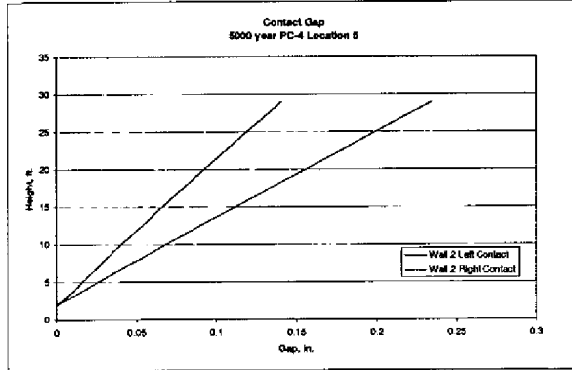
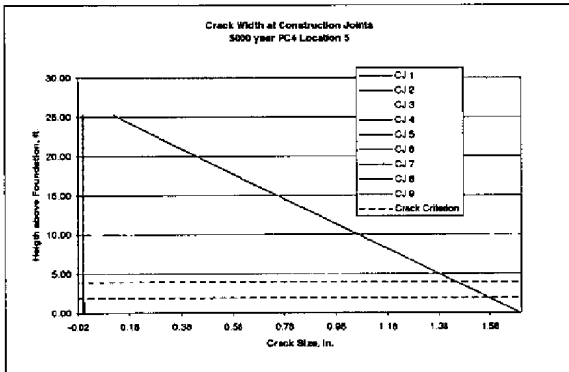
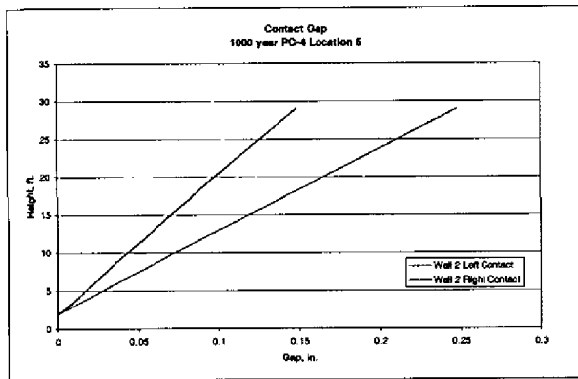
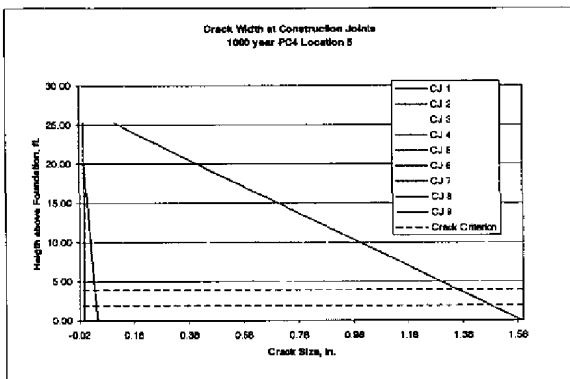
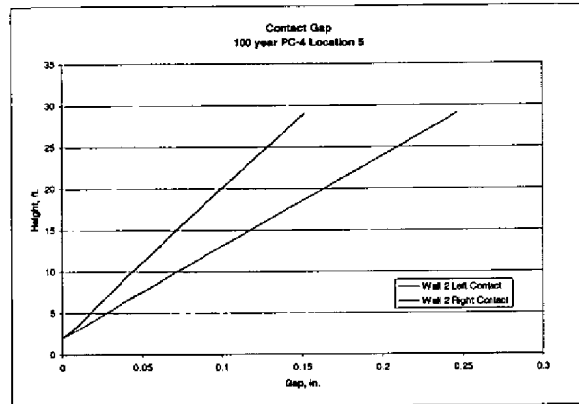
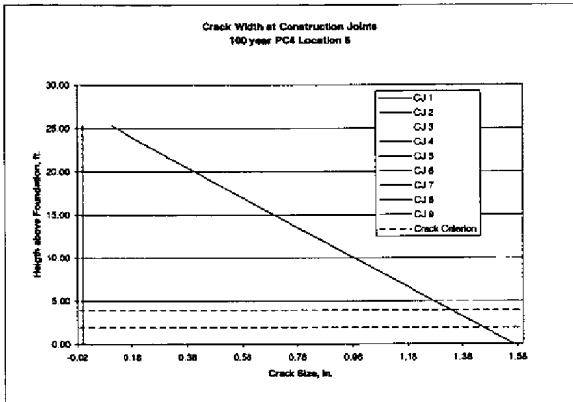


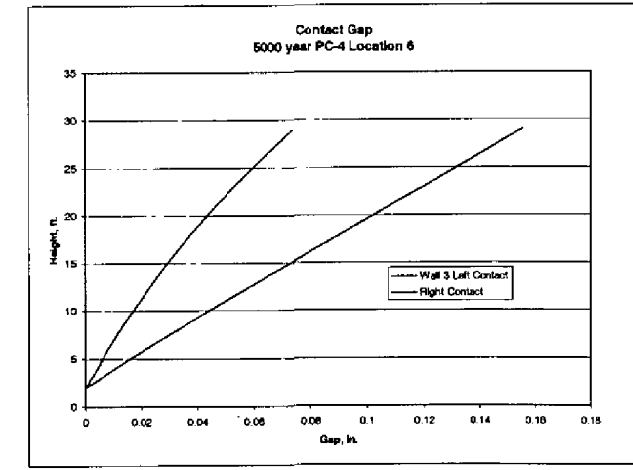
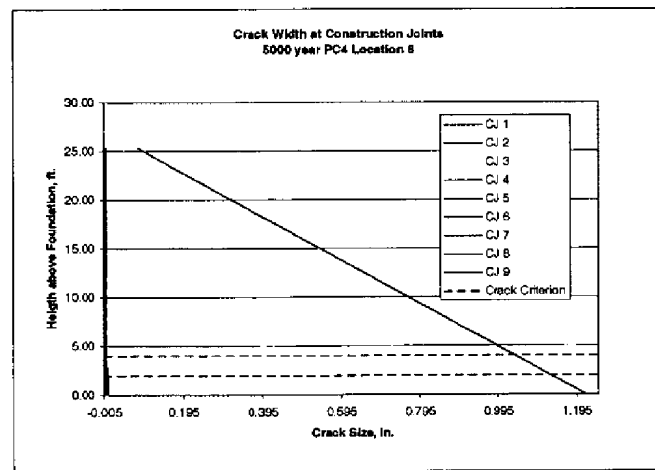
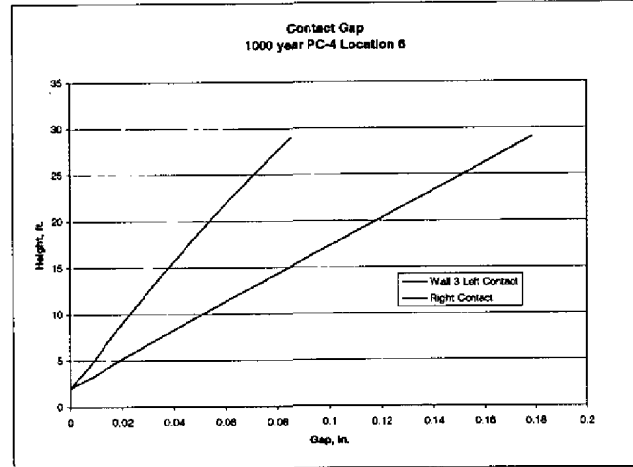
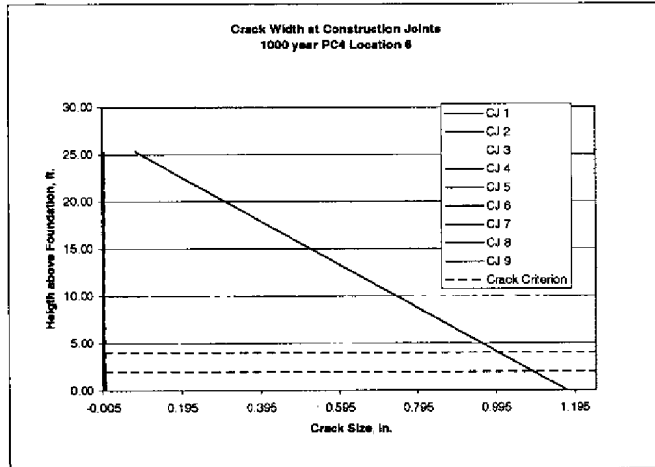
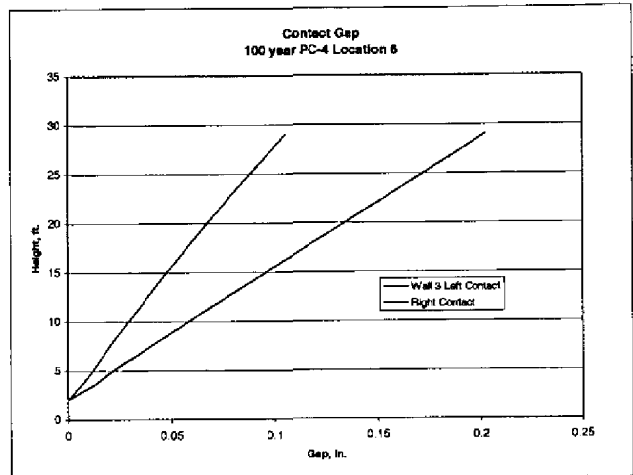
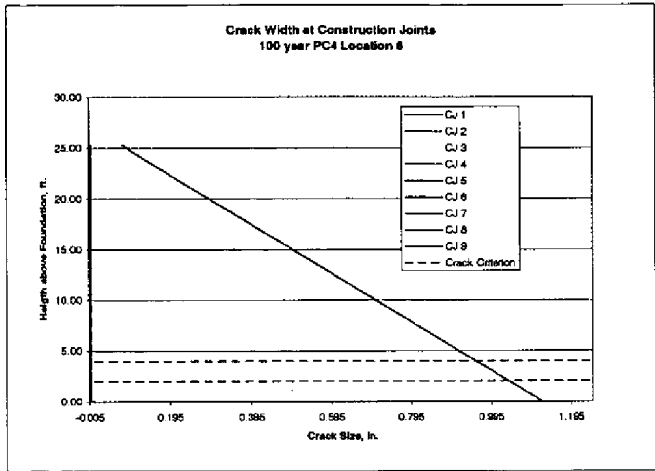


PC-4 Differential Settlement - Location 5
R = 62 ft.

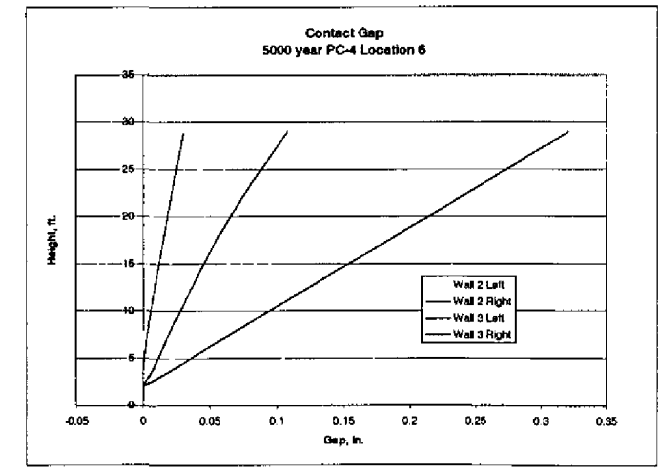
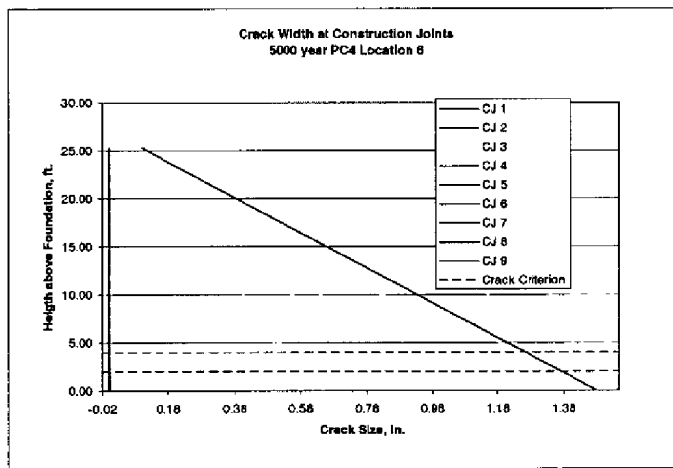
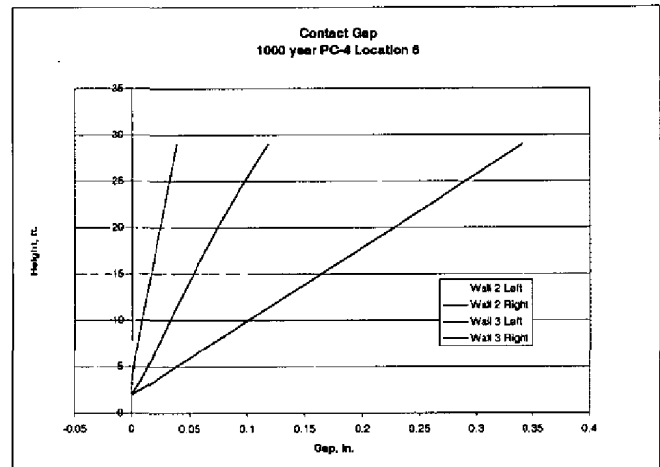
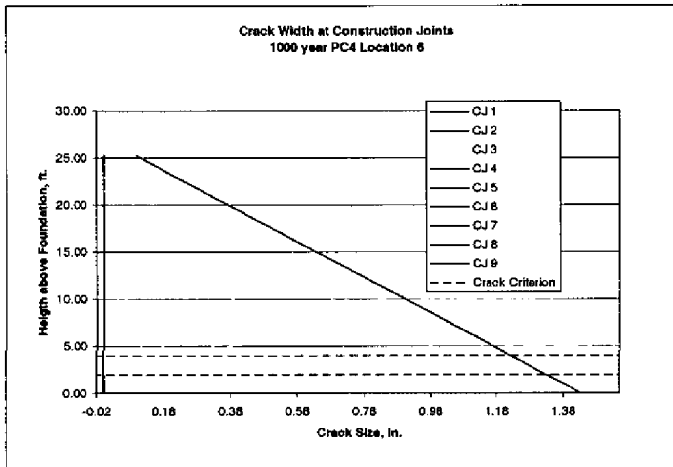
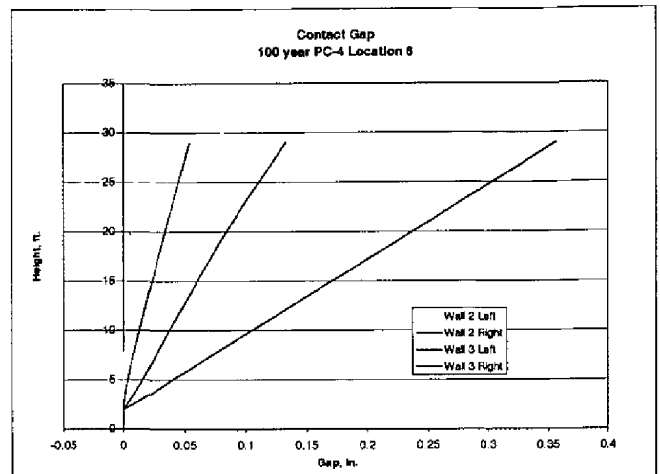
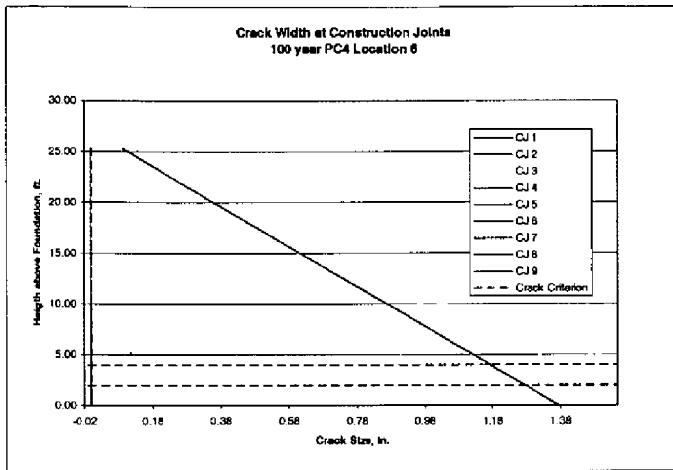


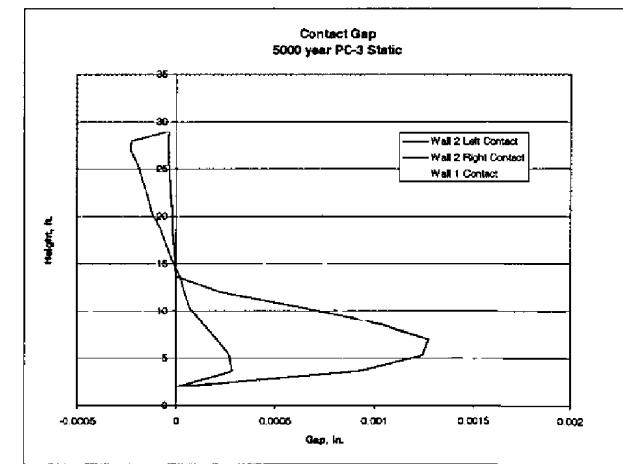
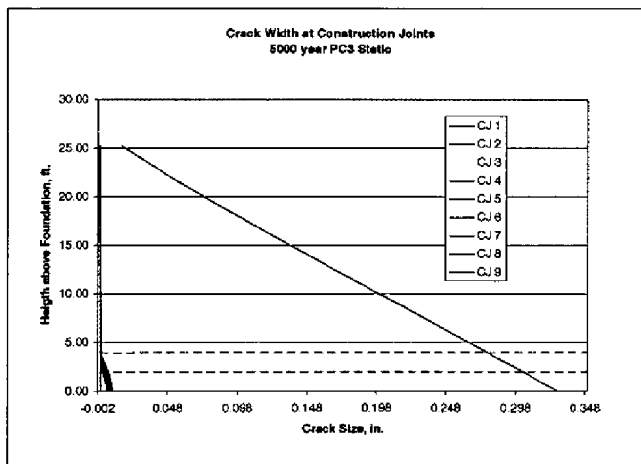
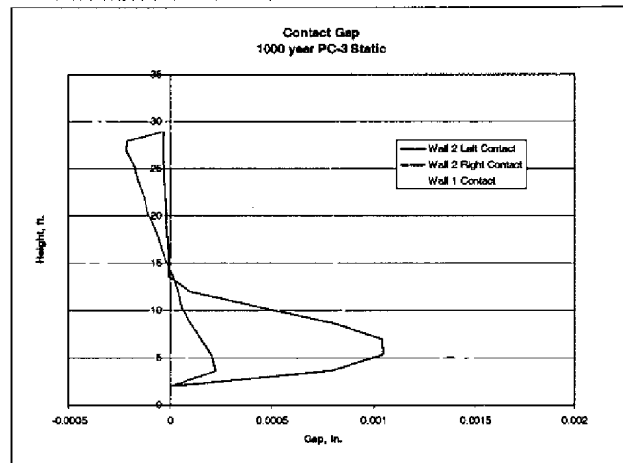
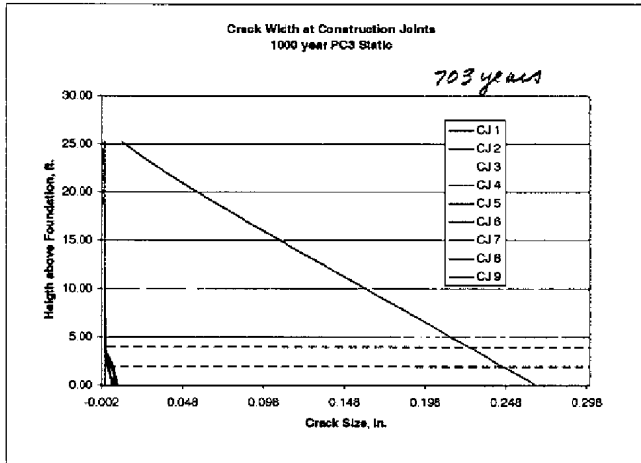
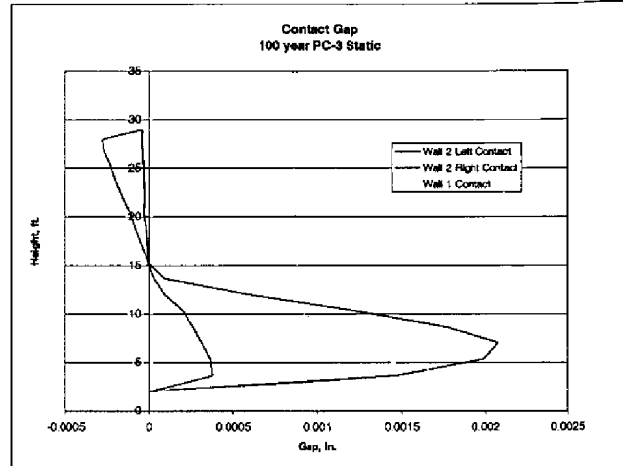
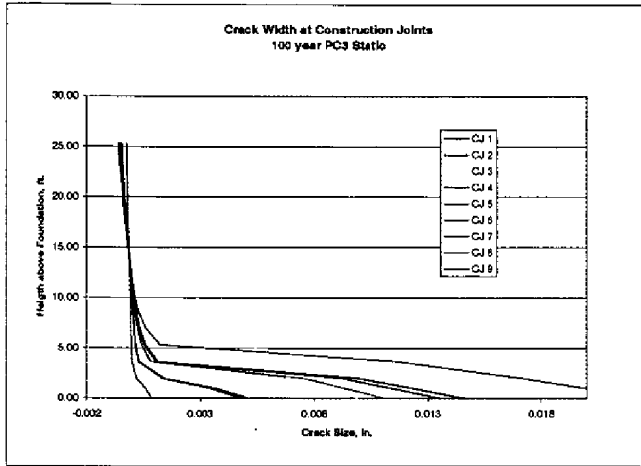
PC-4 Differential Settlement - Location 5
R = 124 ft.



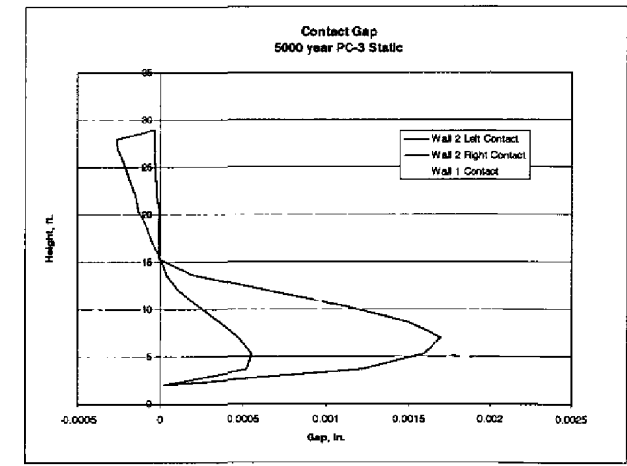
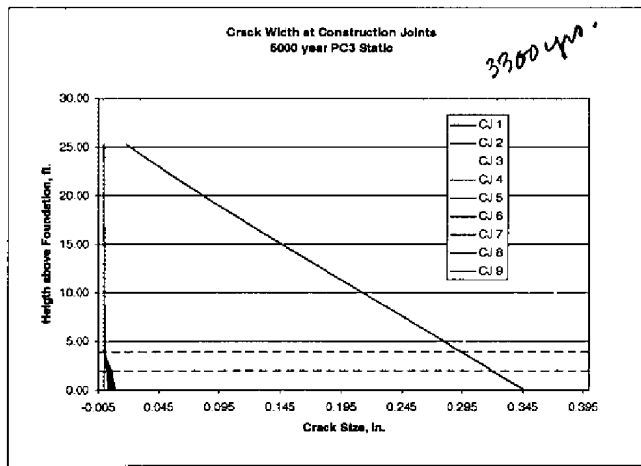
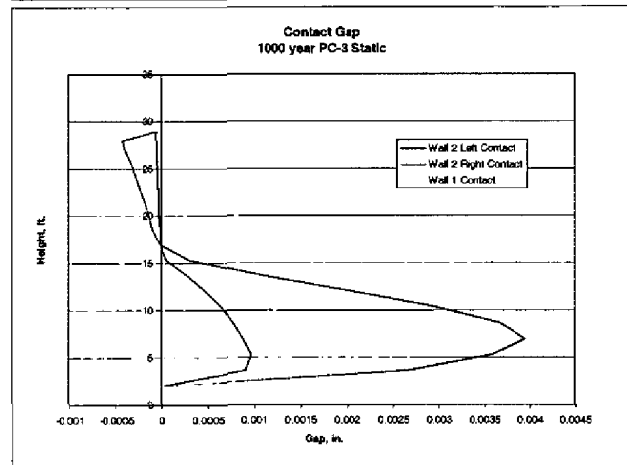
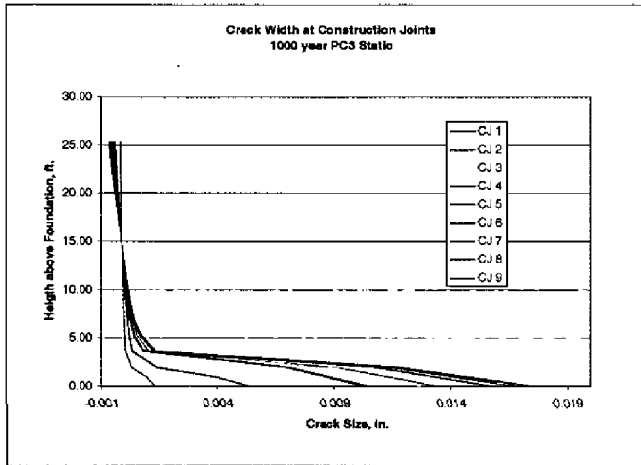
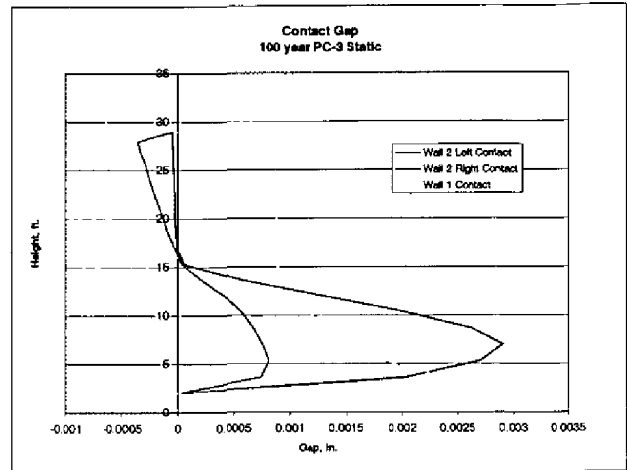
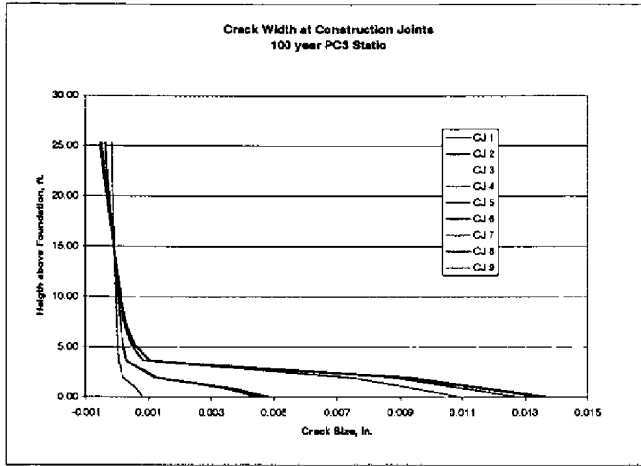


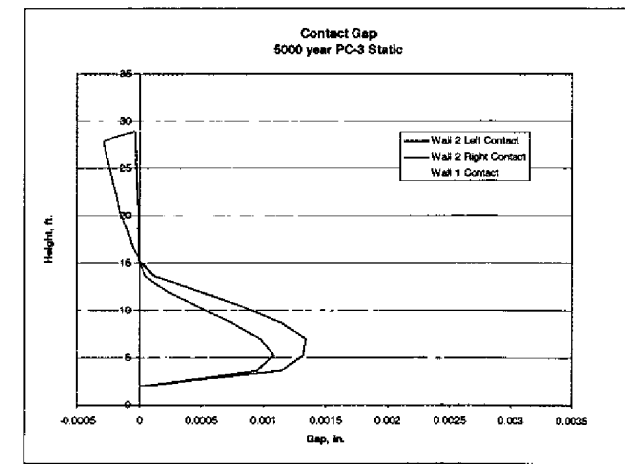
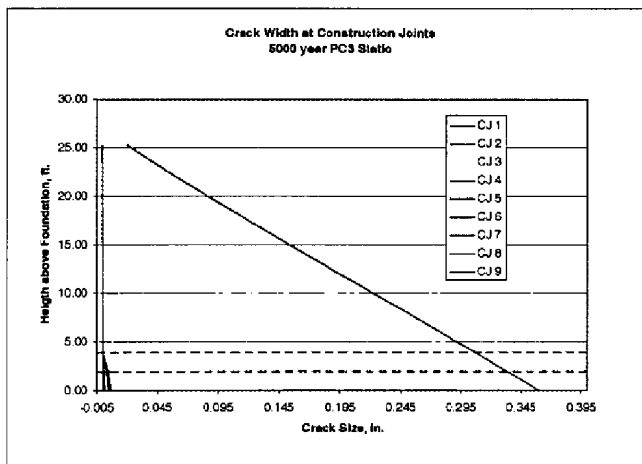
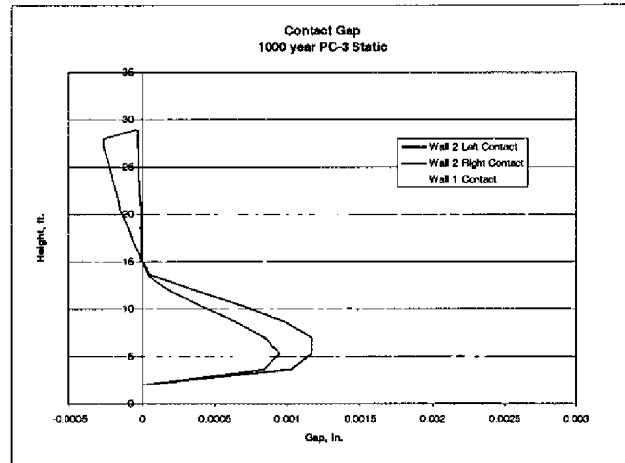
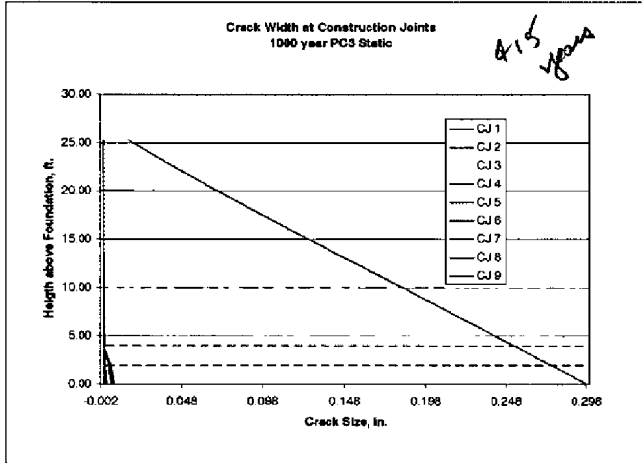
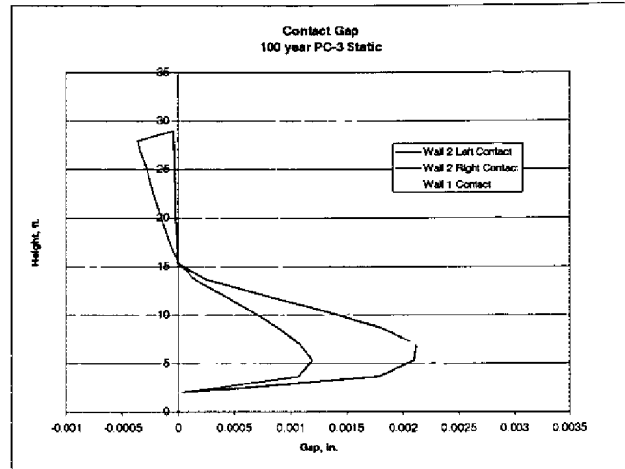
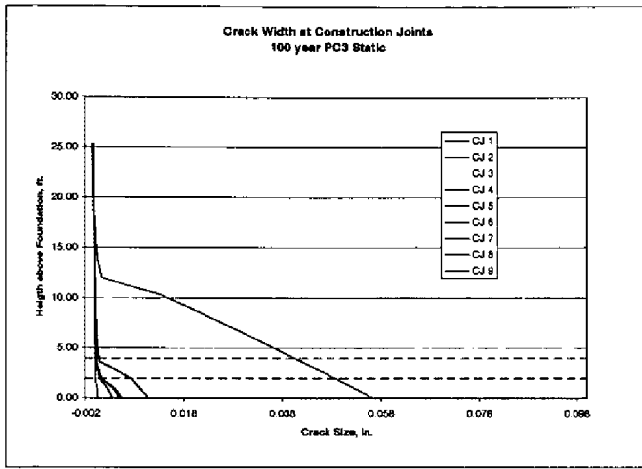
PC-4 Differential Settlement - Location 6
R = 124 ft.



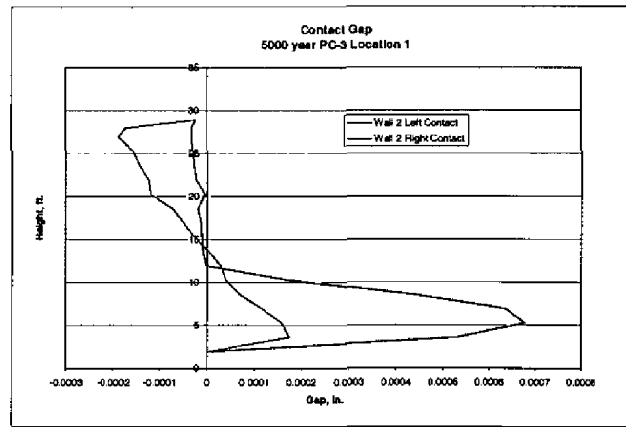
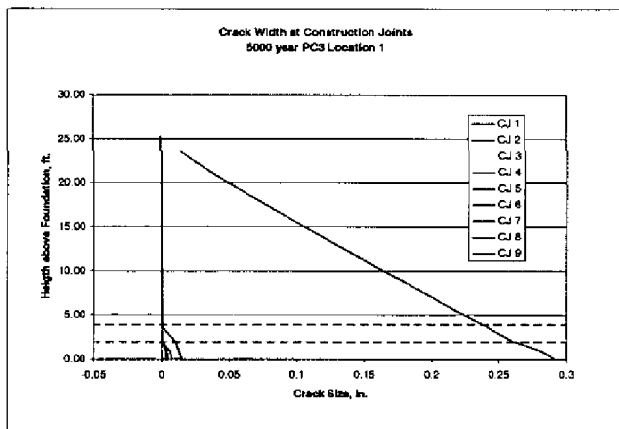
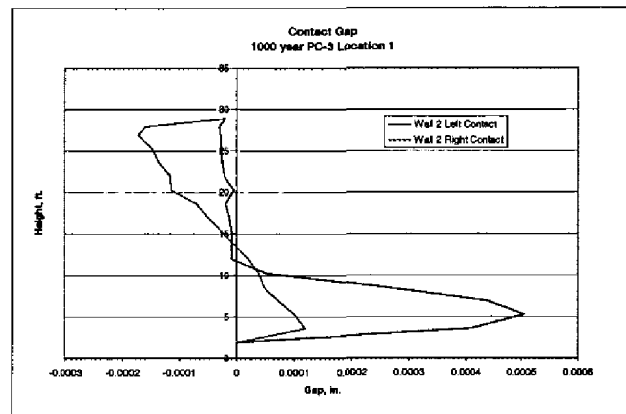
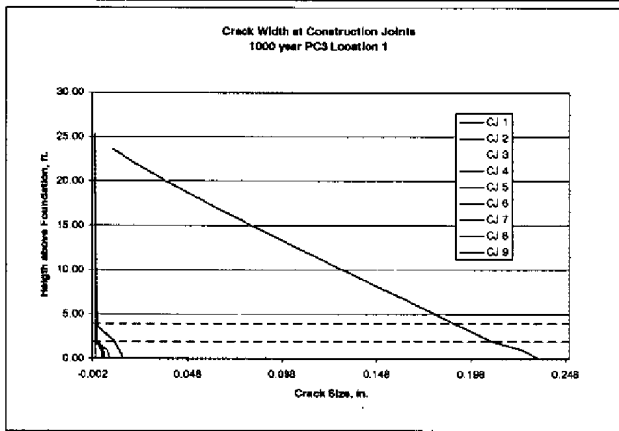
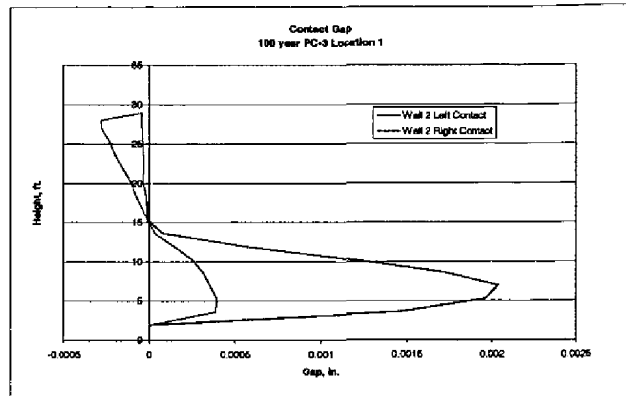
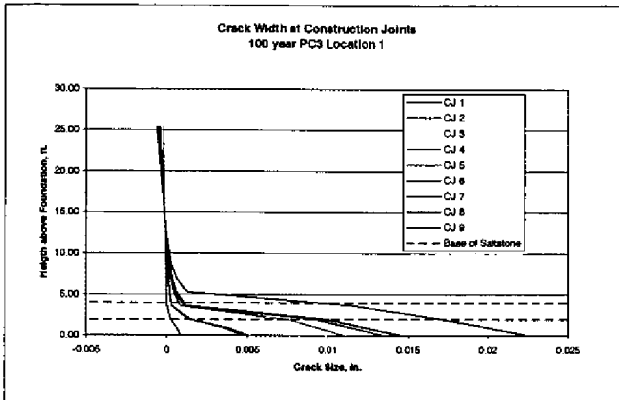


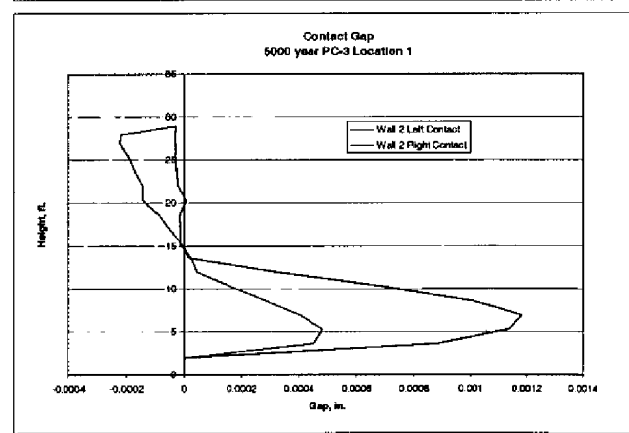
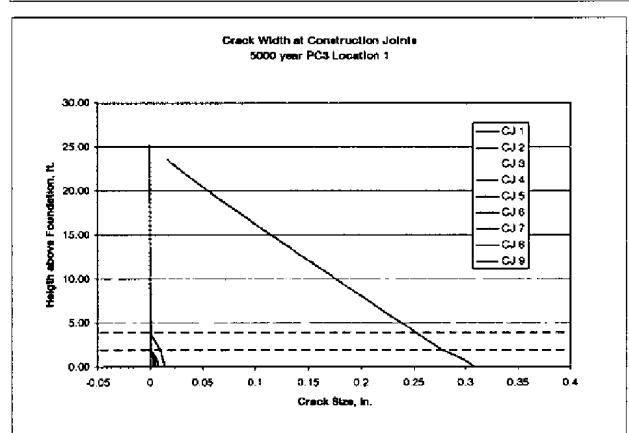
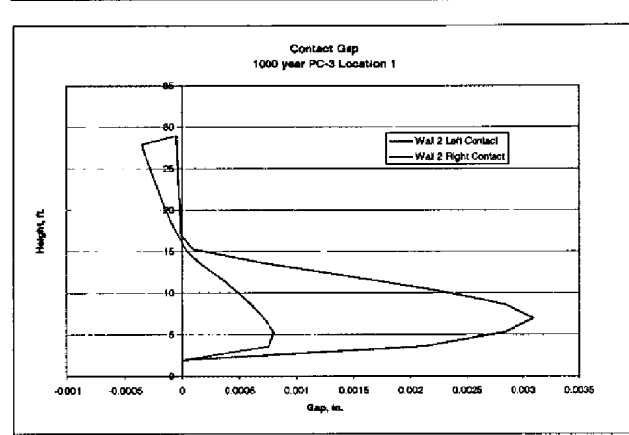
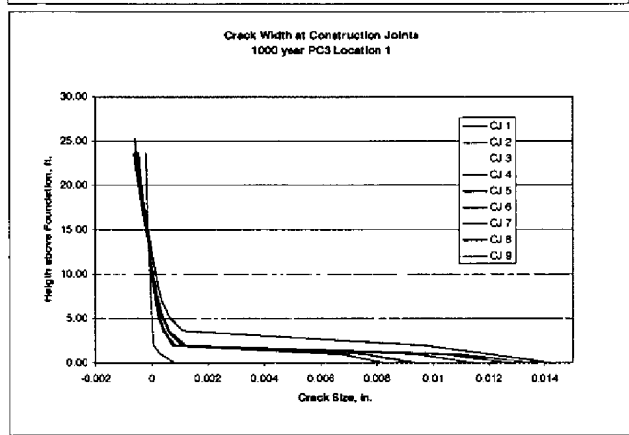
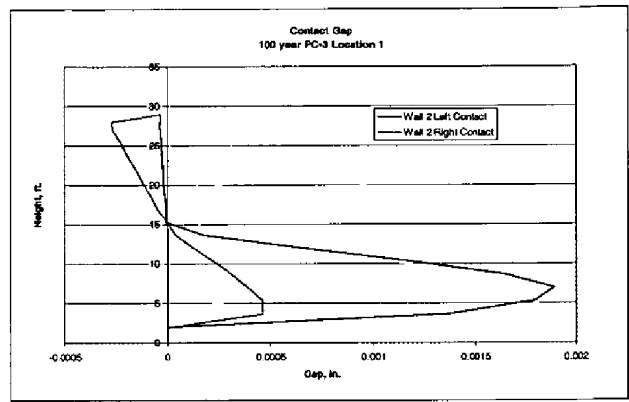
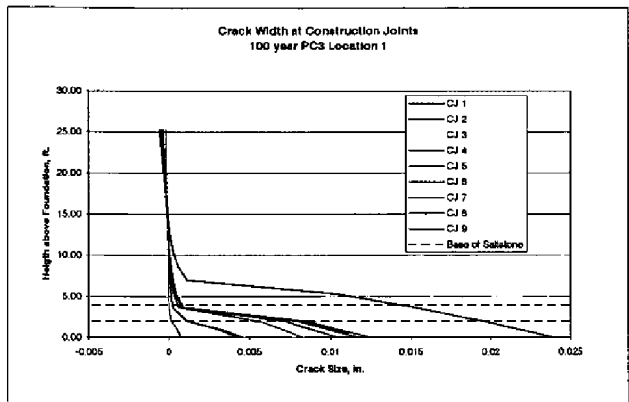
Static Settlement -
Mean Grout Modulus





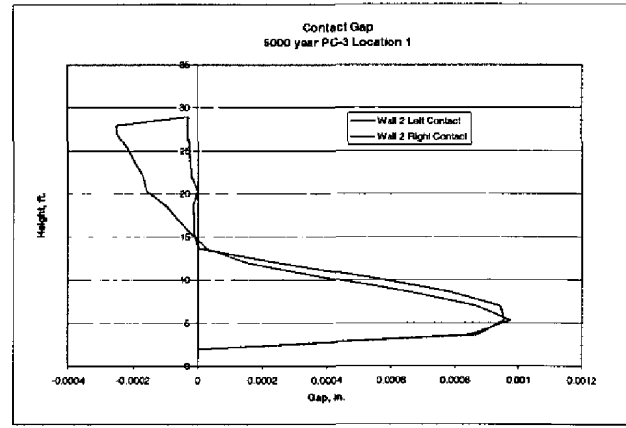
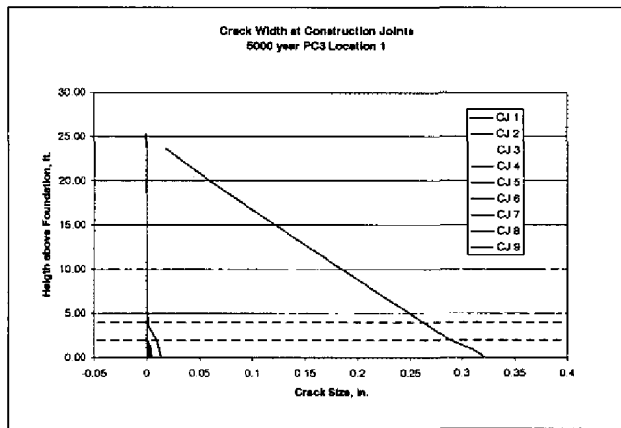
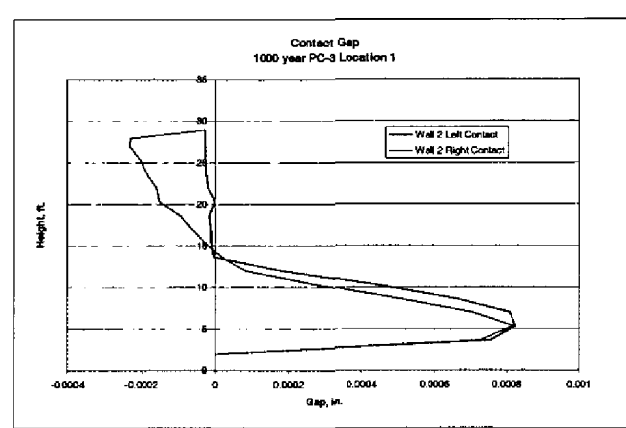
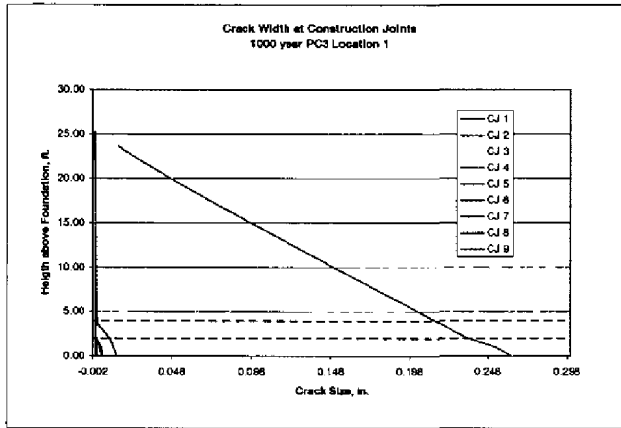
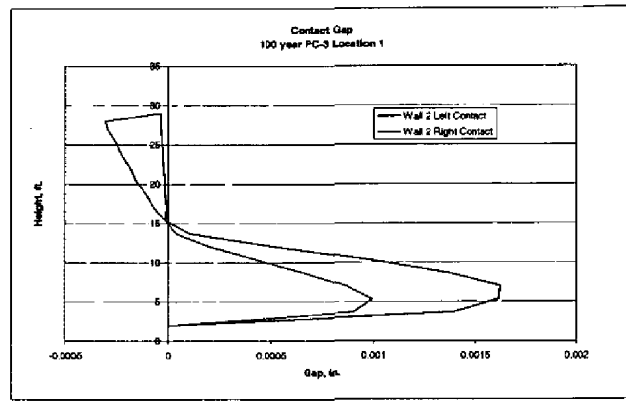
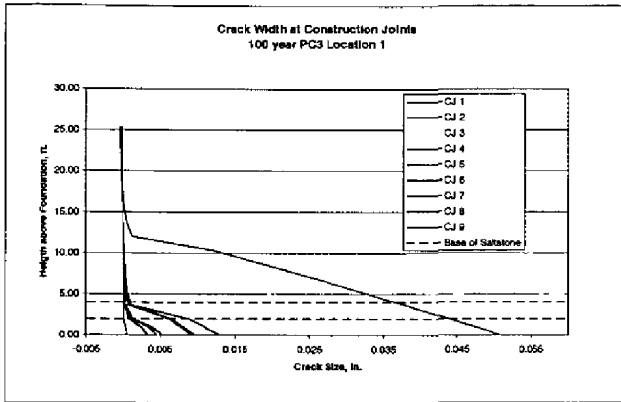
Location 1

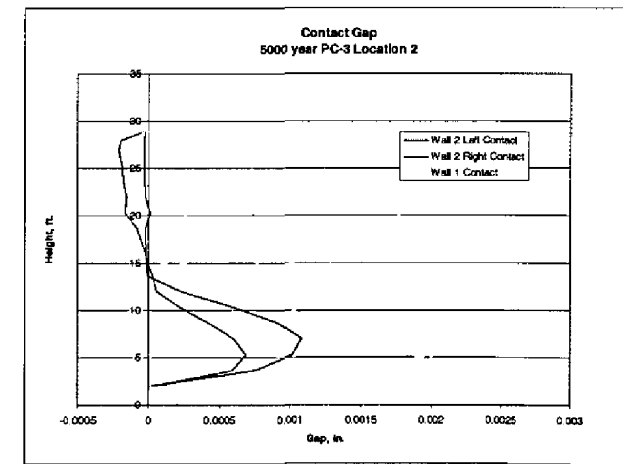
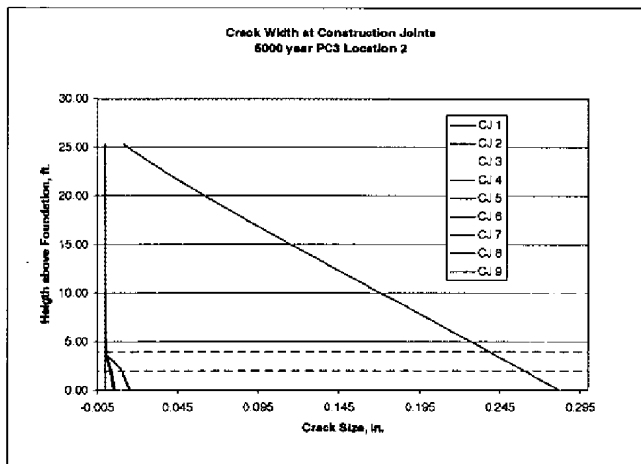
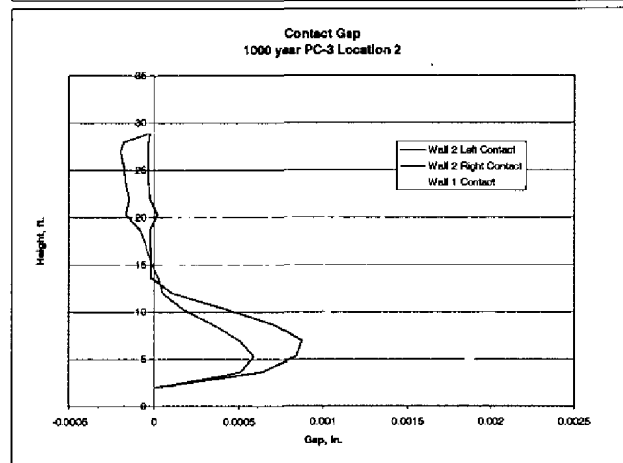
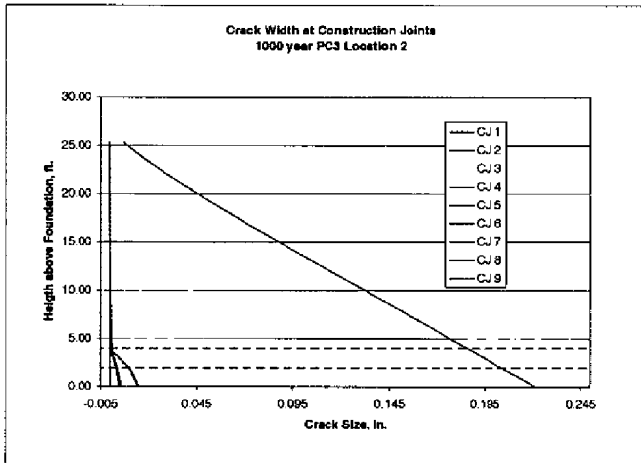
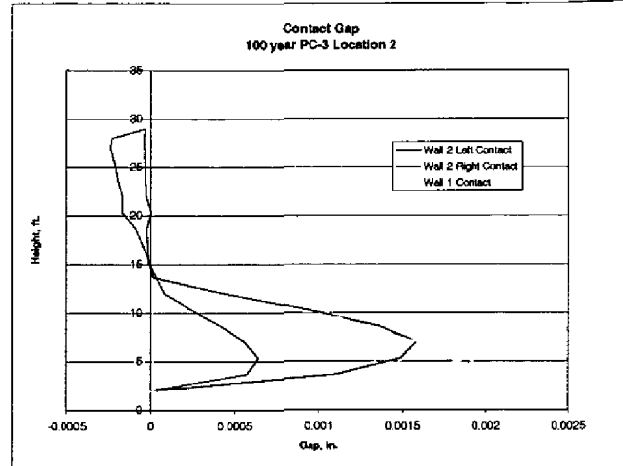
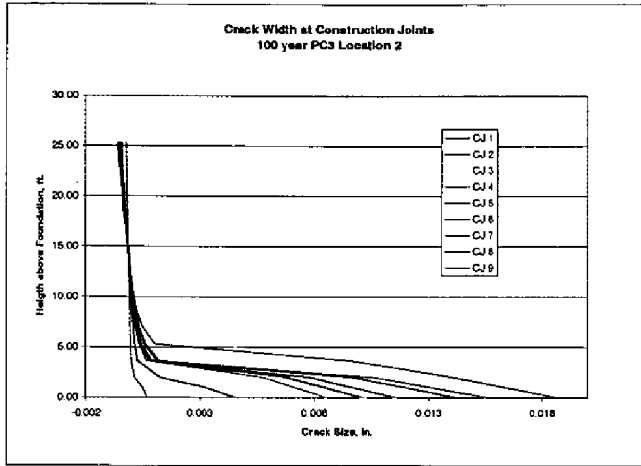




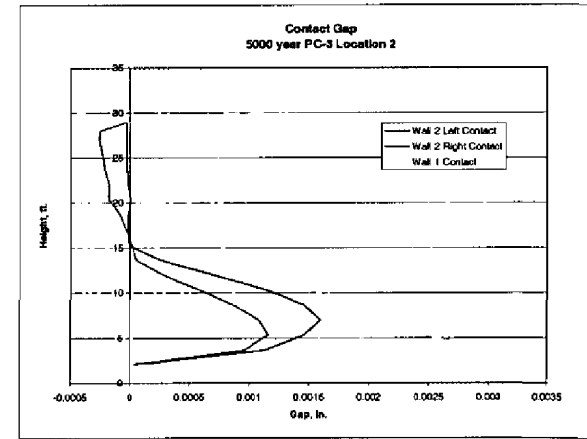
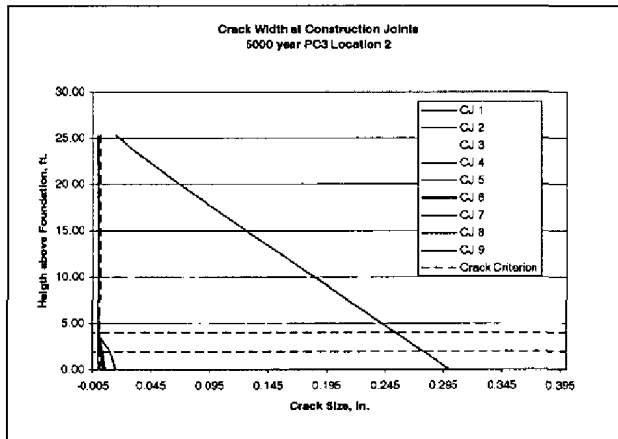
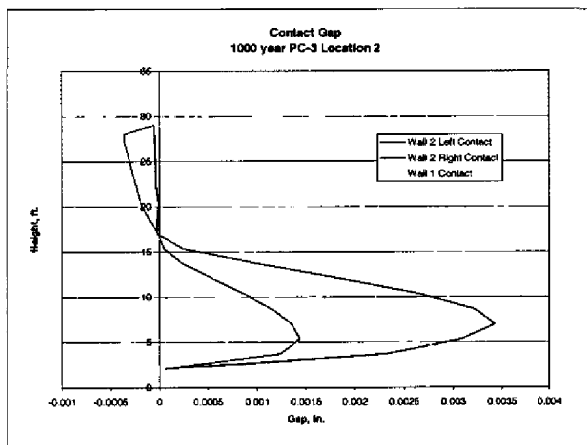
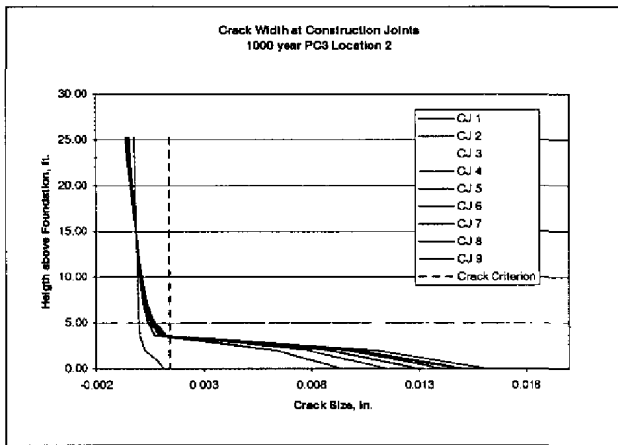
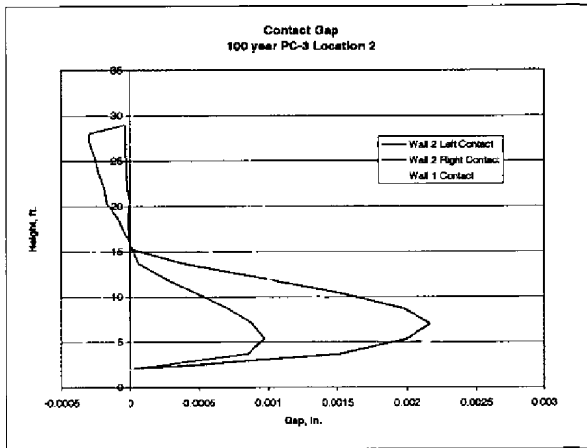
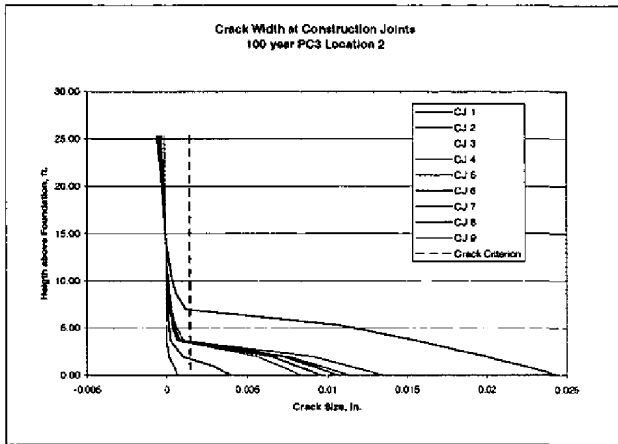
PC-3 Differential Settlement - High Grout Modulus

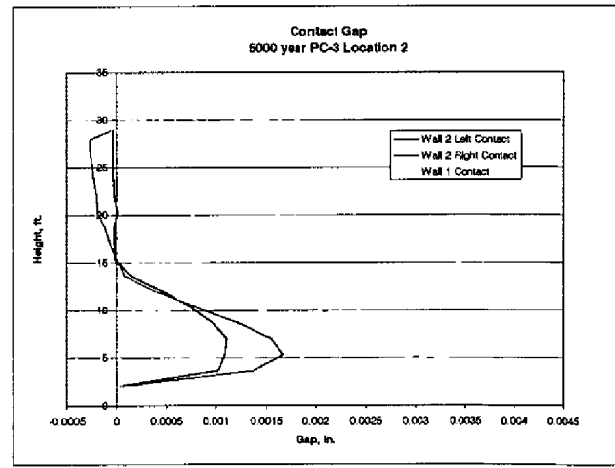
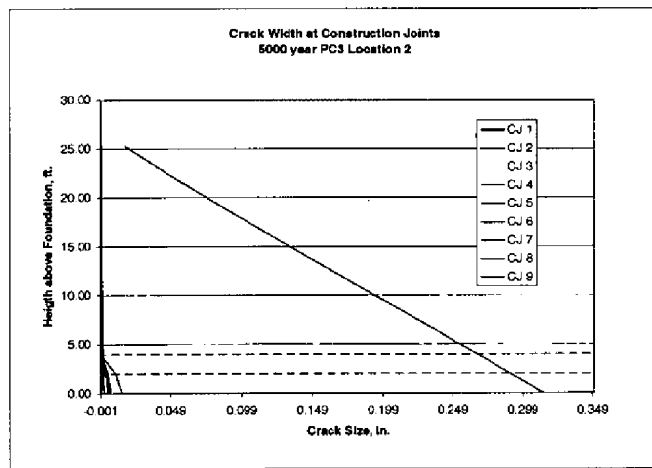
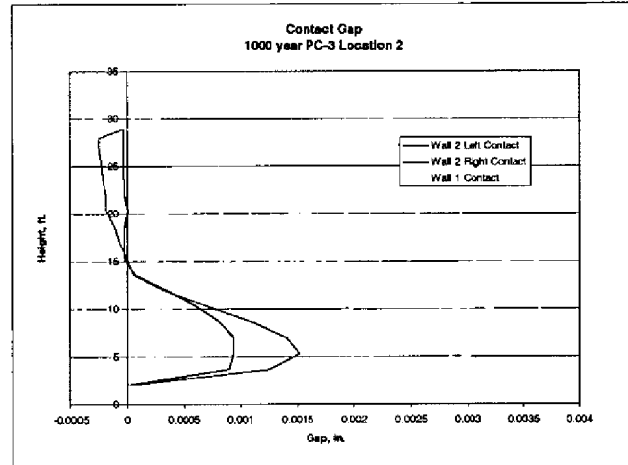
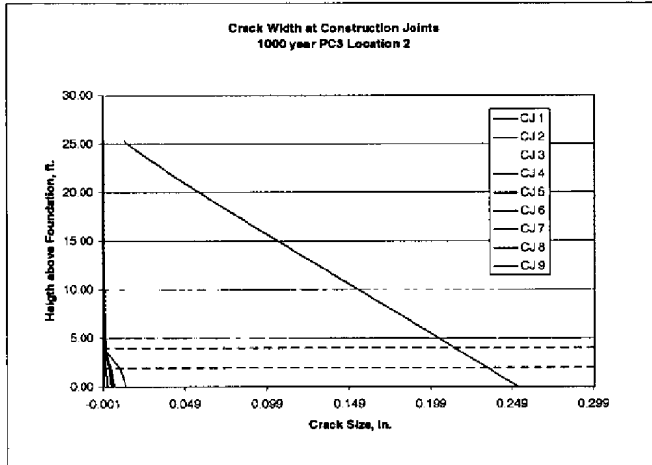
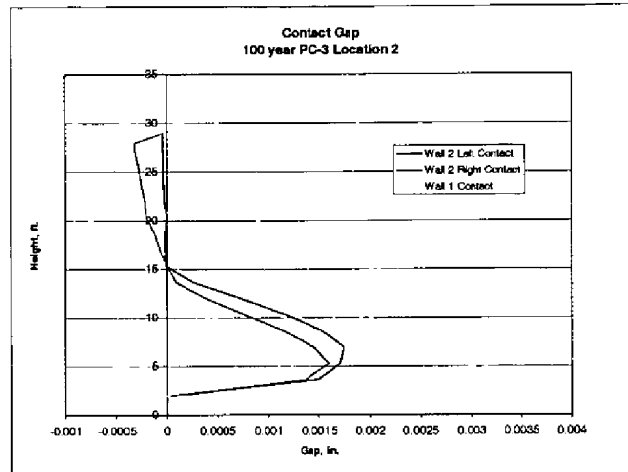
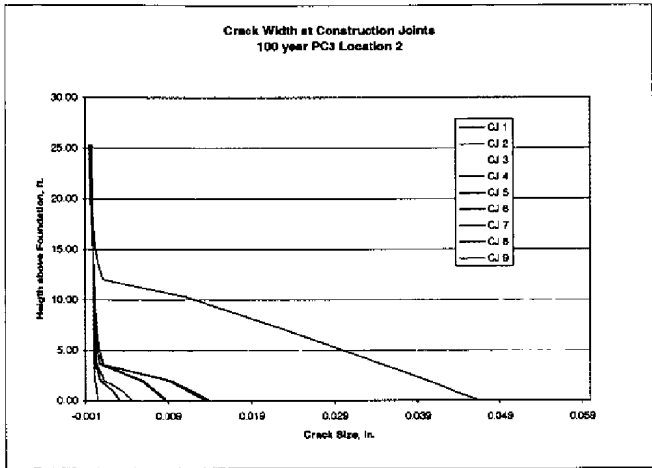
Location 1

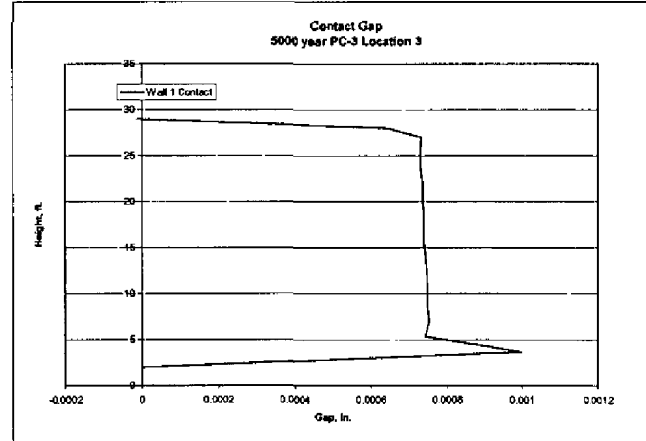
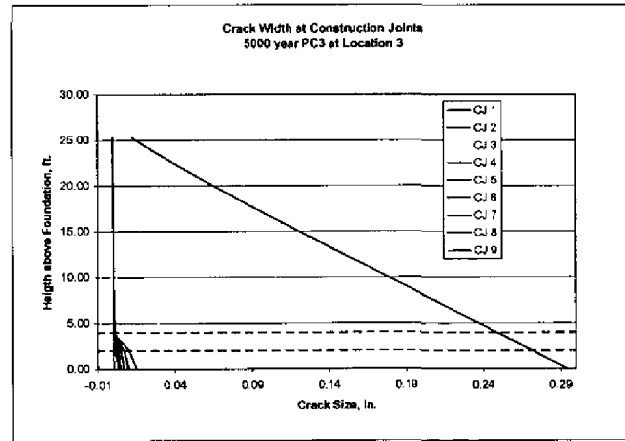
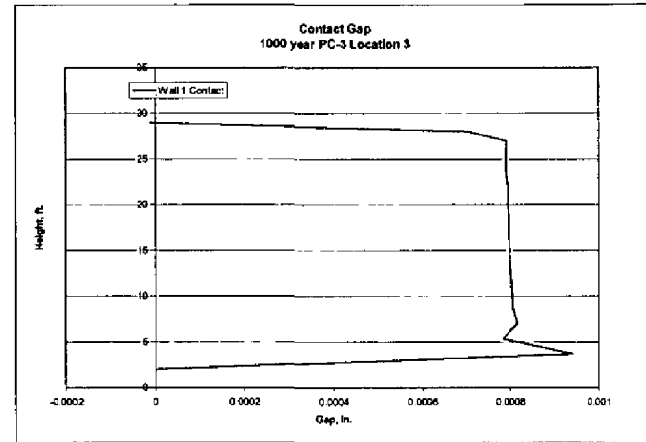
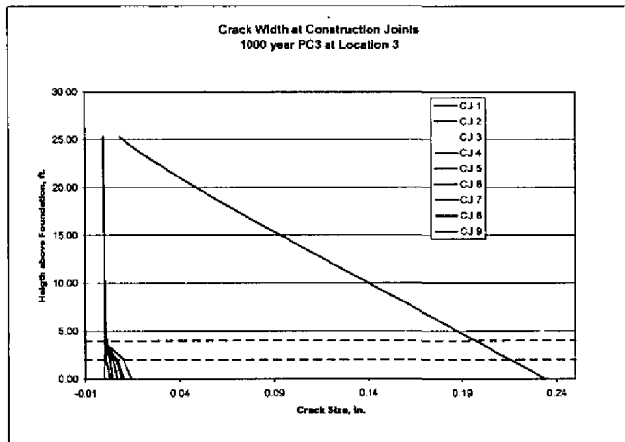
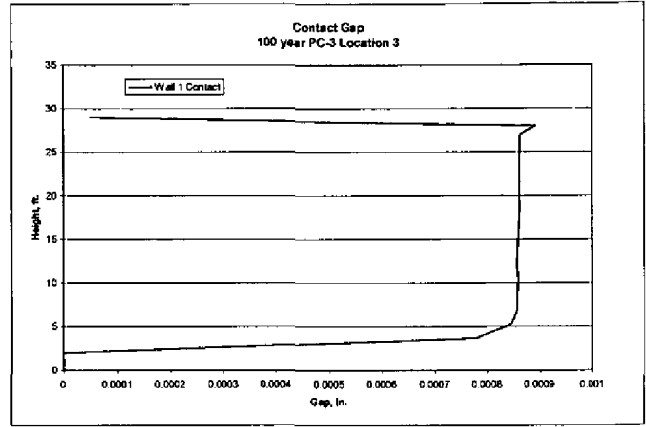
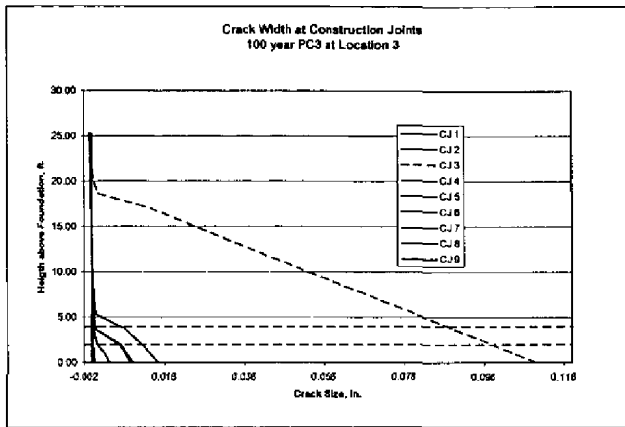


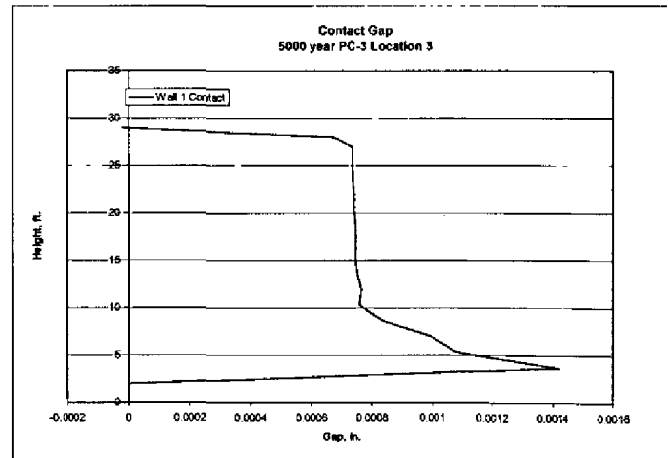
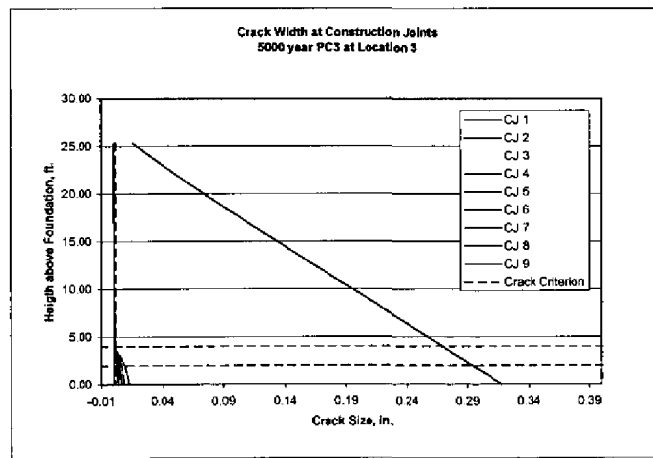
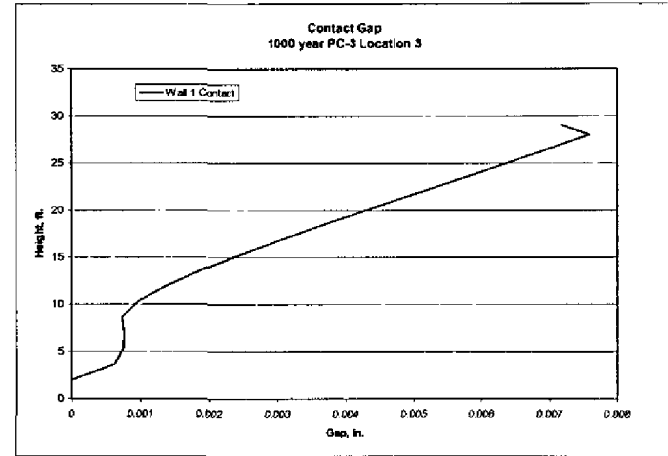
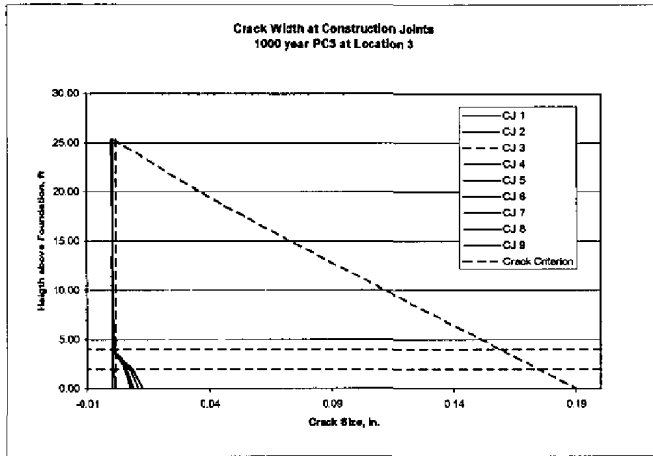
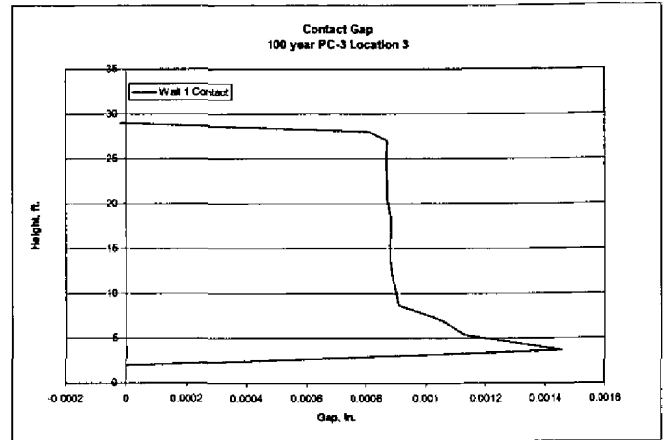
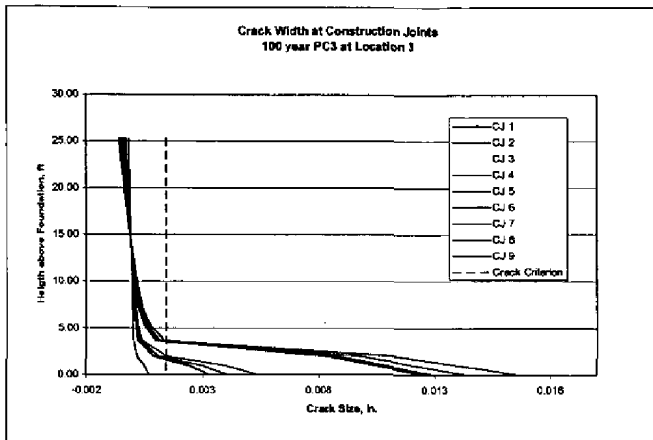


PC-3 Differential Settlement - Location 2
Mean Grout Modulus

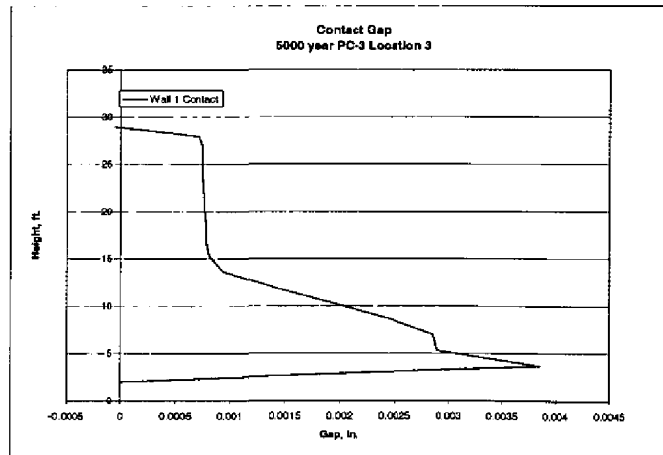
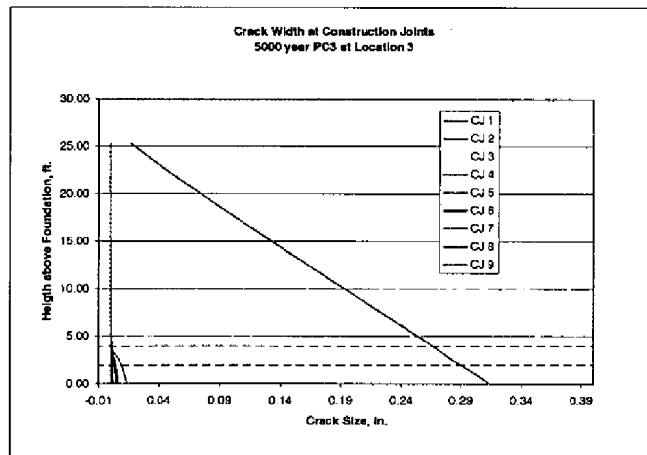
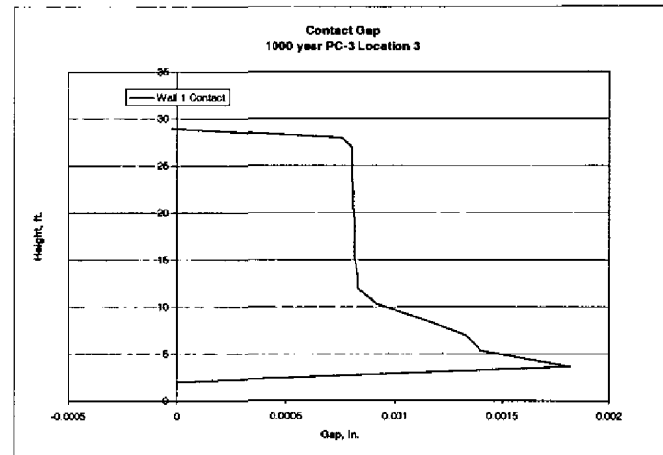
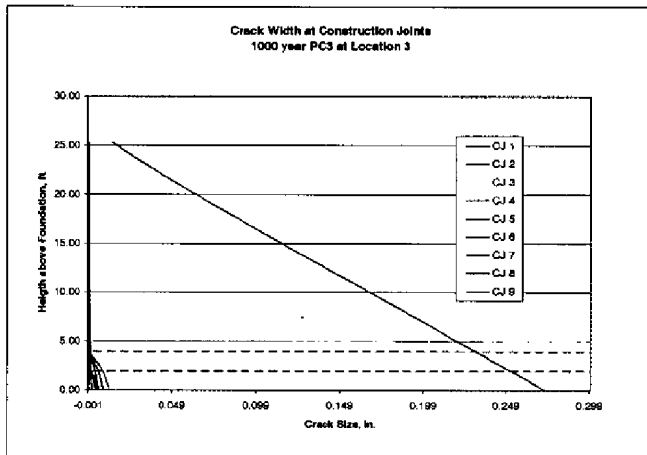
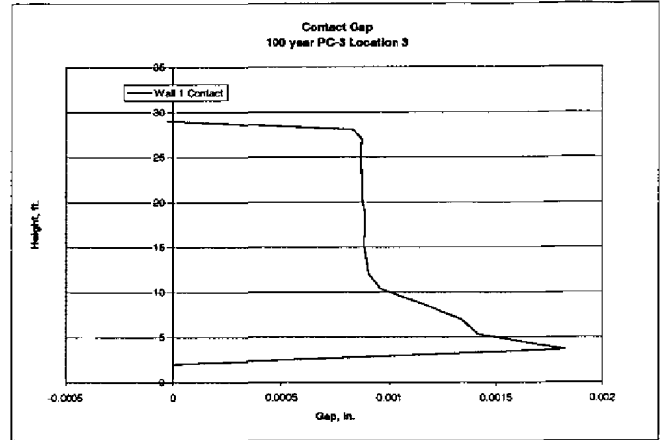
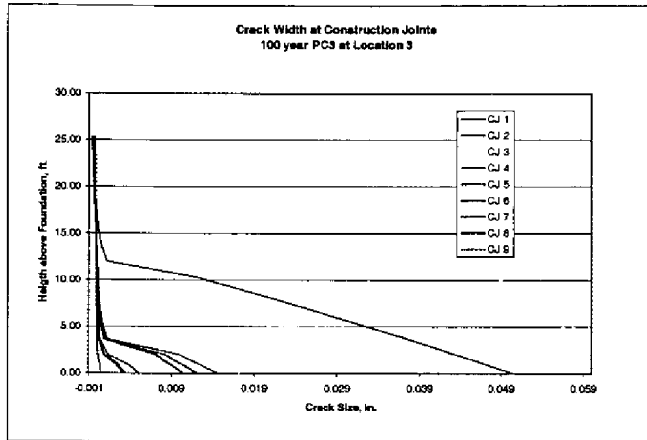








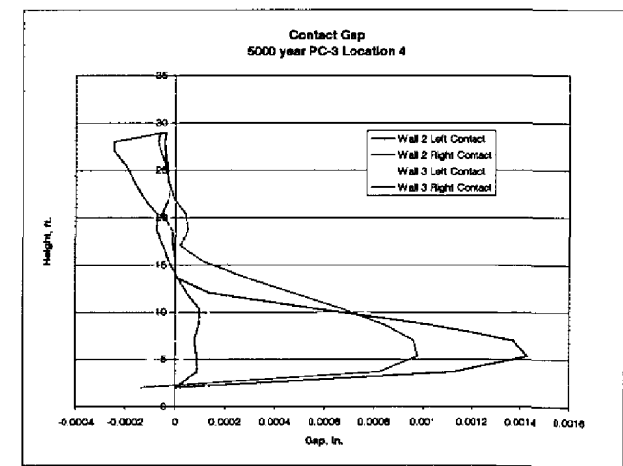
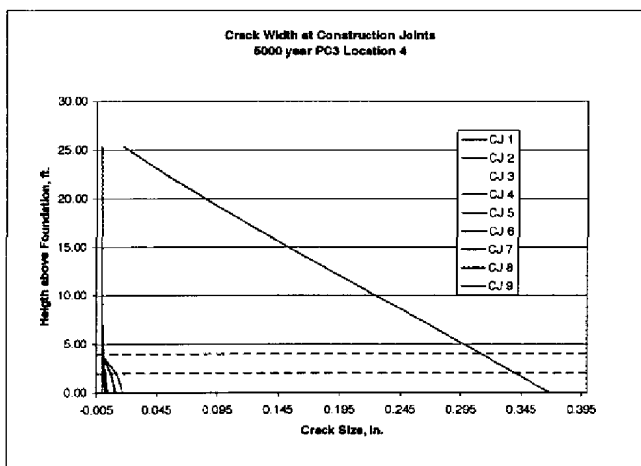
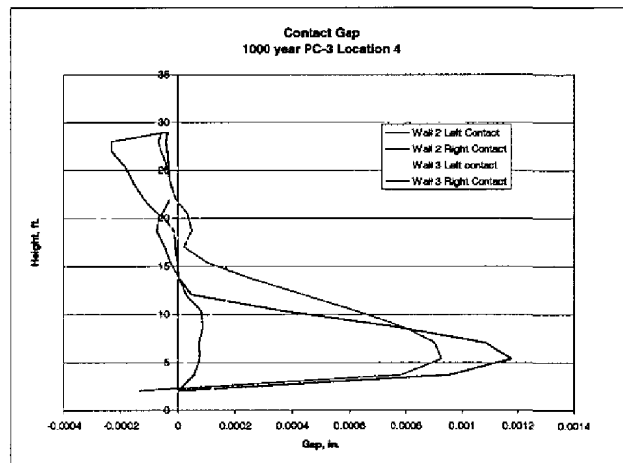
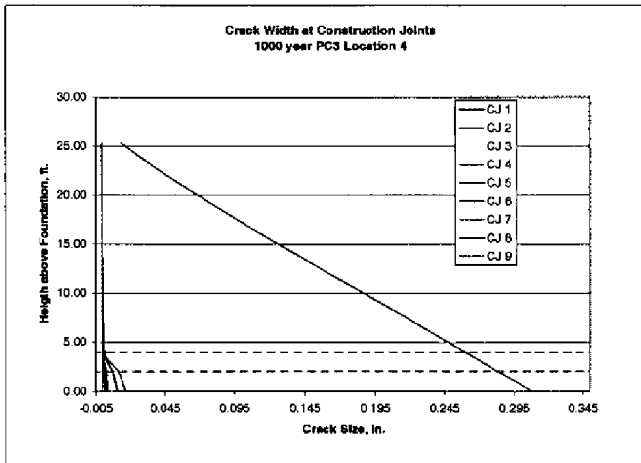
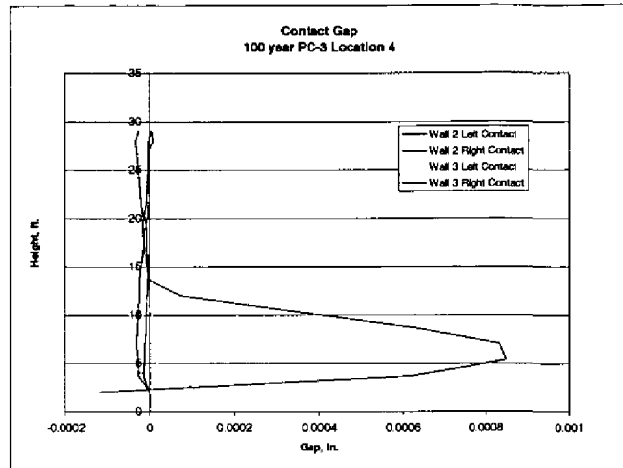
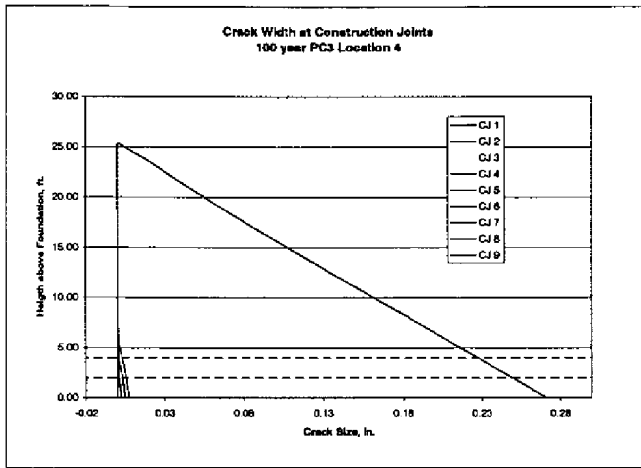
PC-3 Differential Settlement - Location 3
High Grout Modulus

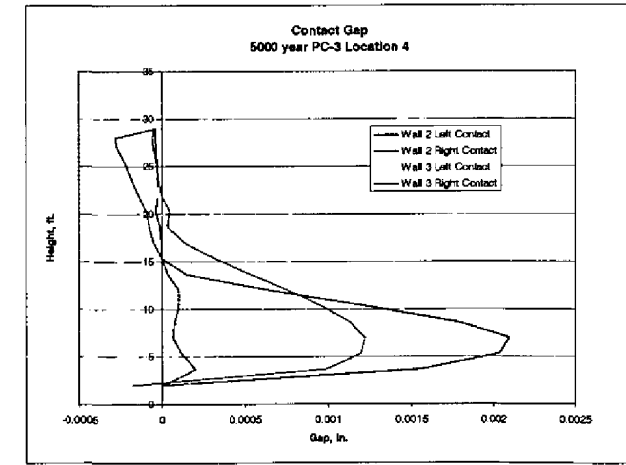
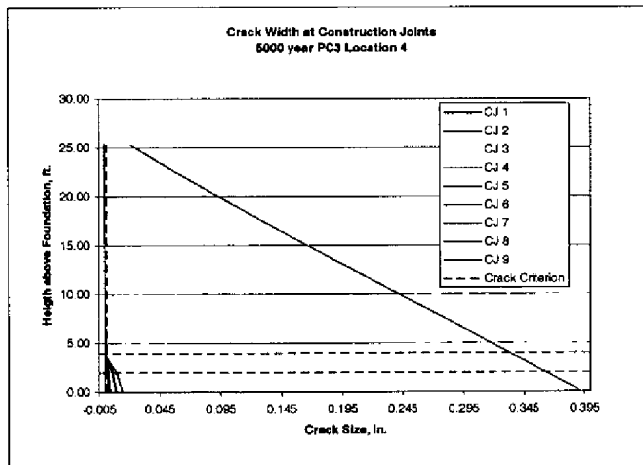
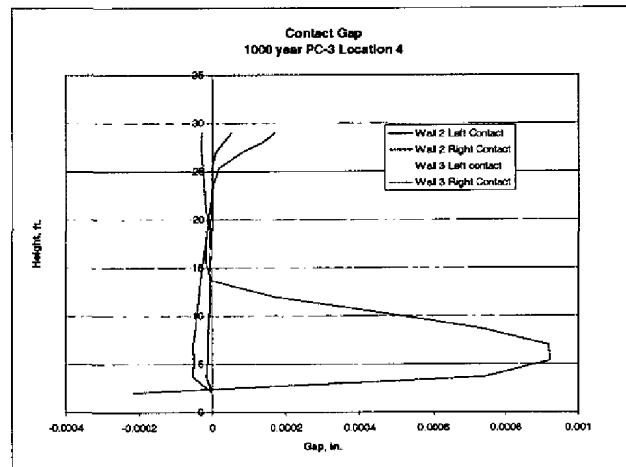
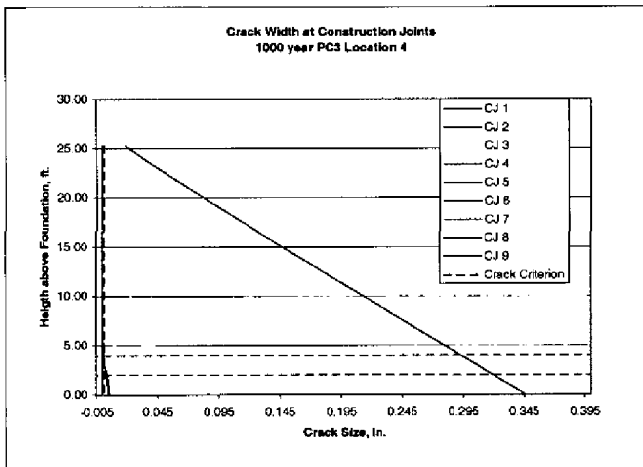
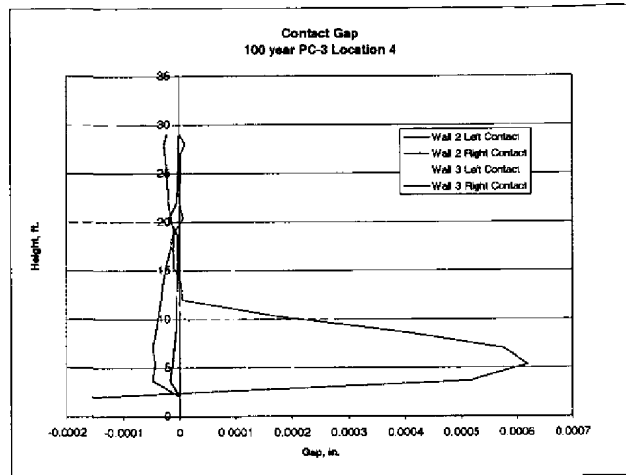
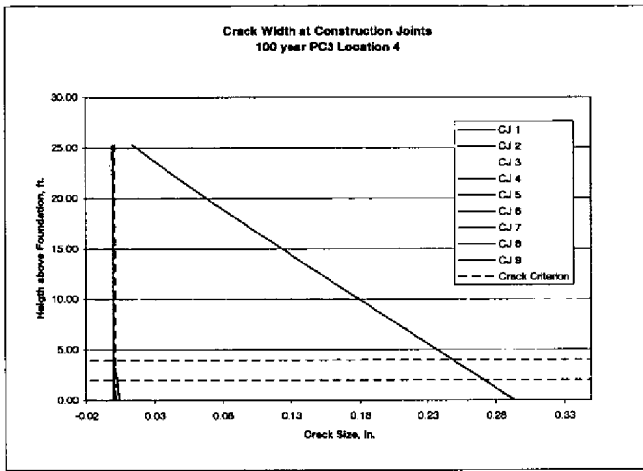


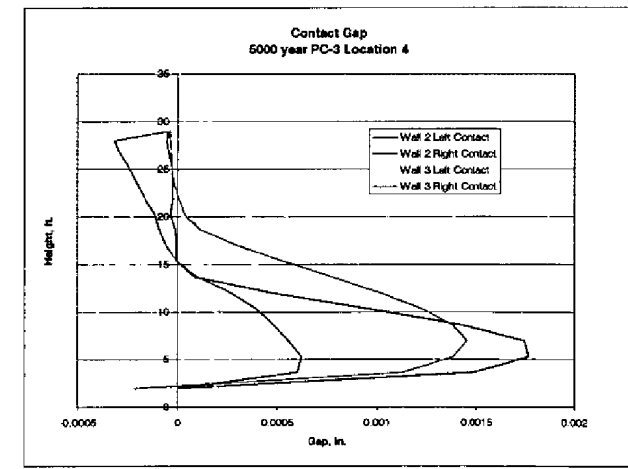
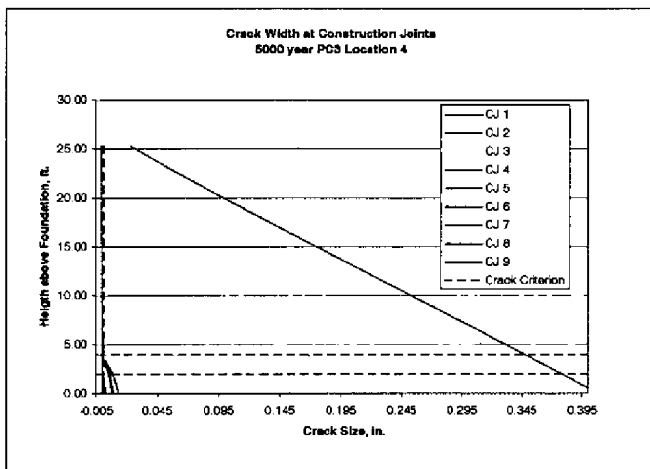
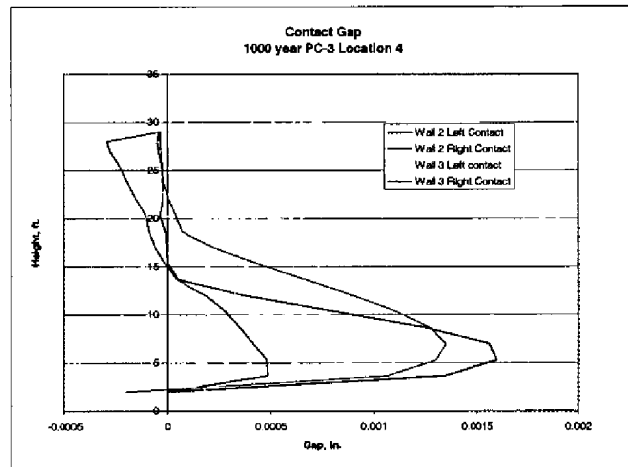
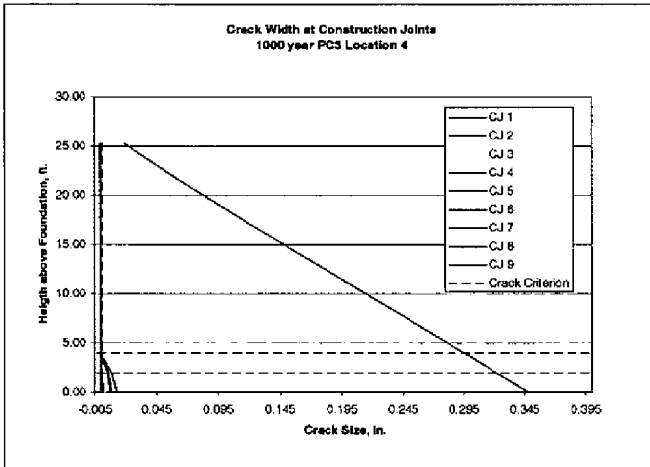
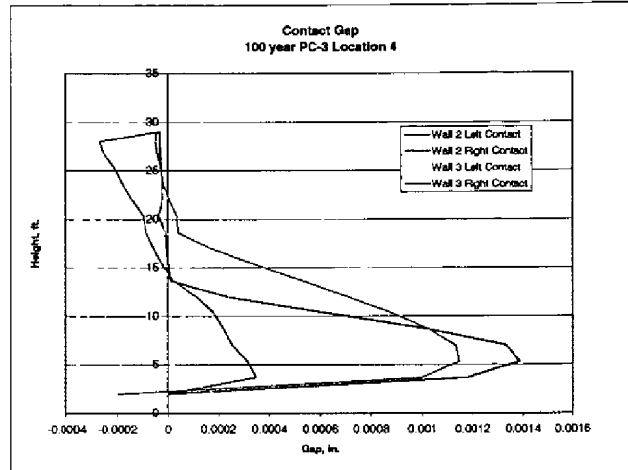
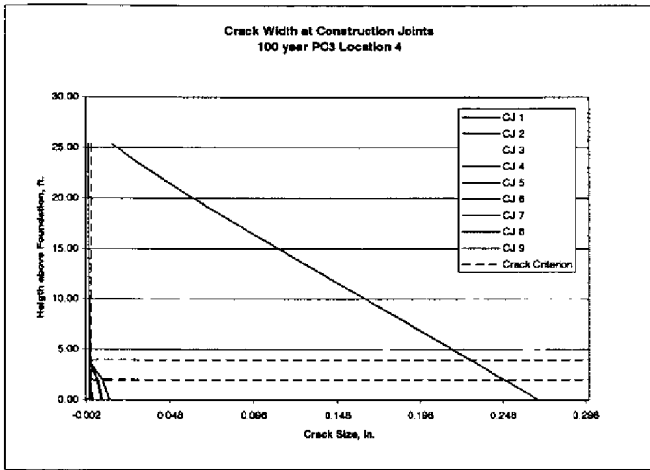
T-CLC-2-00006 Rev.0

PC-3 Differential Settlement - Location 4
Low Grout Modulus

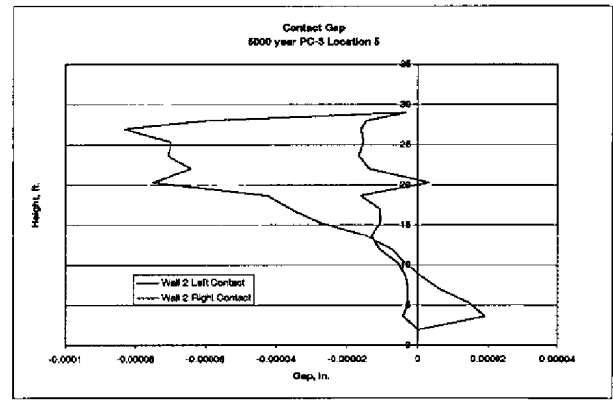
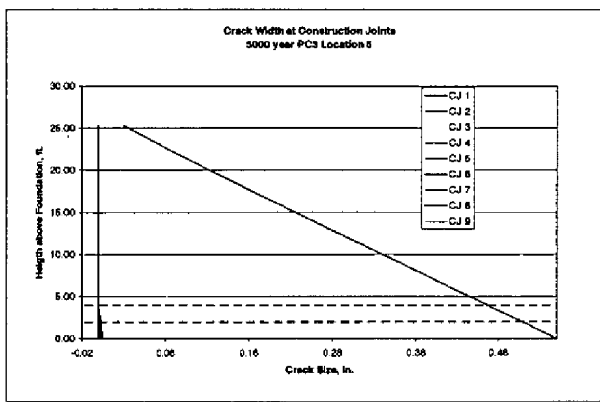
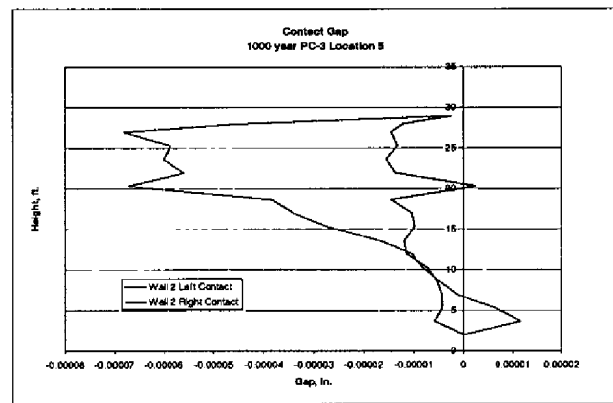
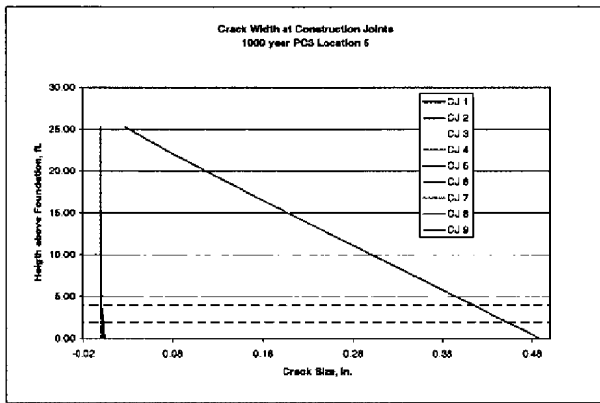
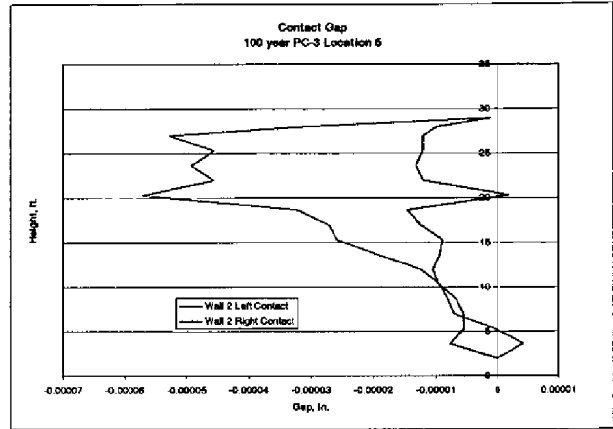
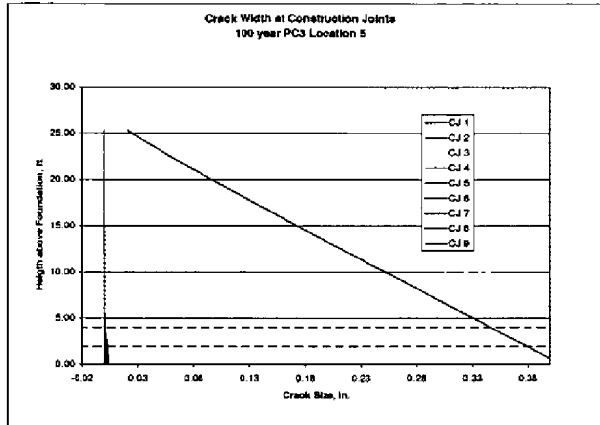
425

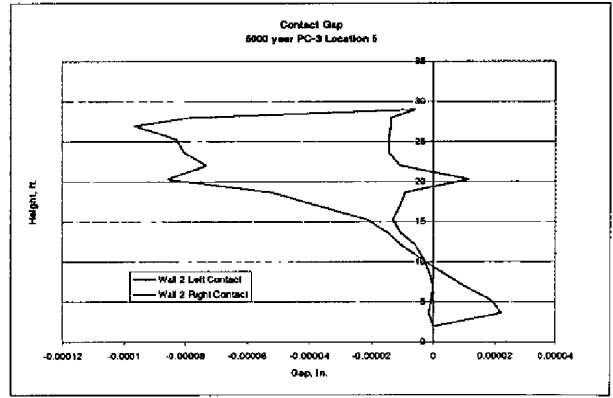
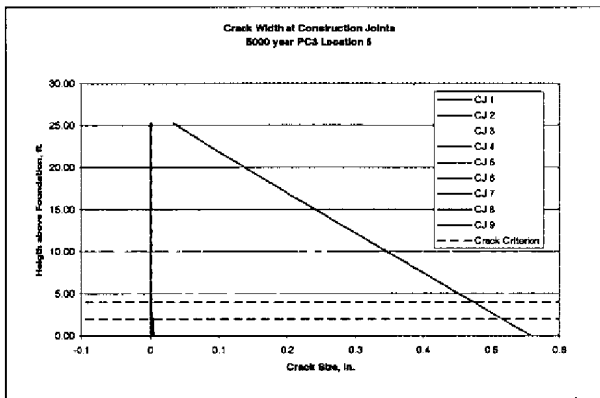
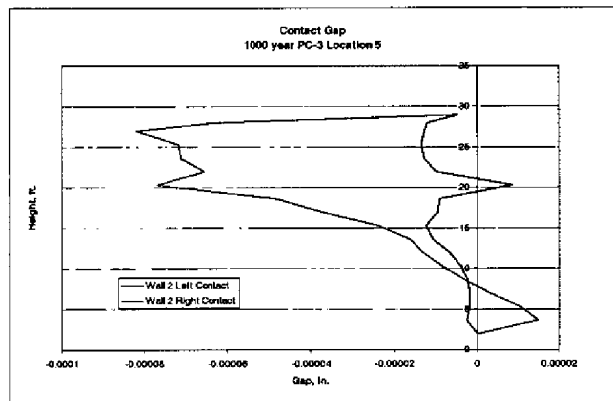
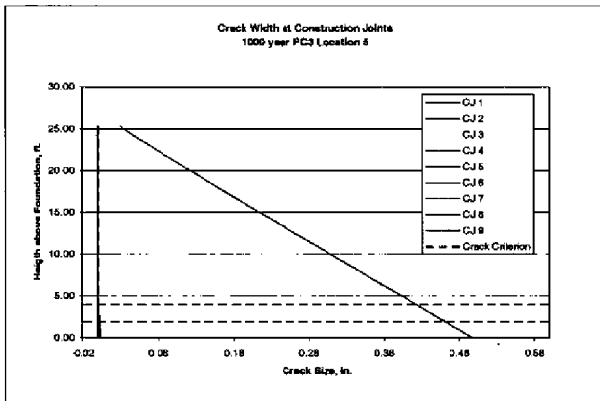
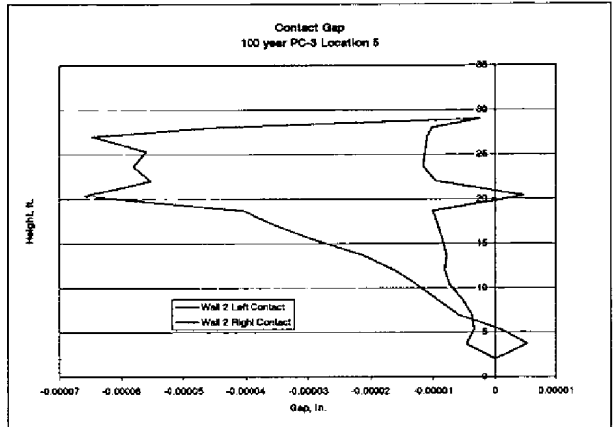
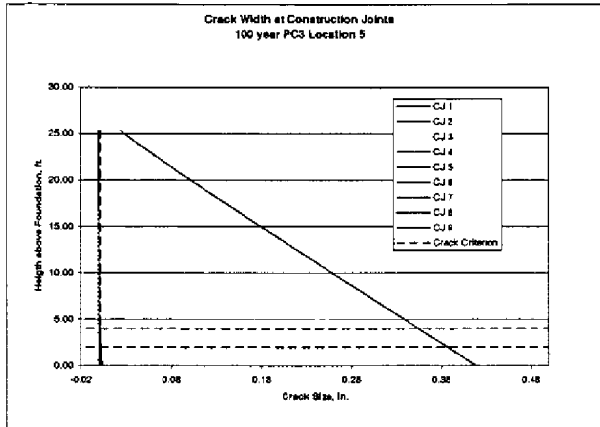




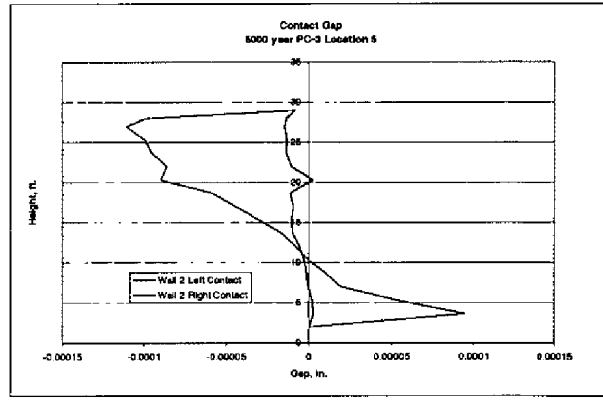
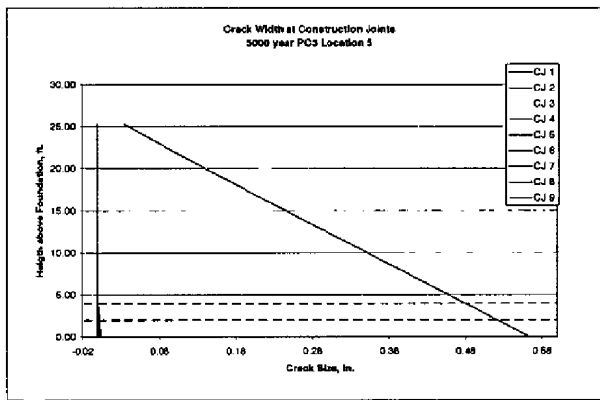
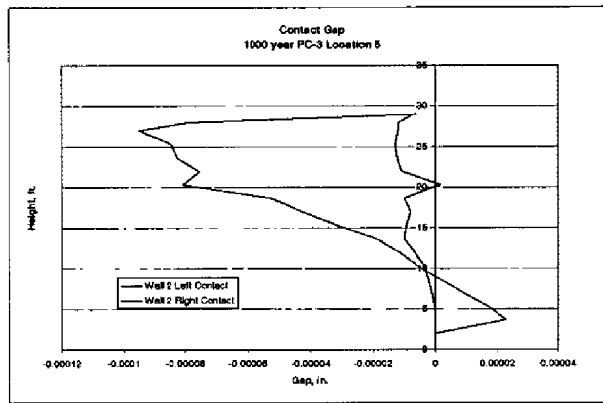
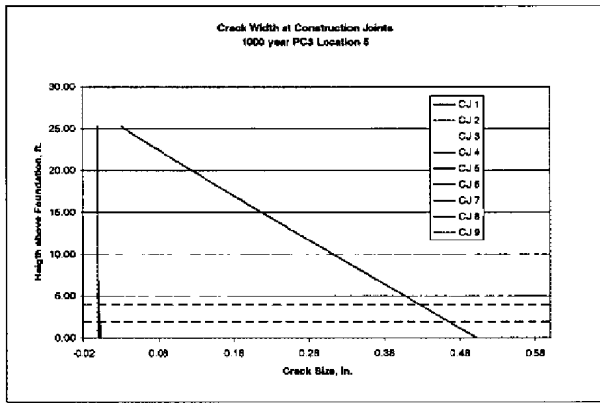
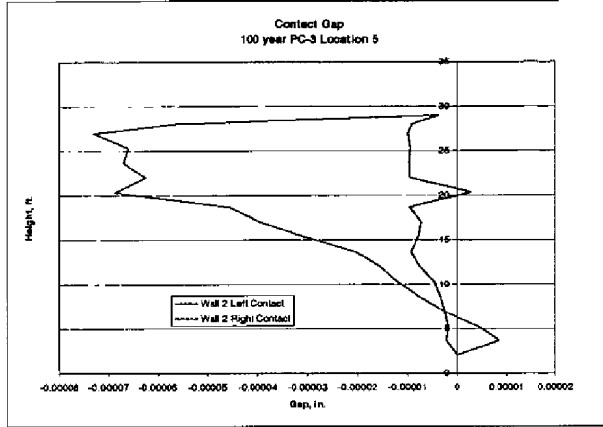
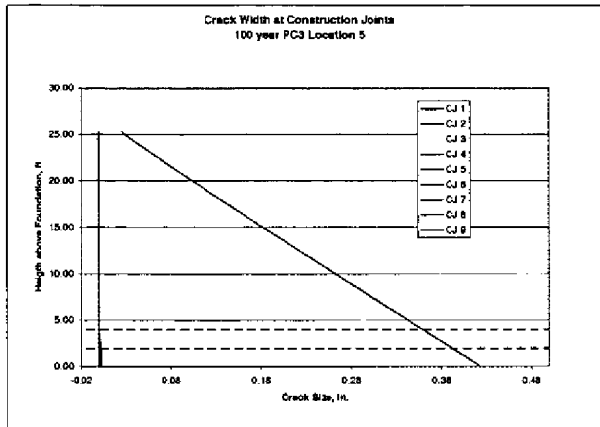


PC-3 Differential Settlement - Location 5
Low Grout Modulus

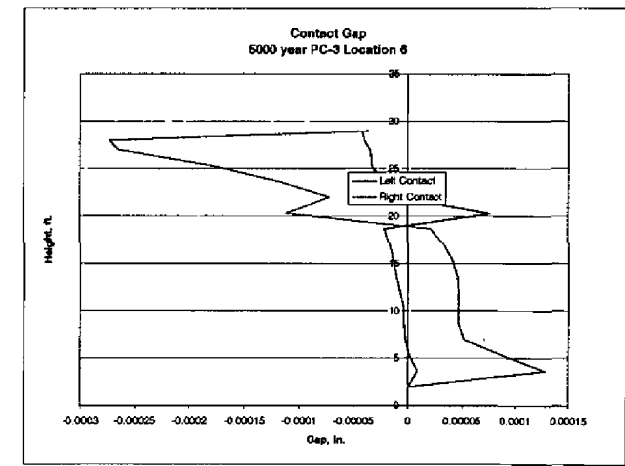
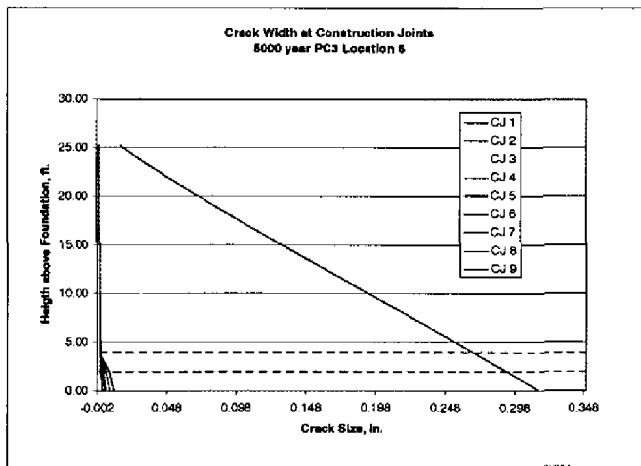
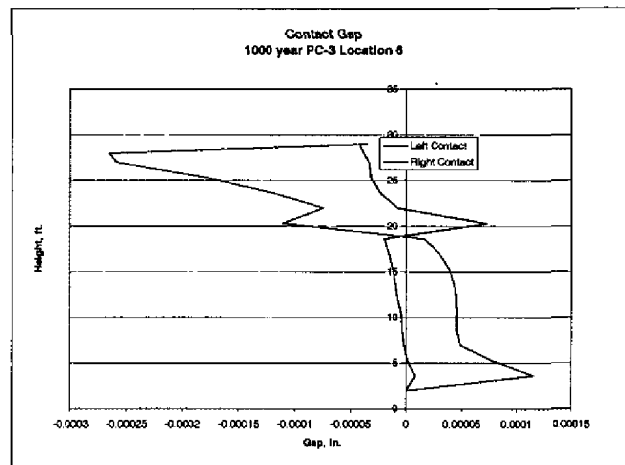
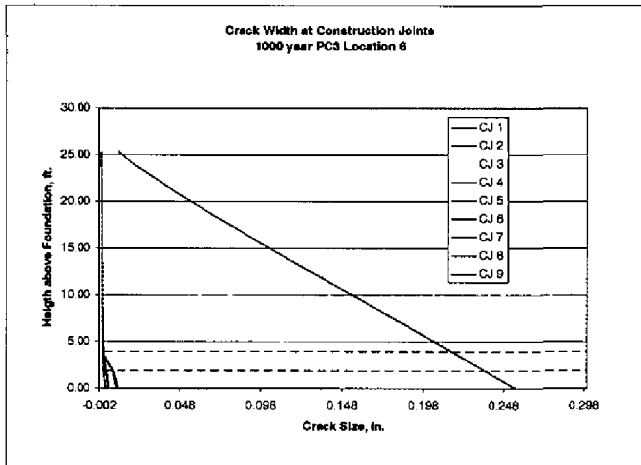
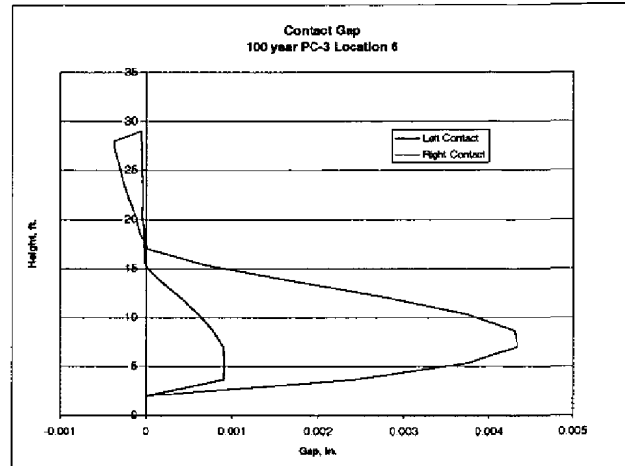
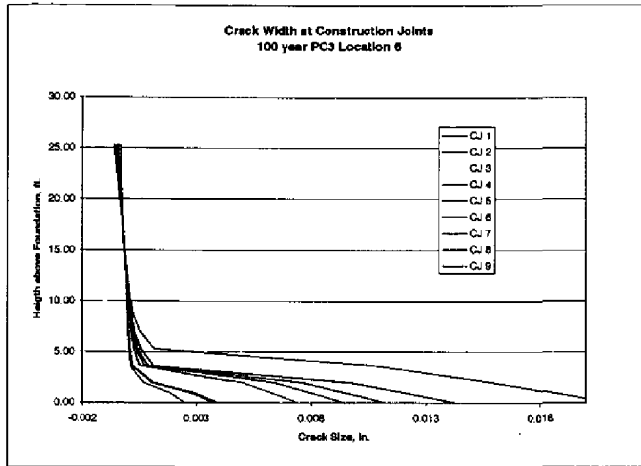




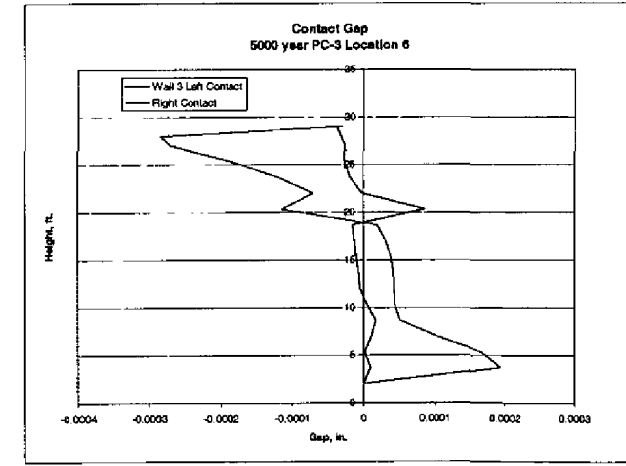
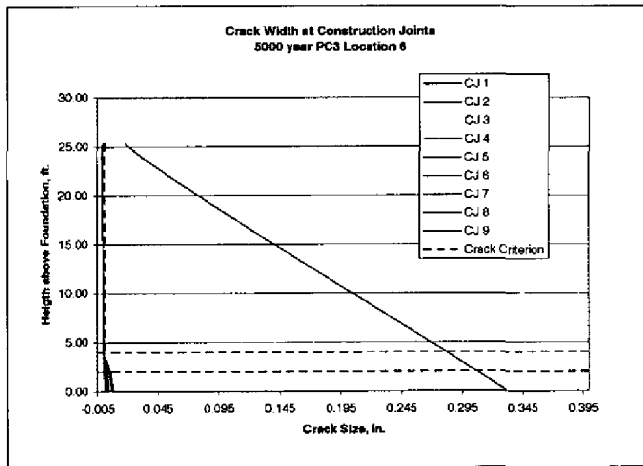
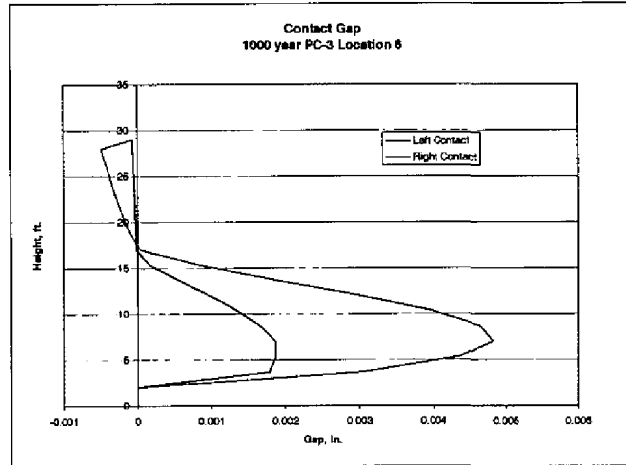
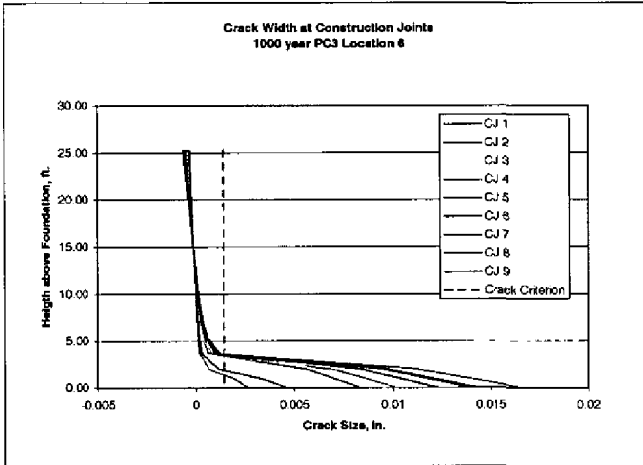
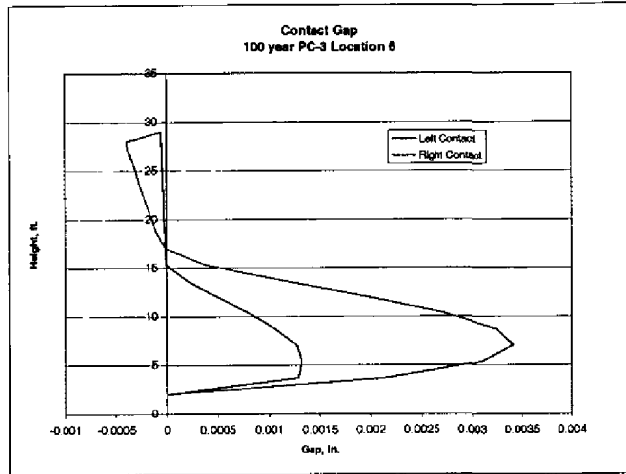
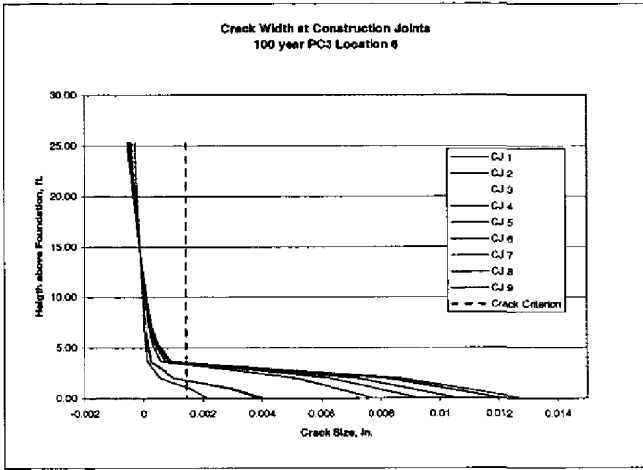
PC-3 Differential Settlement - Location 5
High Grout Modulus



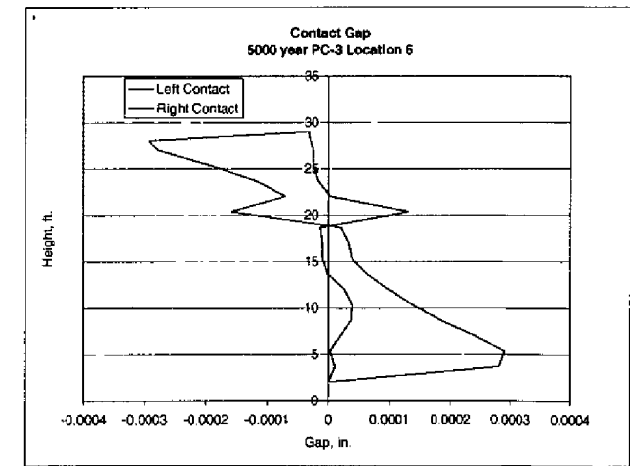
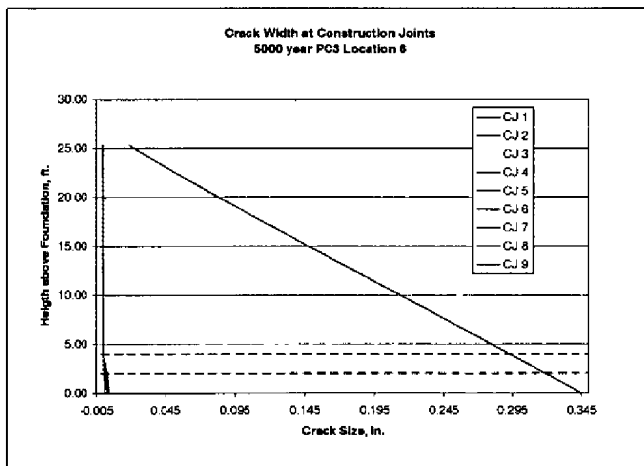
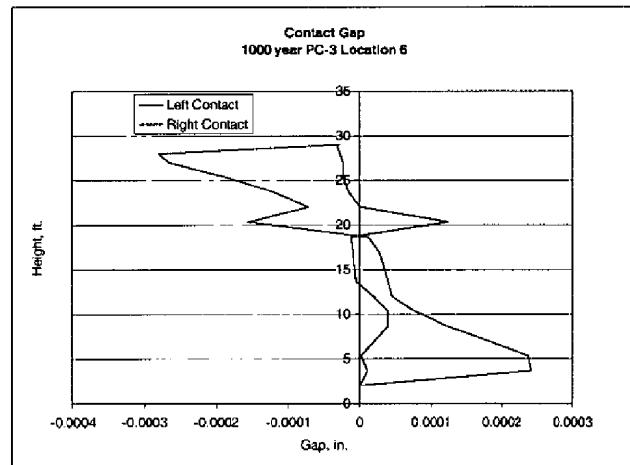
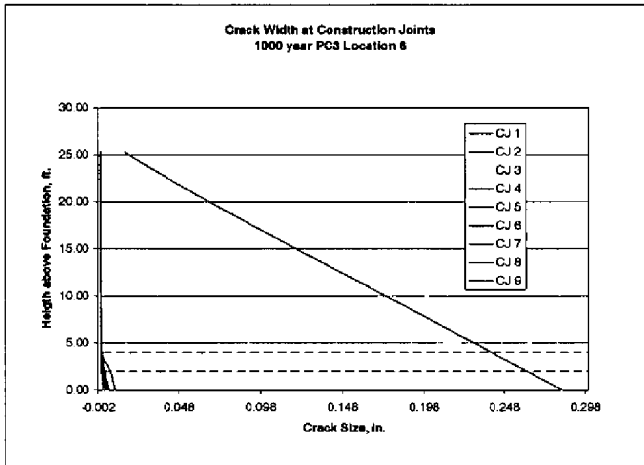
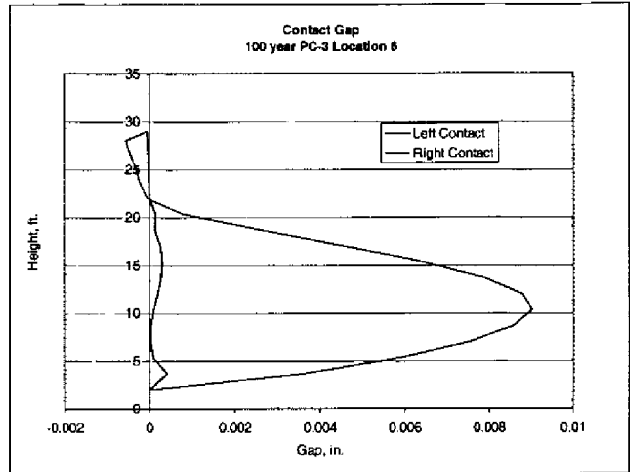
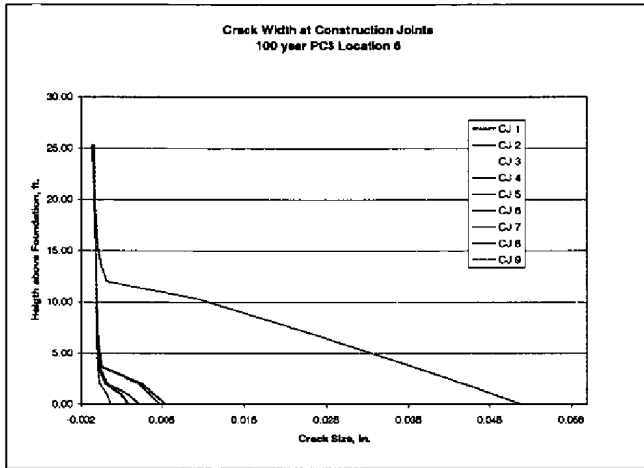
PC-3 Differential Settlement - Location 6
Low Grout Modulus

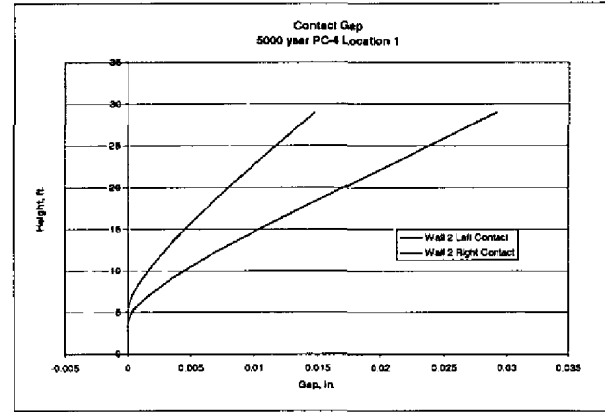
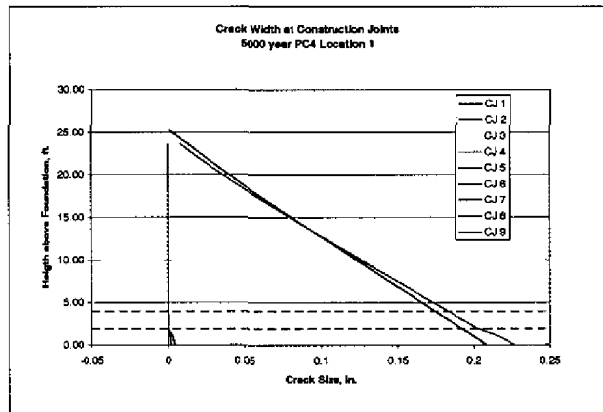
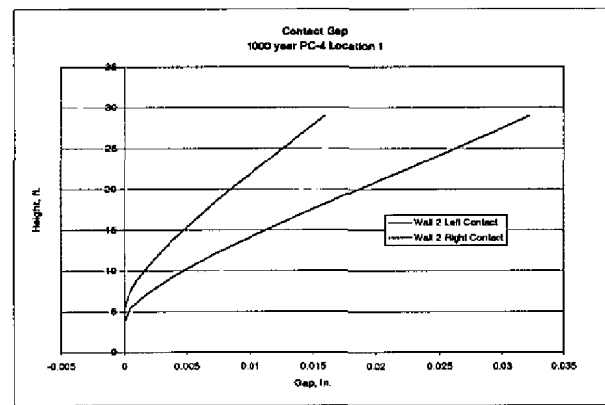
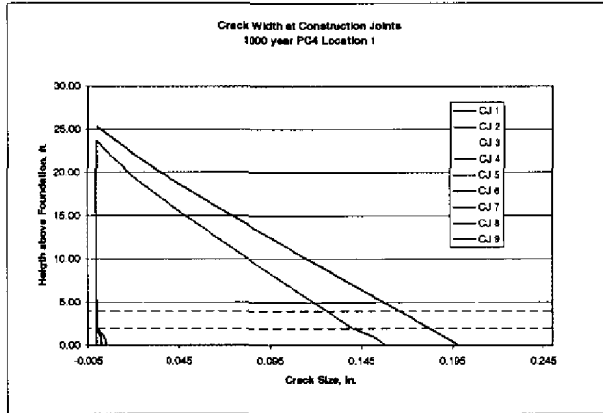
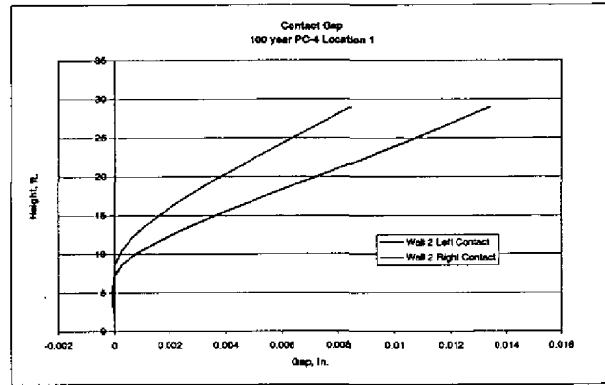
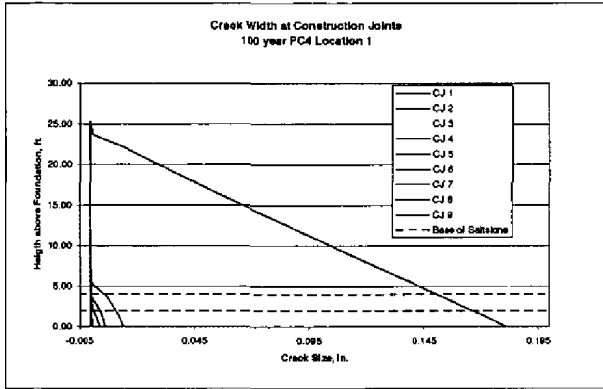


PC-3 Differential Settlement - Location 6
Mean Grout Modulus



PC-3 Differential Settlement - Location 6
High Grout Modulus

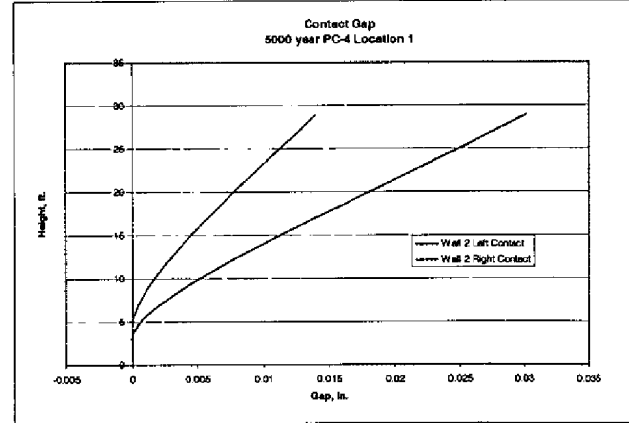
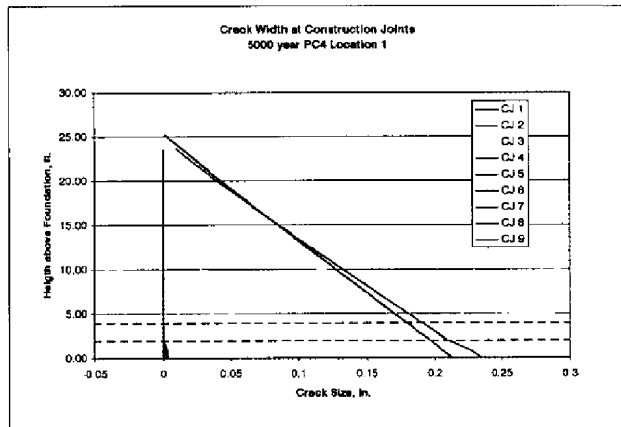
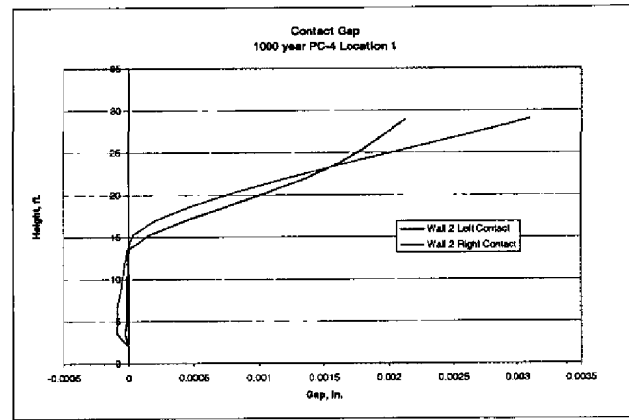
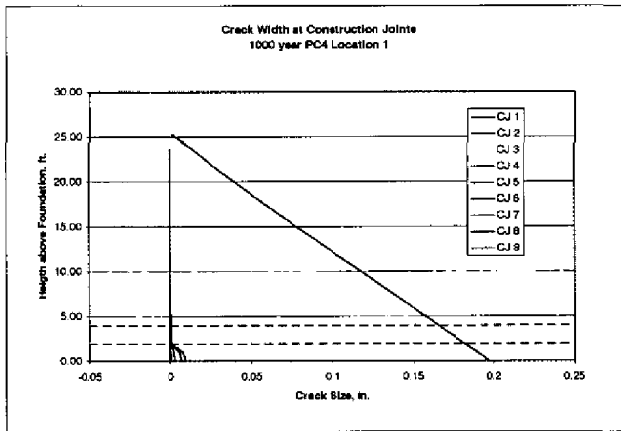
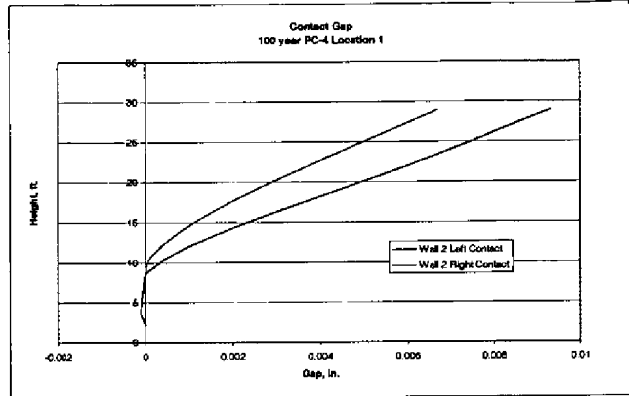
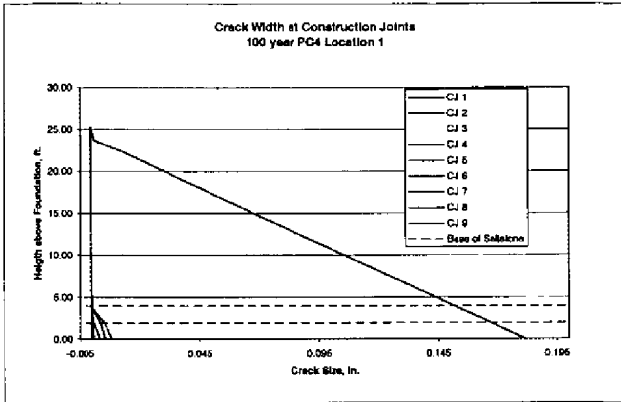




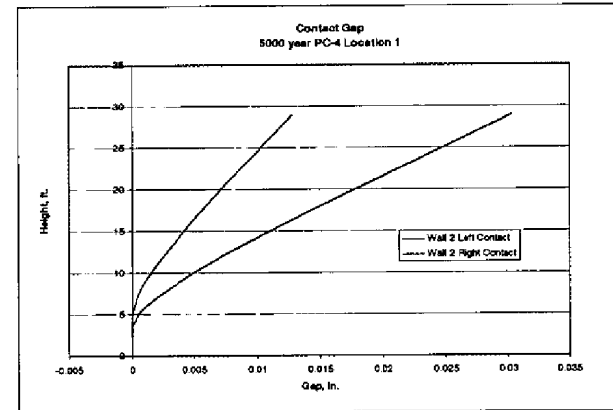
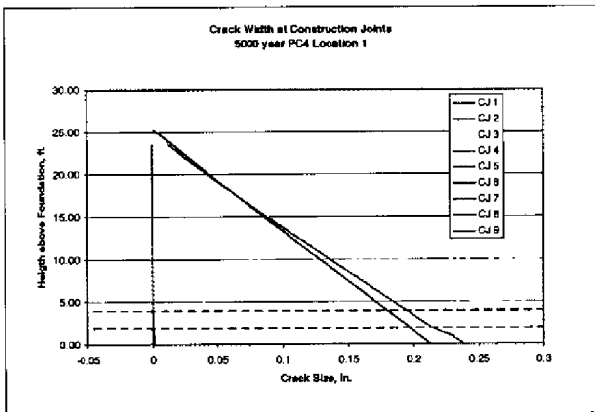
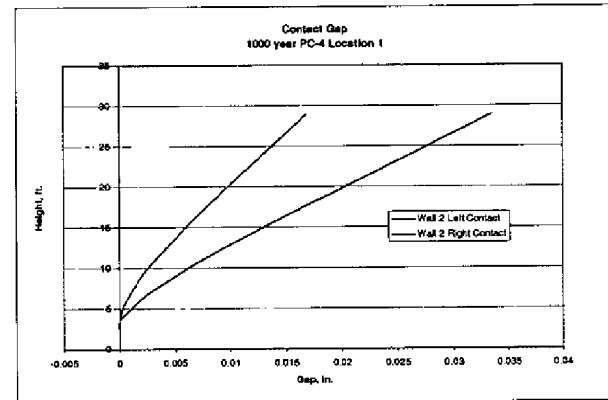
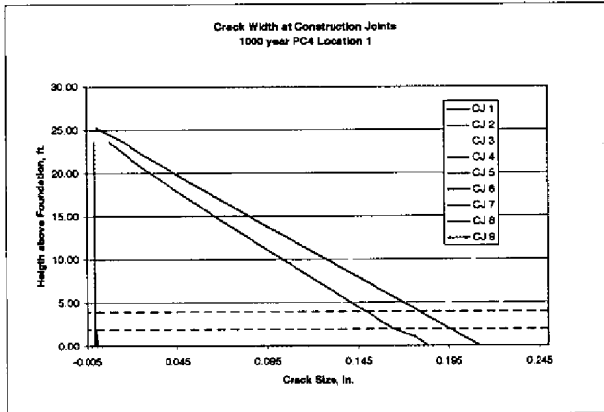
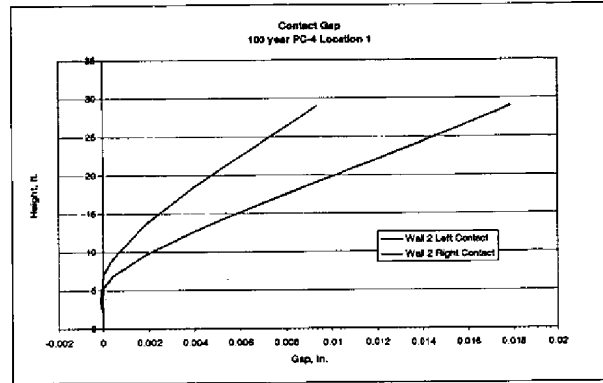
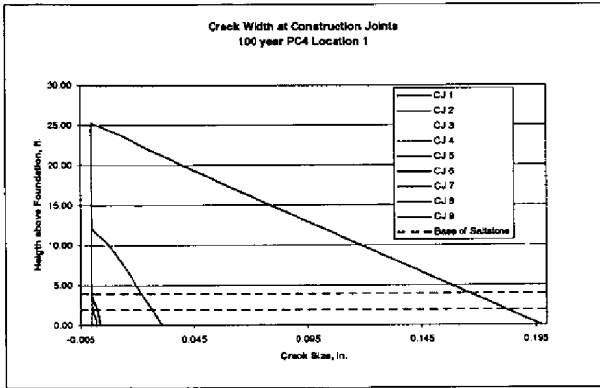
PC-4-2-00000, Rev. 0

PC-4 Differential Settlement - Location 1
Mean Grout Modulus

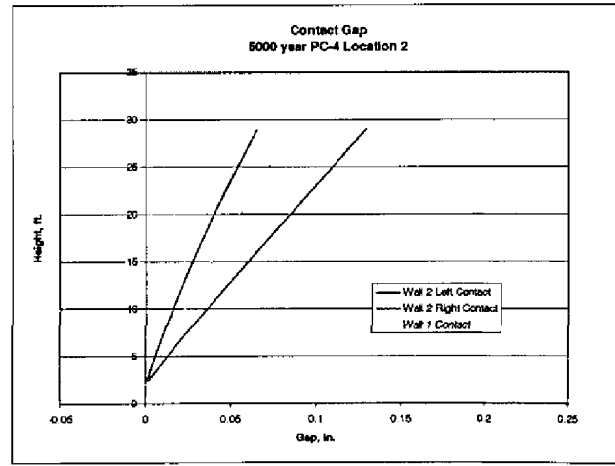
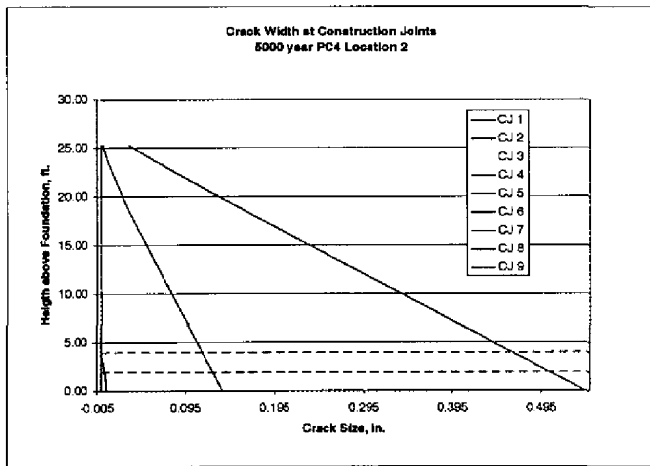
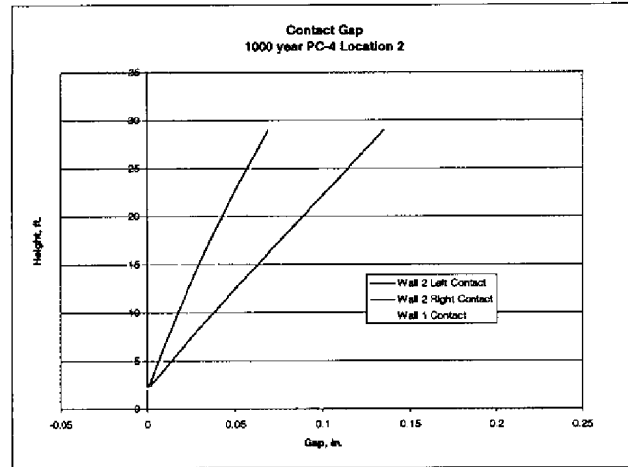
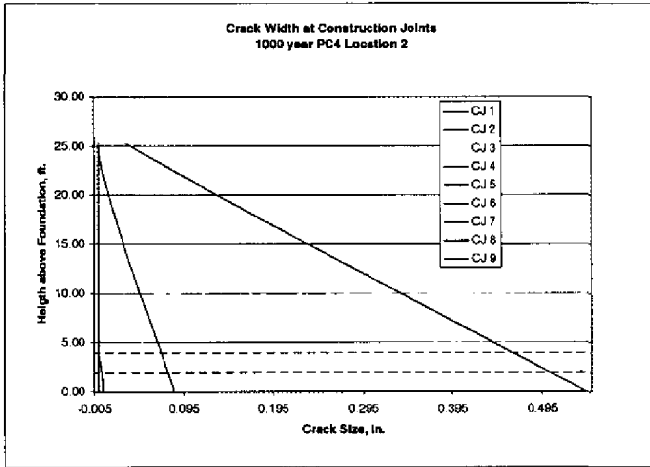
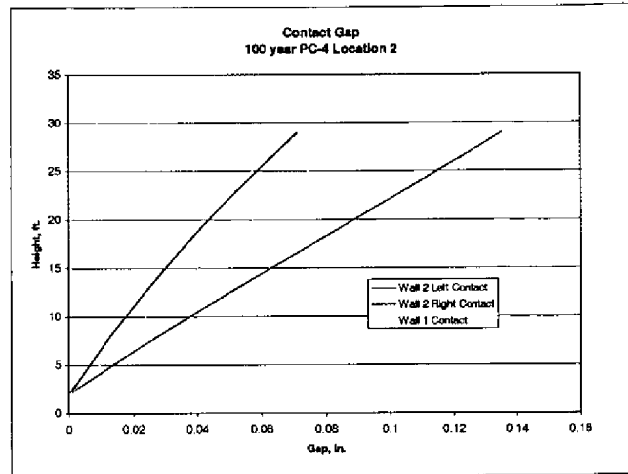
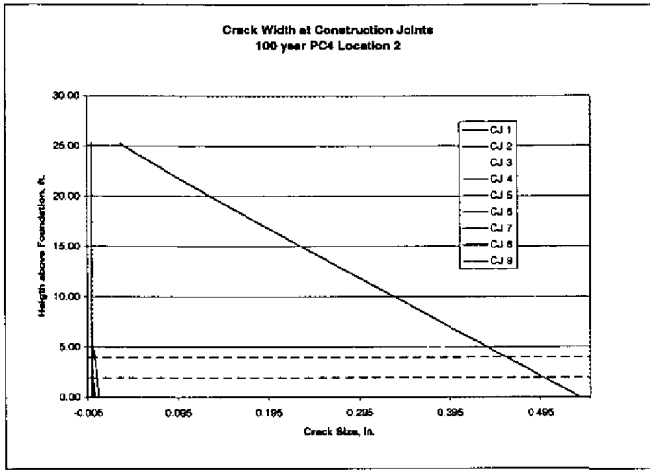
435



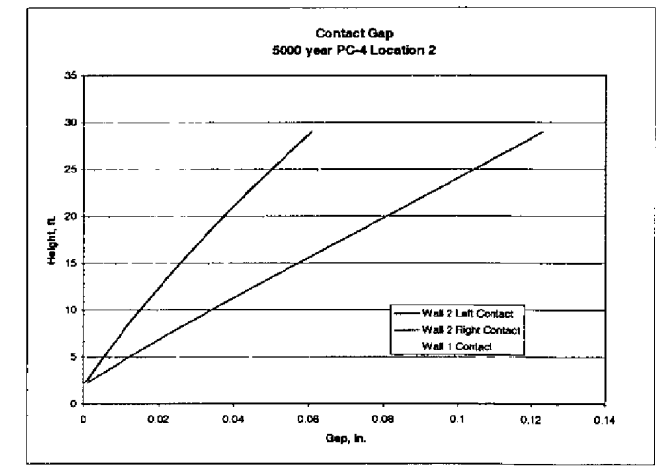
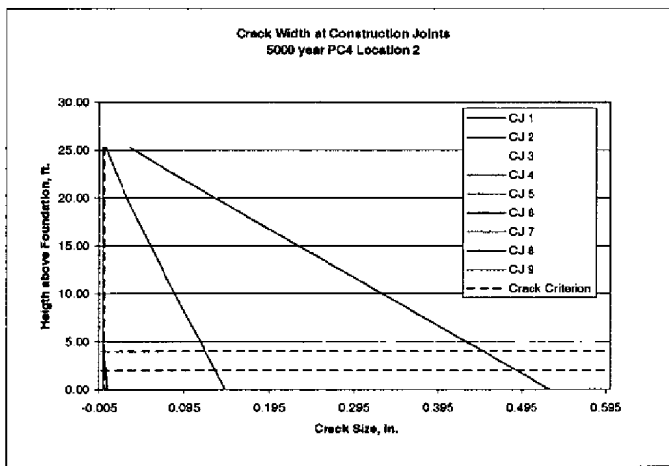
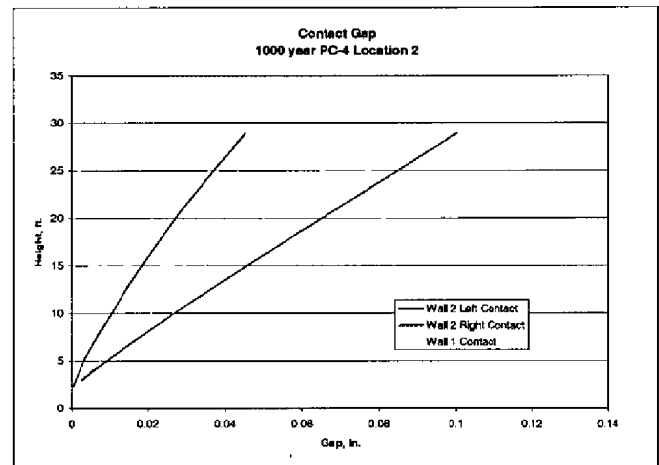
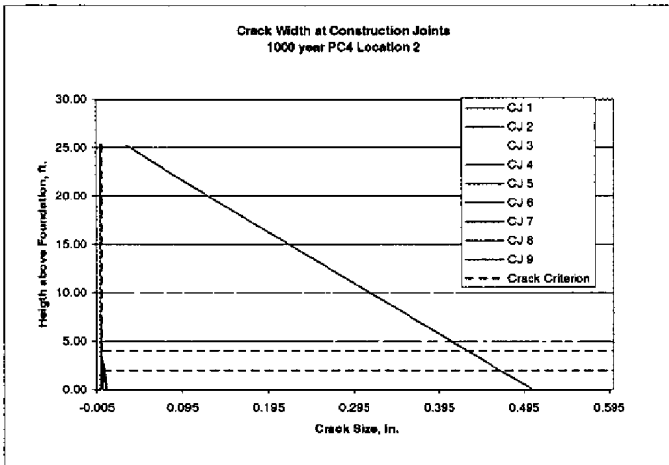
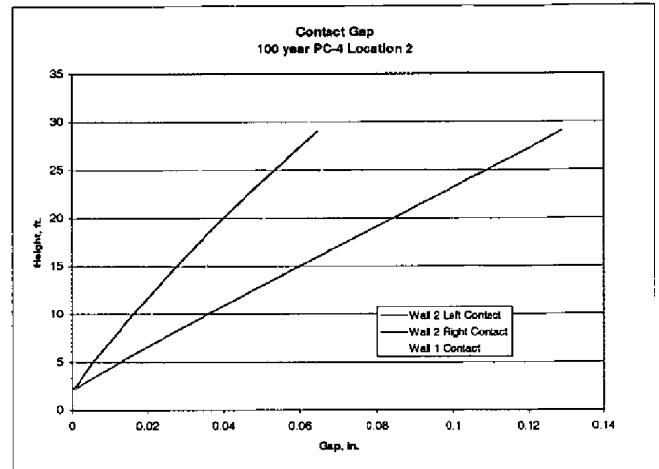
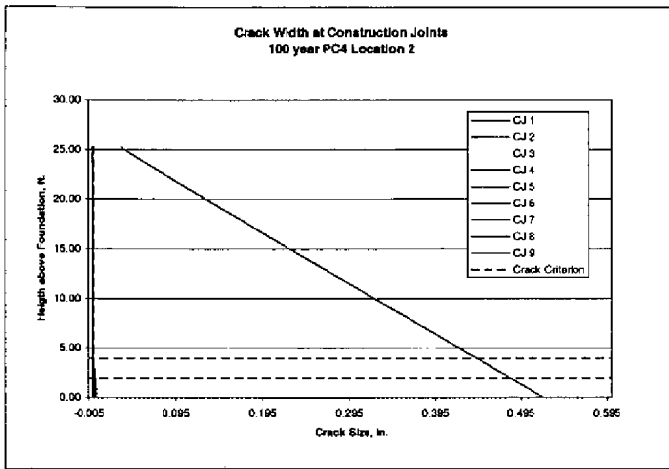
PC-4 Differential Settlement - Location 1
High Grout Modulus



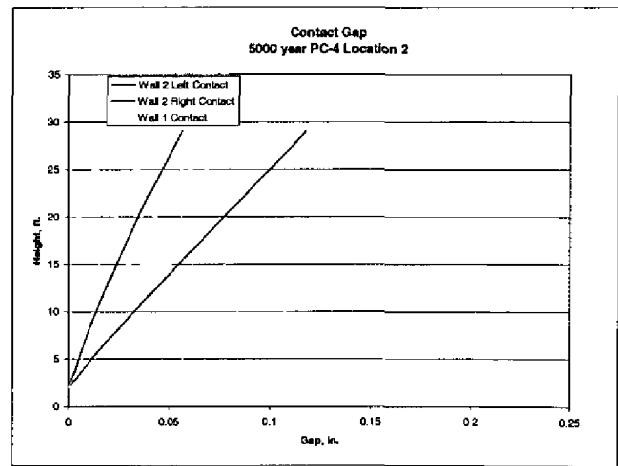
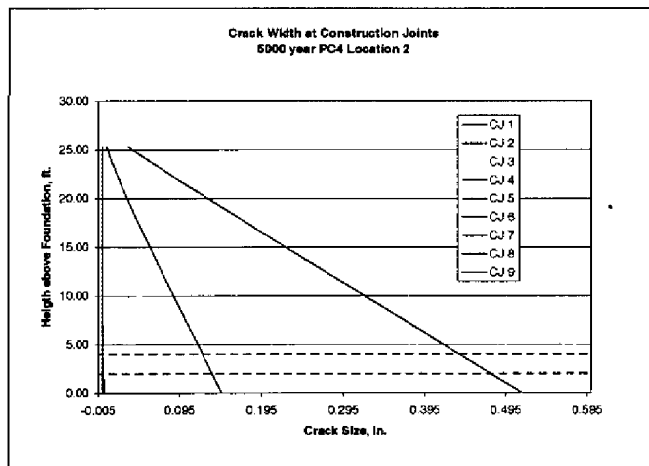
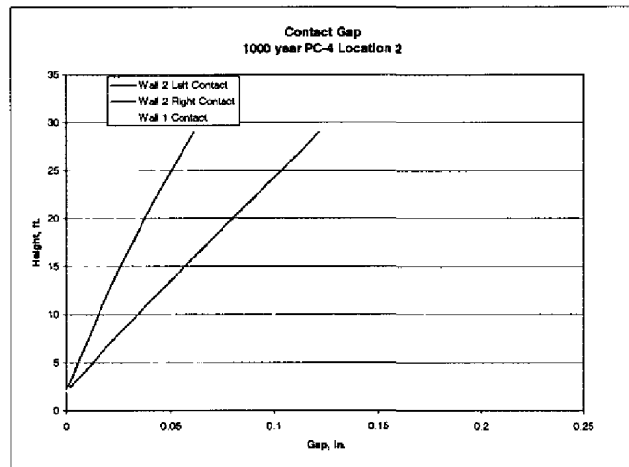
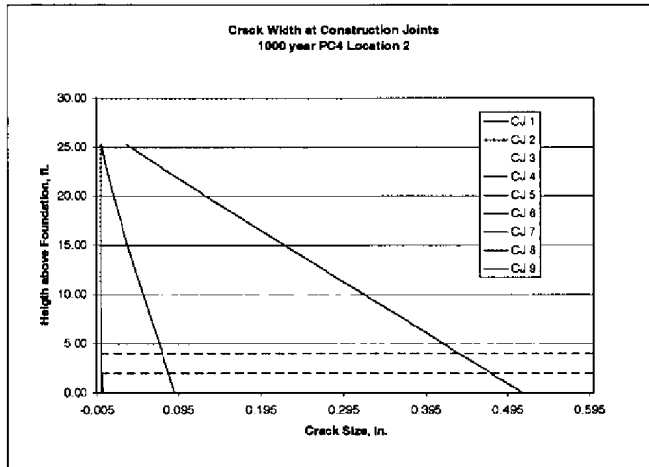
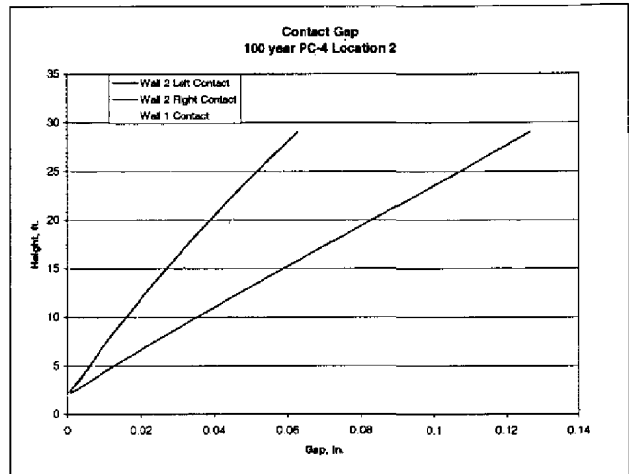
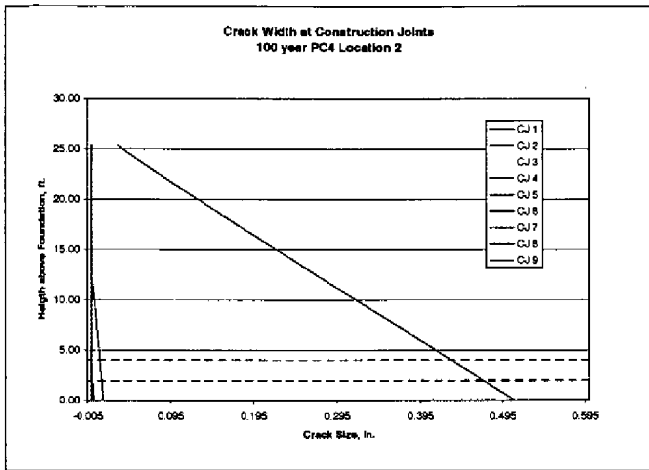
PC-4 Differential Settlement - Location 2
Low Grout Modulus

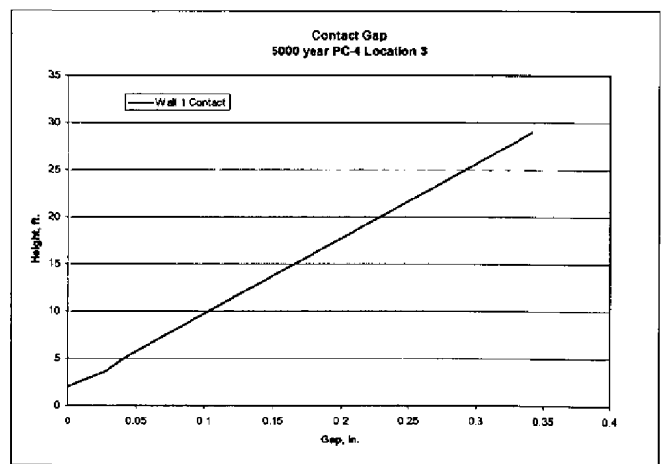
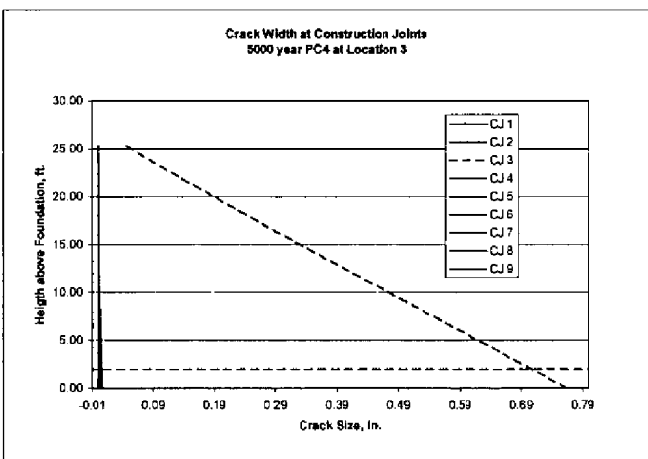
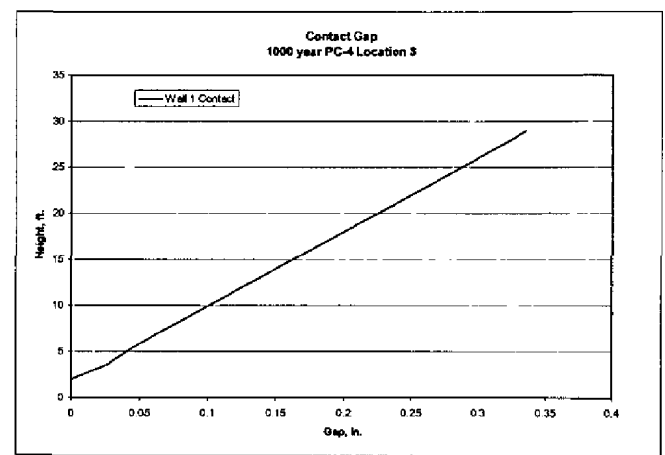
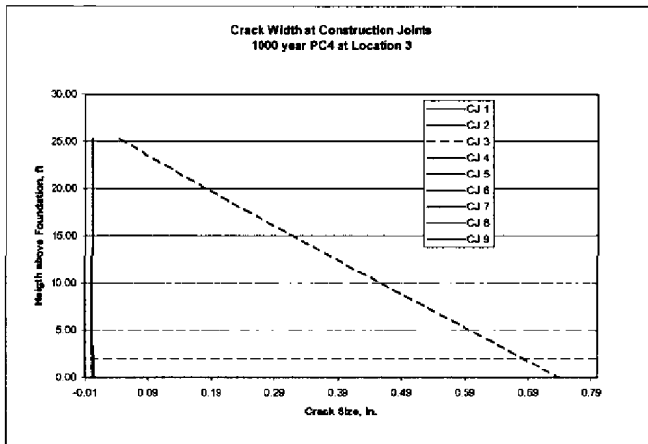
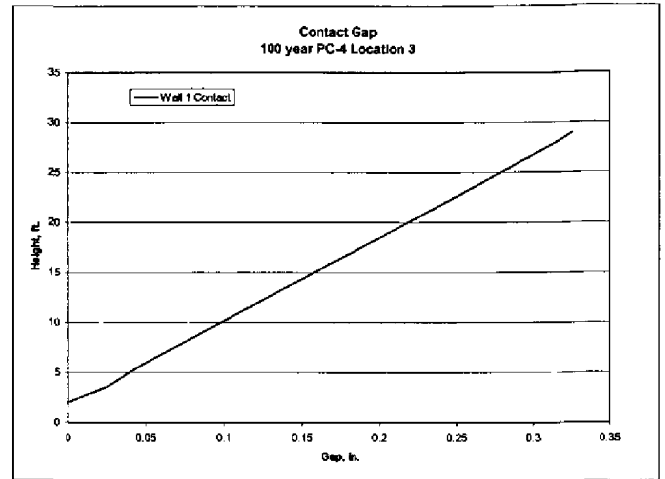
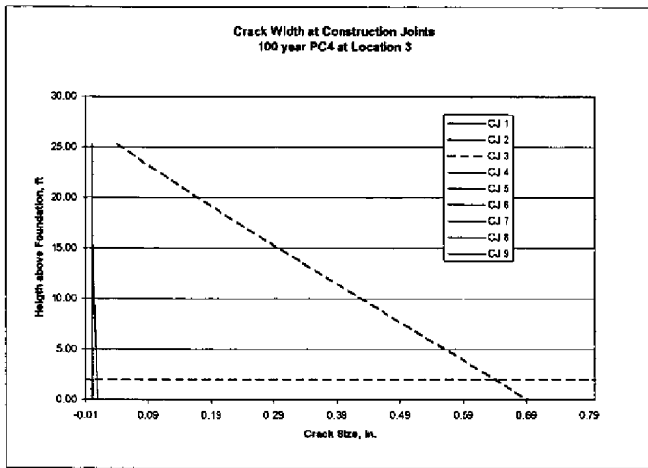


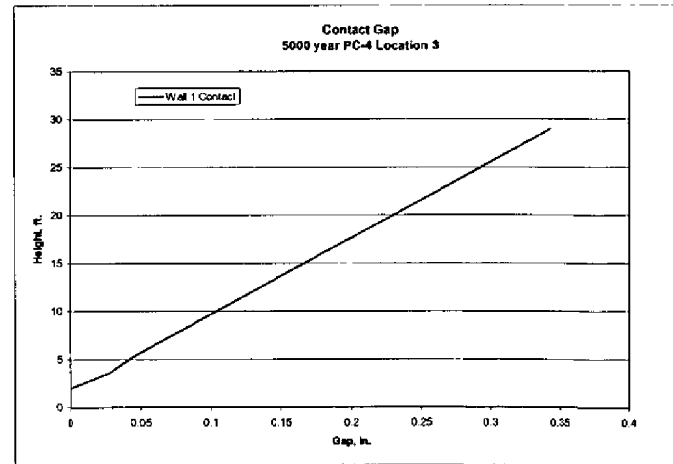
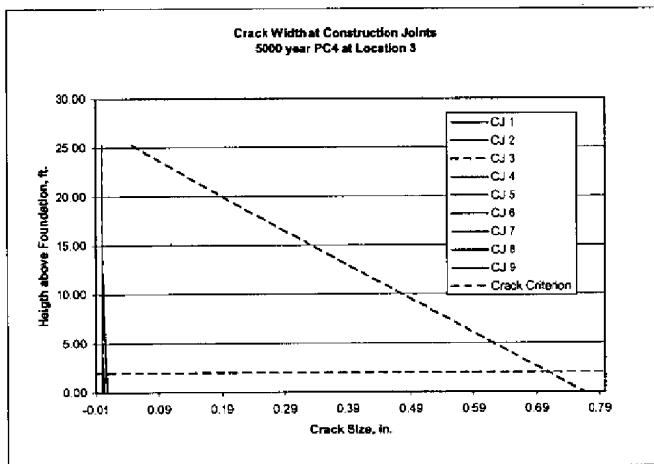
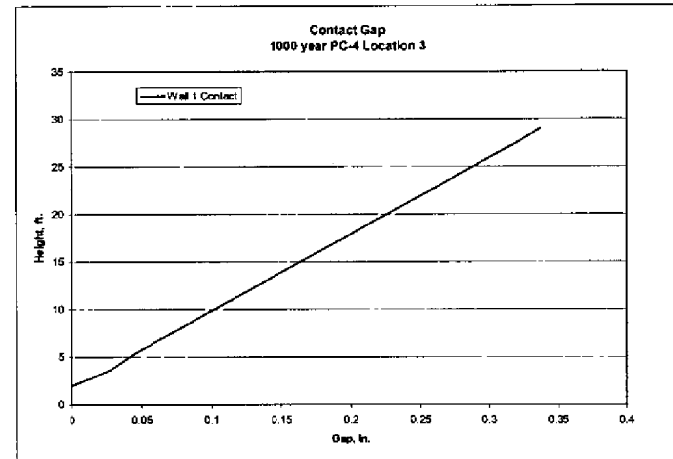
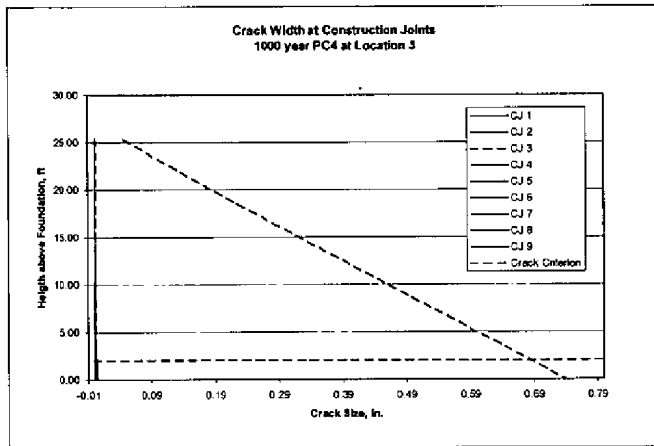
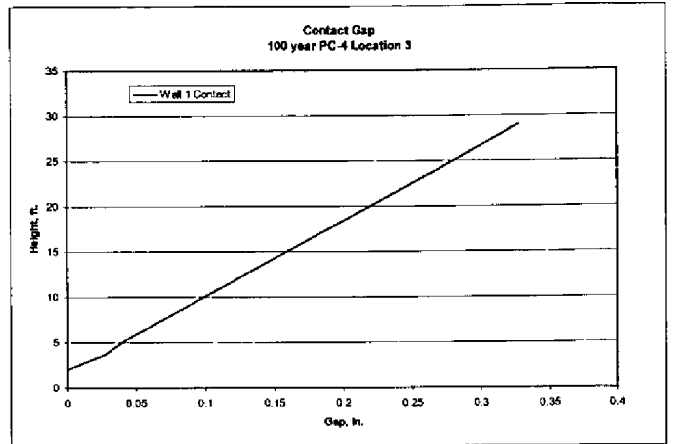
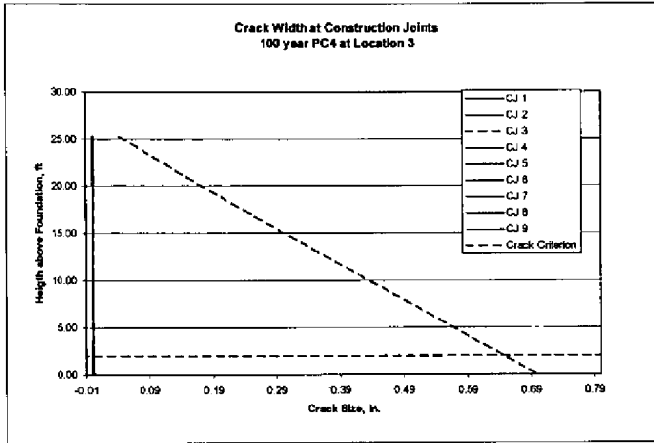
PC-4 Differential Settlement - Location 2
Mean Grout Modulus

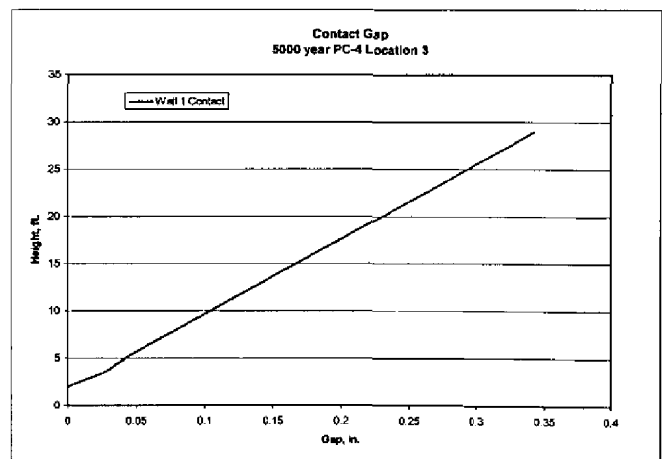
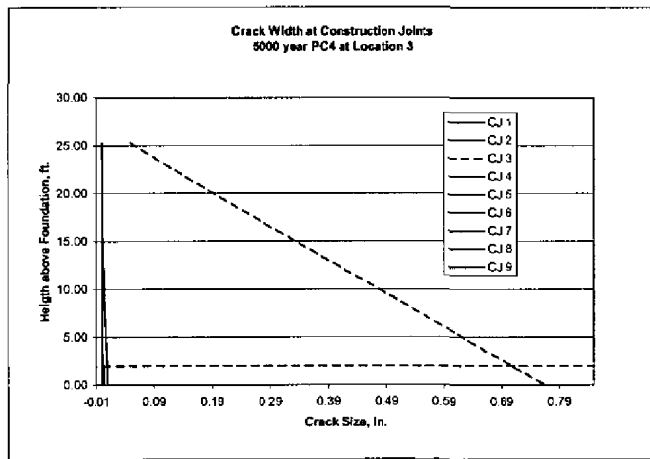
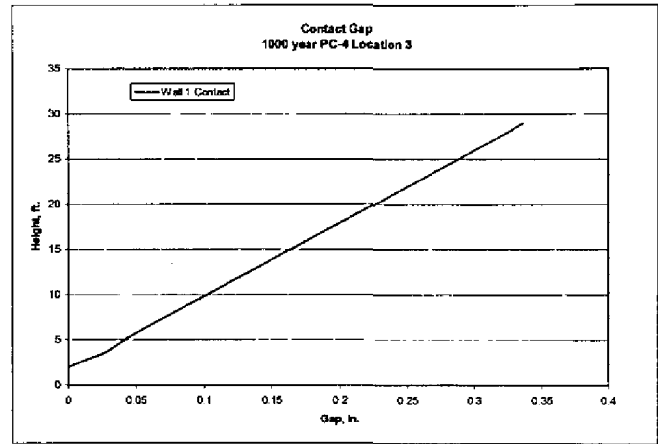
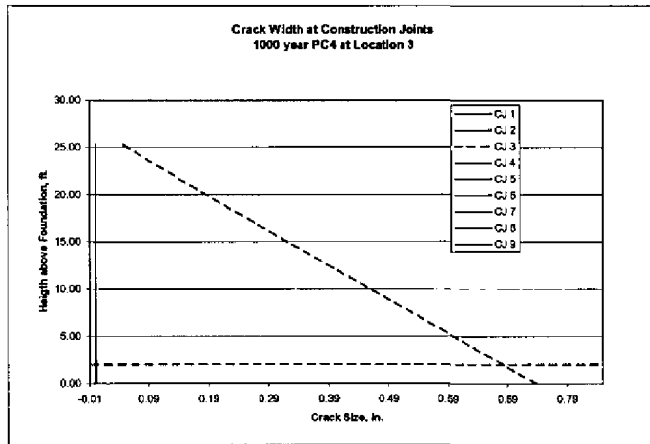
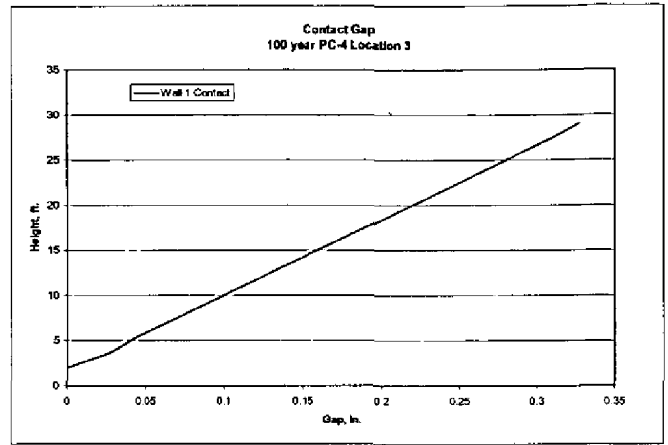
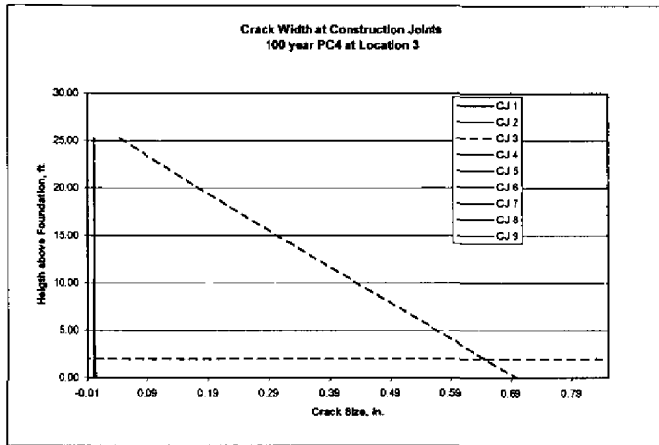


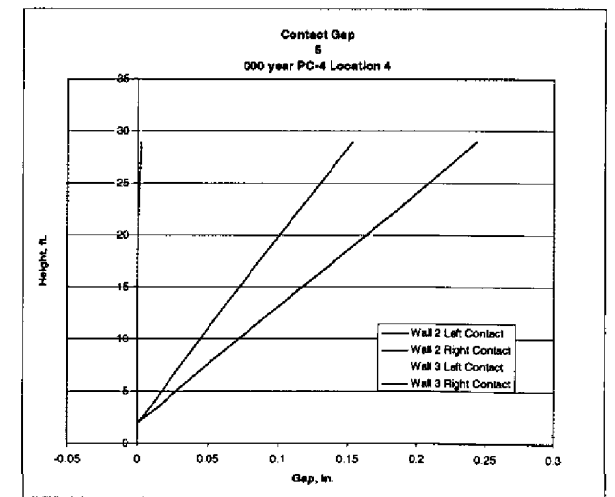
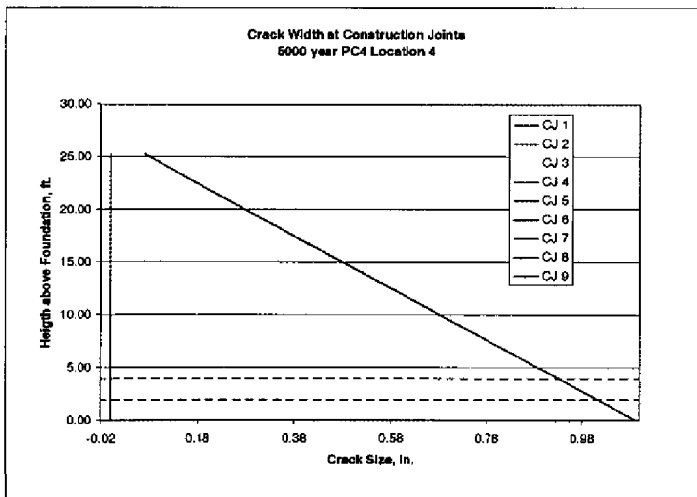
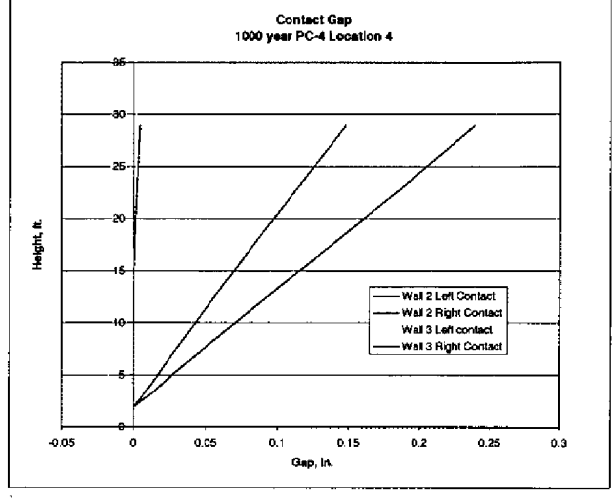
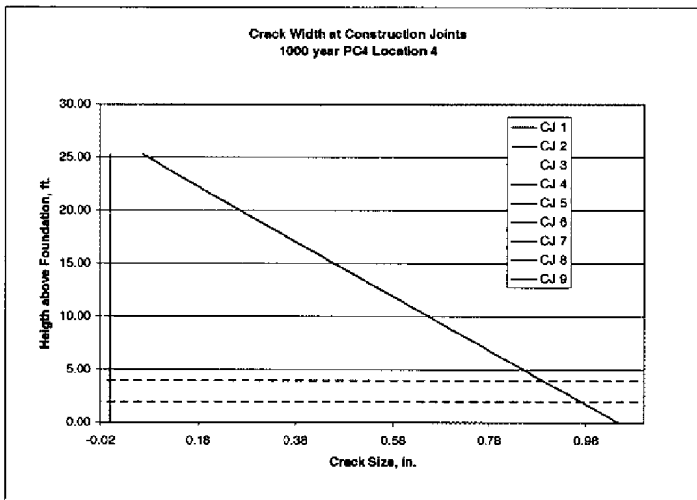
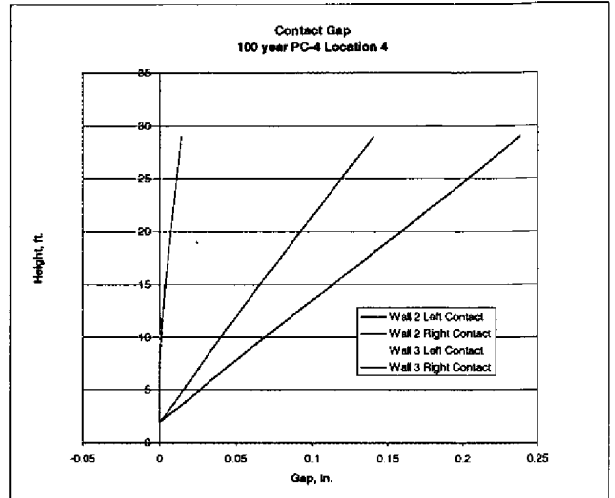
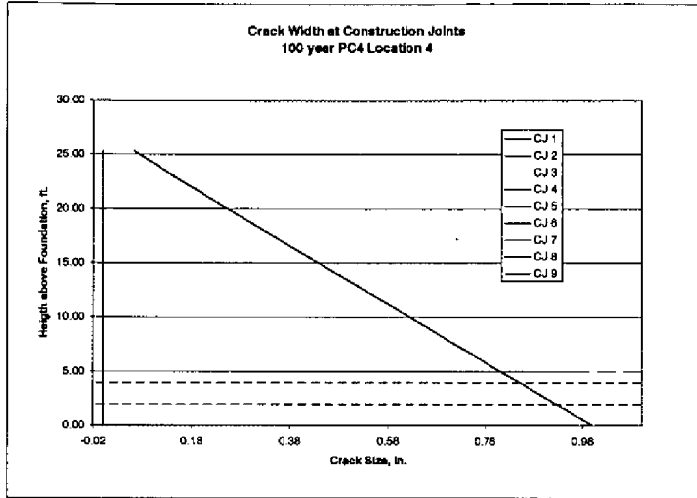
PC-4 Differential Settlement - Location 2
High Grout Modulus

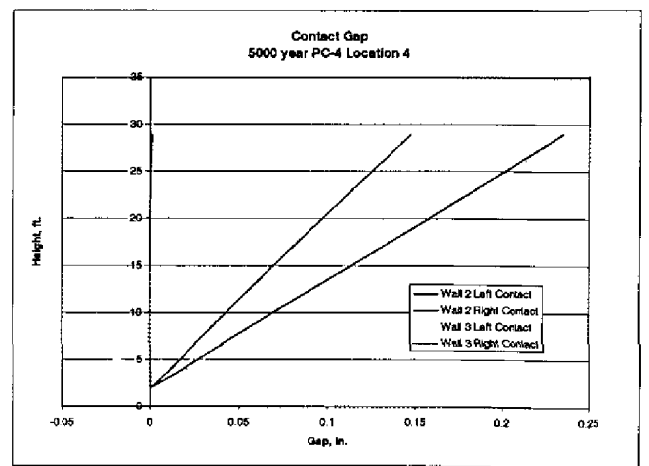
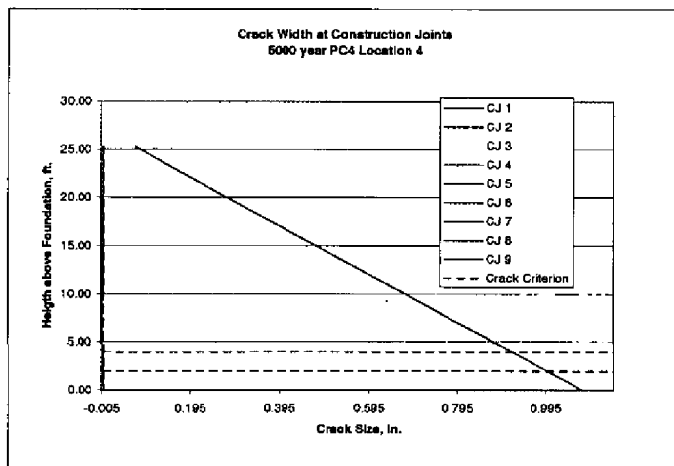
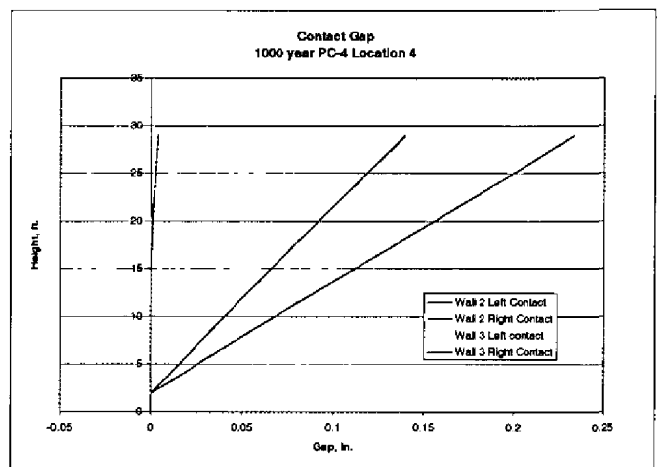
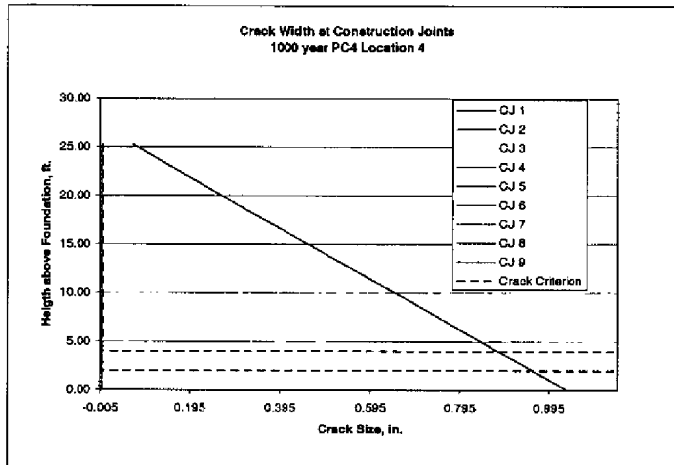
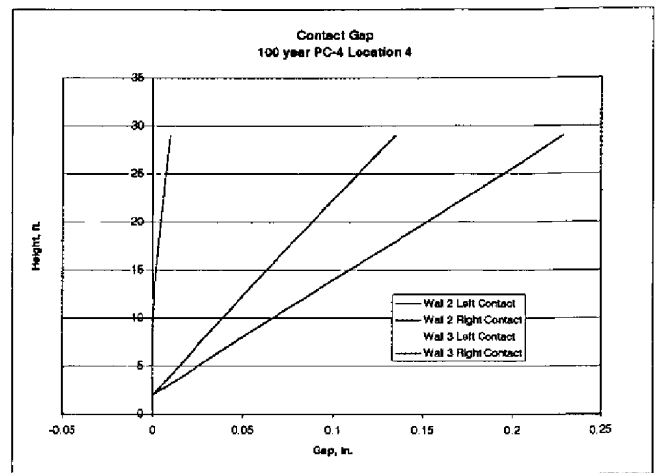
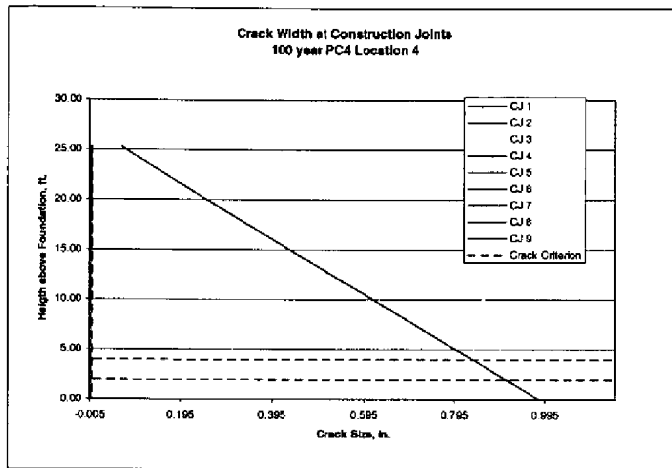




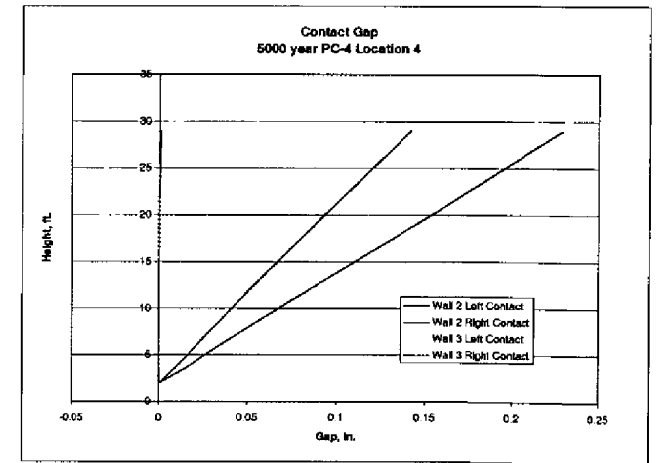
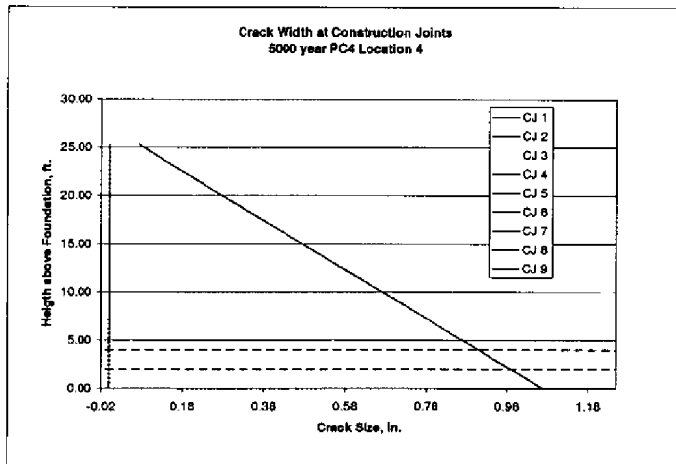
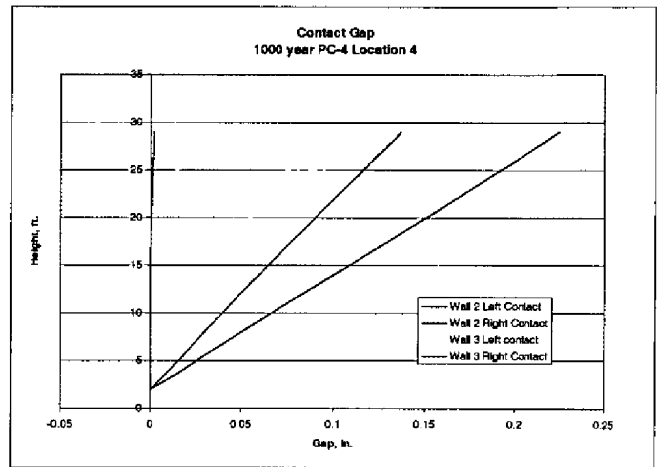
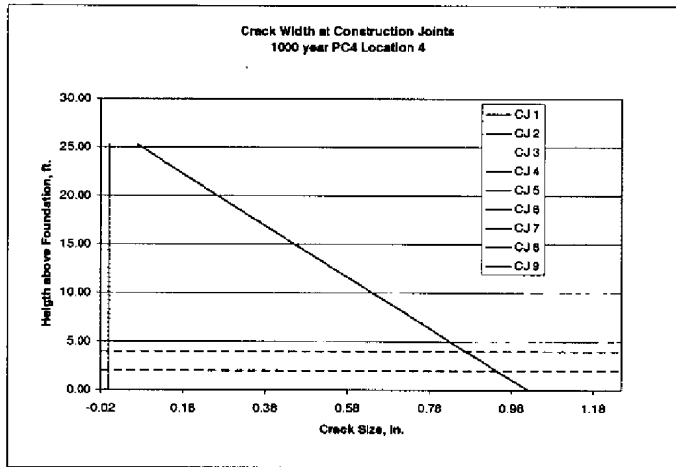
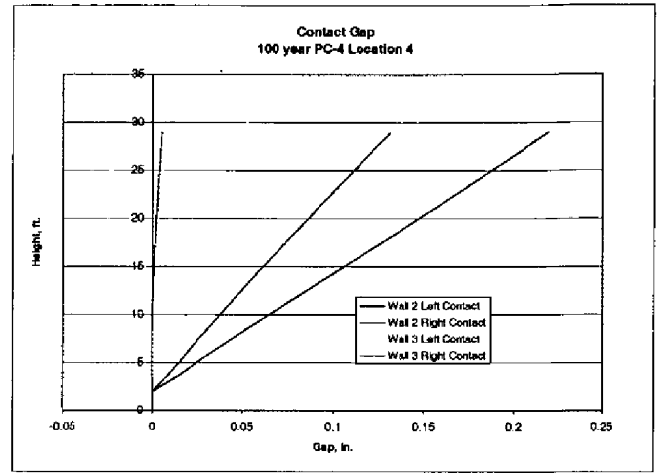
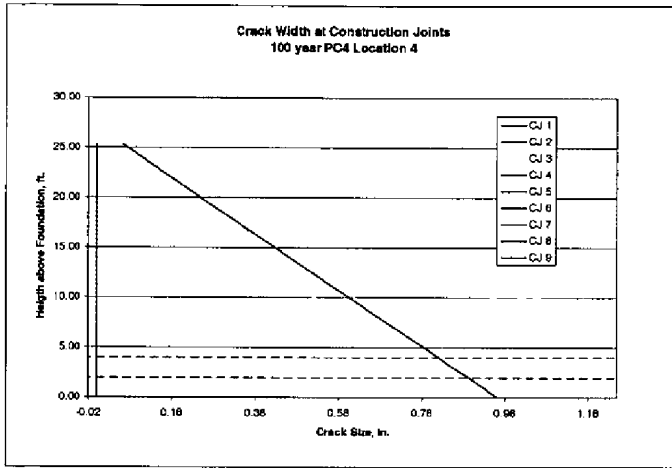


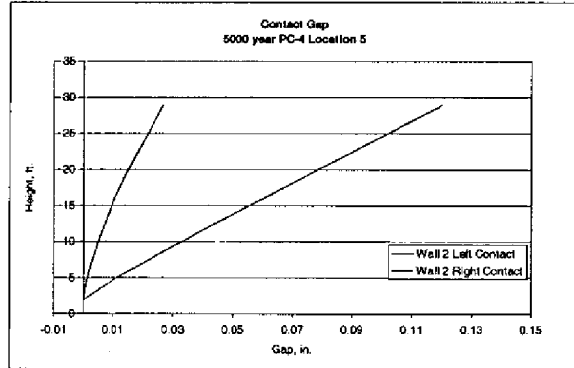
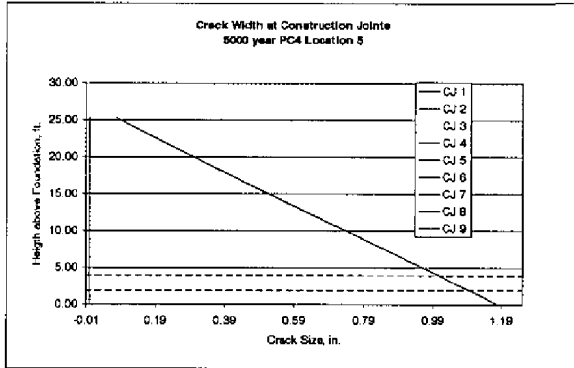
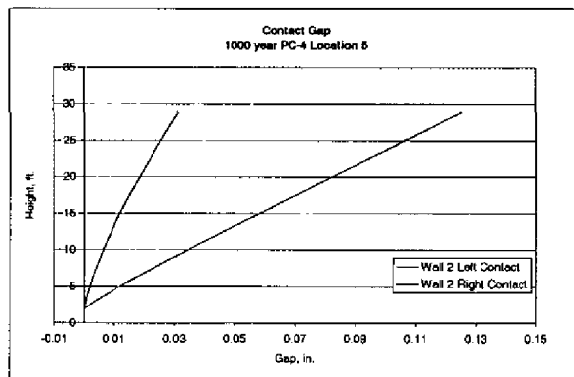
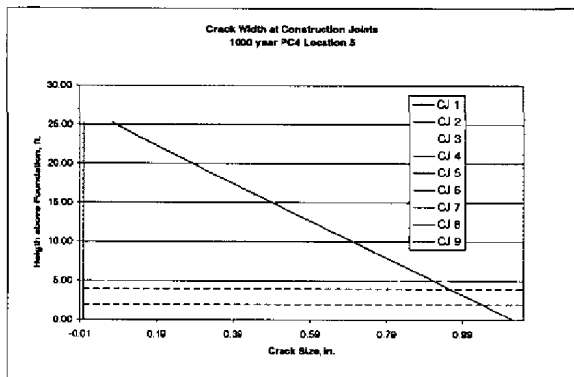
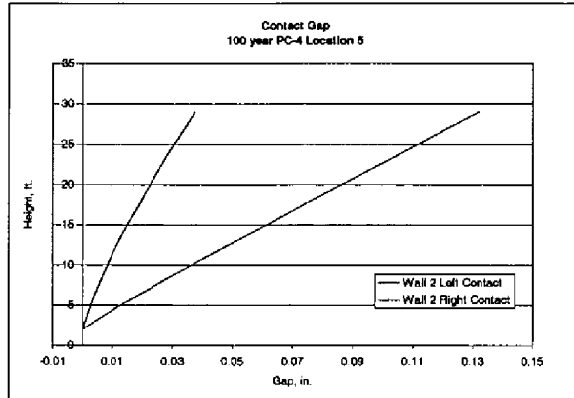
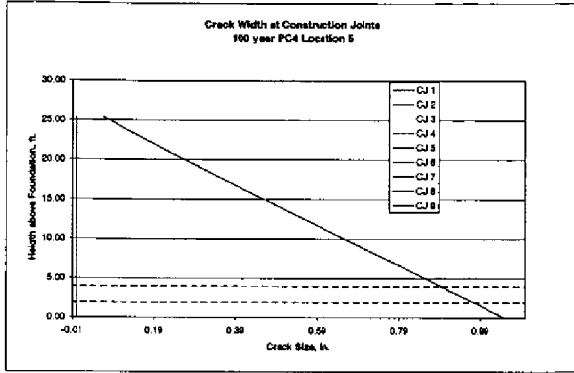




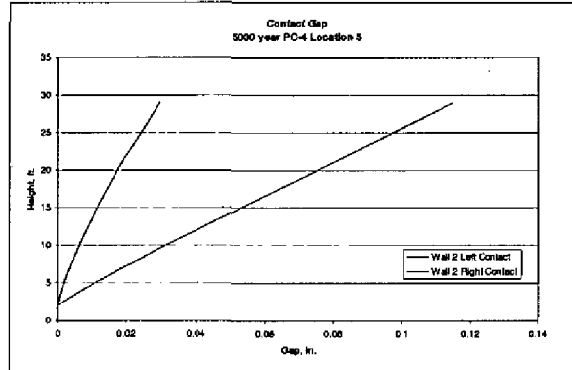
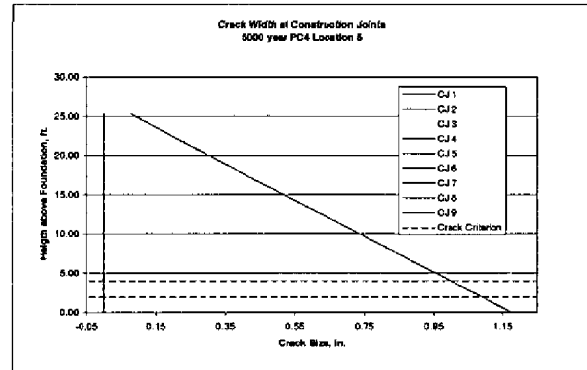
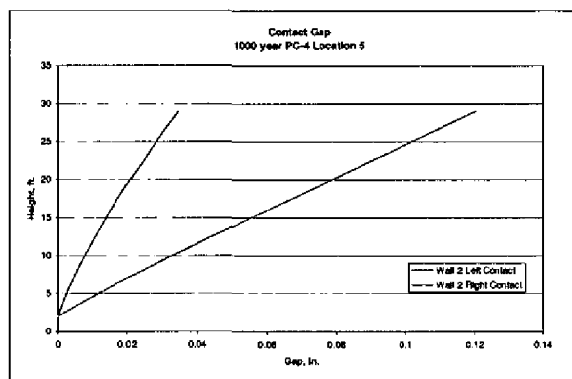
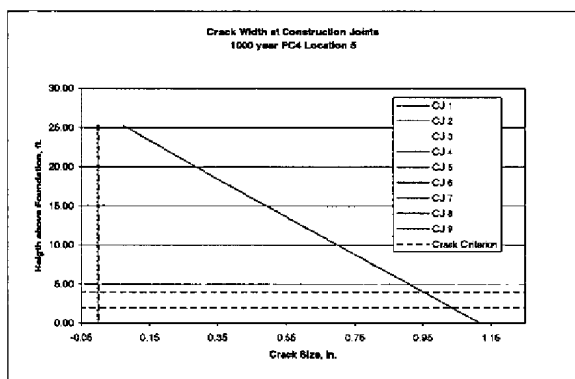
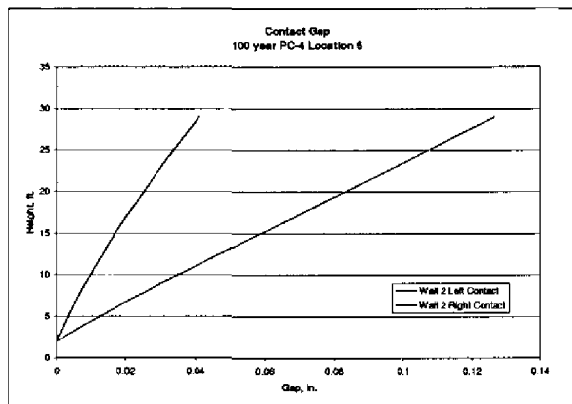
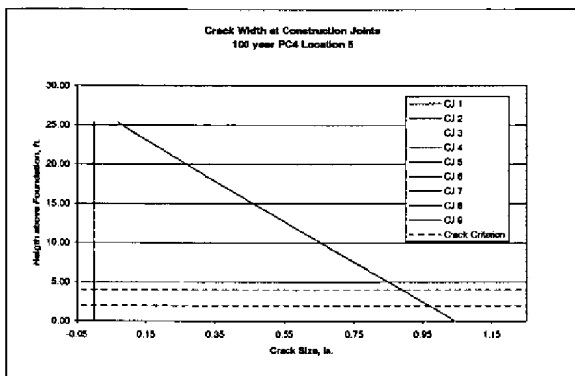


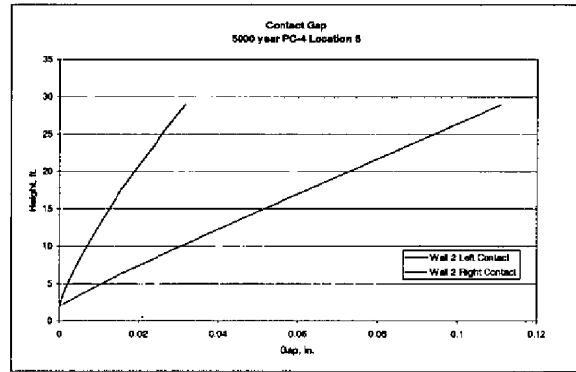
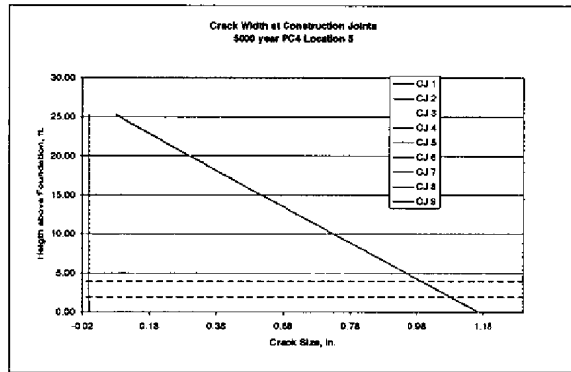
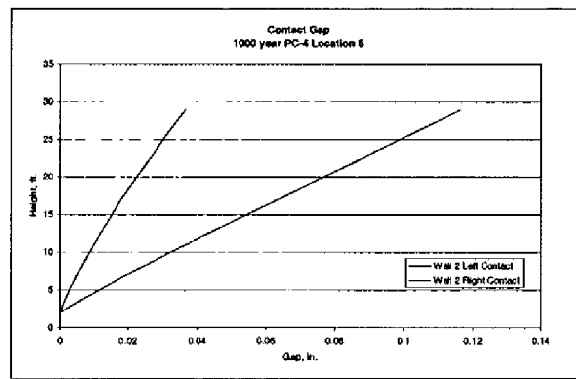
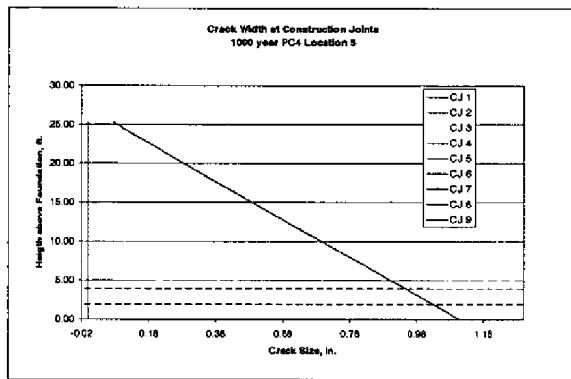
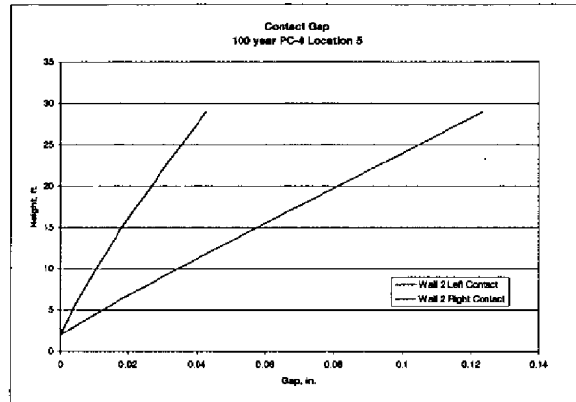
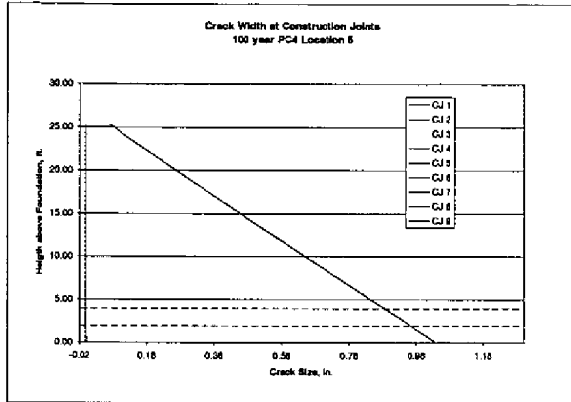
PC-4 Differential Settlement - Location 4
High Grout Modulus

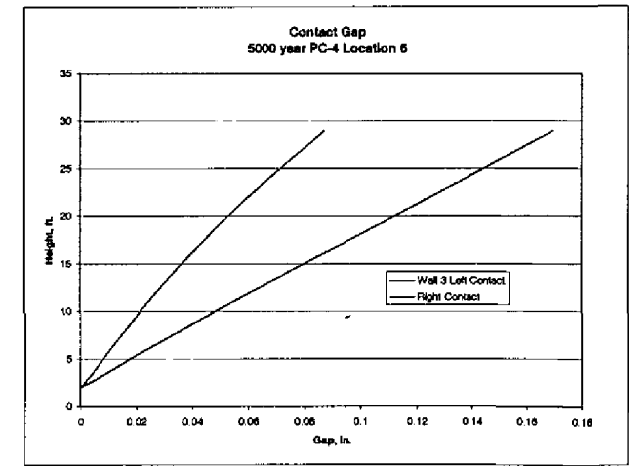
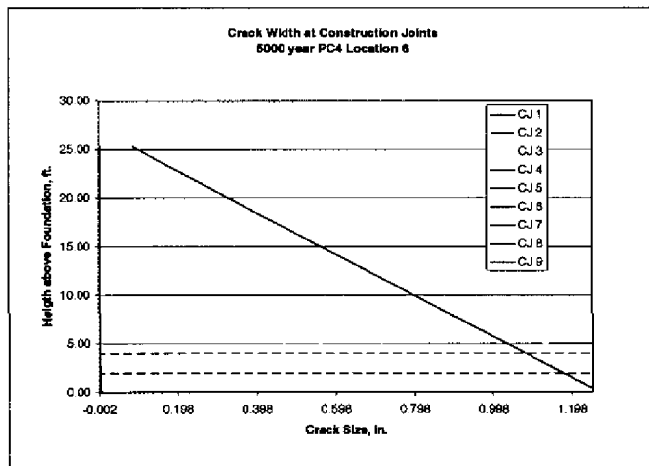
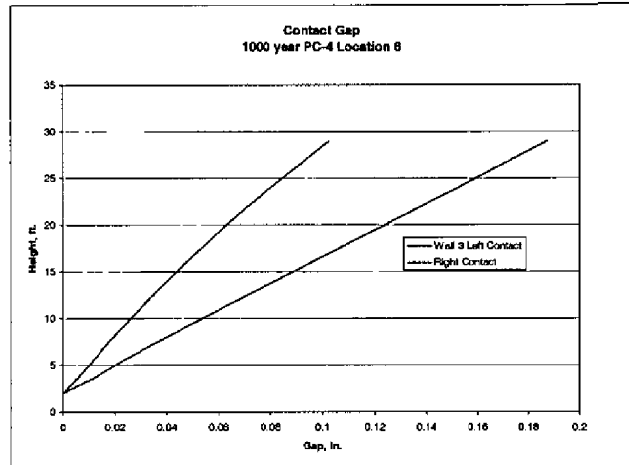
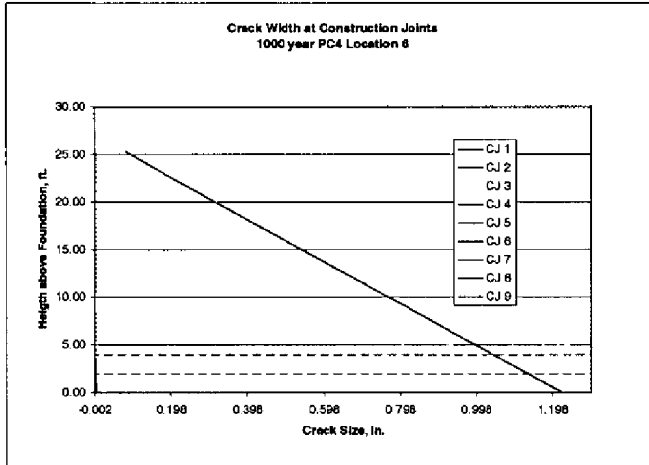
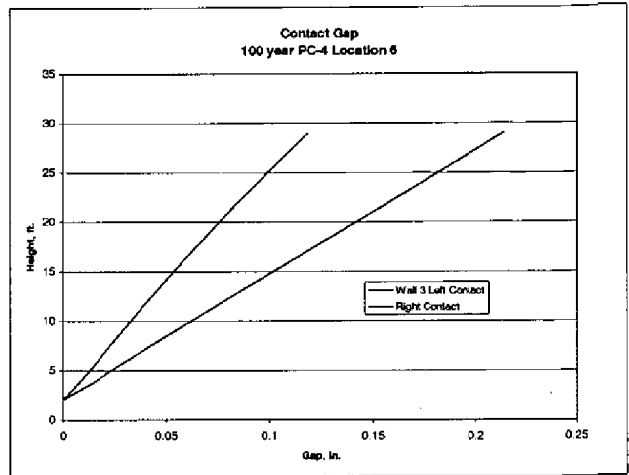
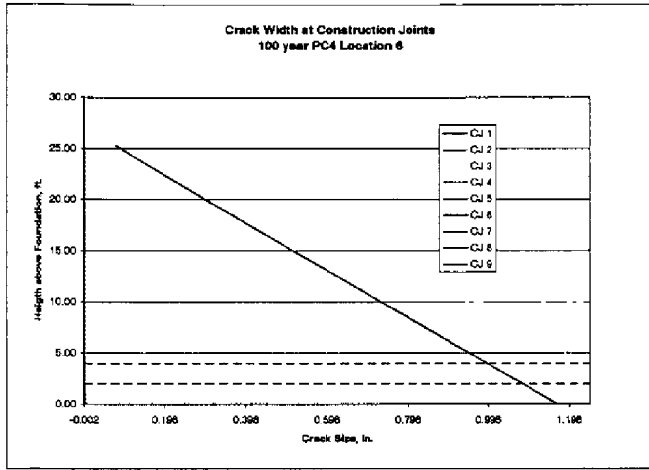




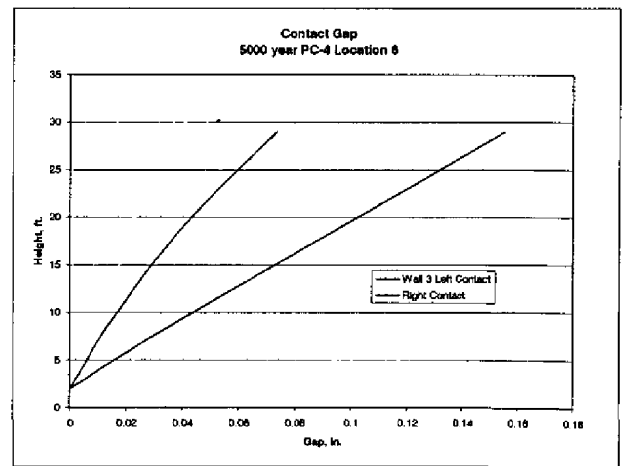
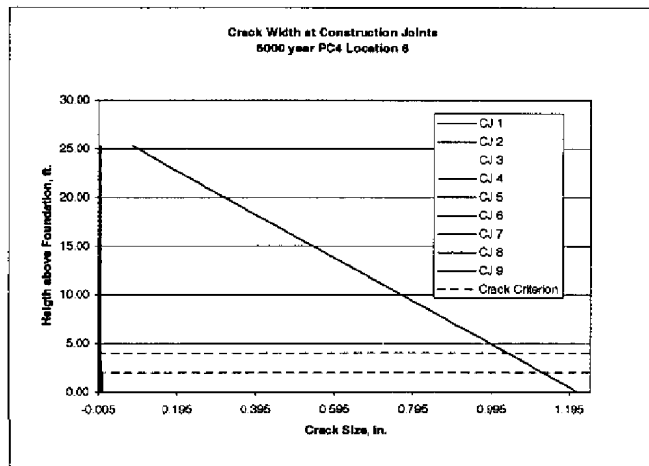
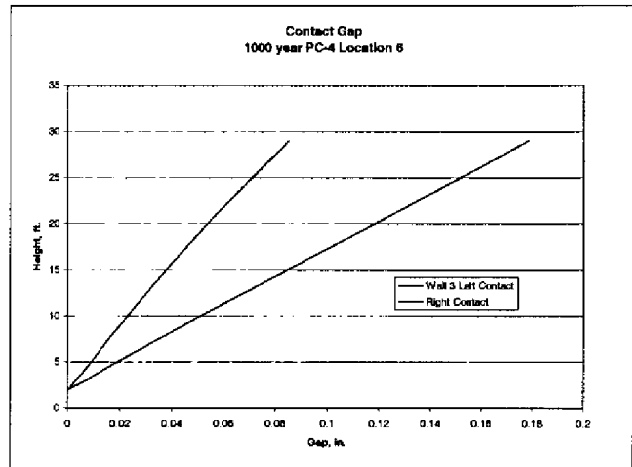
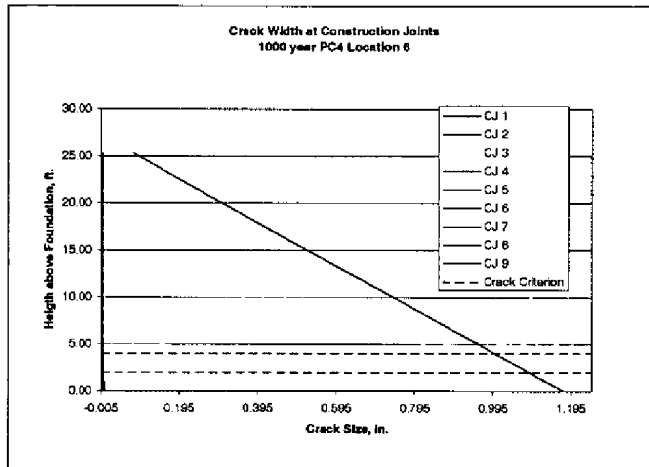
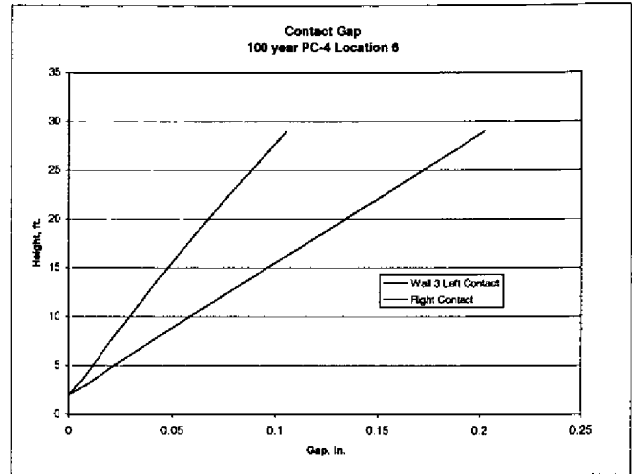
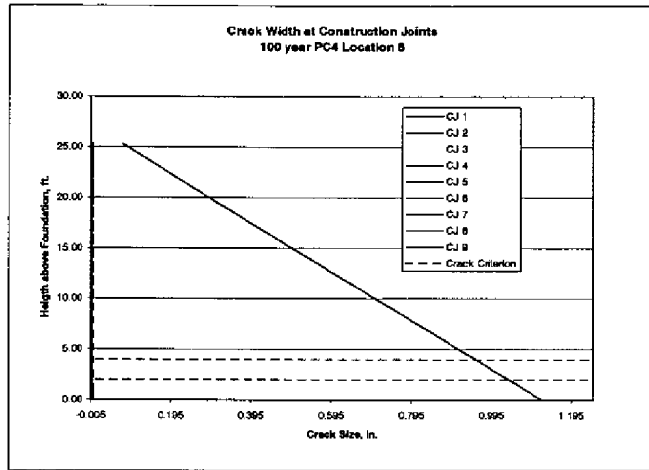
PC-4 Differential Settlement - Location 5
Mean Grout Modulus

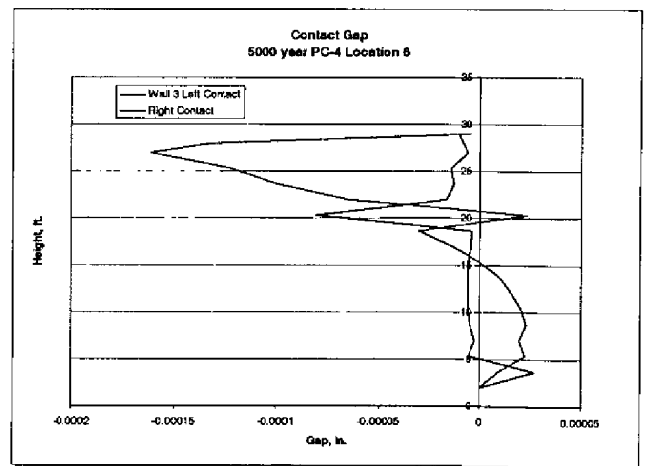
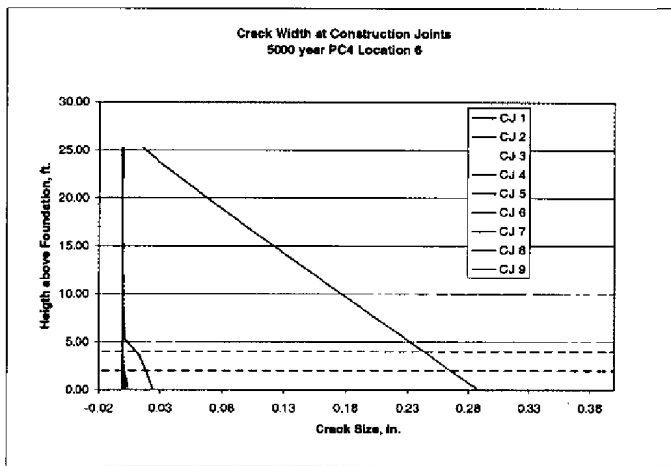
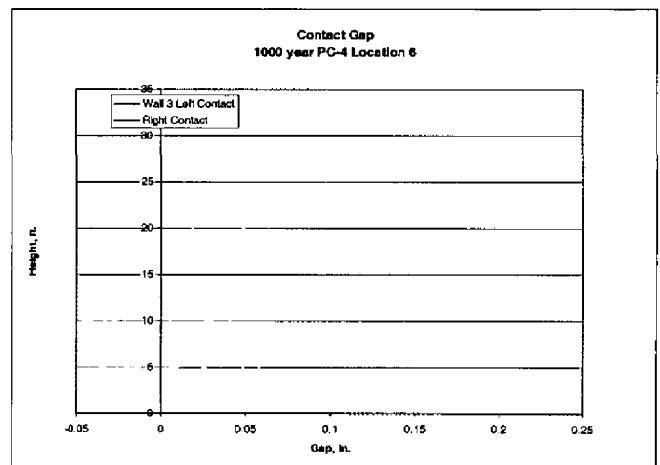
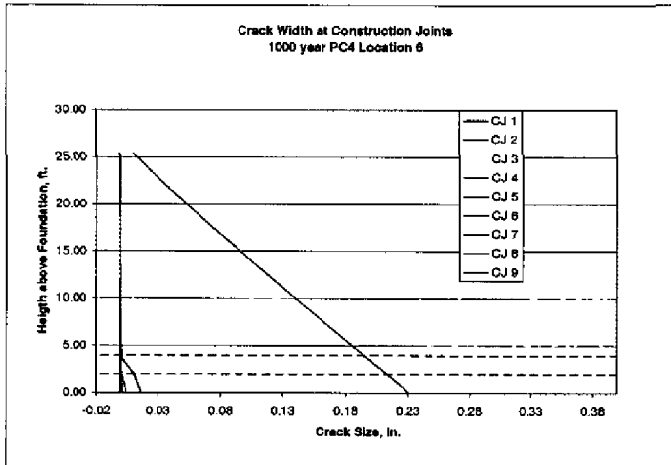
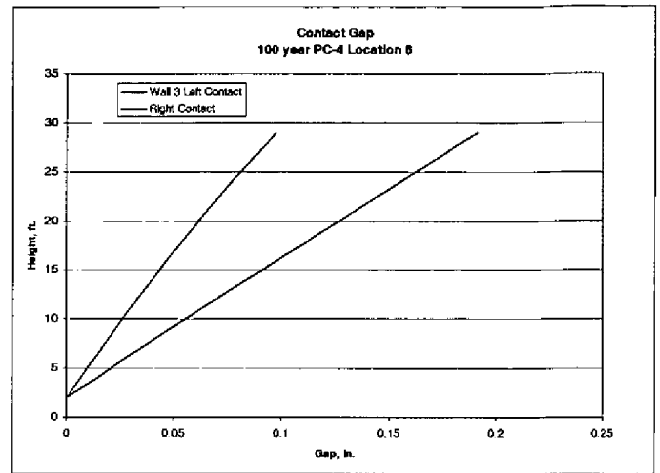
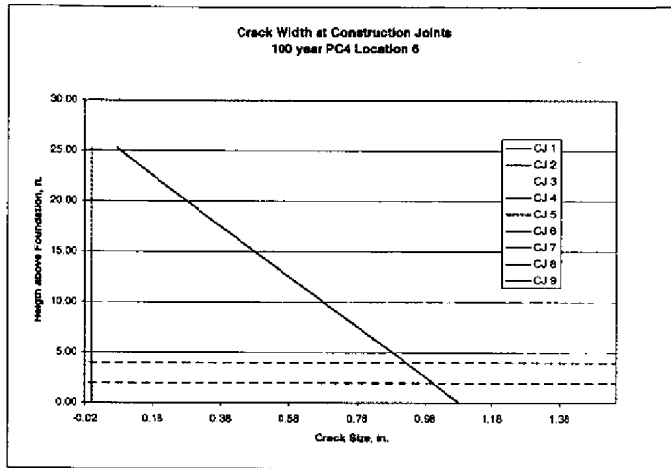




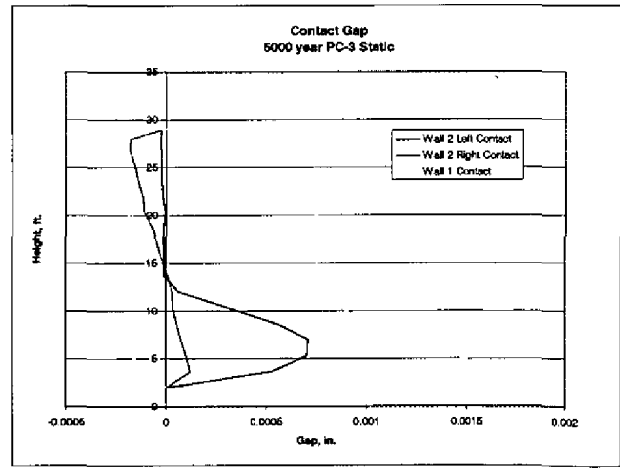
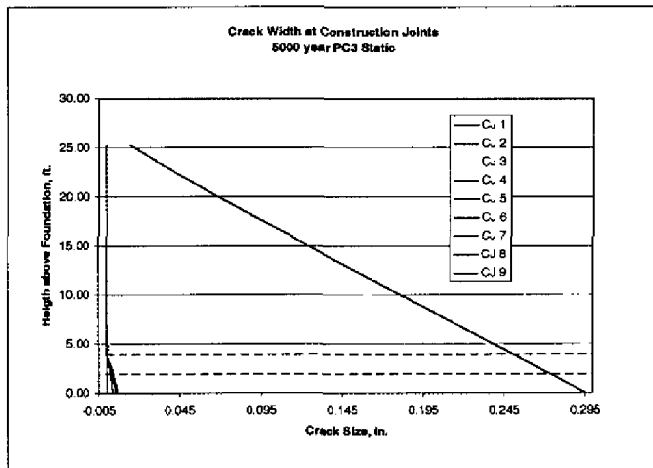
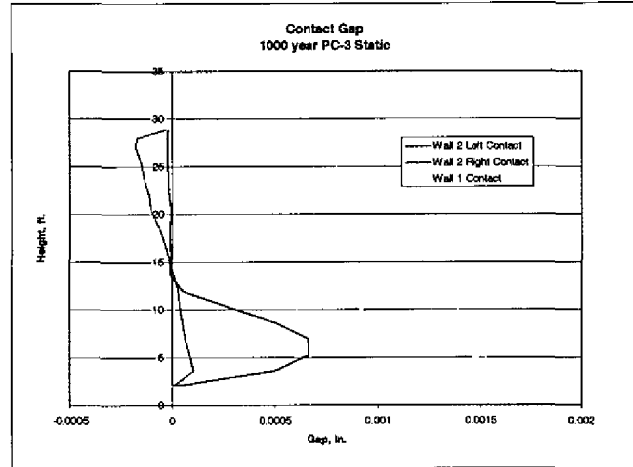
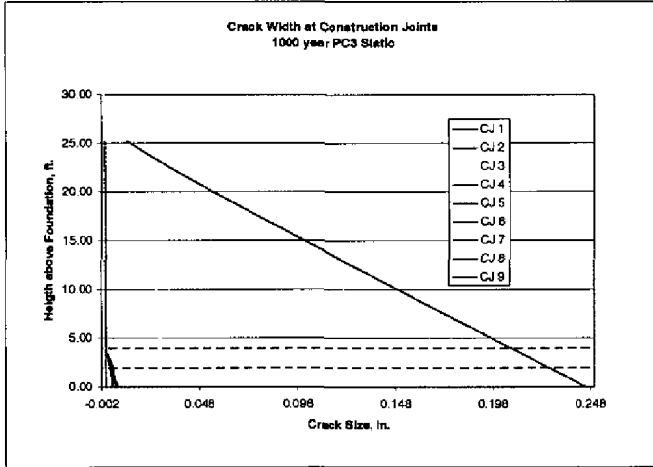
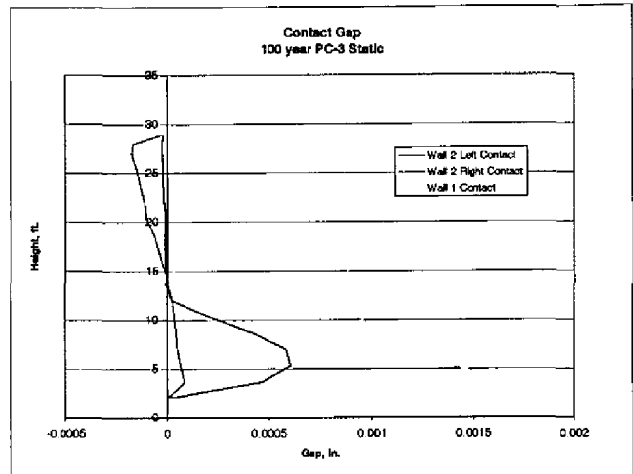
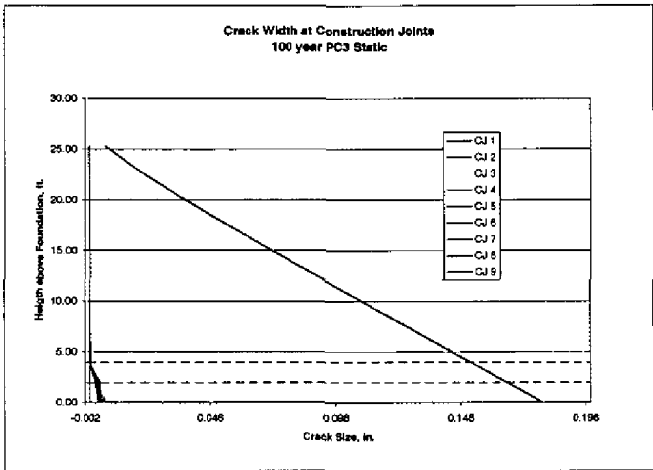


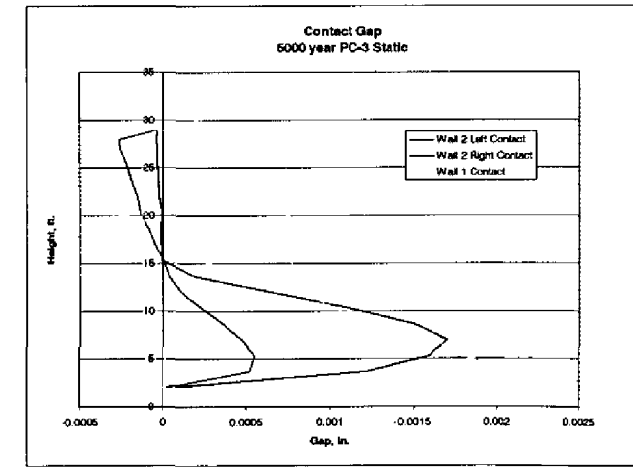
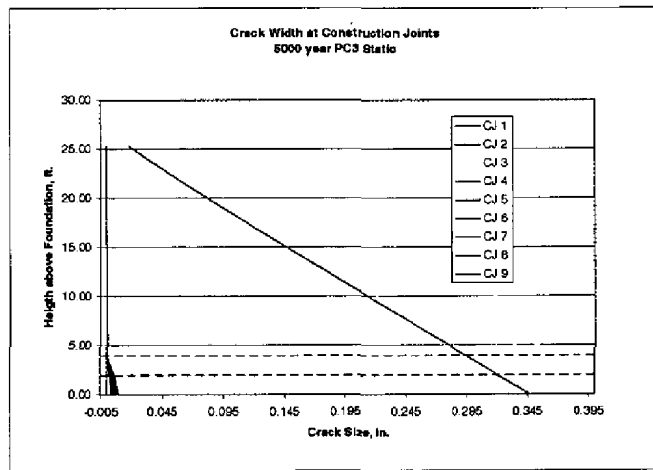
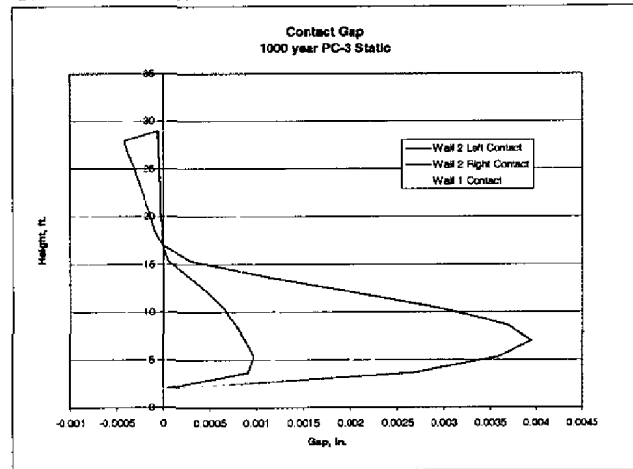
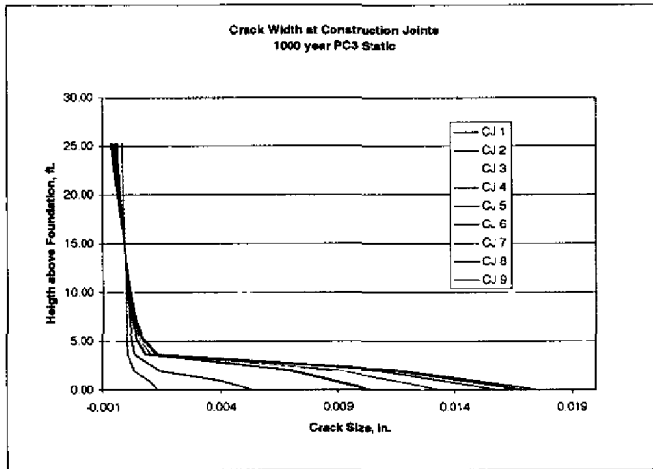
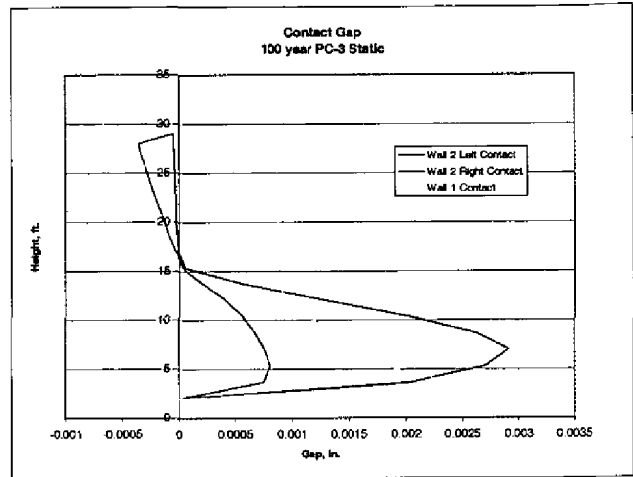
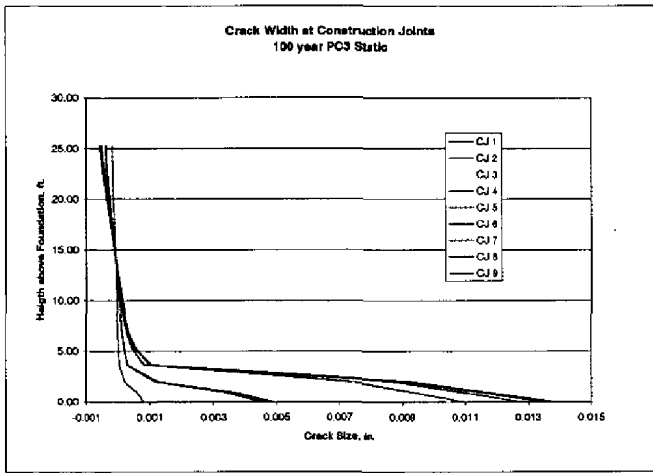
PC-4 Differential Settlement - Location 6
Mean Grout Modulus

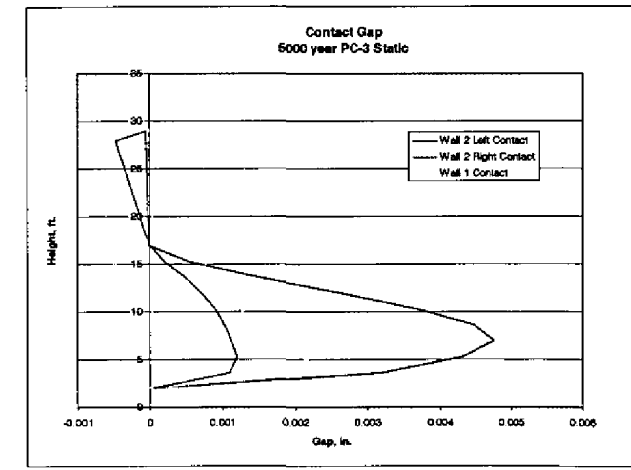
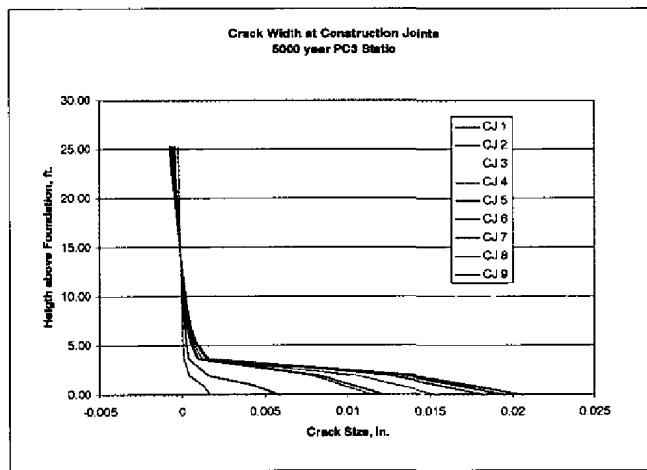
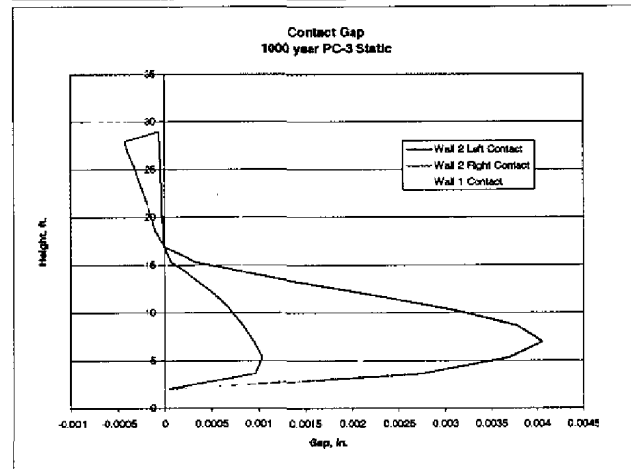
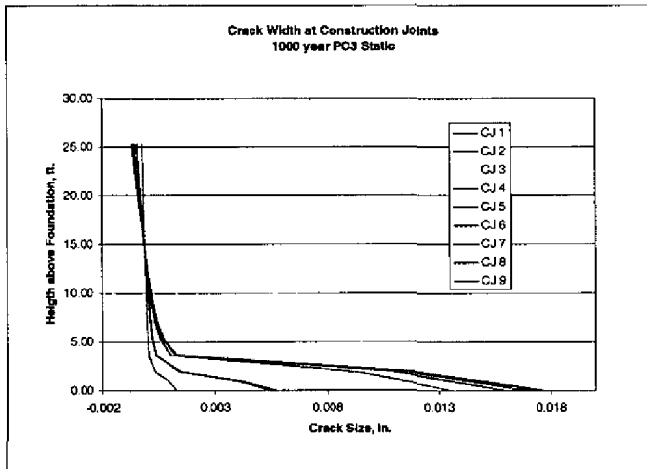
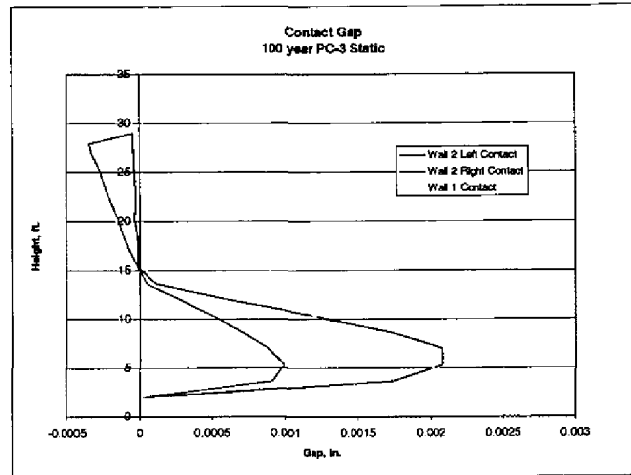
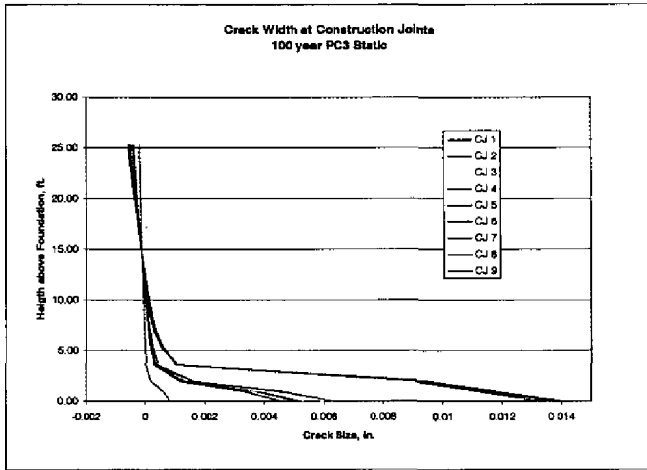


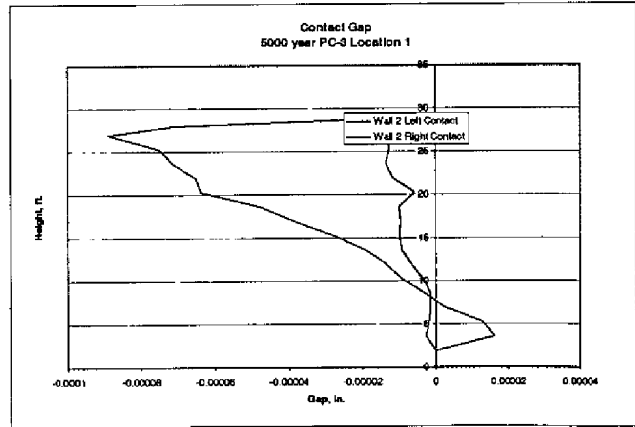
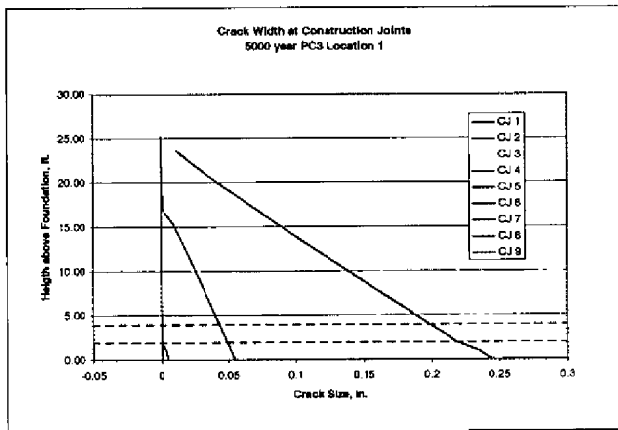
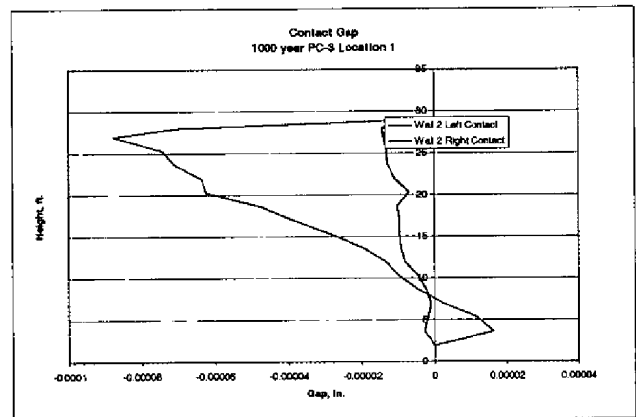
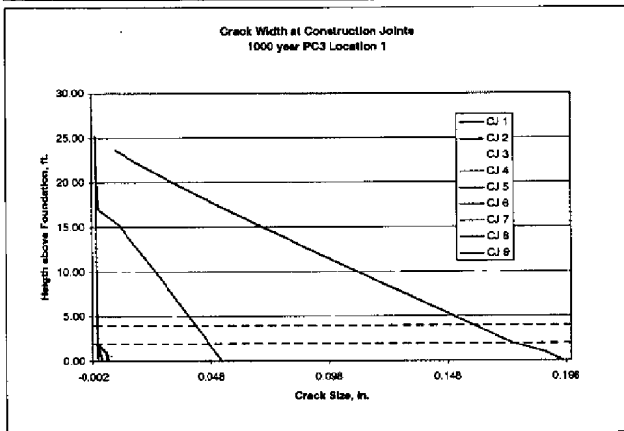
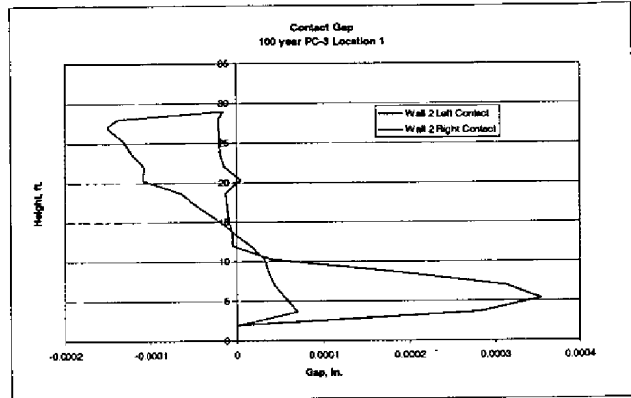
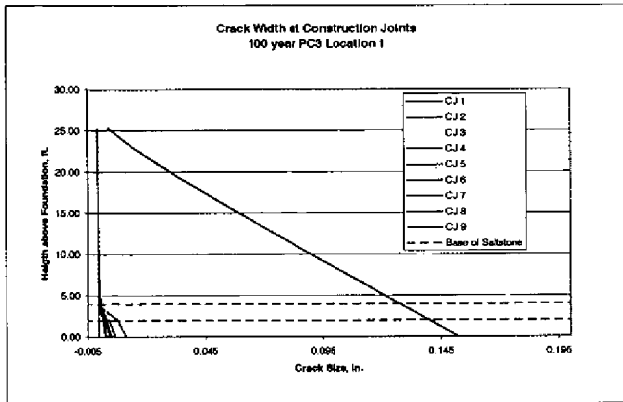


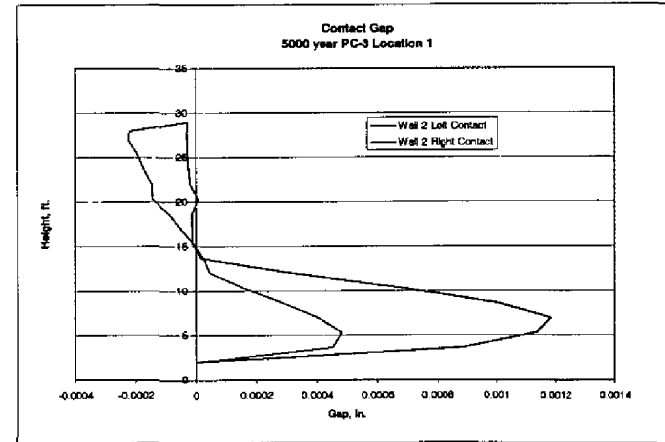
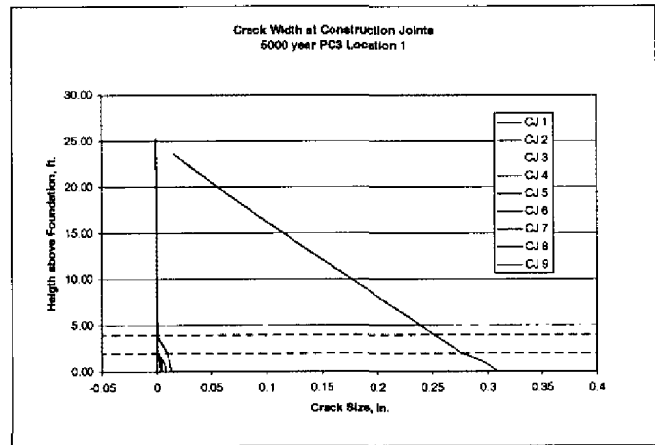
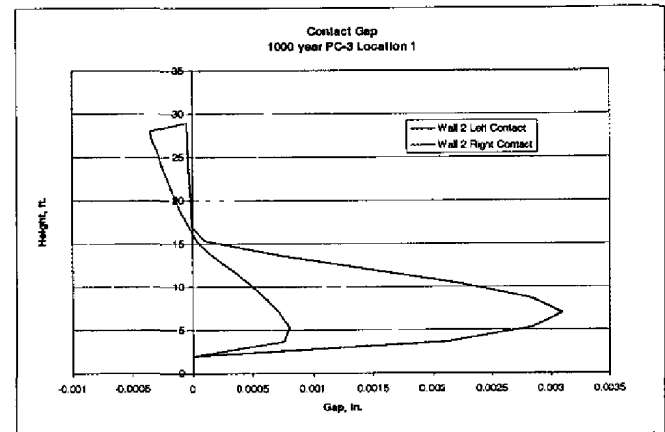
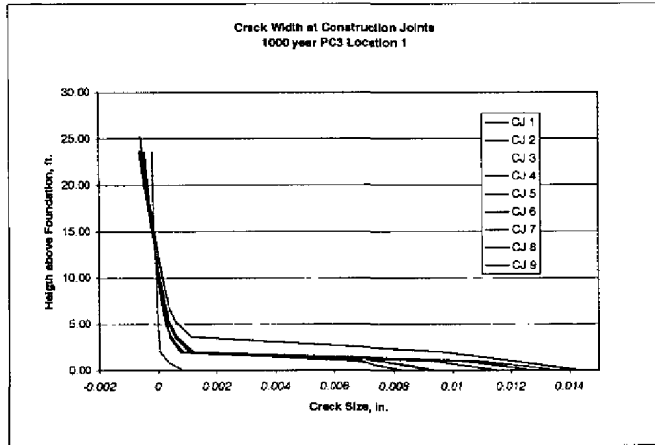
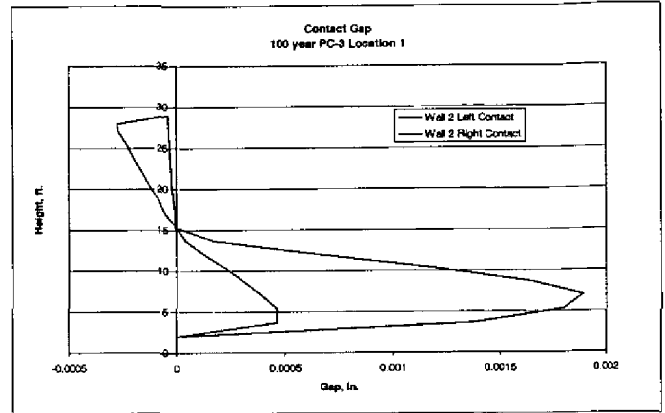
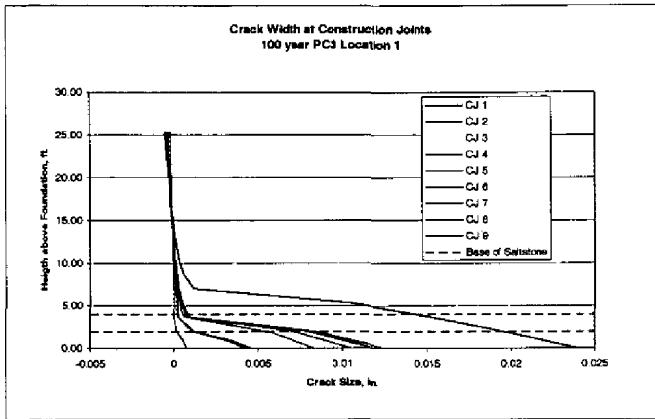
Static Settlement
Low Grout Strength

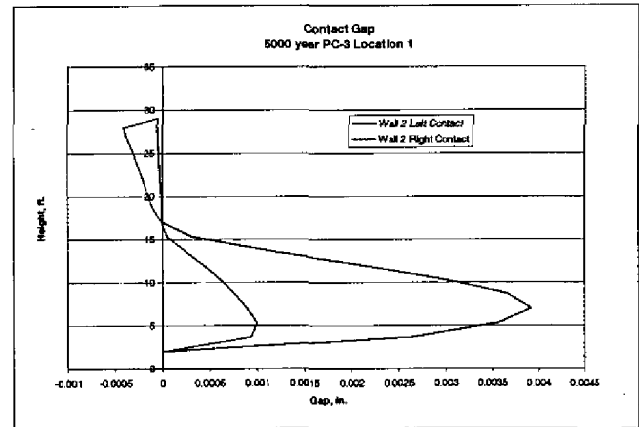
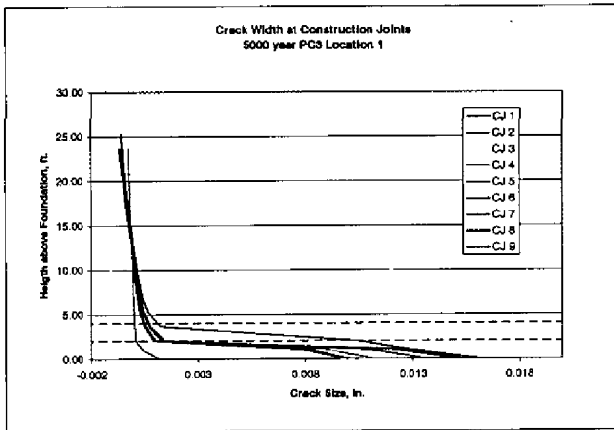
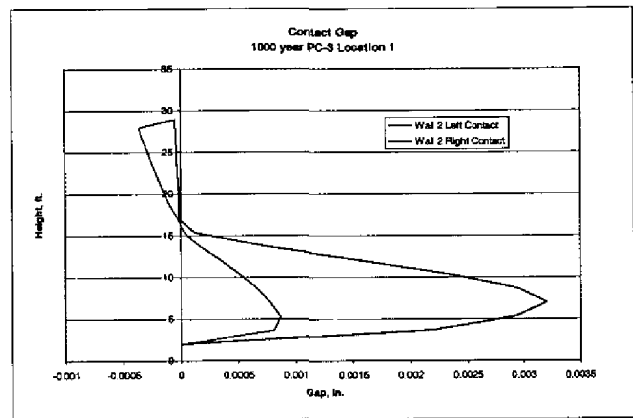
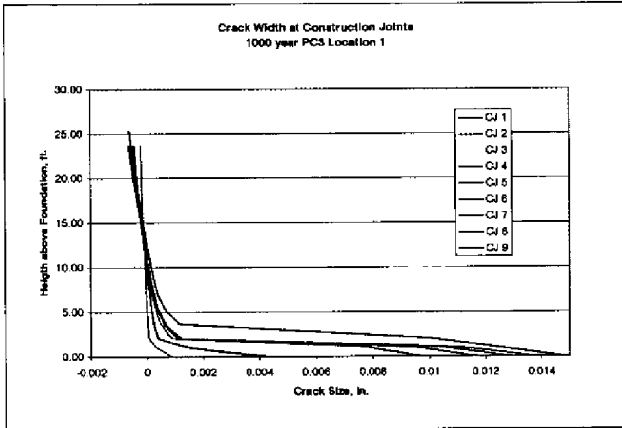
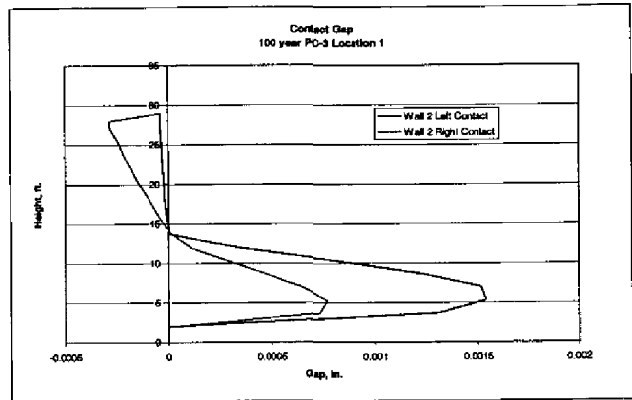
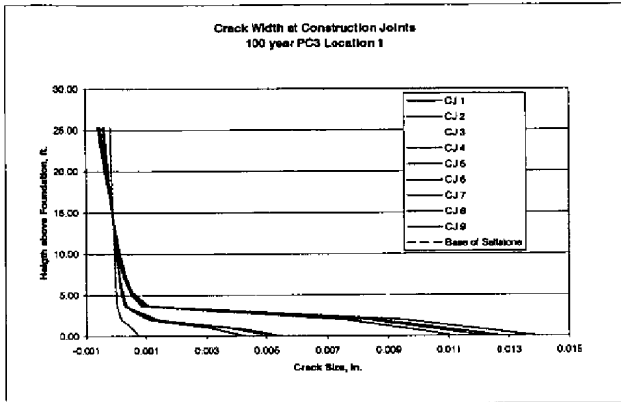




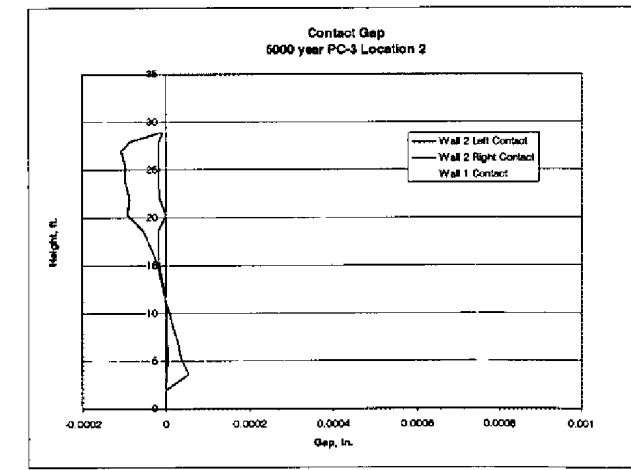
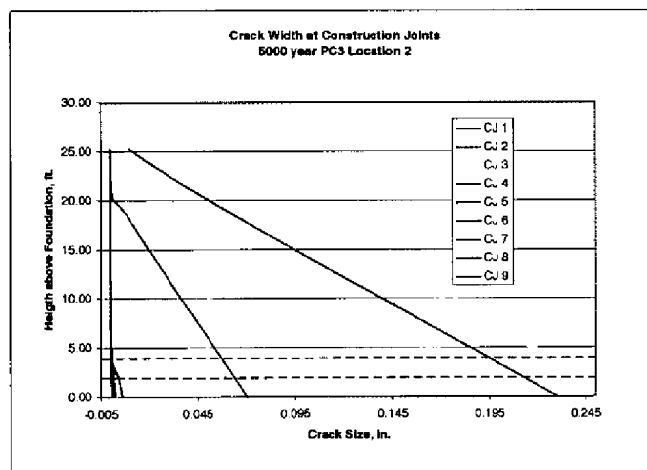
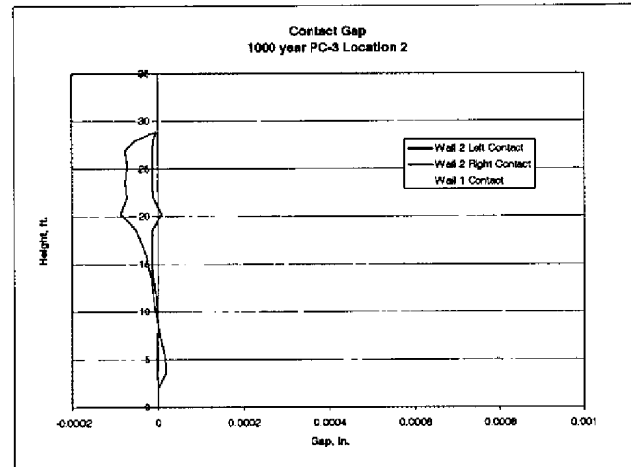
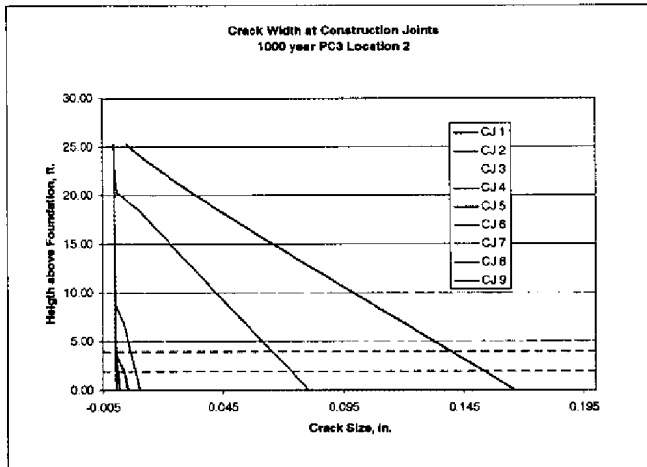
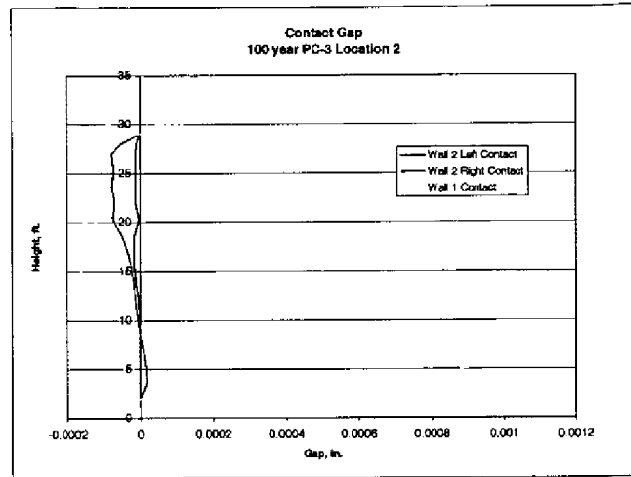
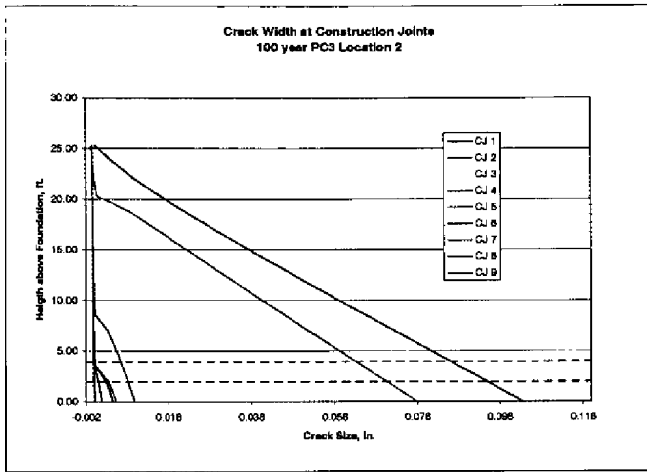


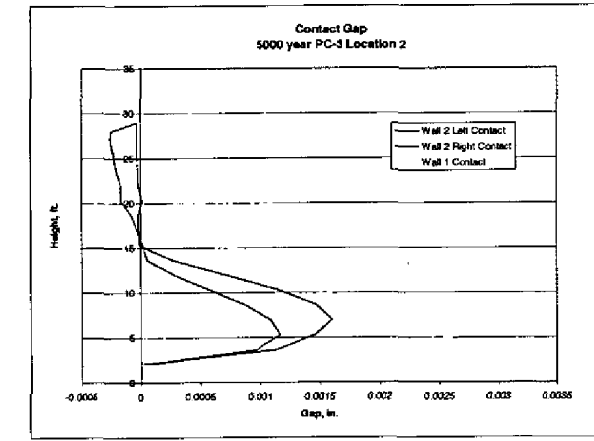
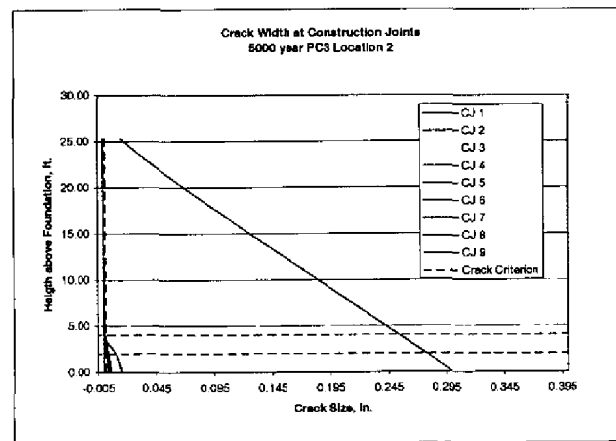
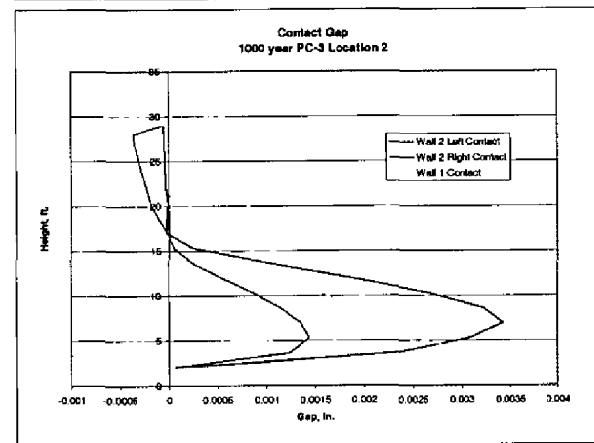
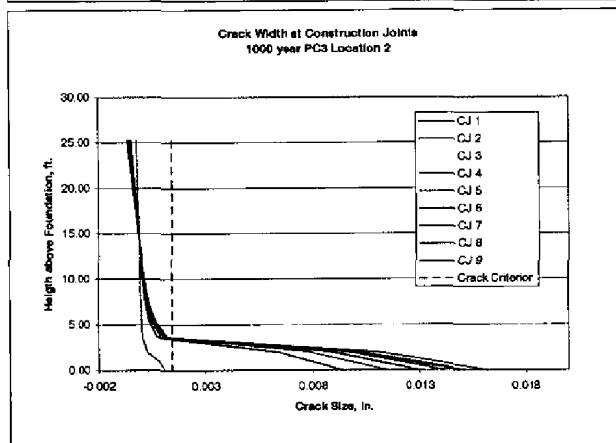
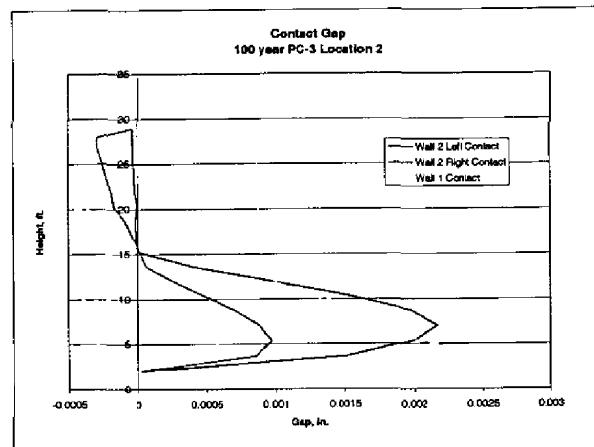
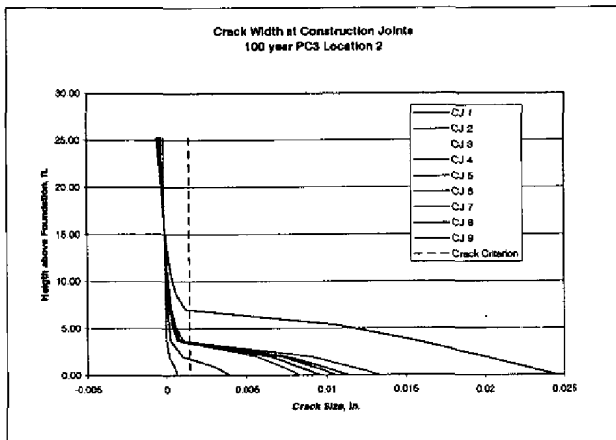




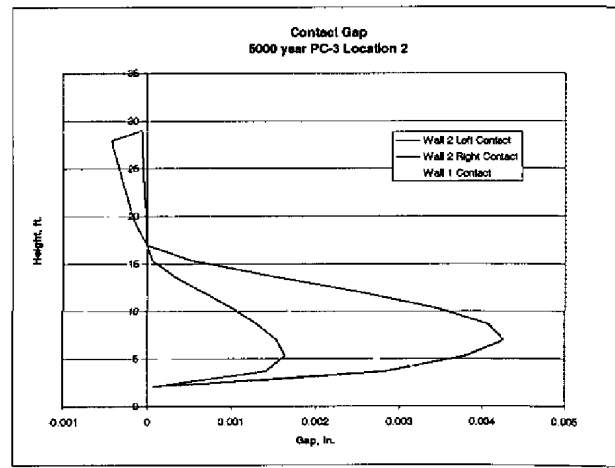
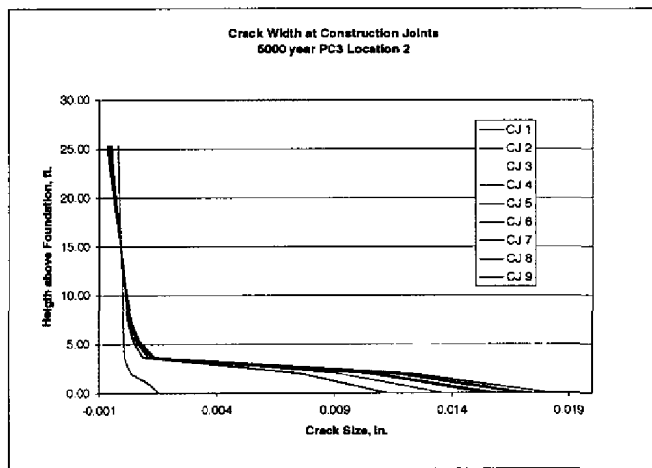
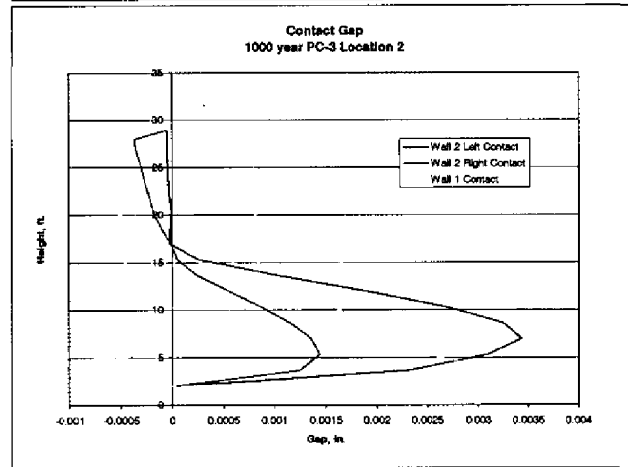
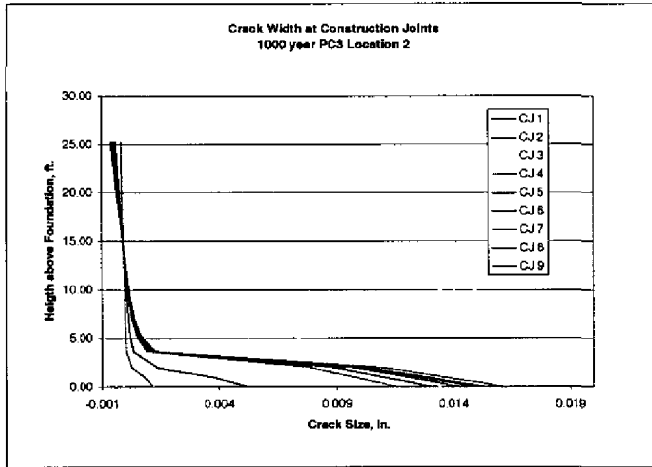
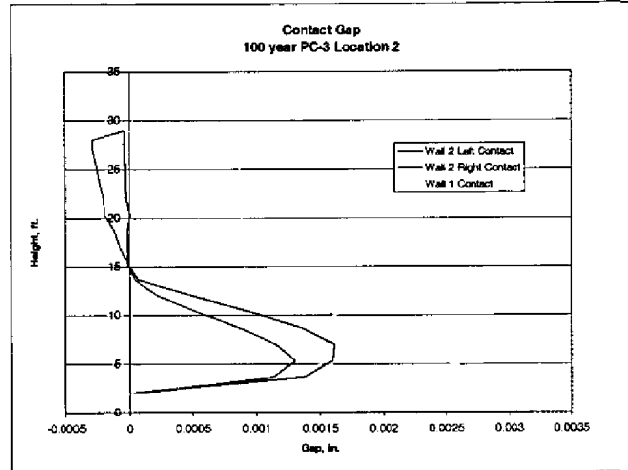
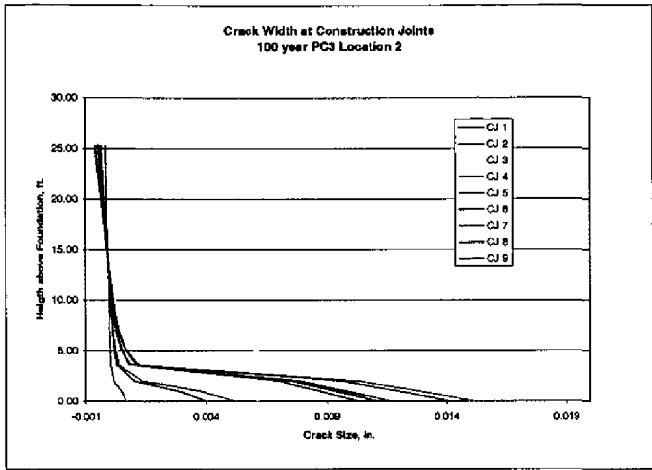


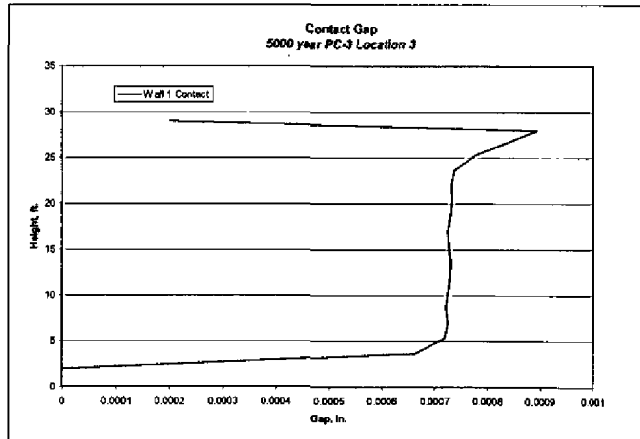
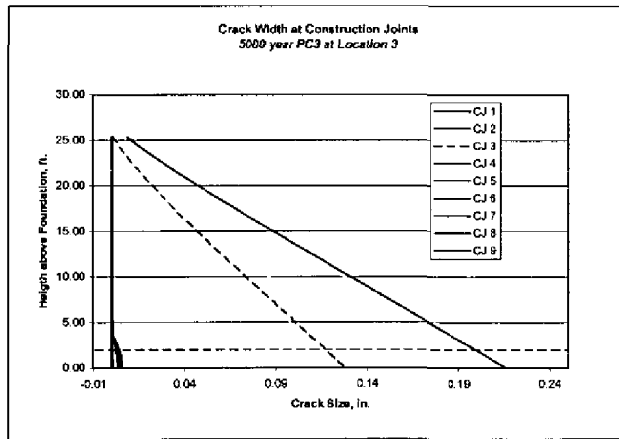
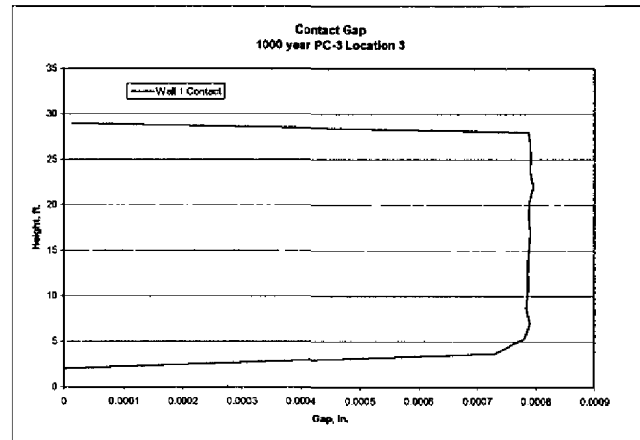
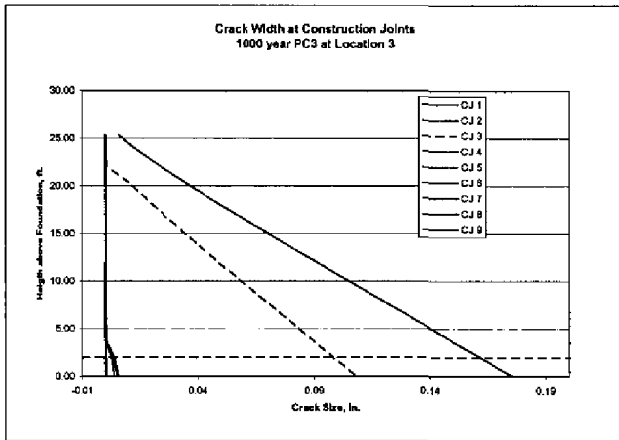
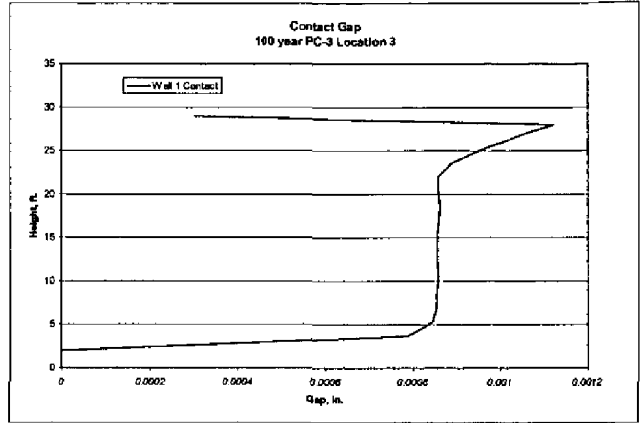
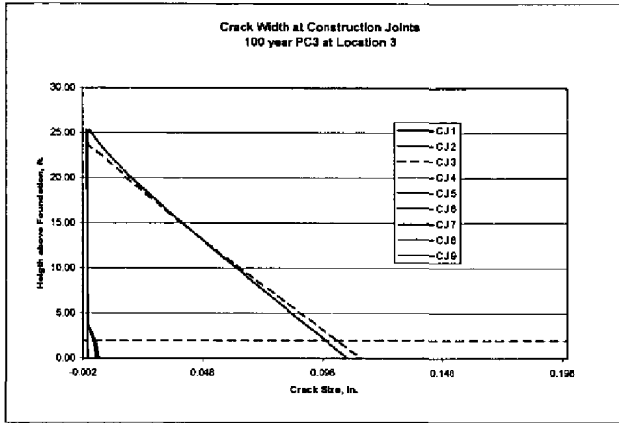
PC-3 Differential Settlement - Location 2
Low Grout Strength

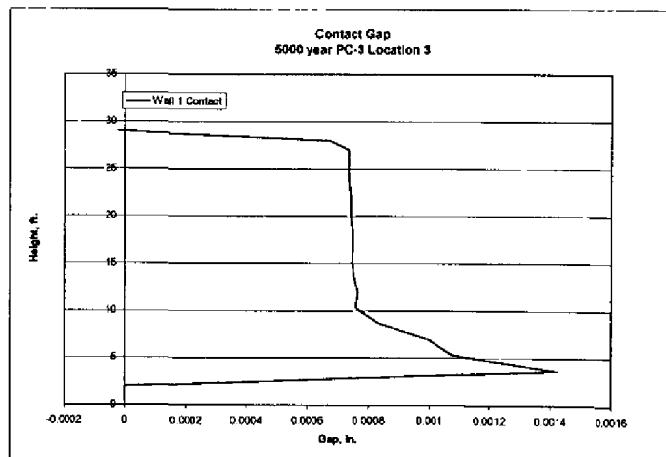
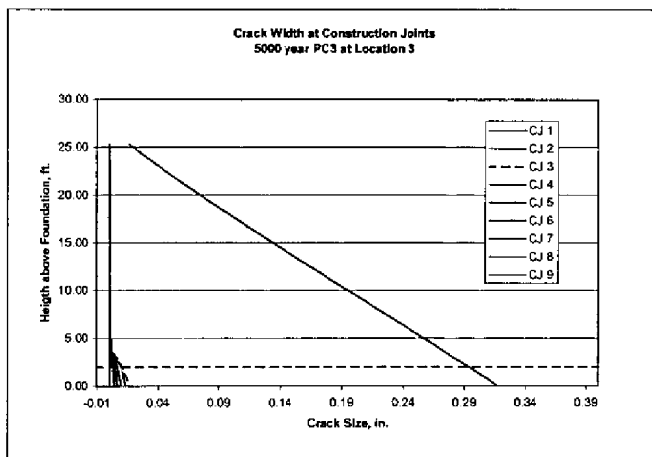
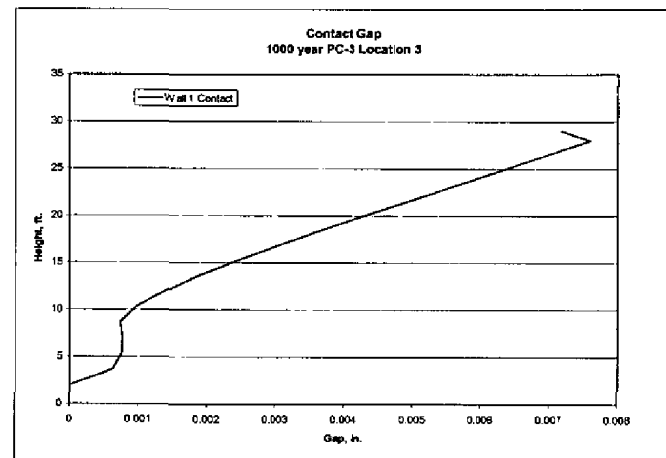
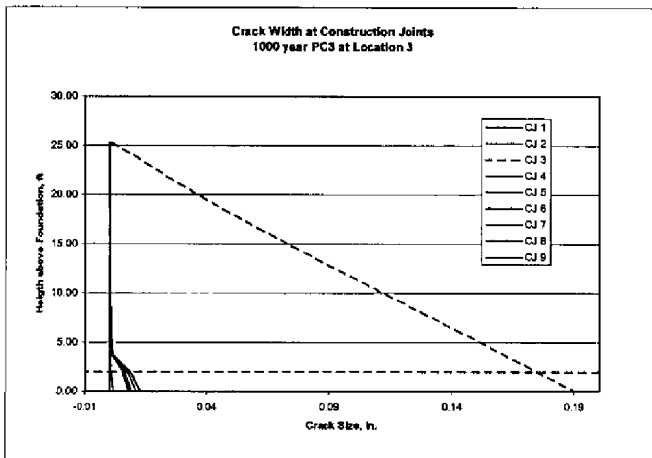
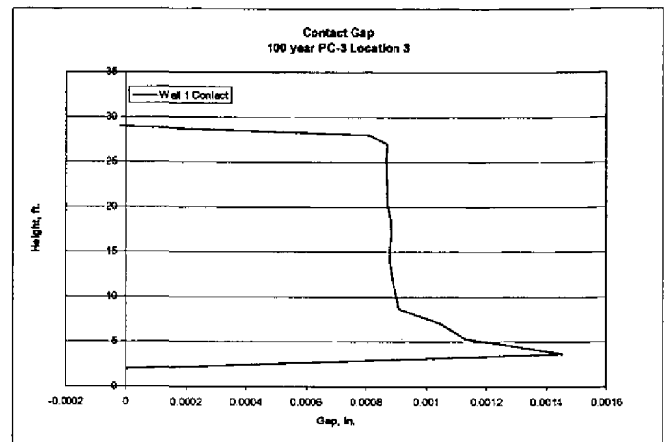
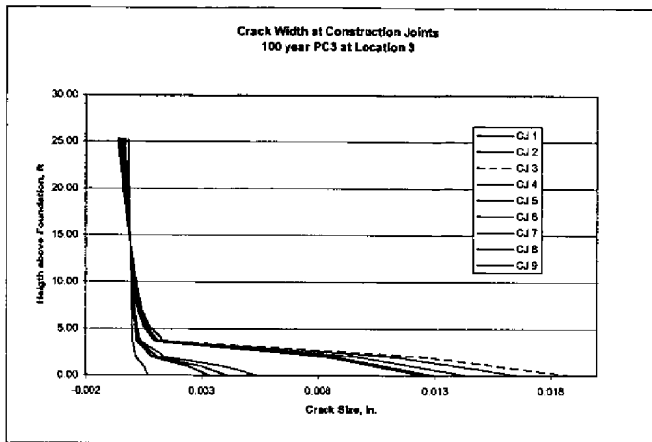


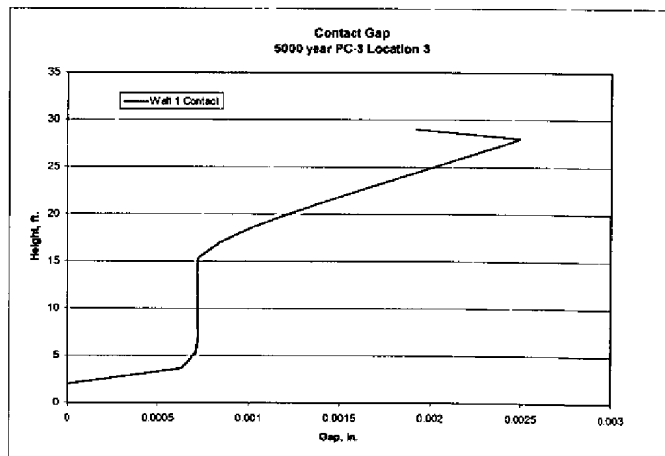
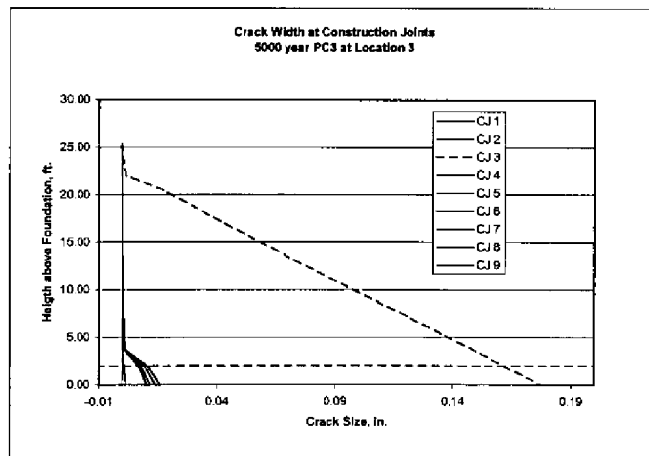
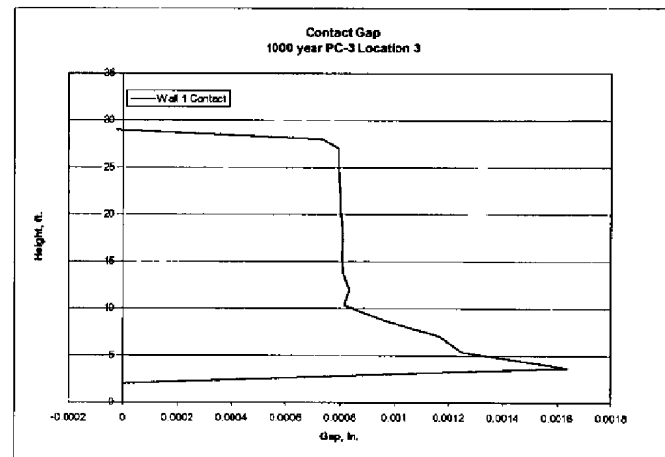
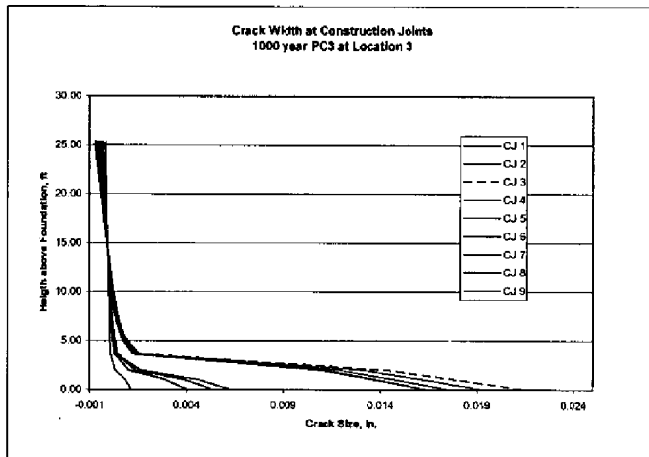
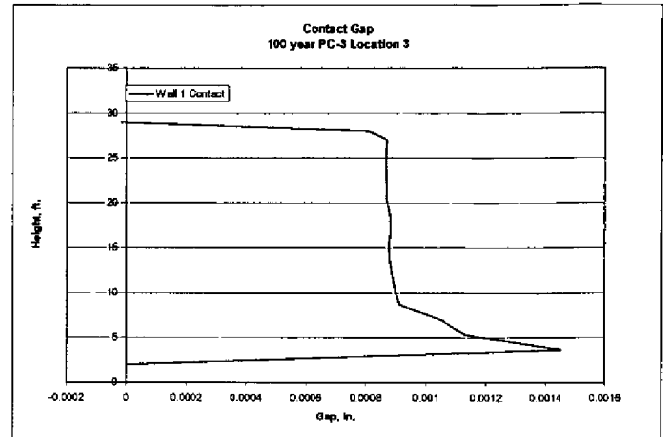
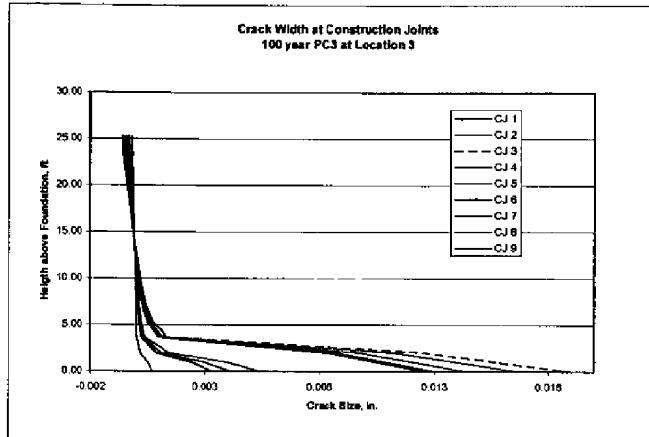


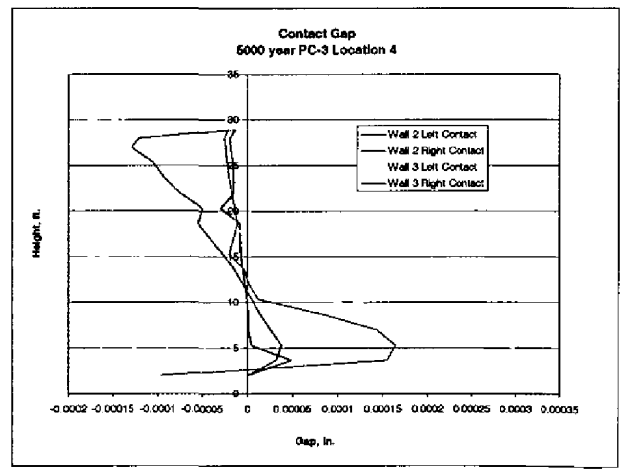
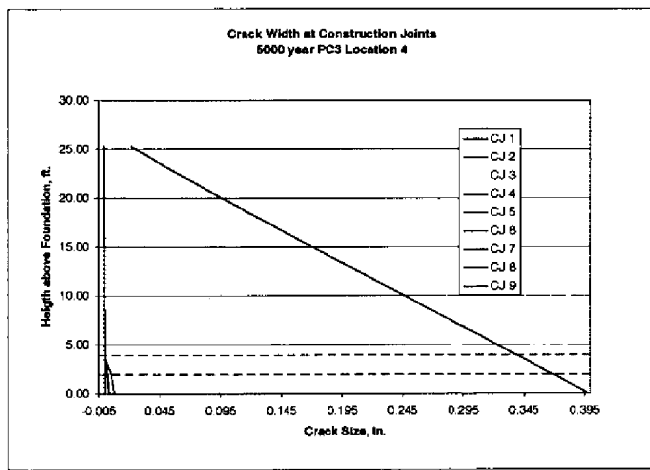
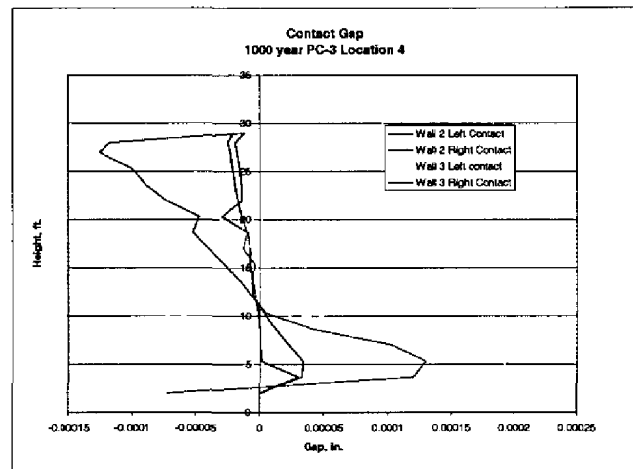
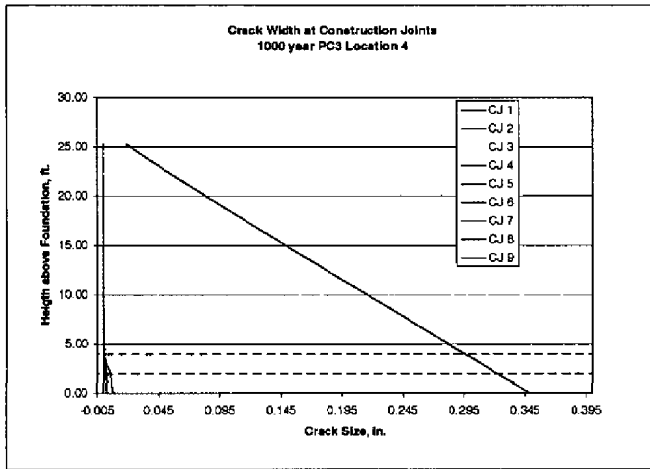
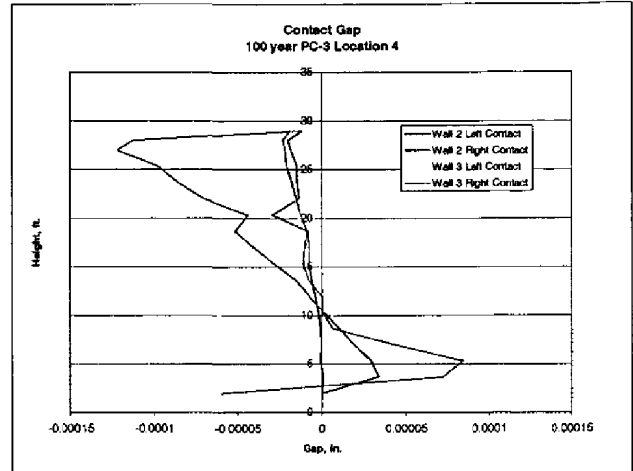
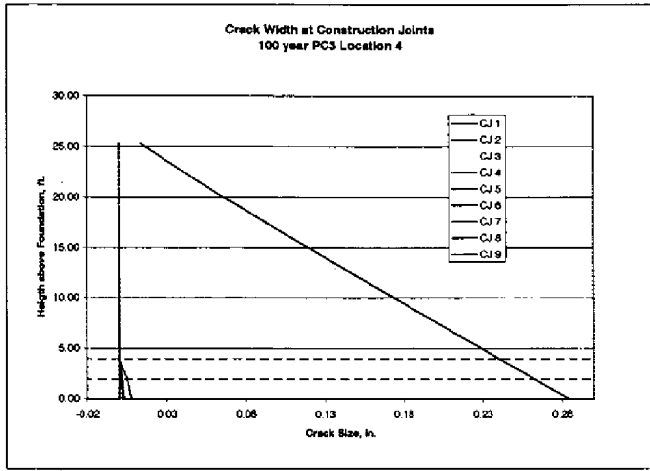
PC-3 Differential Settlement - Location 2
High Grout Strength

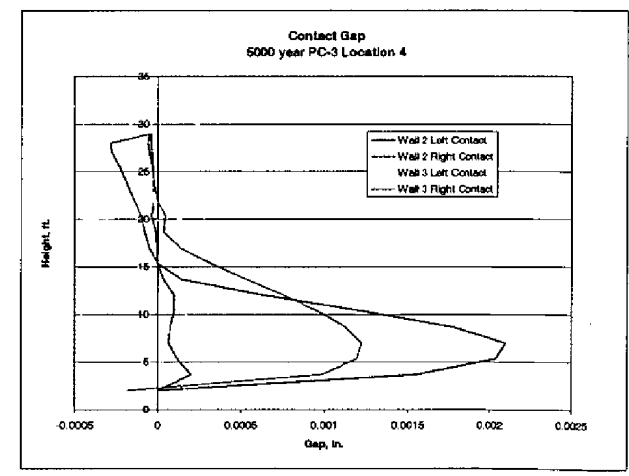
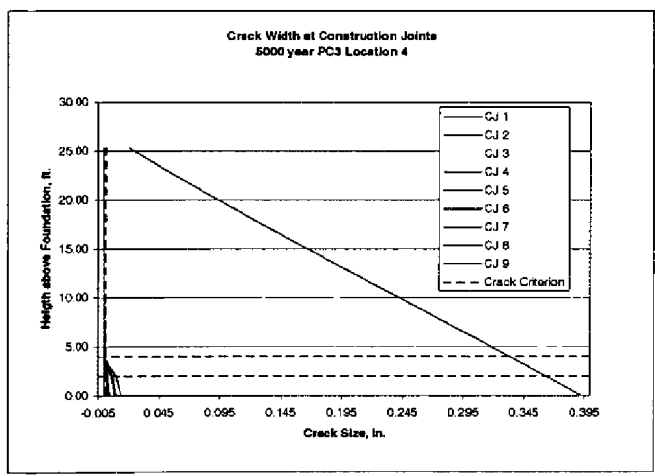
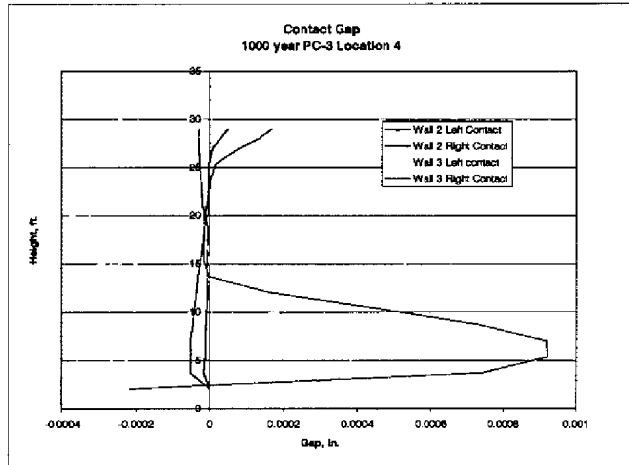
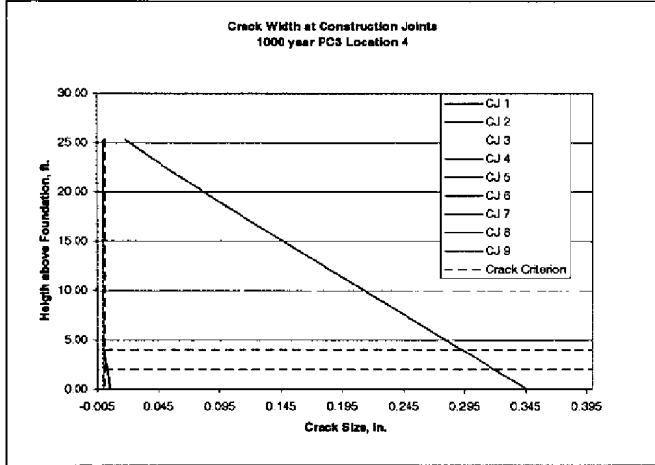
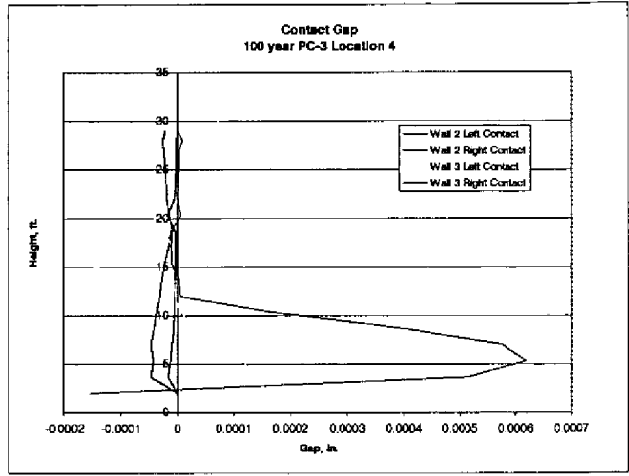
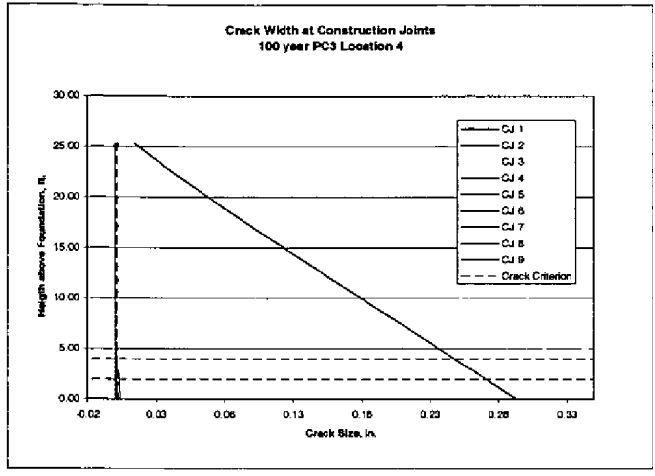








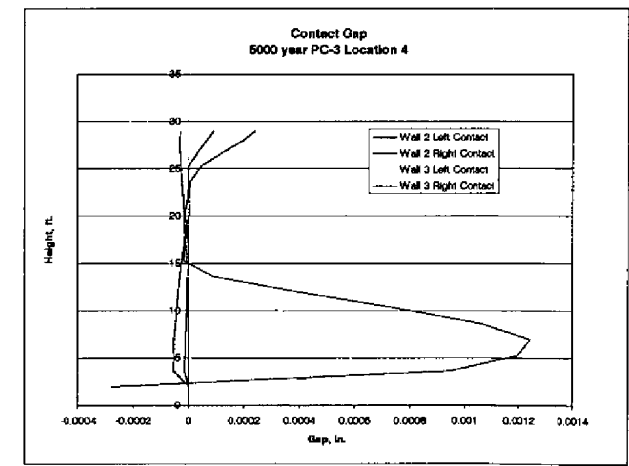
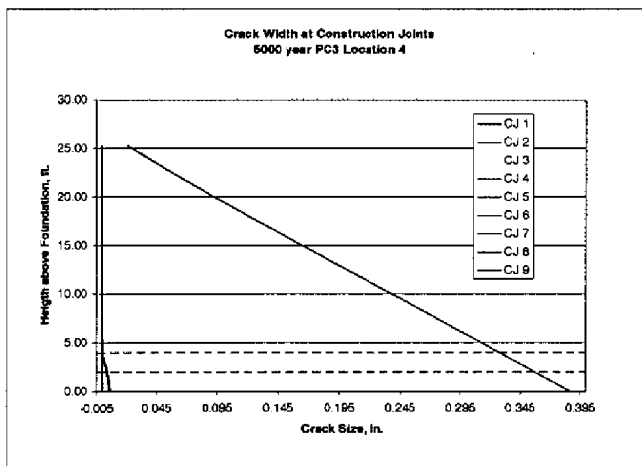
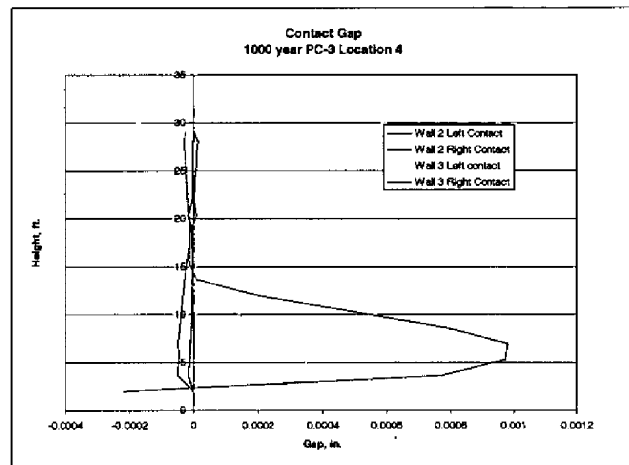
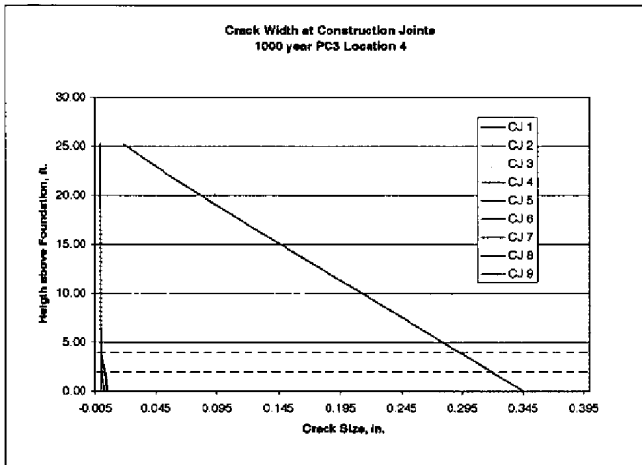
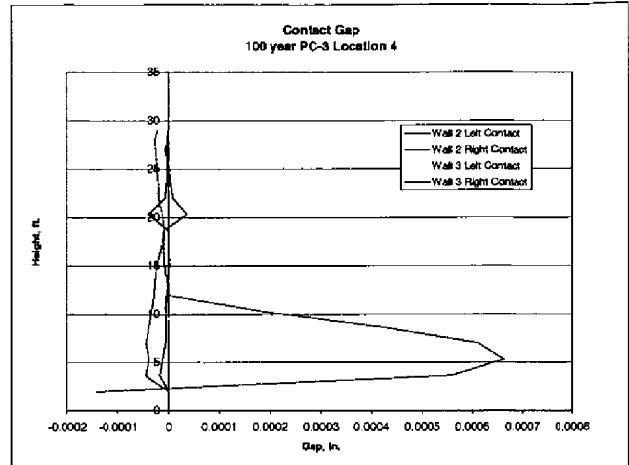
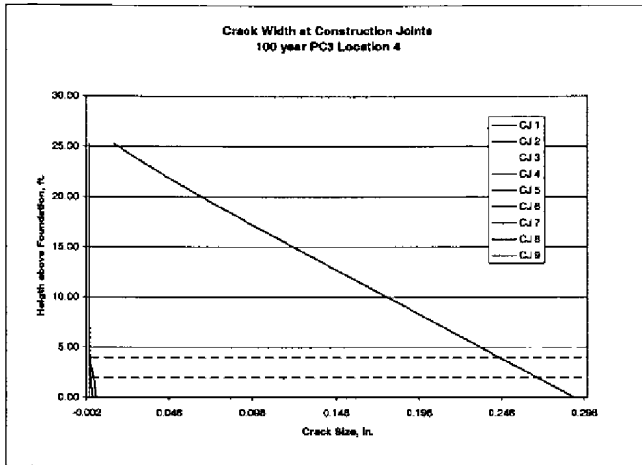




T-CC-2-00006, Rev. 0

PC-3 Differential Settlement - Location 4
High Grout Strength

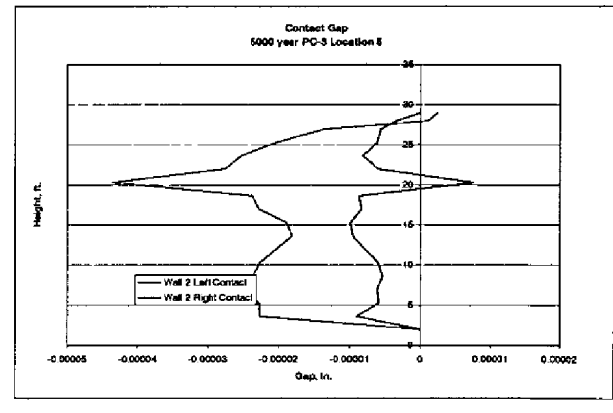
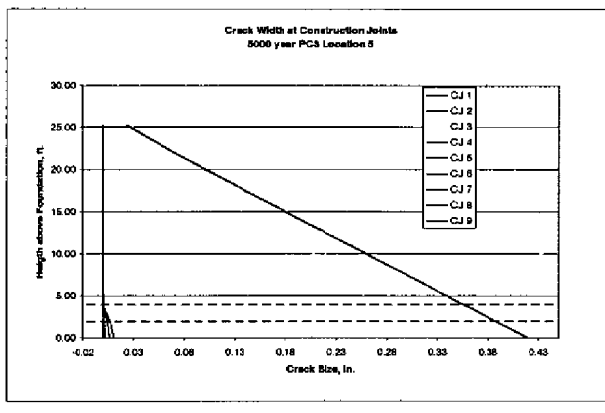
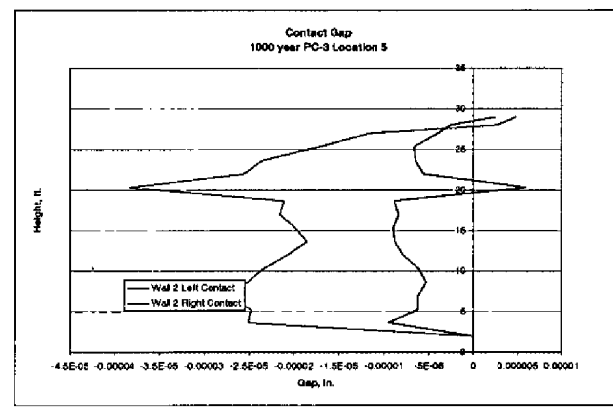
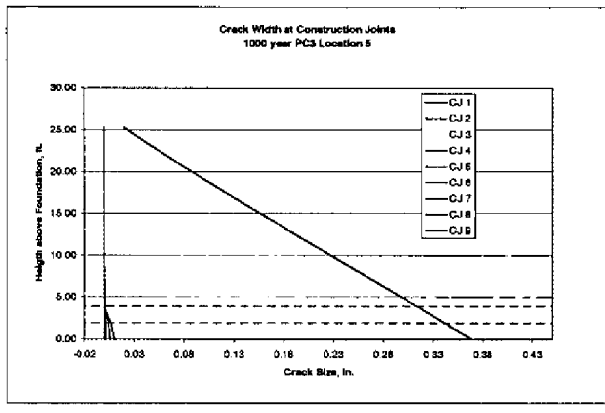
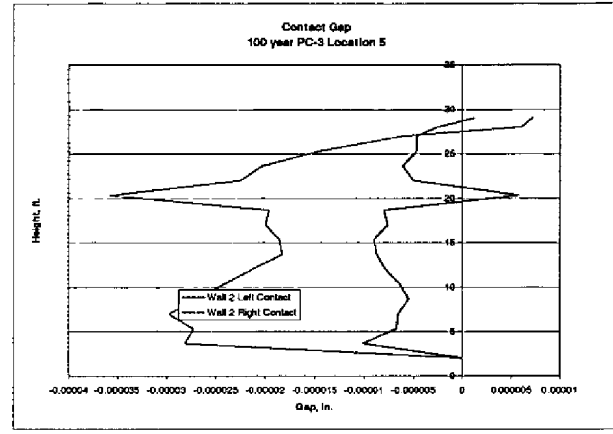
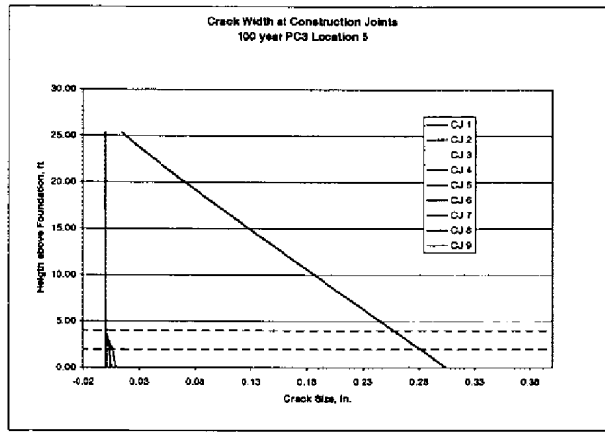
466



T-CLC-2-00006
Rev. 0

PC-3 Differential Settlement - Location 5
Low Grout Strength

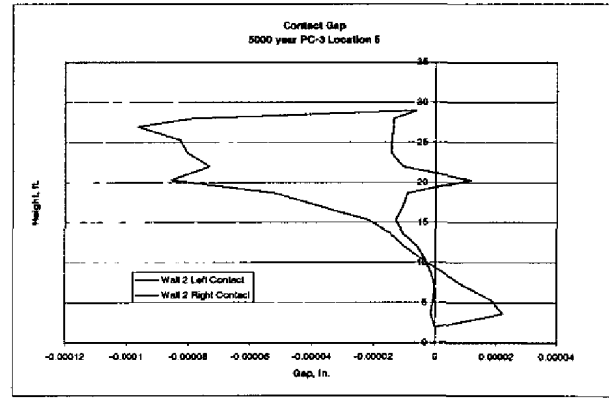
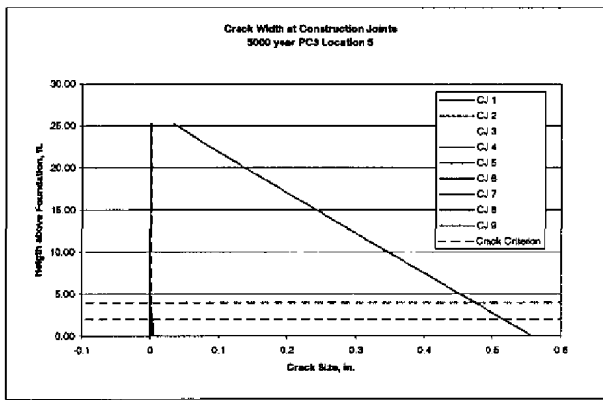
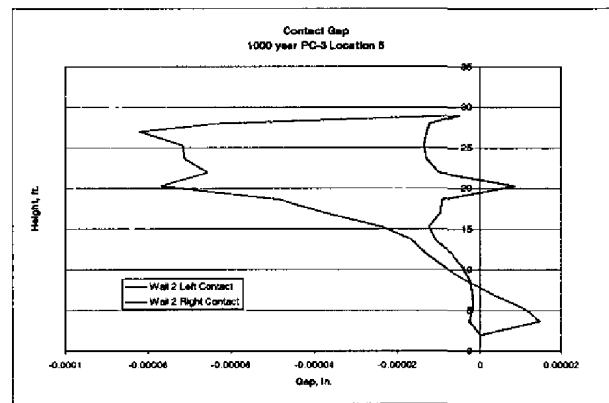
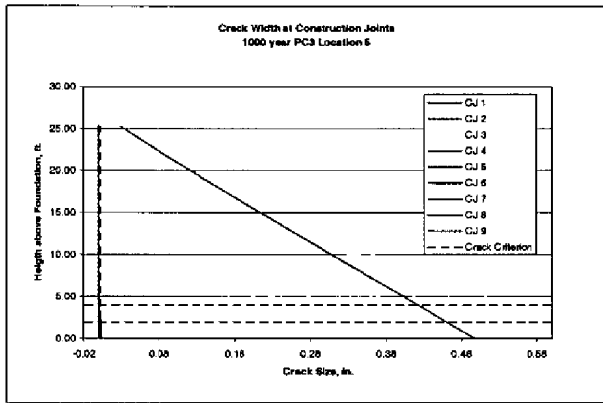
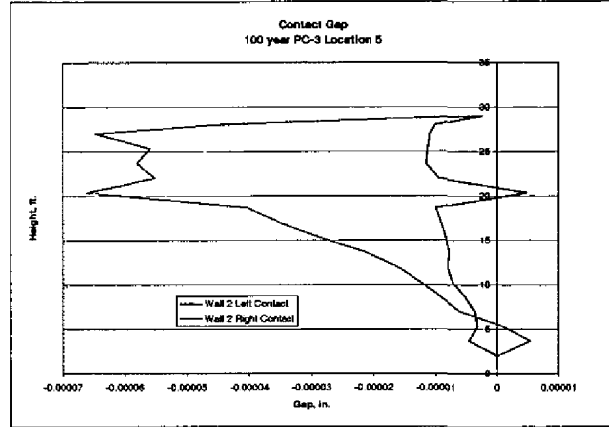
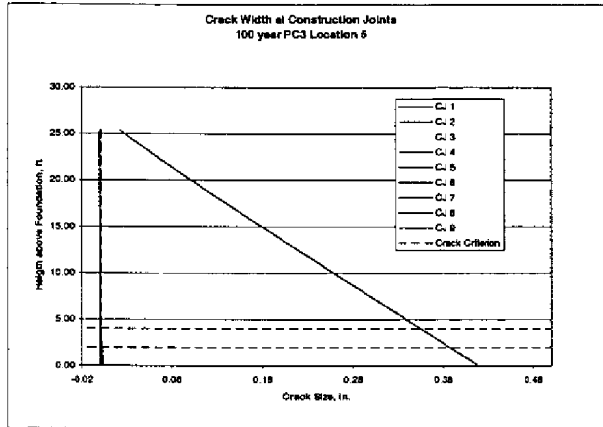
467



T-CLC-2-00006
 Rev. 0

PC-3 Differential Settlement - Location 5
 Mean Grout Strength

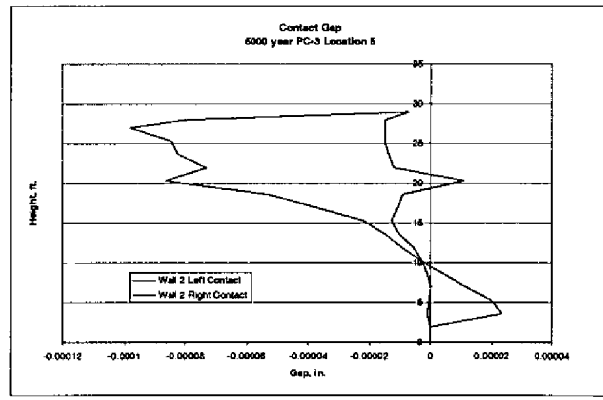
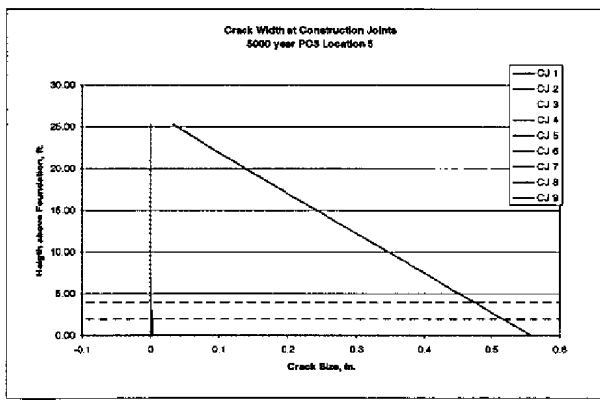
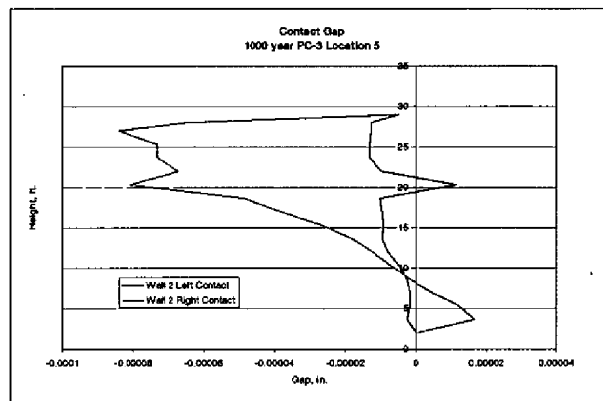
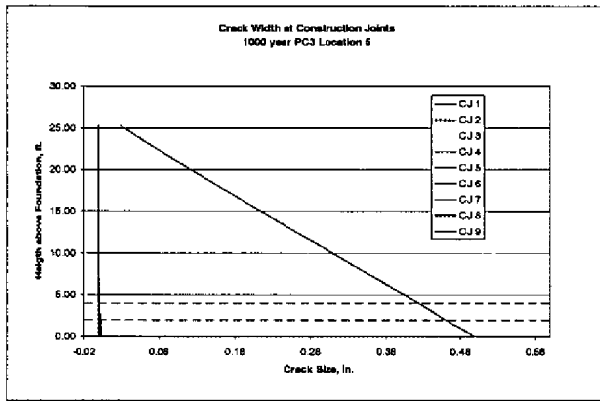
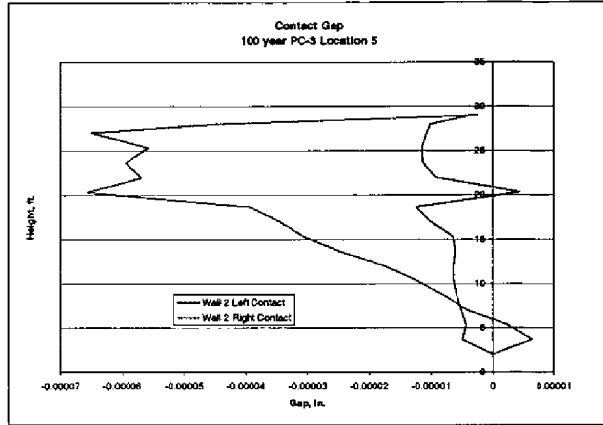
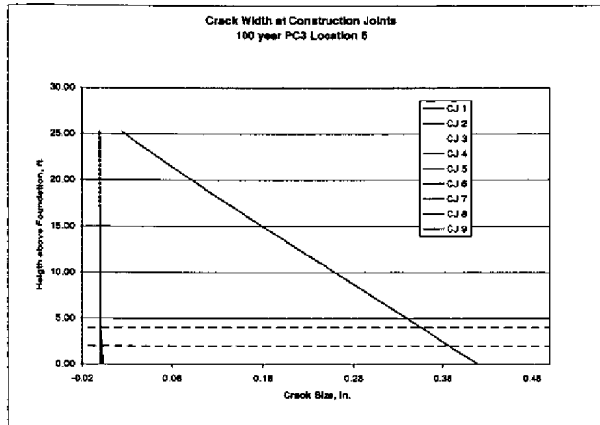
468



T-LLC-2-00006
 Rev. 1.0

PC-3 Differential Settlement - Location 5
 High Grout Strength

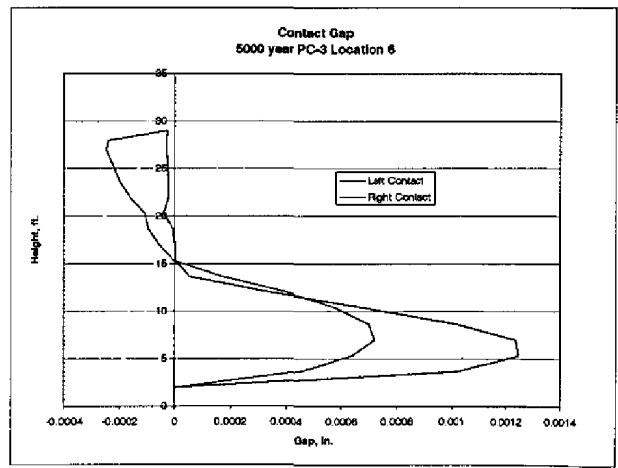
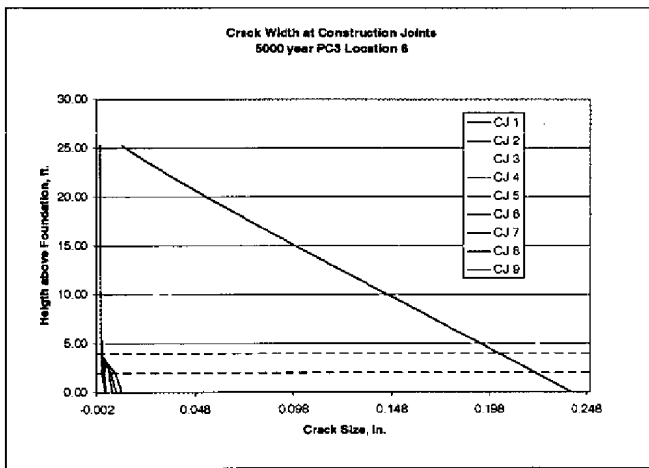
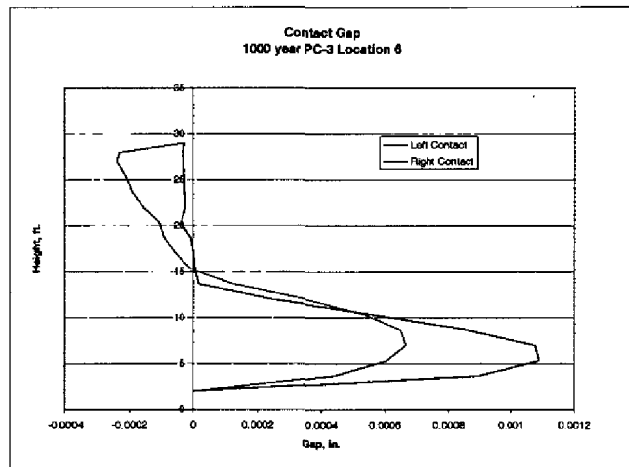
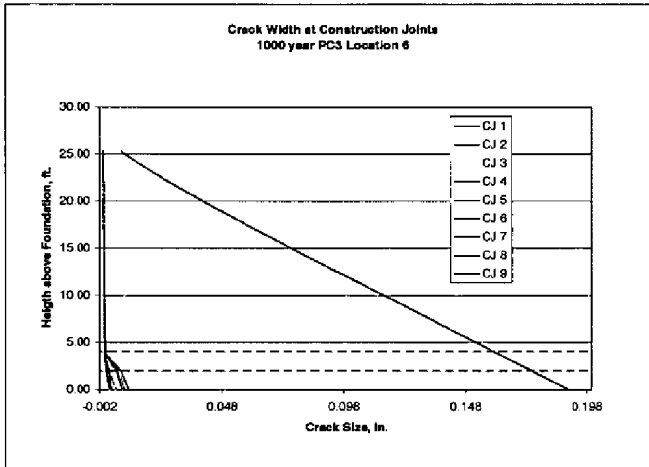
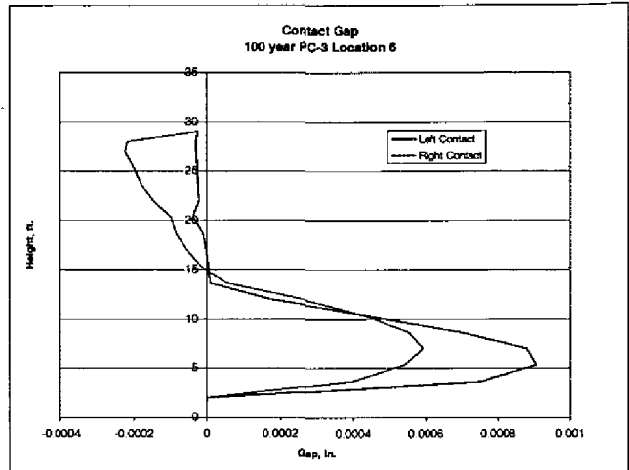
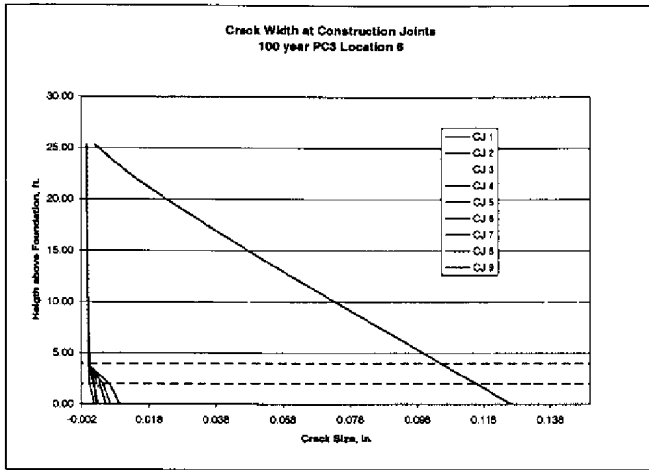
469



T-LLC-2-00006
Rev. 0

PC-3 Differential Settlement - Location 6
Low Grout Strength

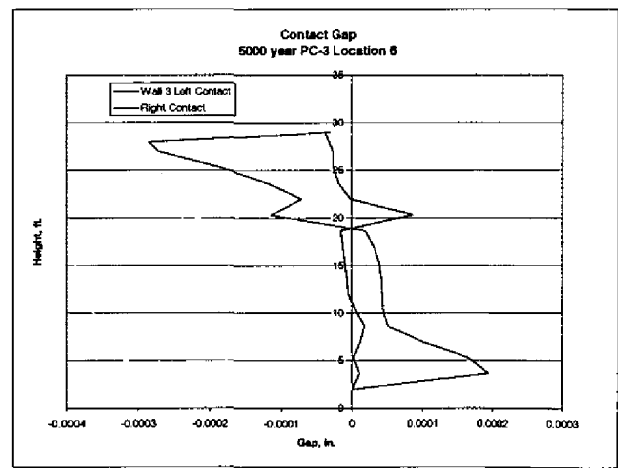
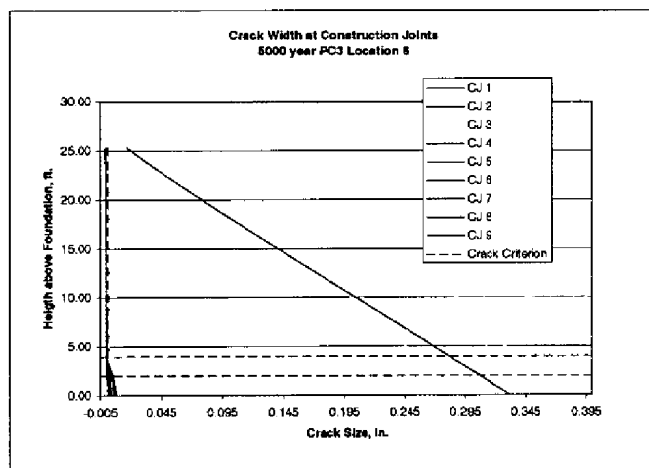
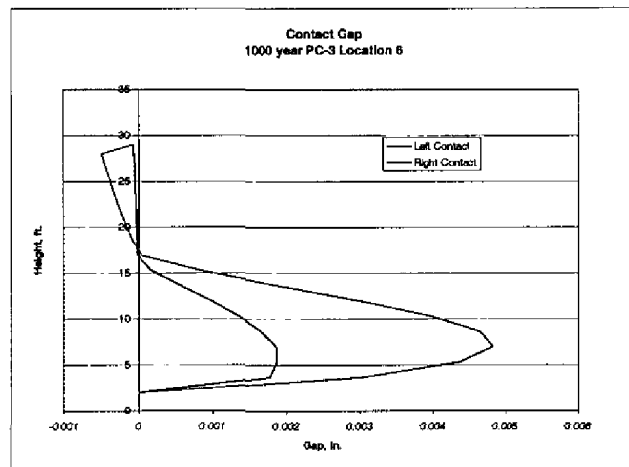
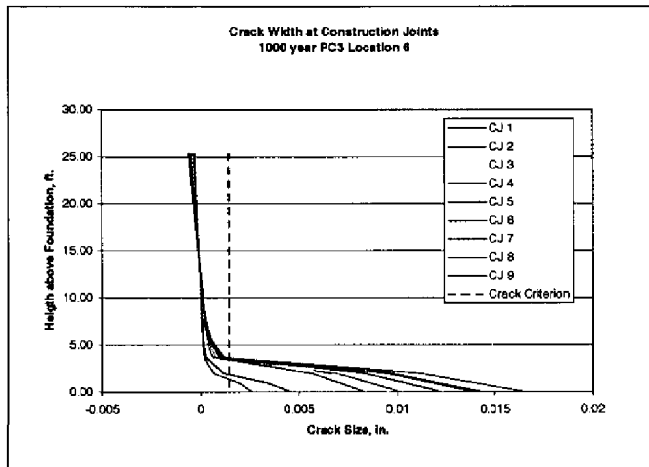
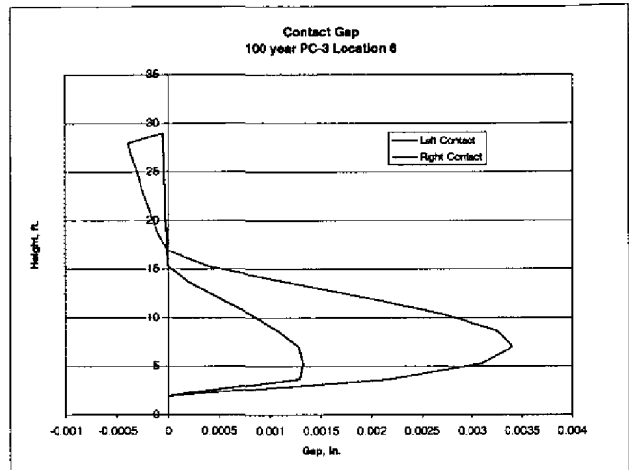
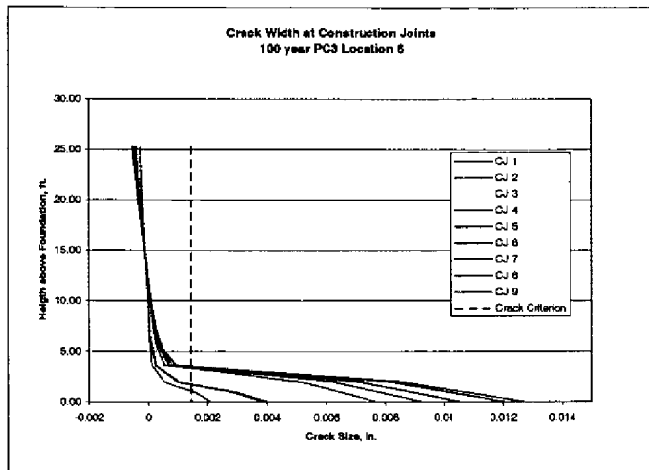
470



T-CLL-2-00006
Rev. 0

PC-3 Differential Settlement - Location 6
Mean Grout Strength

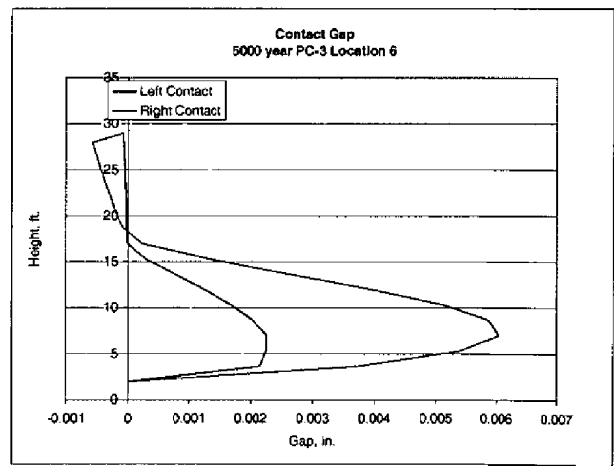
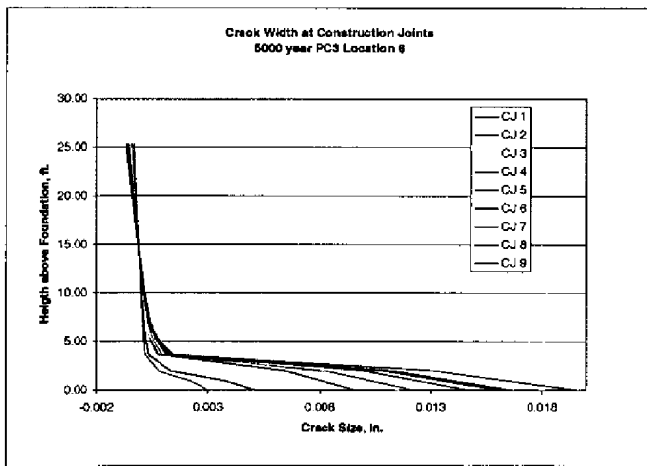
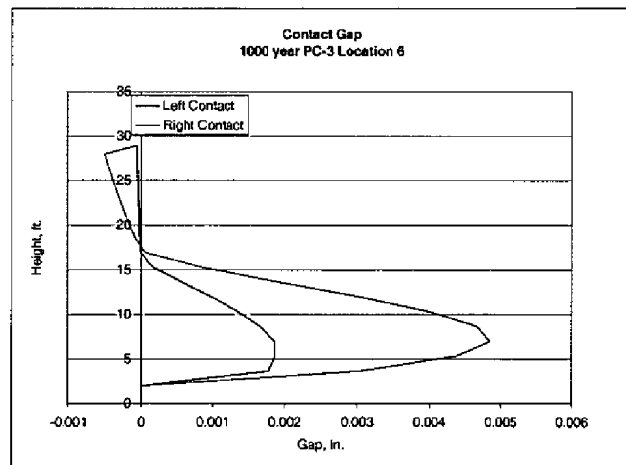
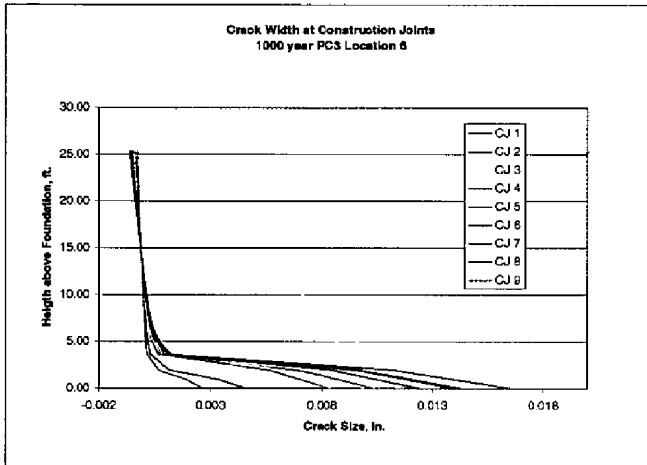
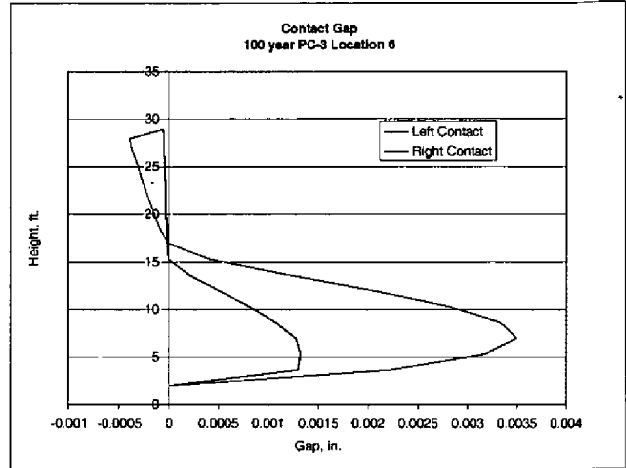
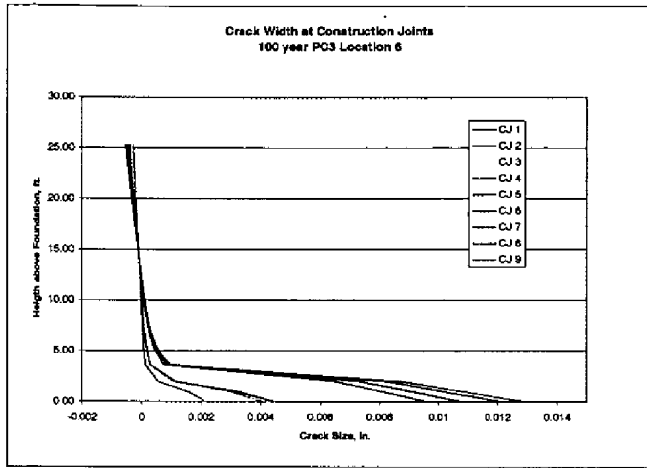
471



T-CC-2-00006
Rev. 0

PC-3 Differential Settlement - Location 6
High Grout Strength

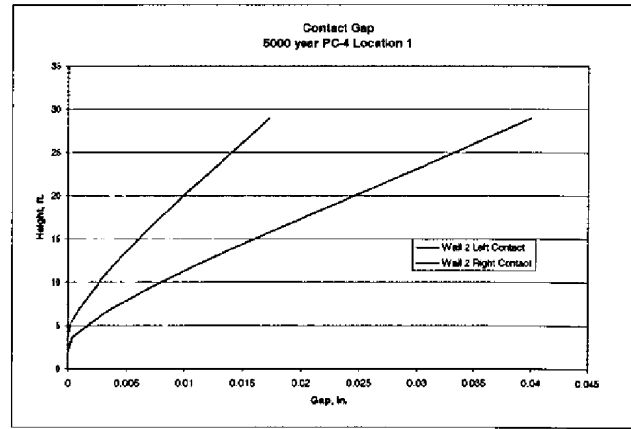
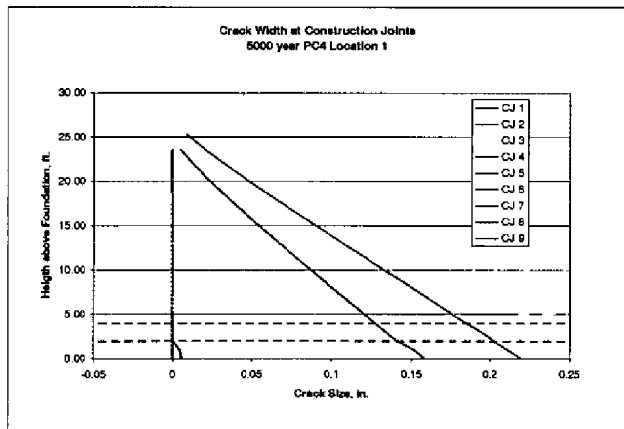
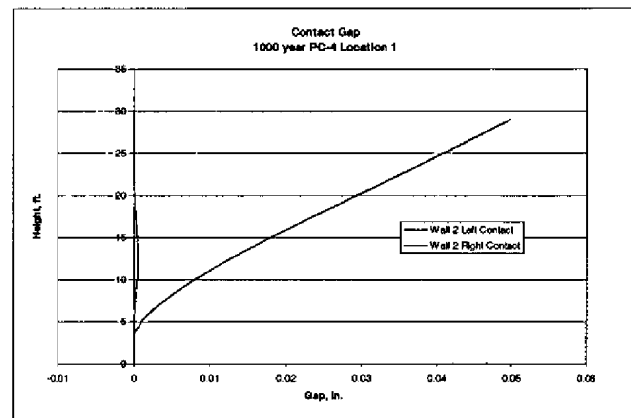
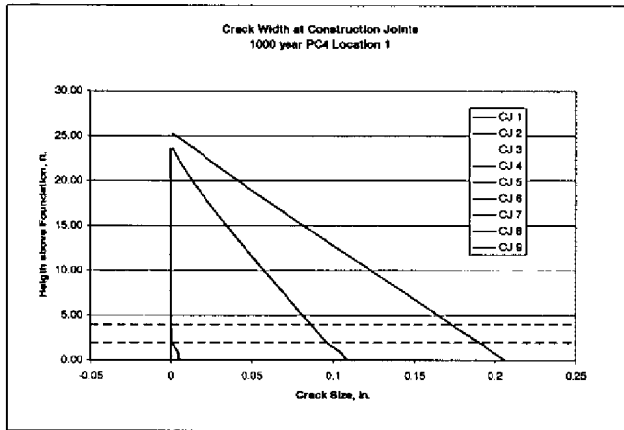
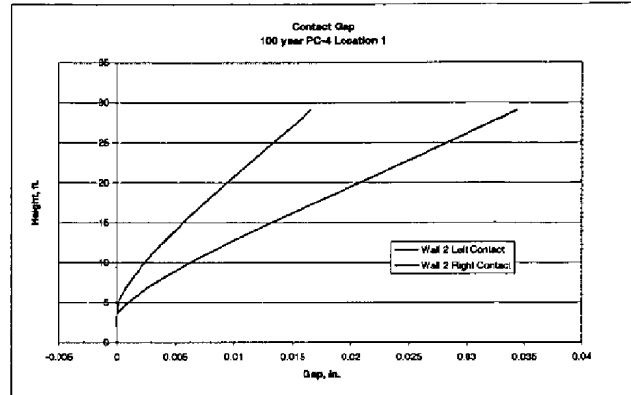
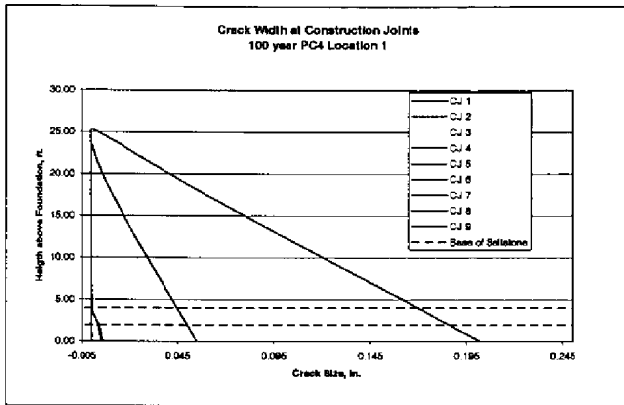
472



T-LL-2-00006
Rev. 0

PC-4 Differential Settlement - Location 1
Low Grout Strength

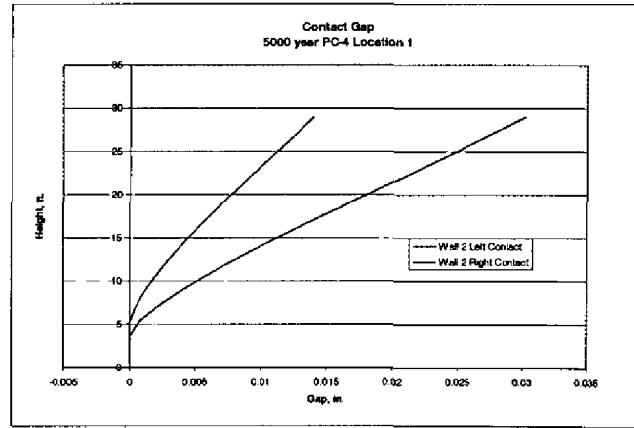
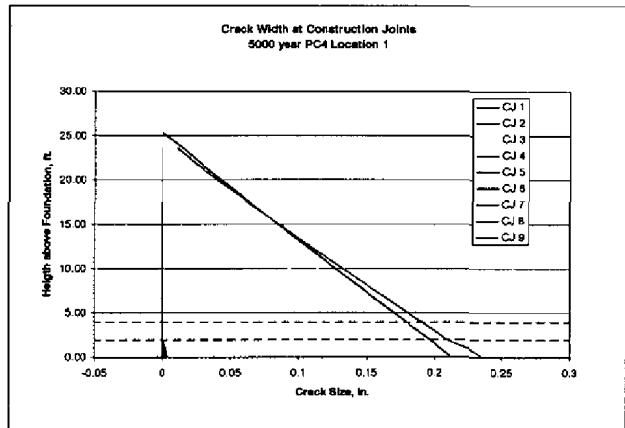
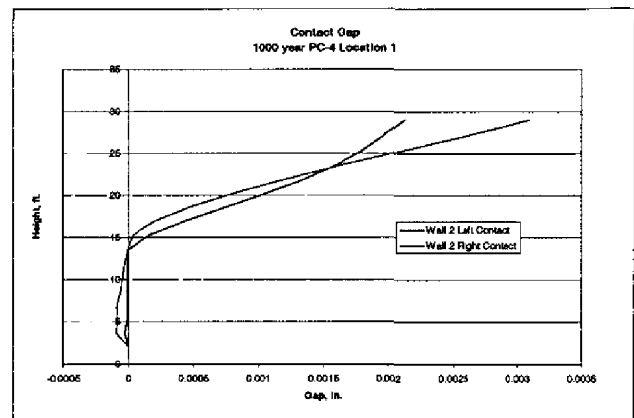
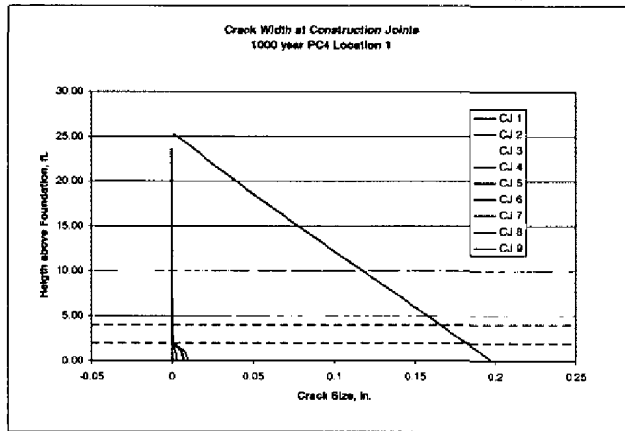
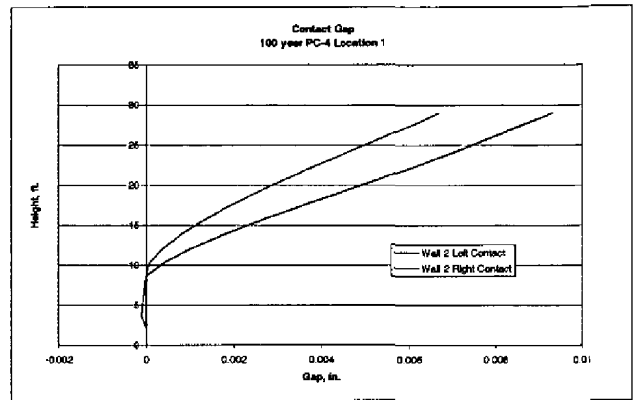
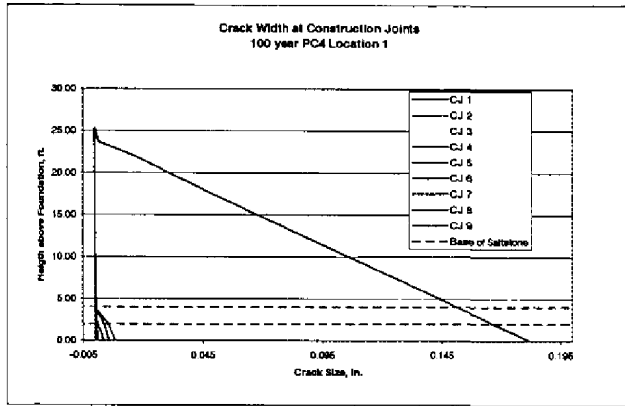
473



PC-4-2-00006
Rev. 0

PC-4 Differential Settlement - Location 1
Mean Grout Strength

474

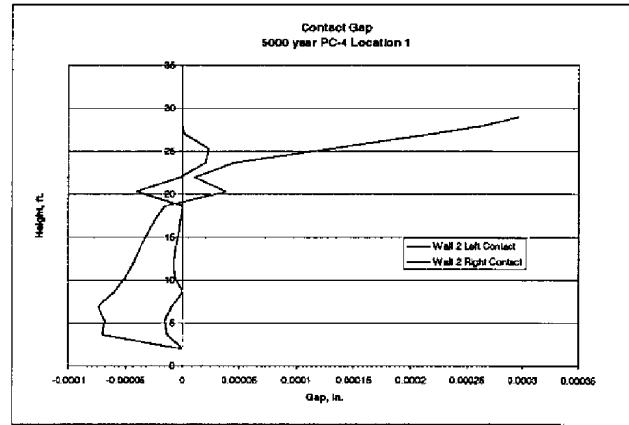
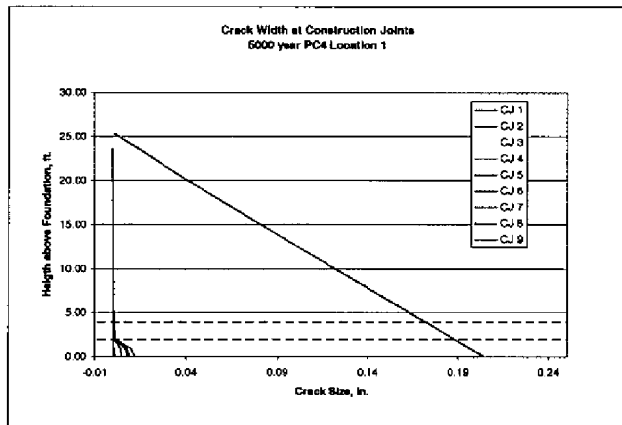
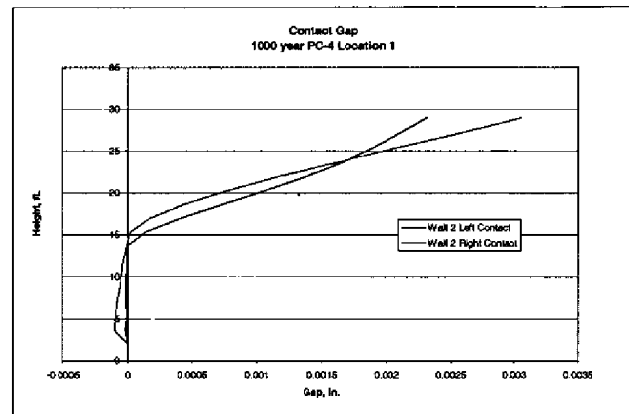
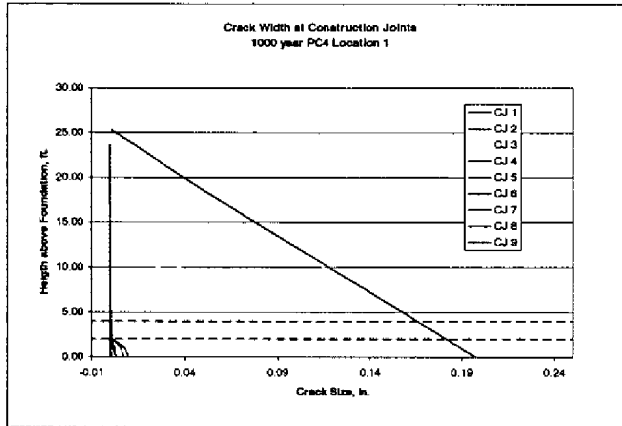
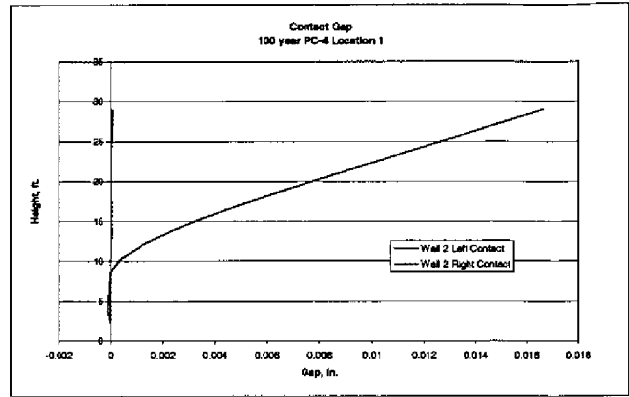
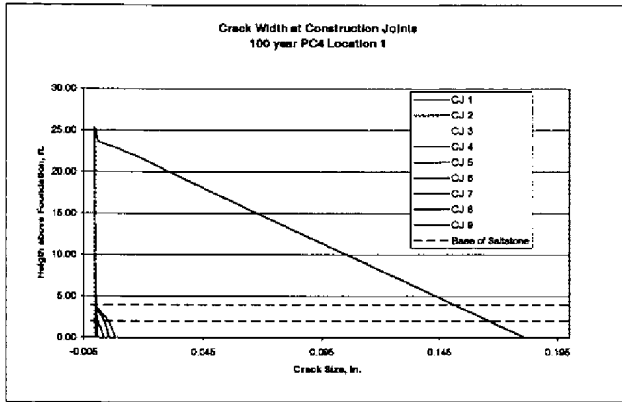


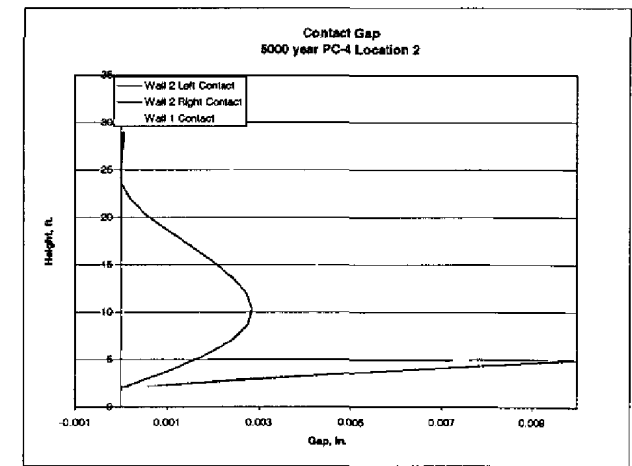
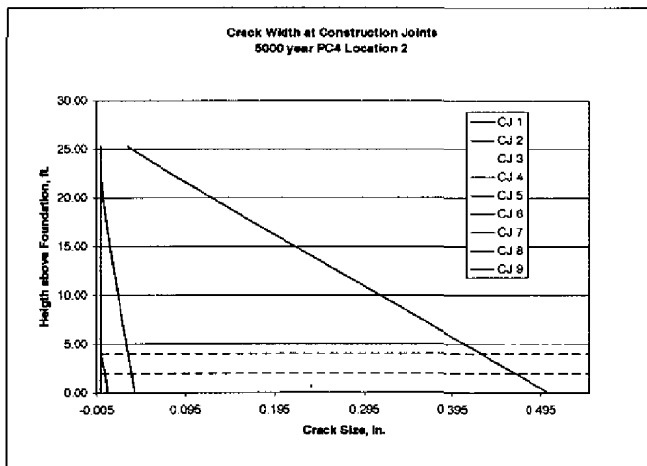
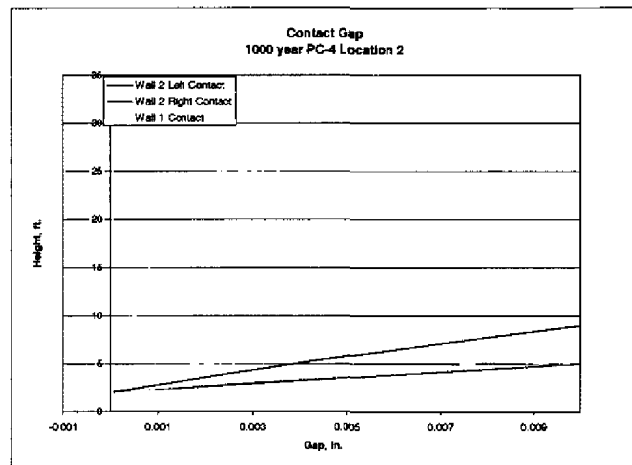
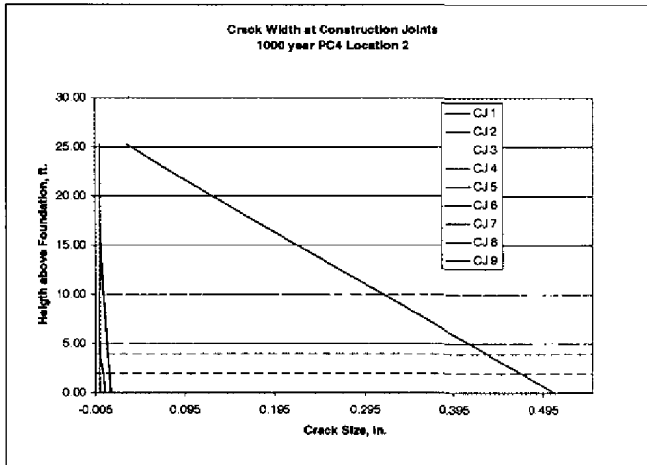
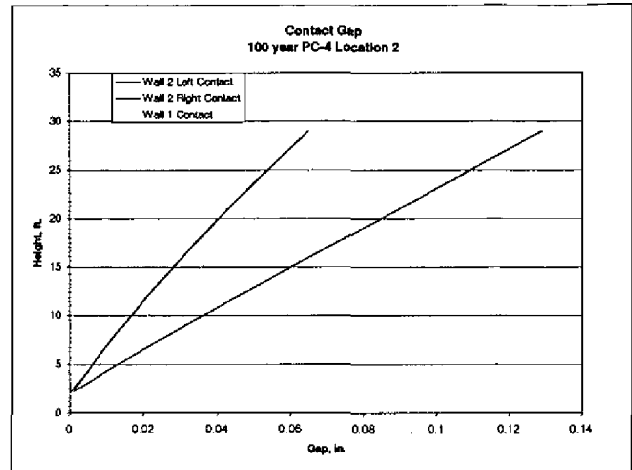
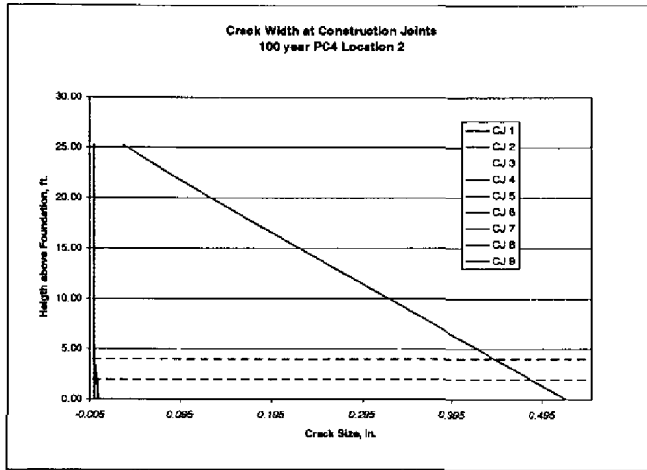
T-ELC-2-00006

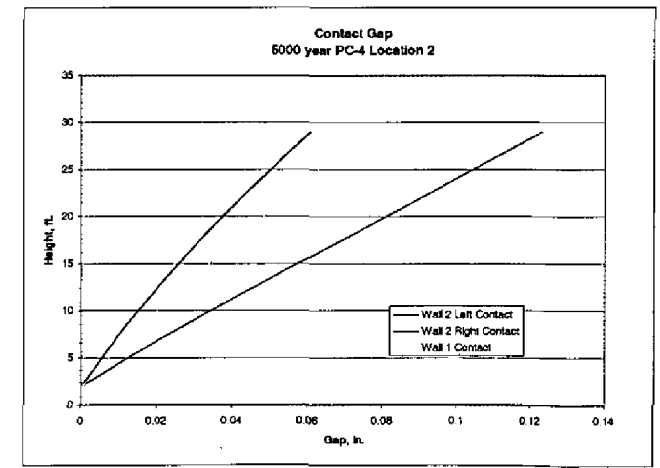
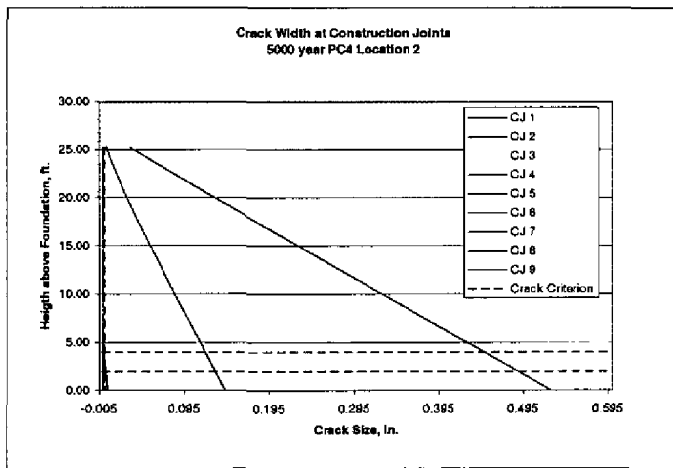
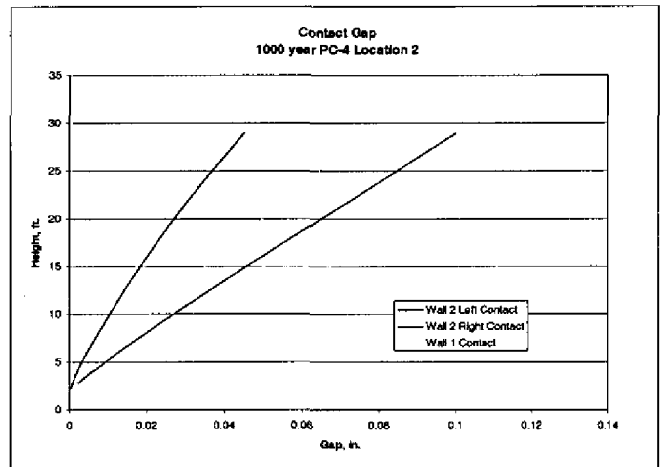
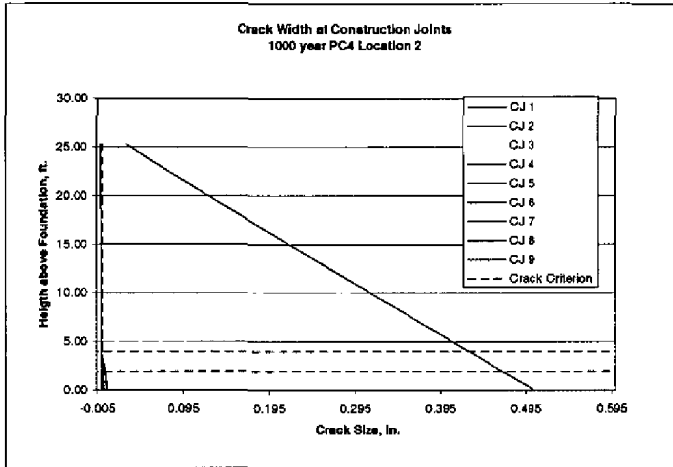
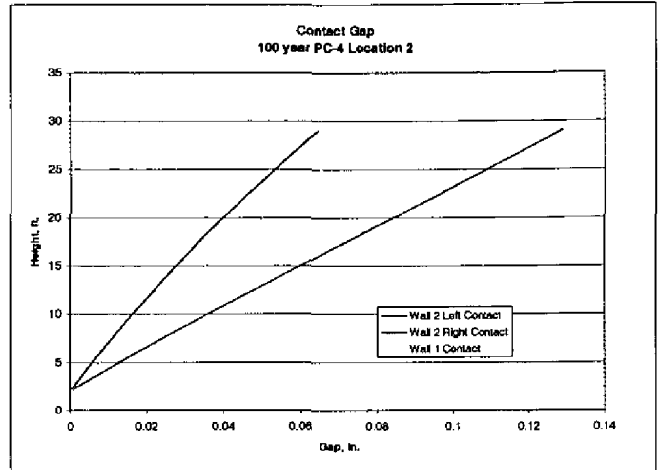
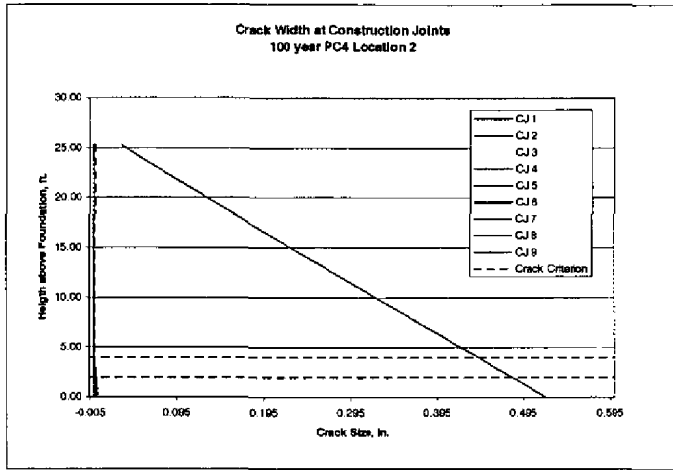
Rev - 0

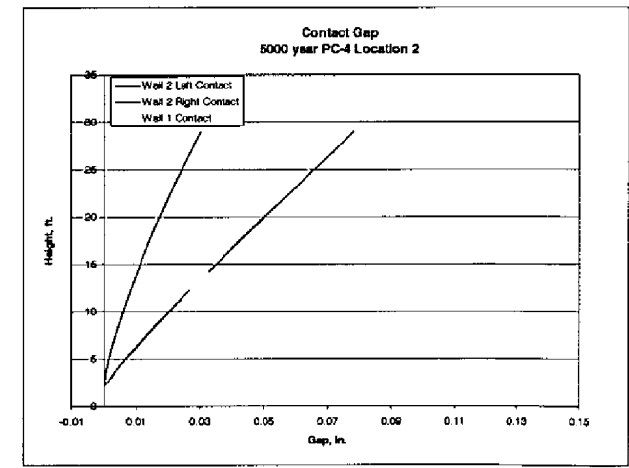
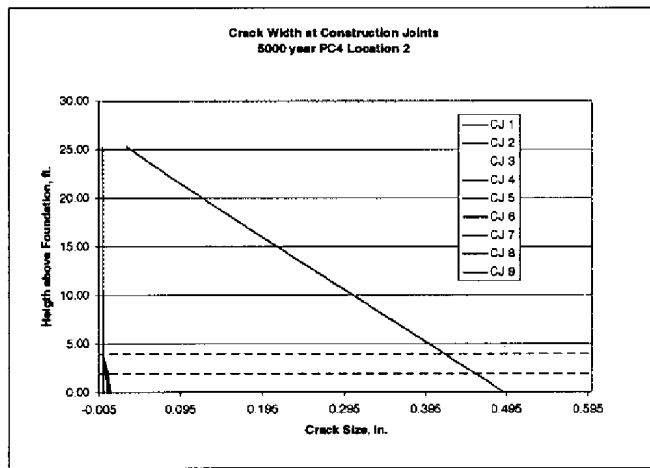
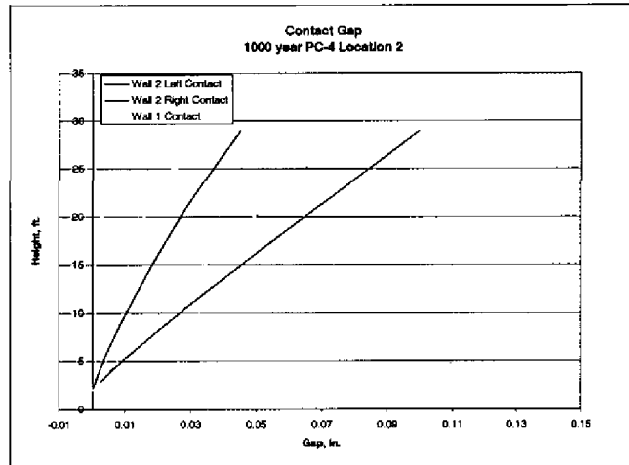
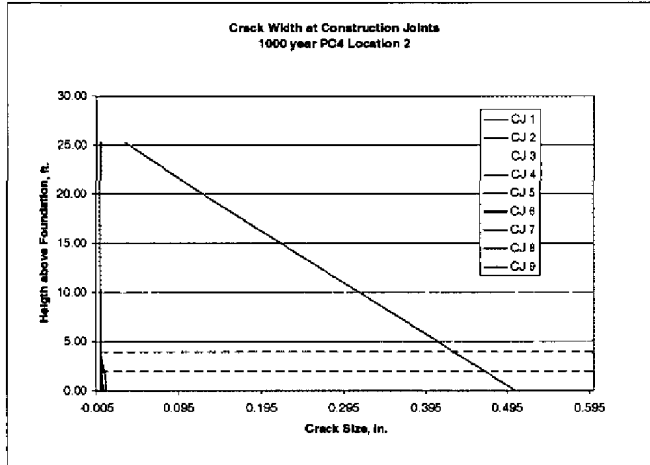
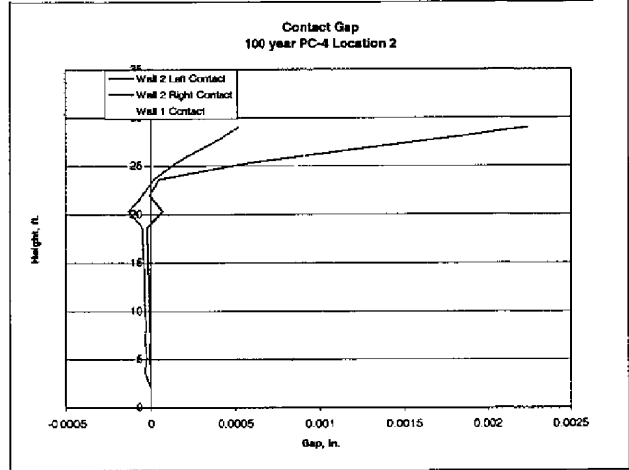
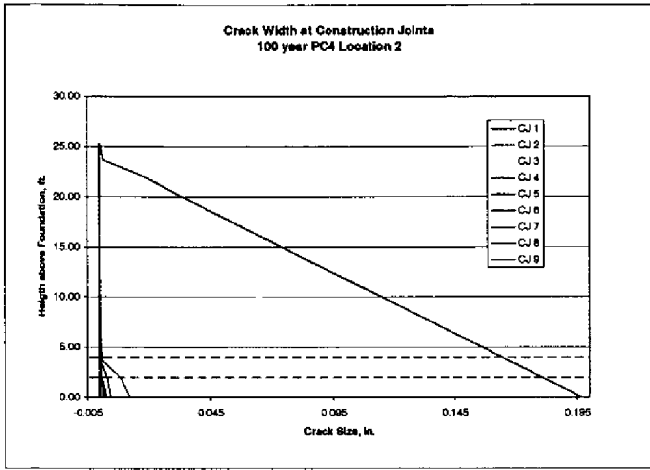
PC-4 Differential Settlement - Location 1
High Grout Strength

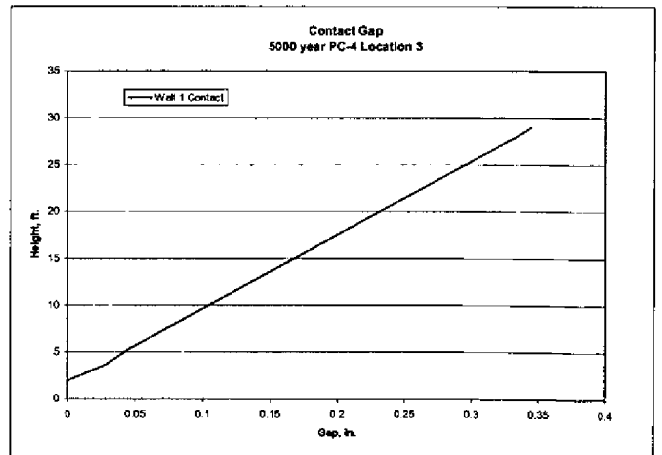
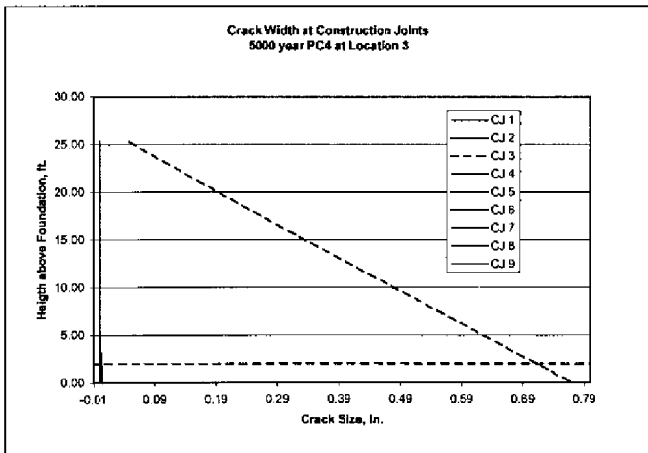
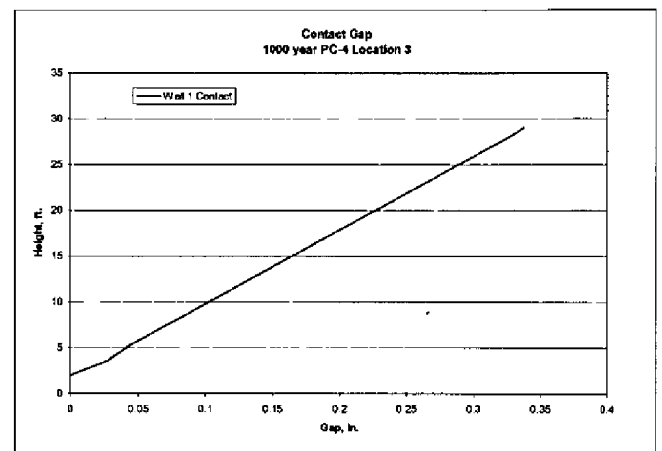
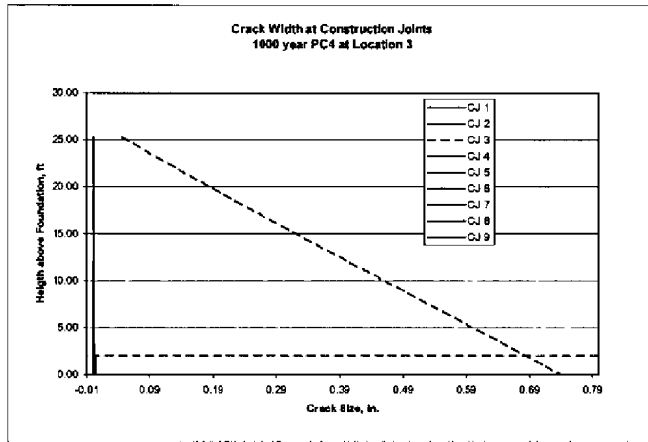
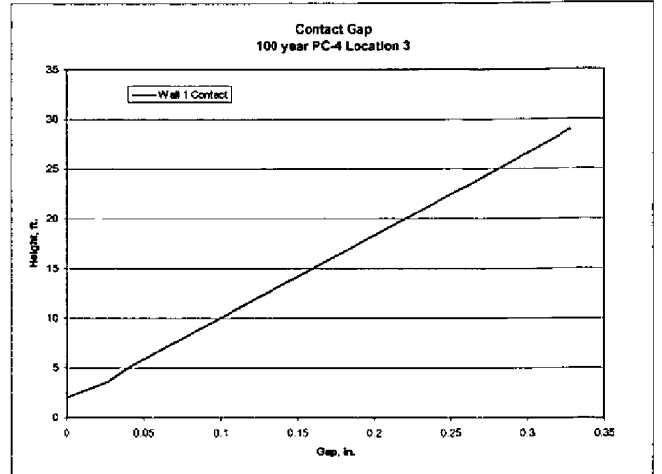
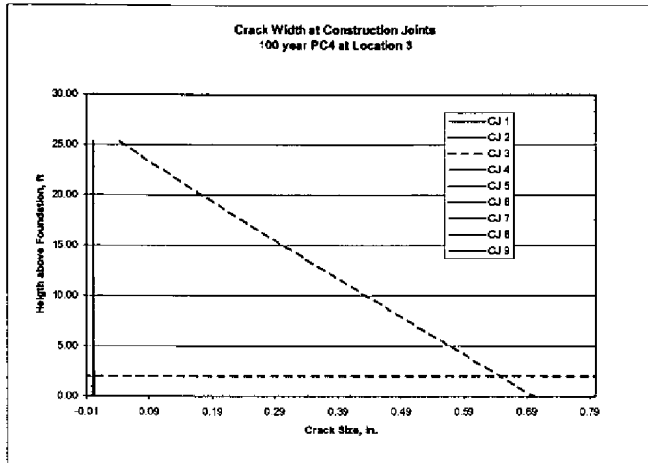
475

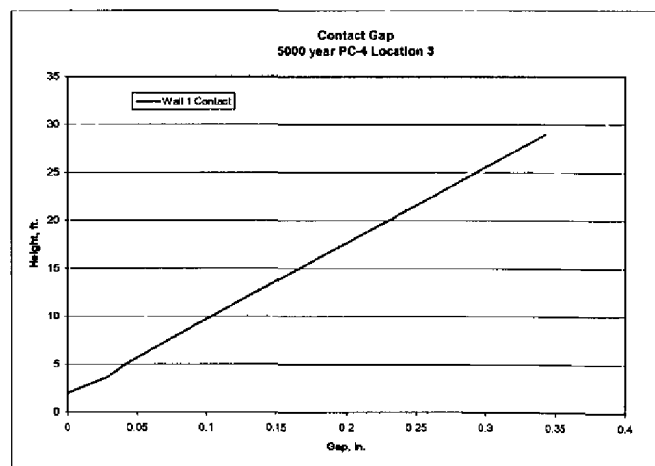
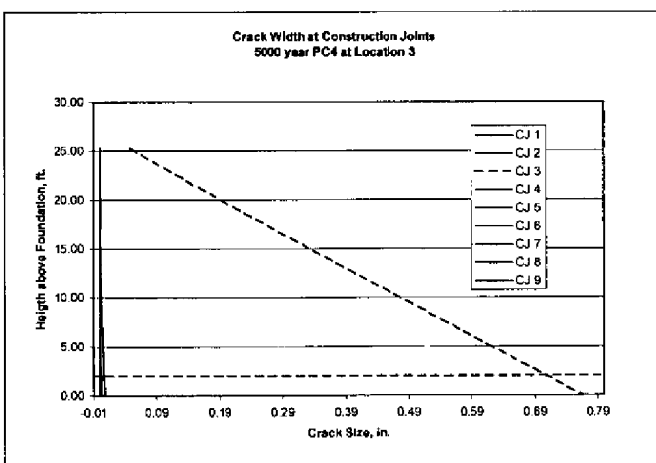
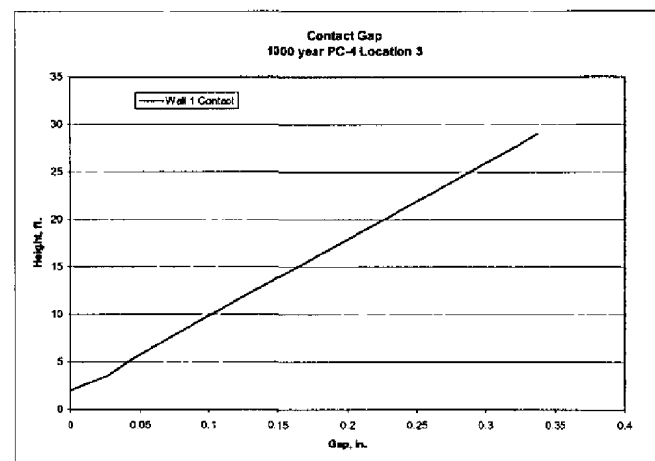
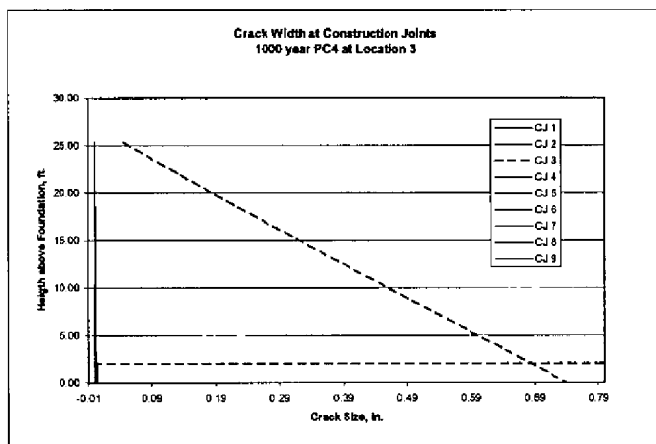
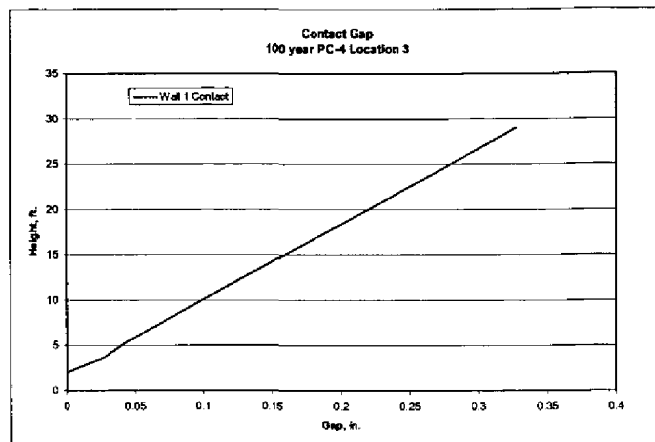
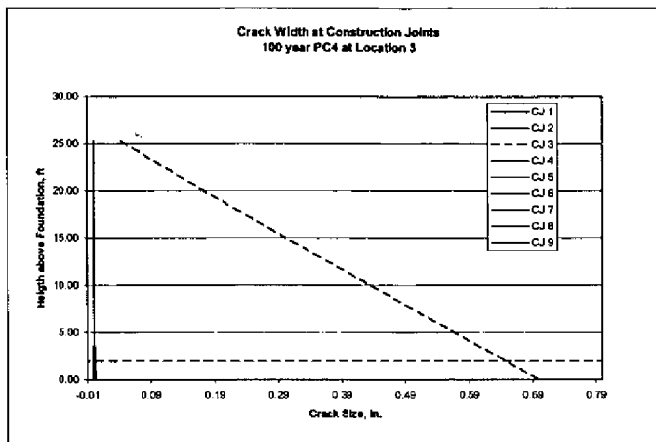


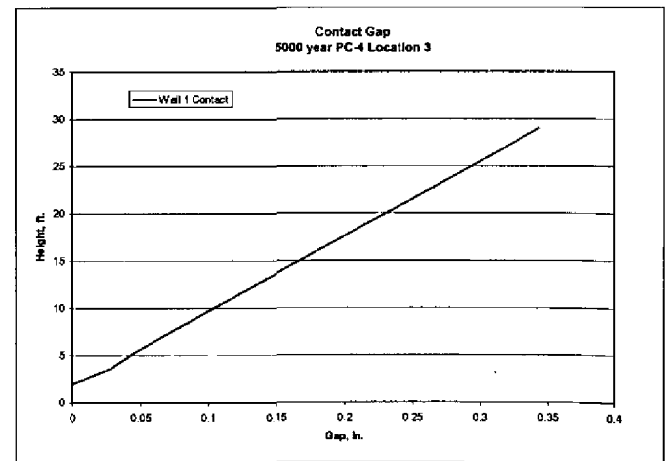
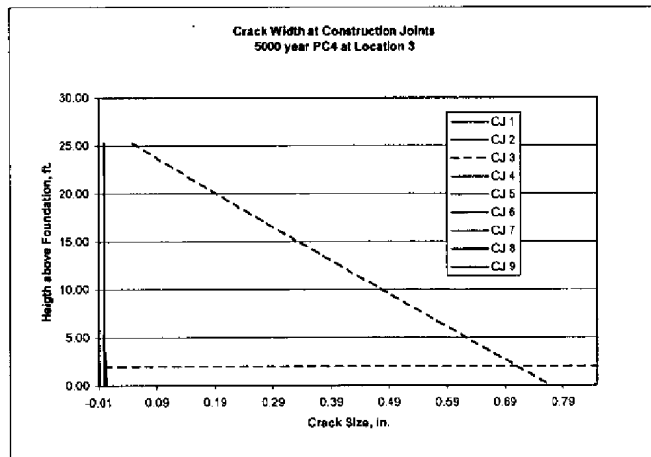
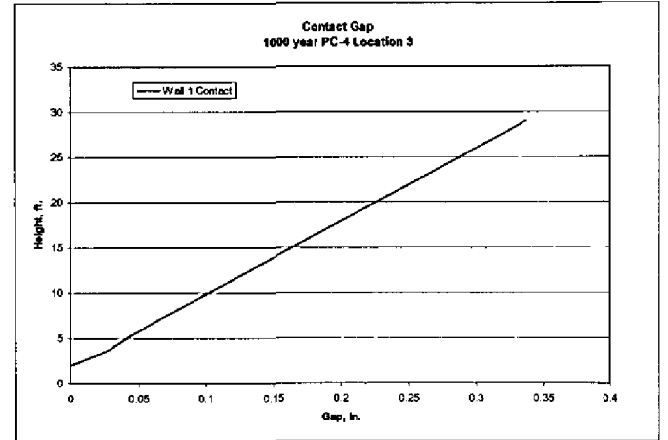
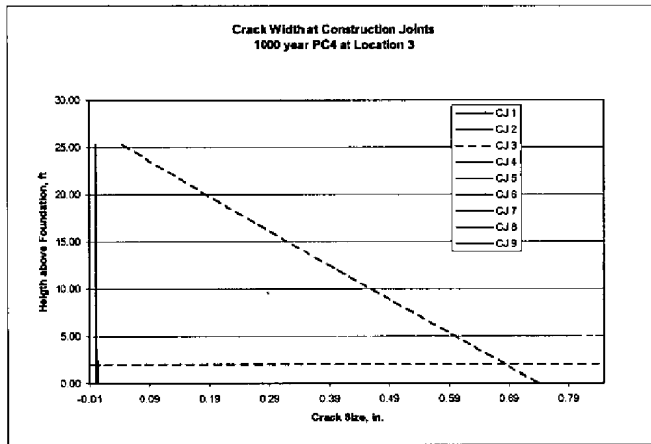
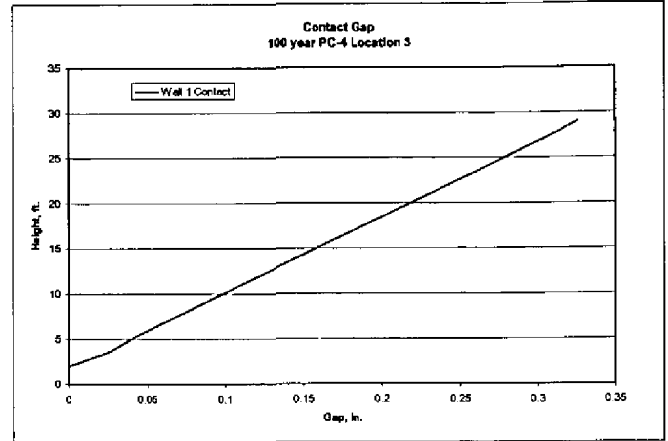
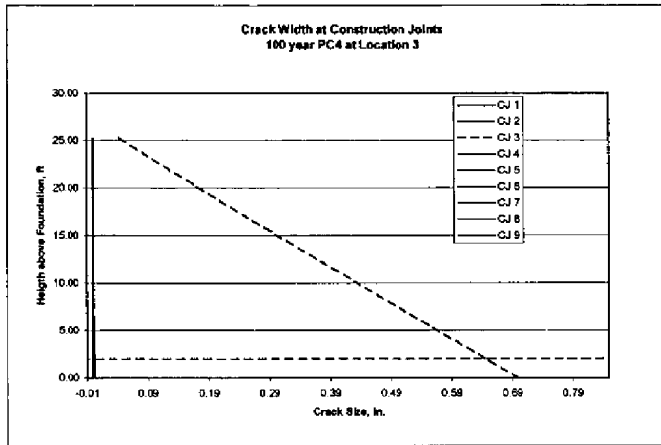


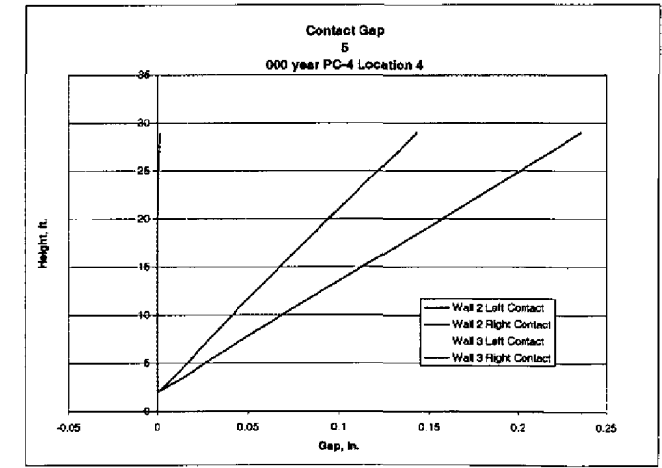
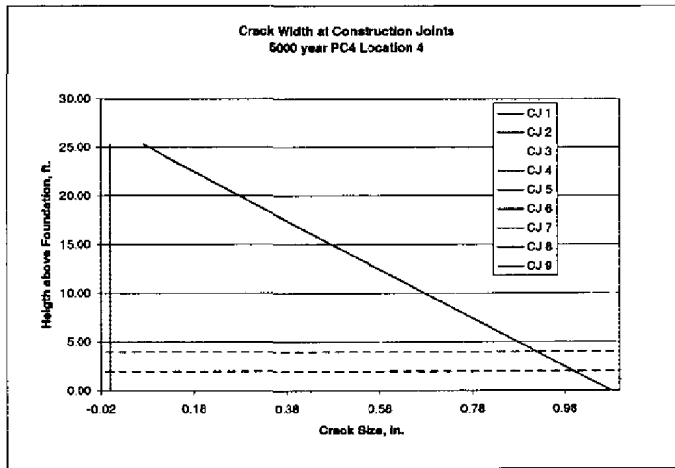
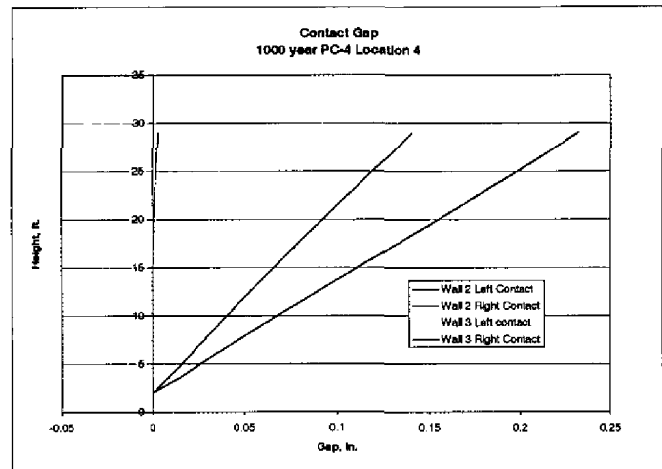
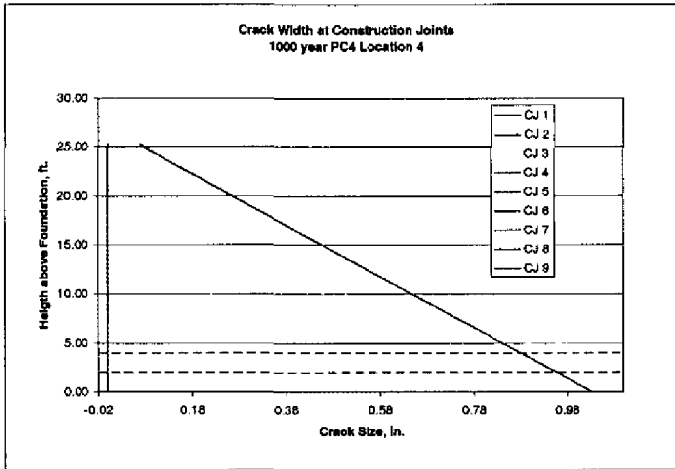
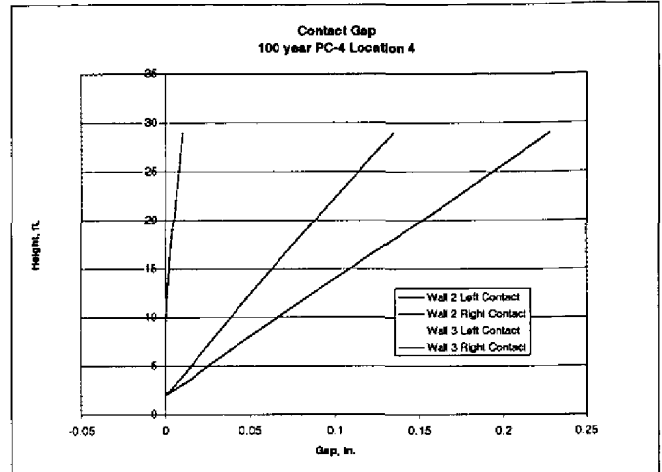
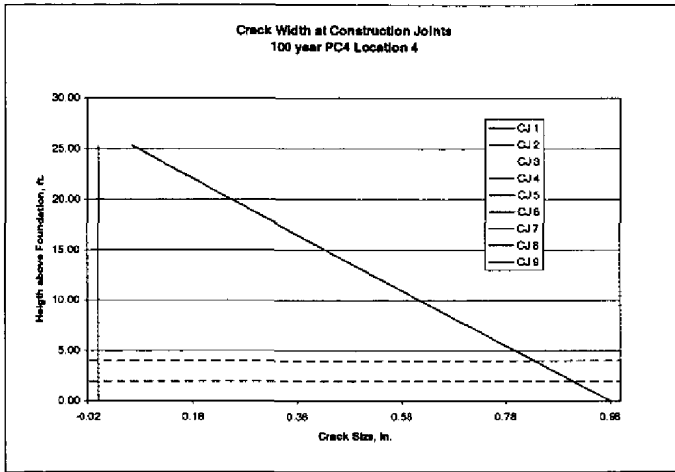








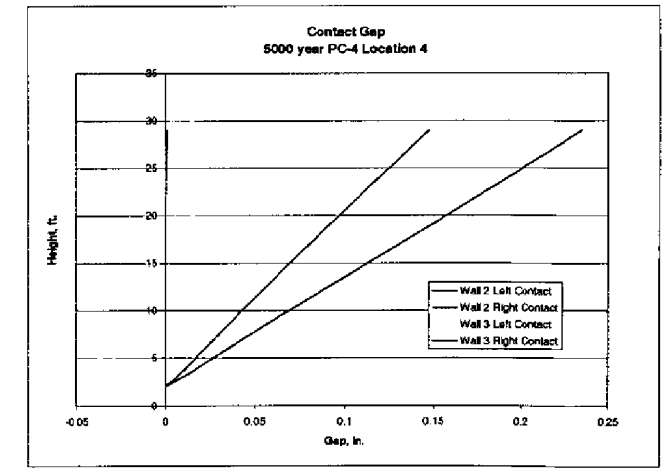
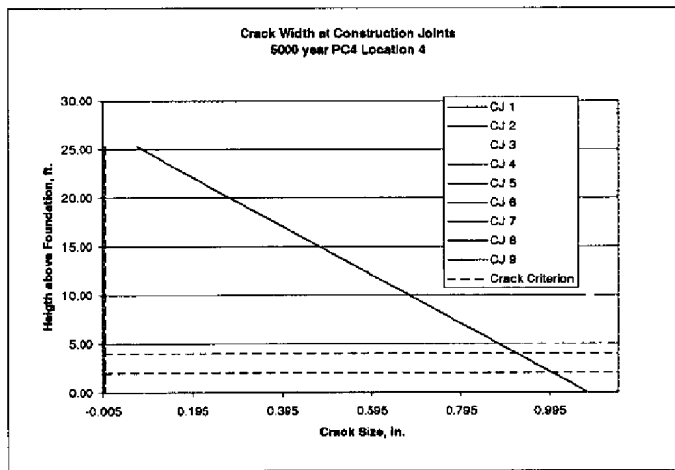
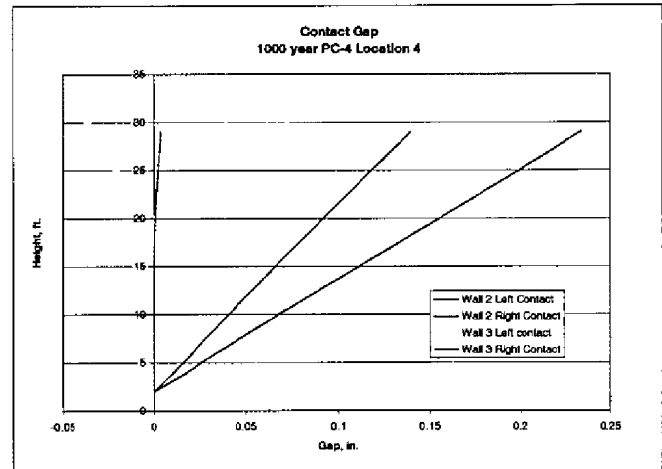
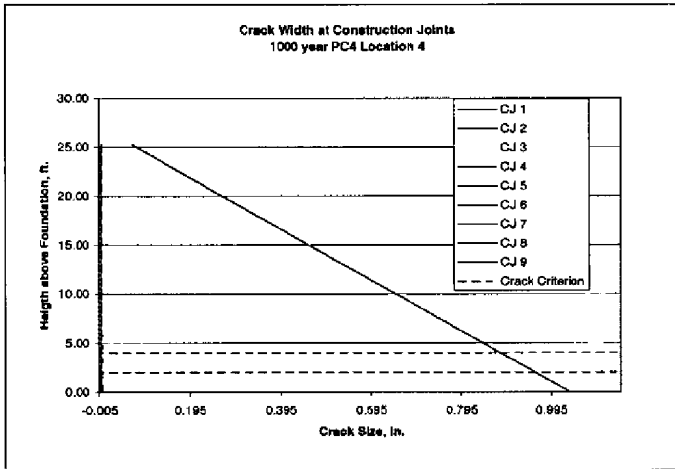
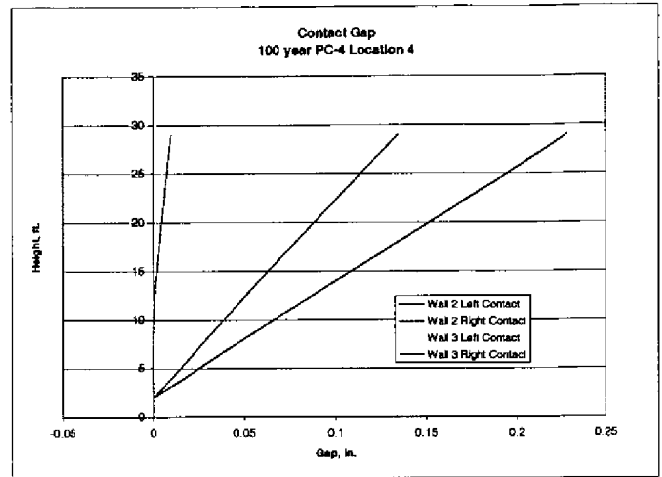
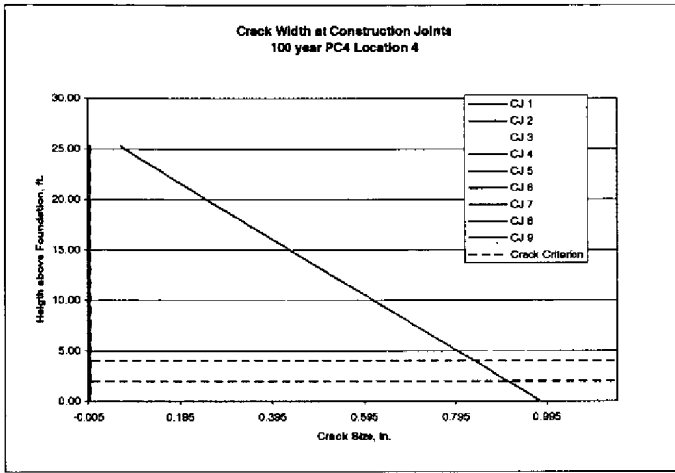




T-CLL-2-00006
 Rev 10

PC-4 Differential Settlement - Location 4
 Mean Grout Strength

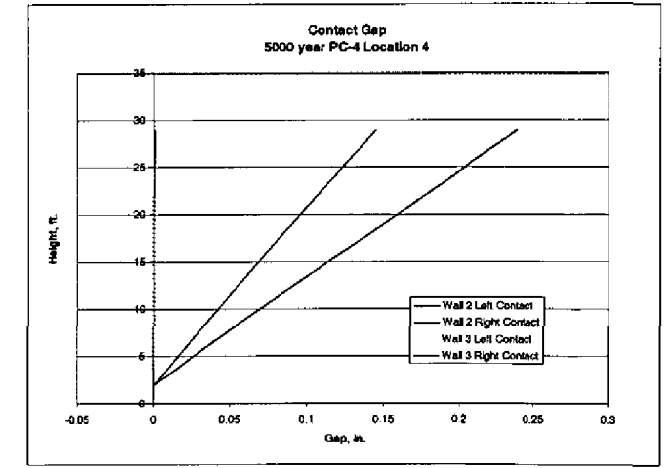
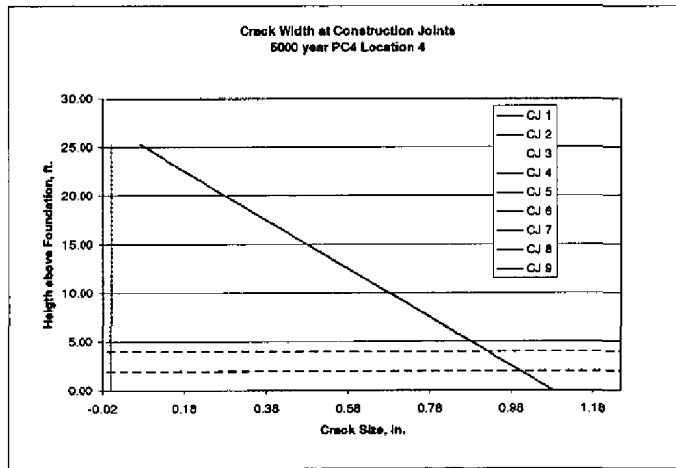
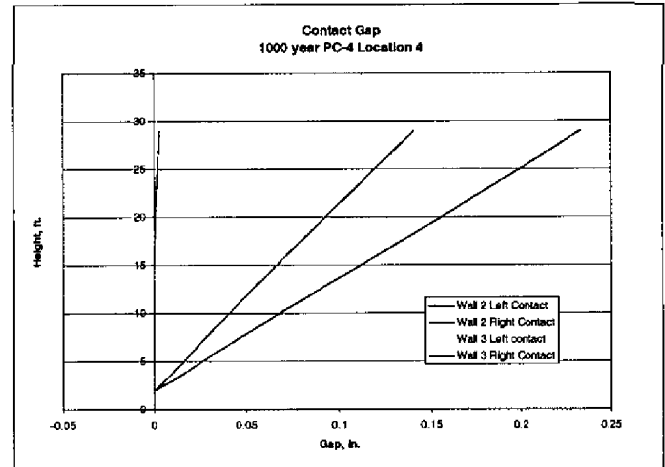
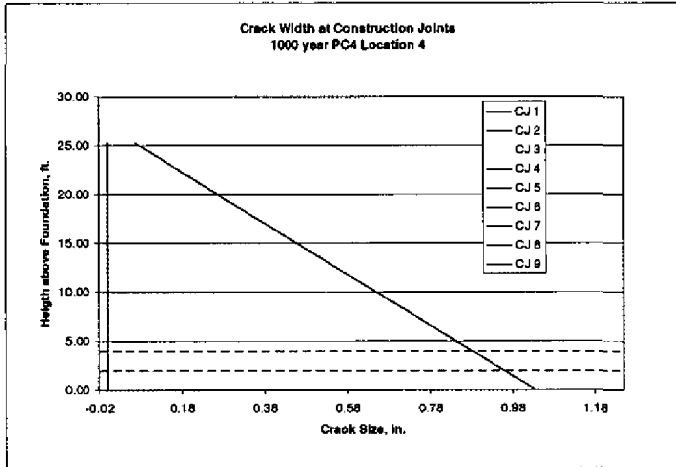
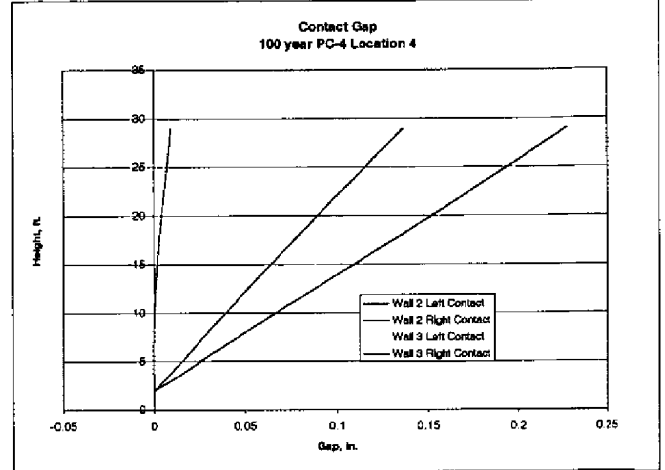
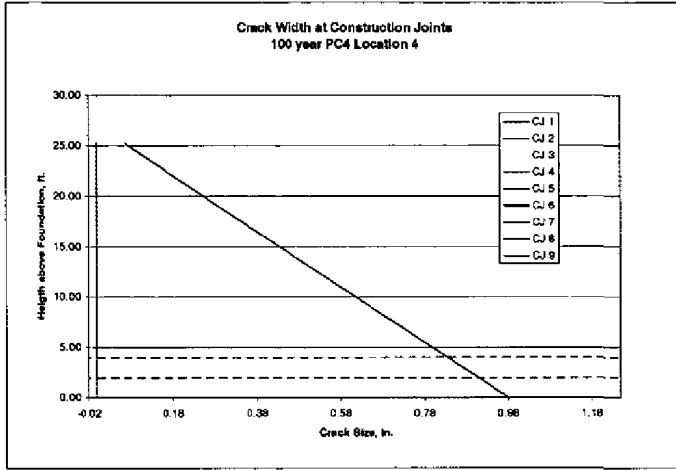
483



T-LLC-E-00006
Rev. 0

PC-4 Differential Settlement - Location 4
High Grout Strength

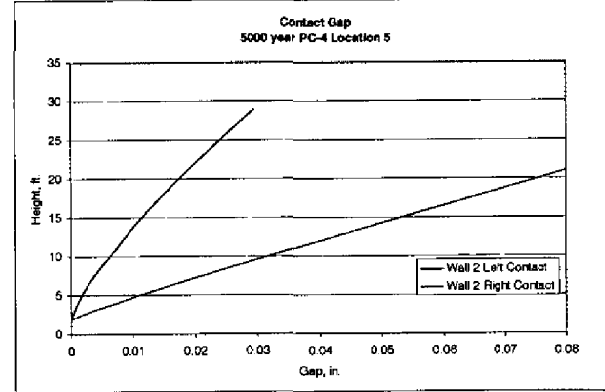
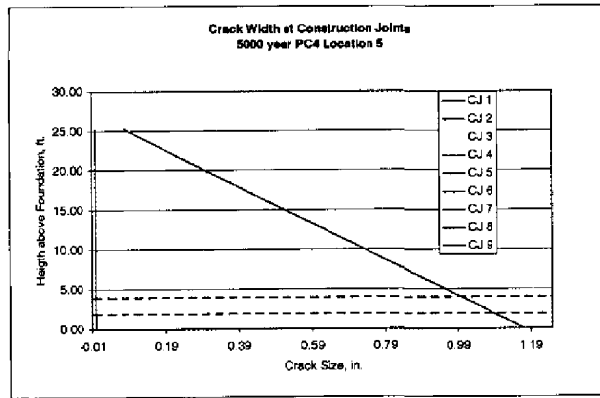
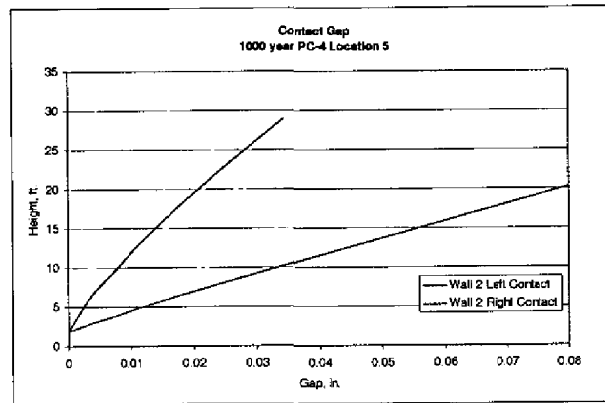
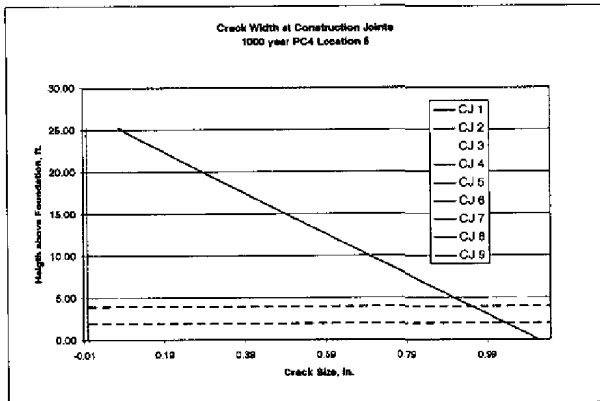
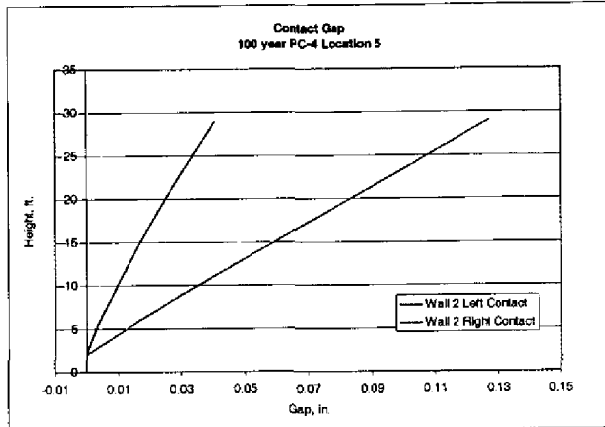
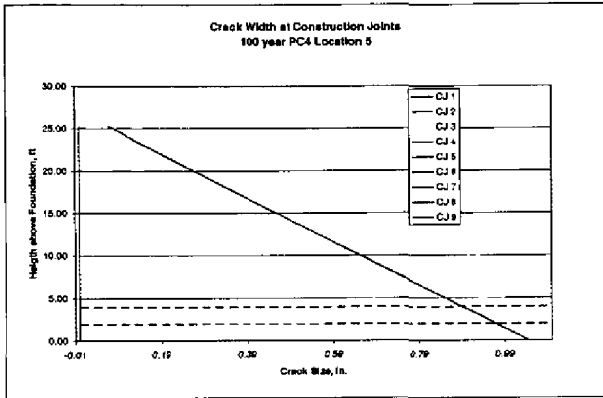
484



T-CLE-2-00006
Rev. 0

PC-4 Differential Settlement - Location 5
Low Grout Strength

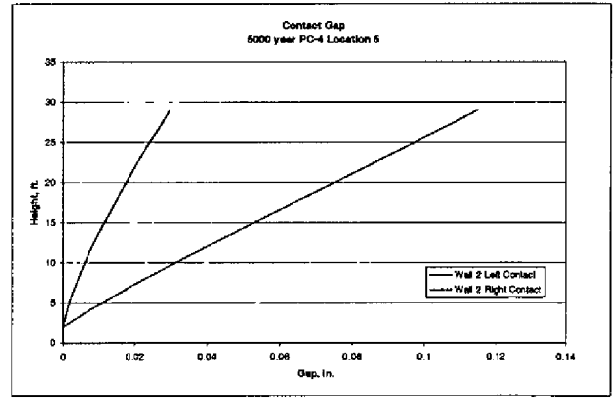
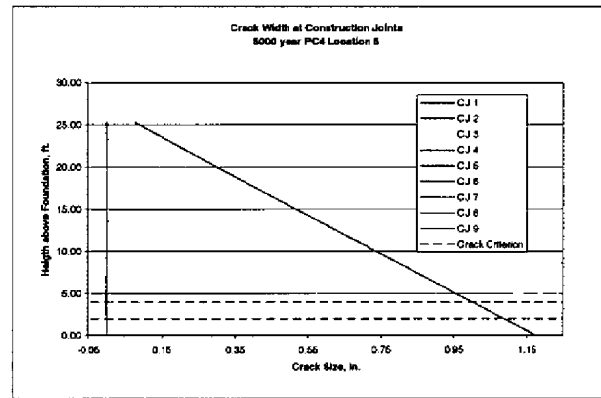
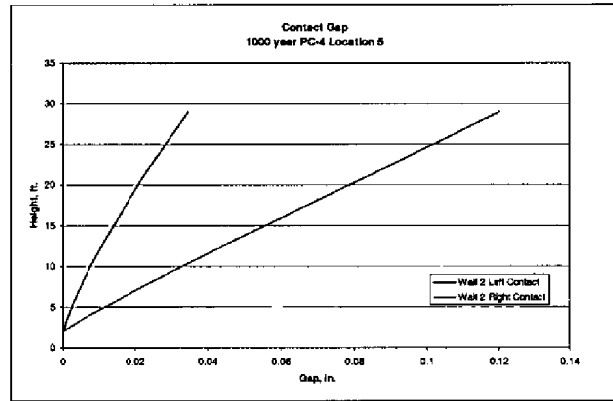
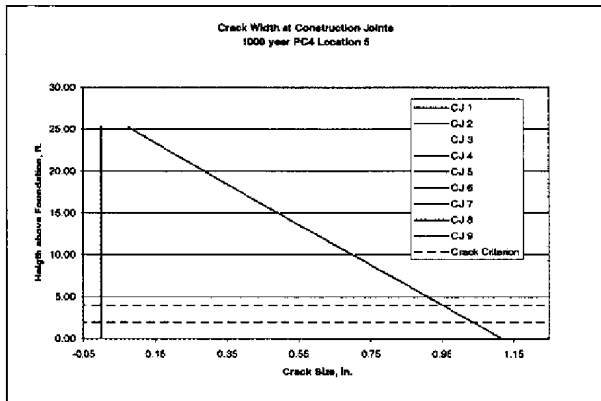
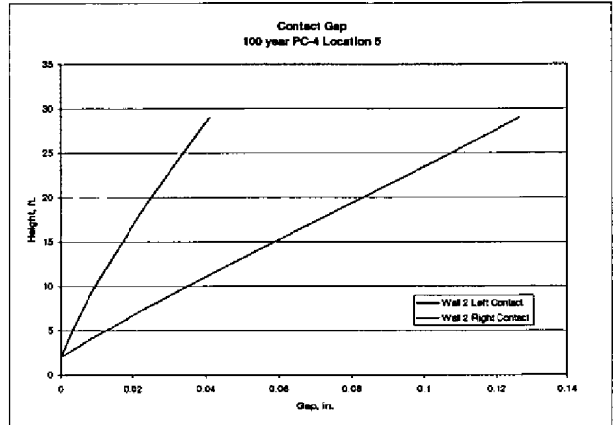
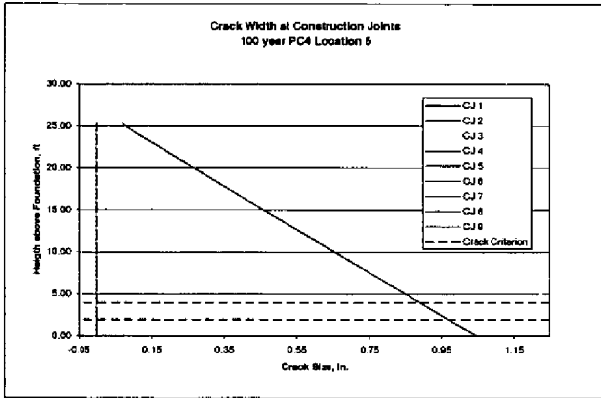
485



T-LLC-2-00006
 Rev. 0

PC-4 Differential Settlement - Location 5
 Mean Grout Strength

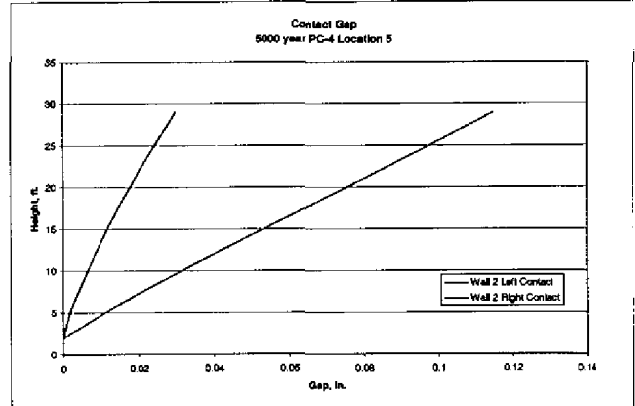
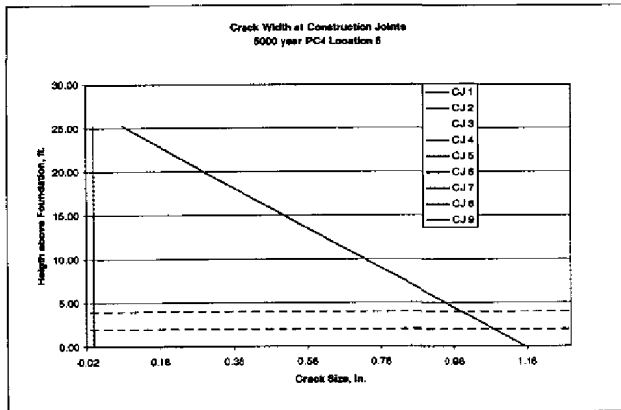
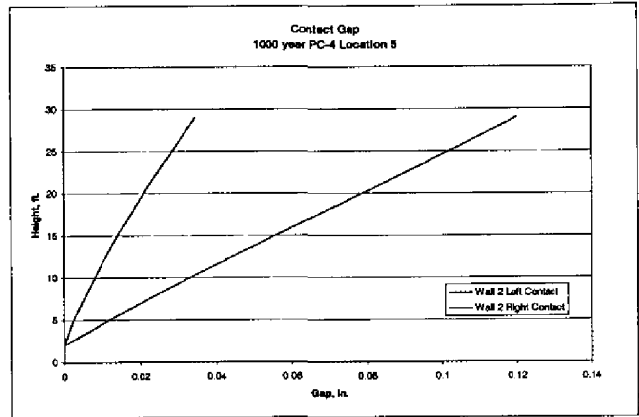
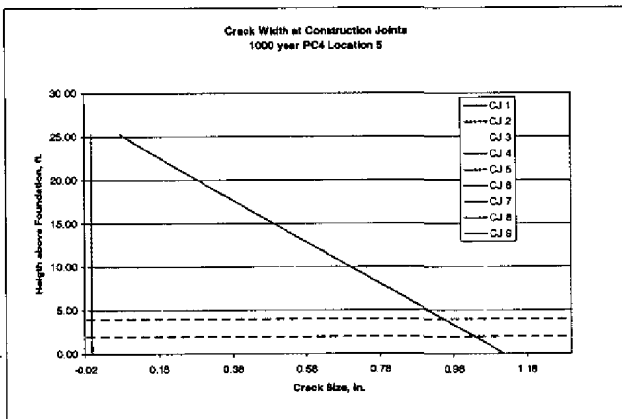
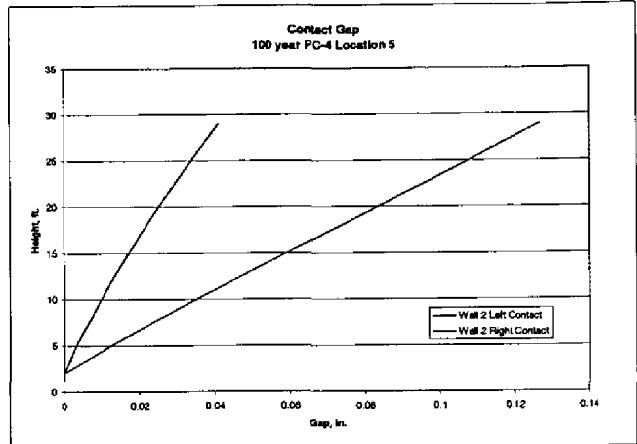
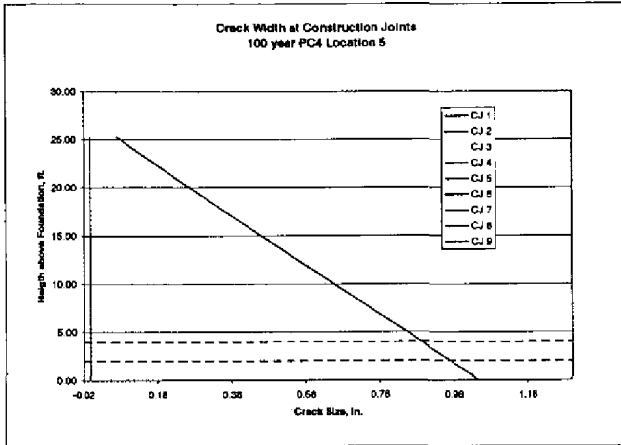
ABP



F-CLL-2-00006
Rev. 0

PC-4 Differential Settlement - Location 5
High Grout Strength

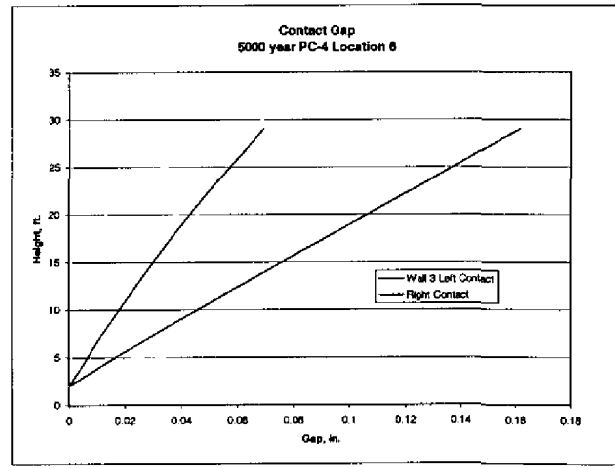
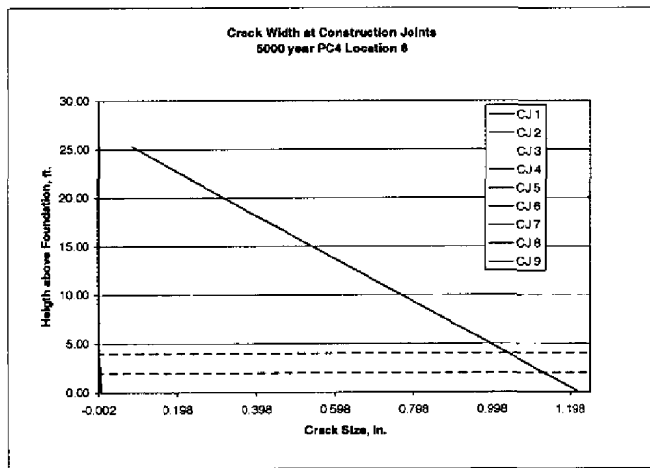
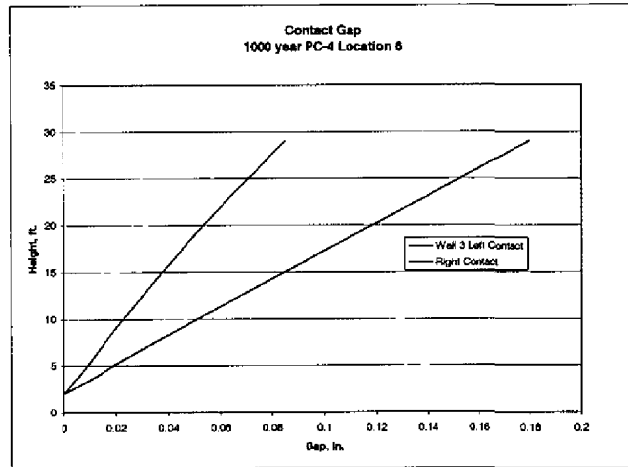
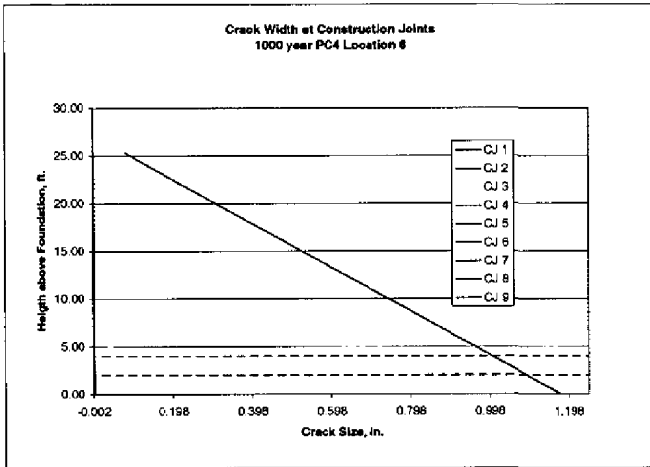
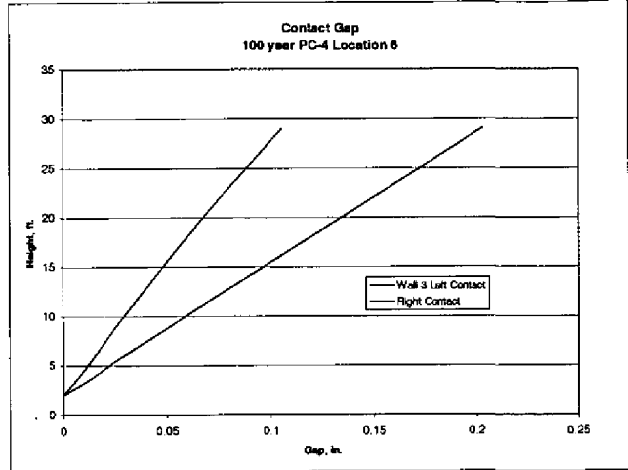
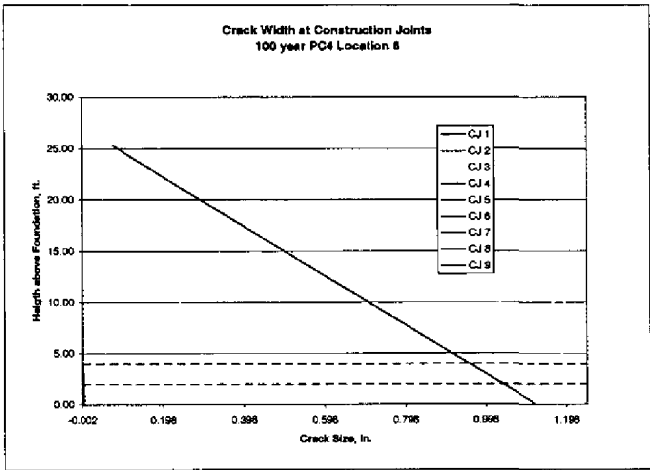
487



T-CLC-8-00006
Rev. 0

PC-4 Differential Settlement - Location 6
Low Grout Strength

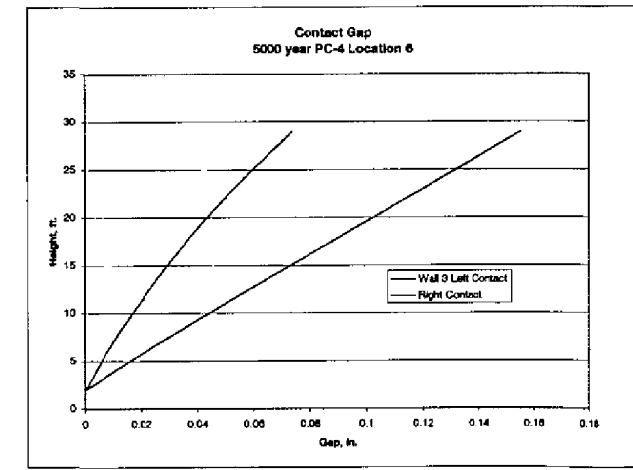
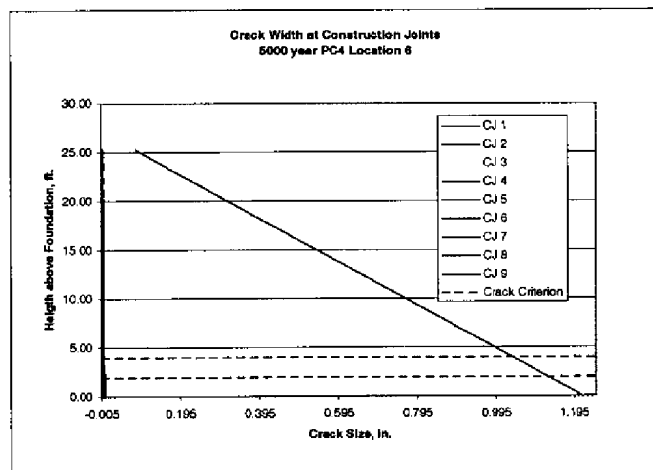
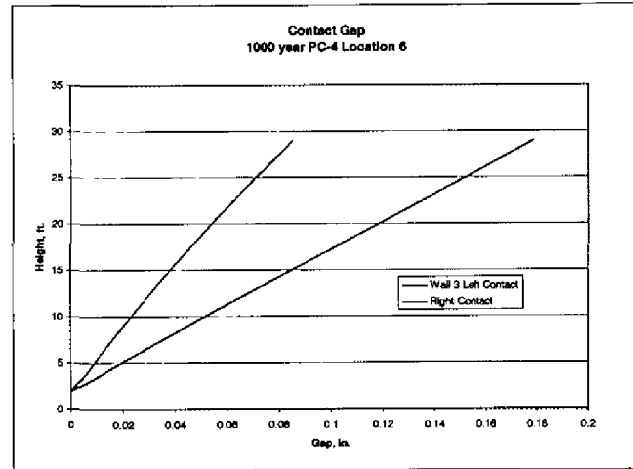
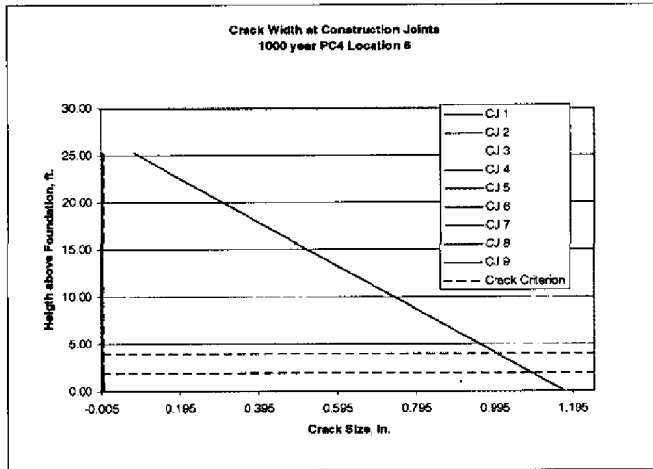
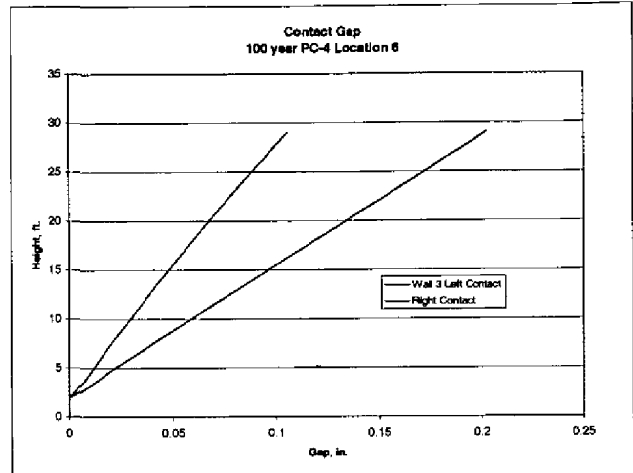
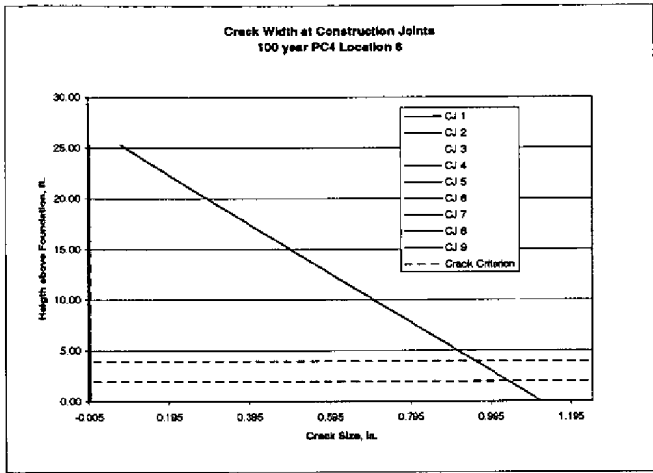
4-23



T-CLL-2-00006
 Res 10

PC-4 Differential Settlement - Location 6
 Mean Grout Strength

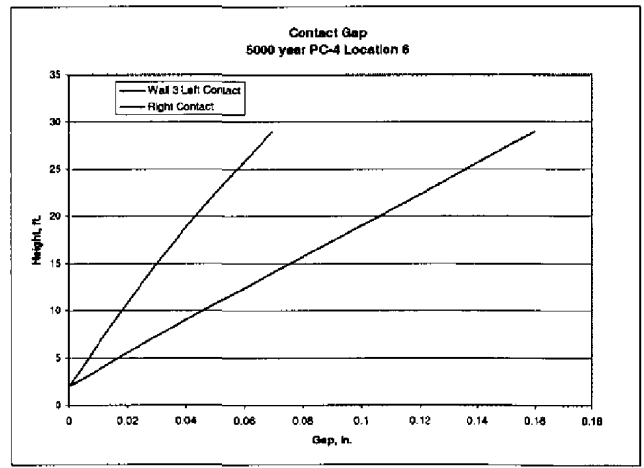
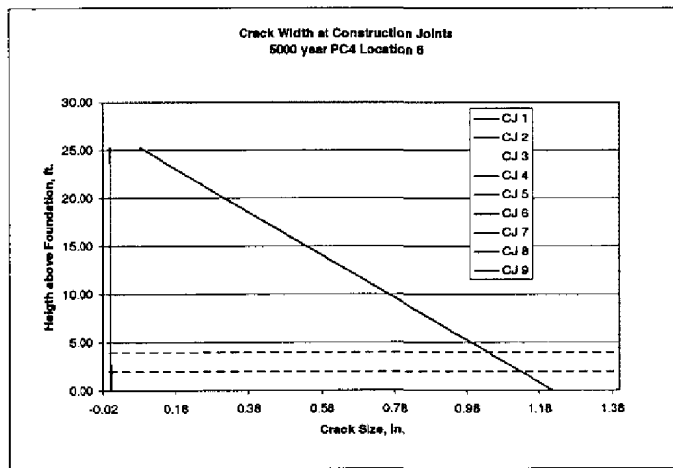
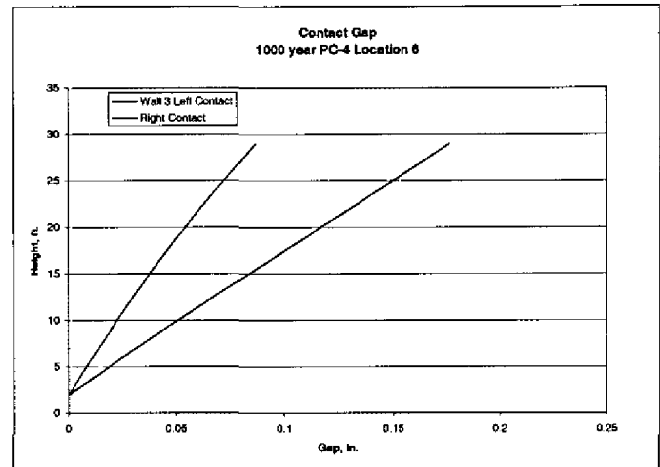
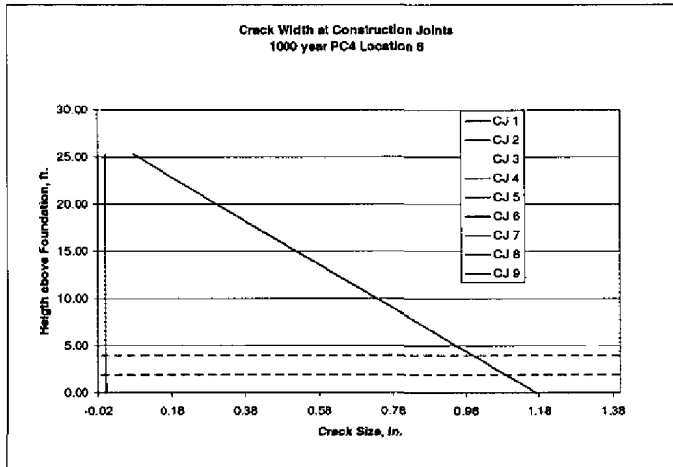
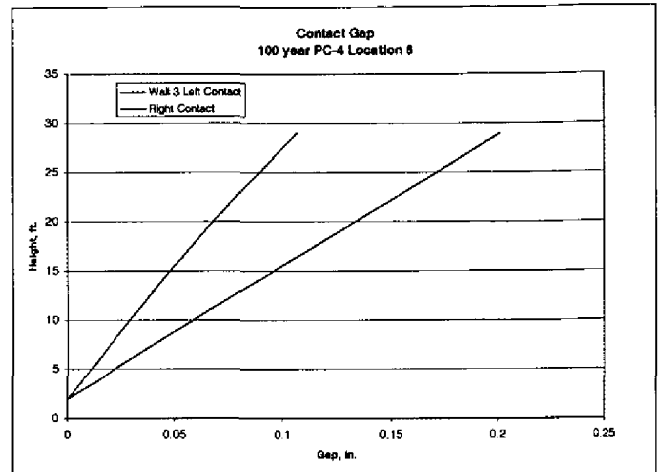
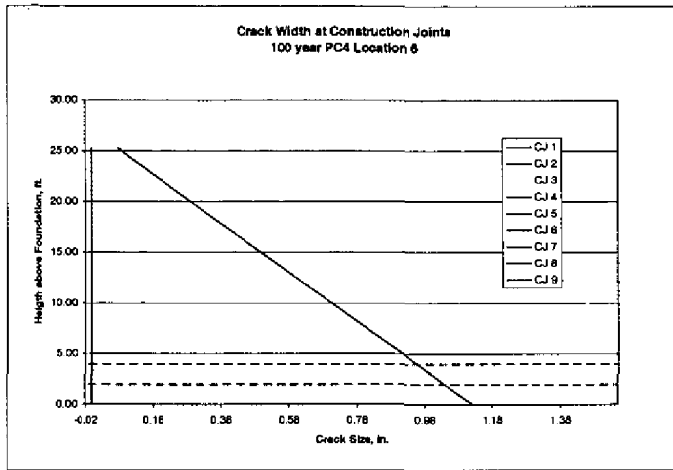
489



T-CLL-2-00006
Rev. 0

PC-4 Differential Settlement - Location 6
High Grout Strength

490



Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 491	Rev. 0
----------------------------------	------------------	-----------

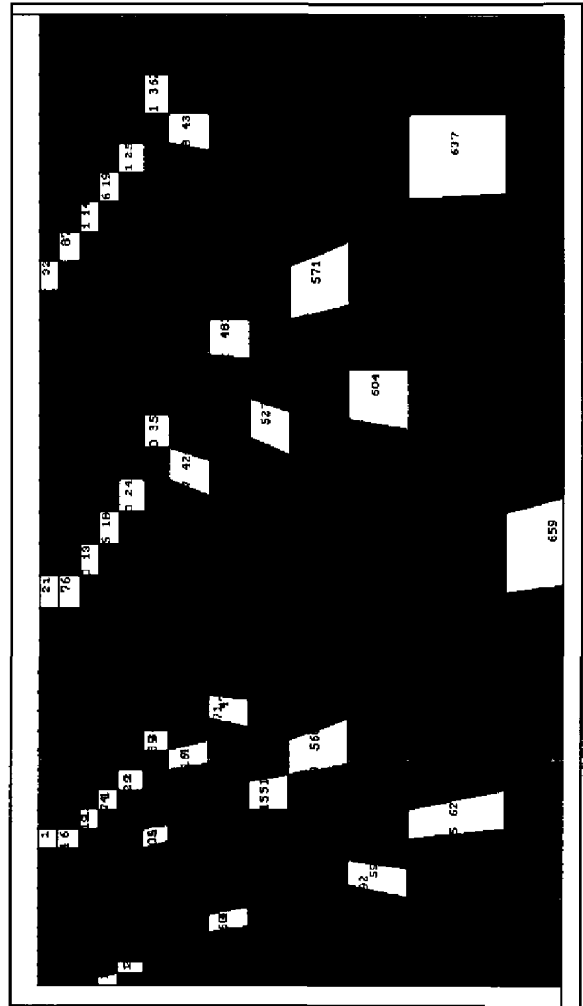
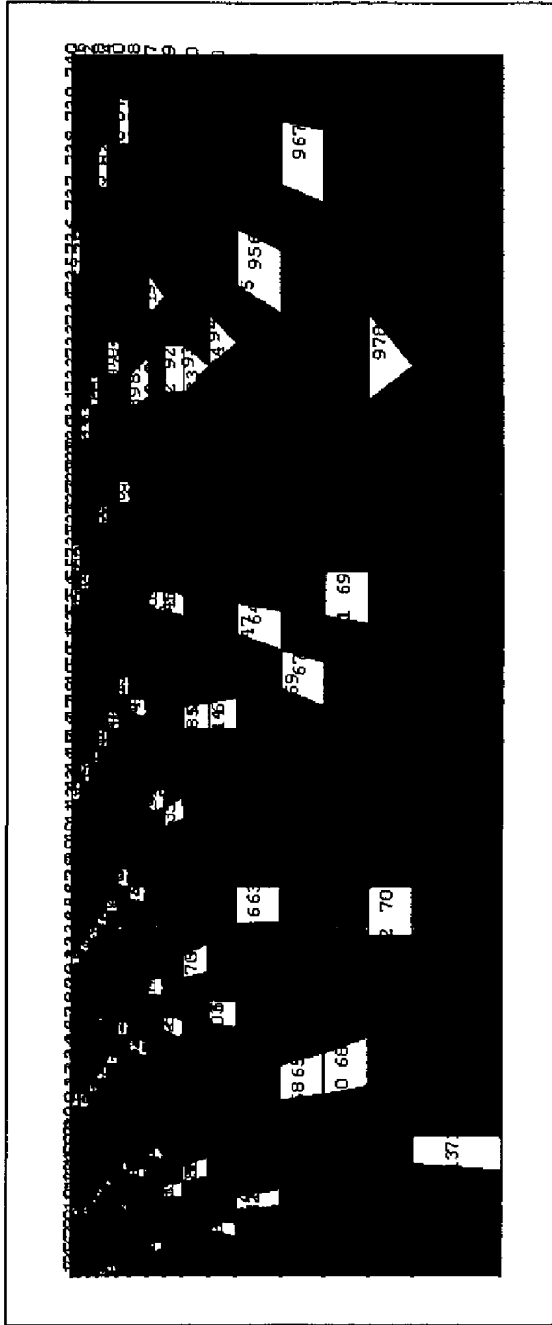
APPENDIX F

ANSYS Model Data

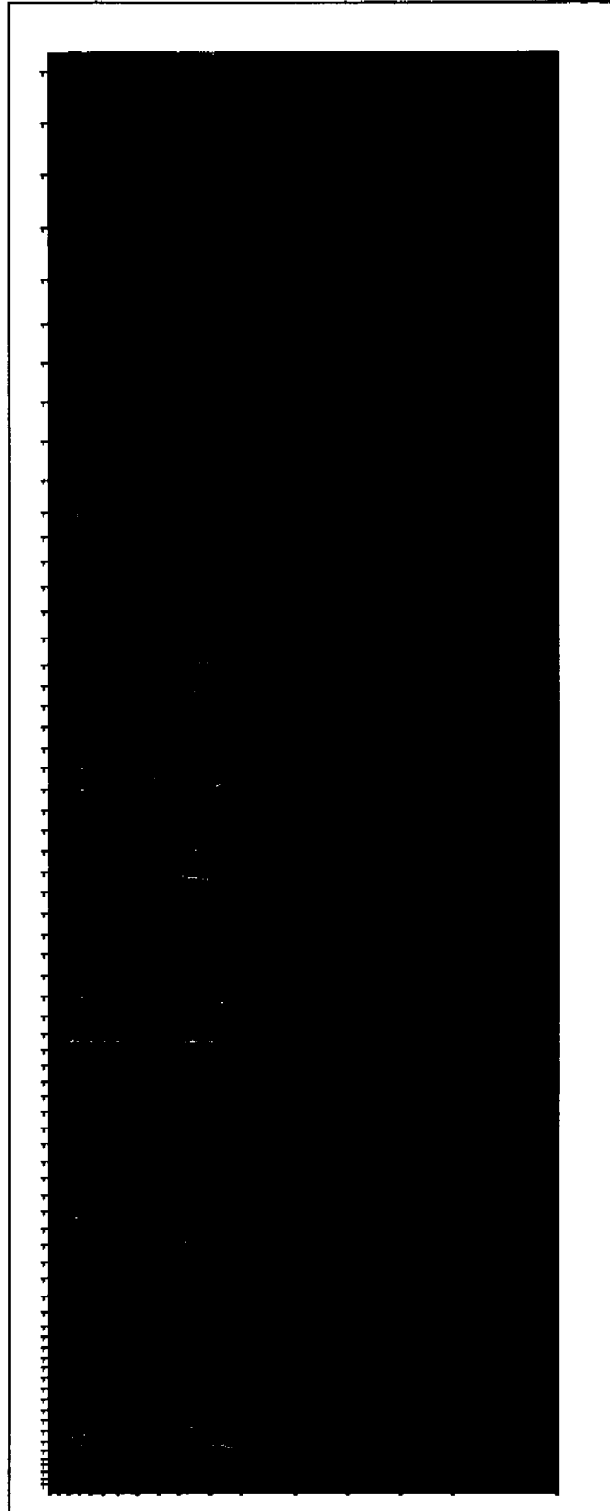
Model 70 – 2D Axisymmetric Sheet 492

Model 300 – 2D Plane Strain Sheet 515

2D Axisymmetric Model ssvle1 (elastic), ssvault6 (creep)
Element Numbers



2D Axisymmetric Model ssvle1 (elastic), ssvault6 (creep)
Material Numbers



Node Coordinates for Model ssv7

NODE	X	Y	Z	NODE	X	Y	Z	NODE	X	Y	Z
1	0	270	0	291	260	165	0	581	0	-200	0
2	10	270	0	292	280	165	0	582	40	-200	0
3	21	270	0	293	300	165	0	583	80	-200	0
4	35.5	270	0	294	320	165	0	584	120	-200	0
5	50	270	0	295	352.7273	165	0	585	160	-200	0
6	59	270	0	296	385.4545	165	0	586	200	-200	0
7	79.16667	270	0	297	418.1818	165	0	587	240	-200	0
8	99.33333	270	0	298	450.9091	165	0	588	280	-200	0
9	119.5	270	0	299	483.6364	165	0	589	320	-200	0
10	139.6667	270	0	300	516.3636	165	0	590	401.4286	-200	0
11	159.8333	270	0	301	549.0909	165	0	591	482.8571	-200	0
12	180	270	0	302	581.8182	165	0	592	564.2857	-200	0
13	200	270	0	303	614.5455	165	0	593	645.7143	-200	0
14	220	270	0	304	647.2727	165	0	594	727.1429	-200	0
15	240	270	0	305	680	165	0	595	808.5714	-200	0
16	250	270	0	306	710	165	0	596	890	-200	0
17	280	270	0	307	740	165	0	597	980	-200	0
18	300	270	0	308	770	165	0	598	1070	-200	0
19	320	270	0	309	800	165	0	599	1160	-200	0
20	352.7273	270	0	310	830	165	0	600	1250	-200	0
21	385.4545	270	0	311	860	165	0	601	1340	-200	0
22	418.1818	270	0	312	890	165	0	602	1430	-200	0
23	450.9091	270	0	313	930	165	0	603	1520	-200	0
24	483.6364	270	0	314	970	165	0	604	1610	-200	0
25	516.3636	270	0	315	1010	165	0	605	0	-300	0
26	549.0909	270	0	316	1050	165	0	606	45.71429	-300	0
27	581.8182	270	0	317	1090	165	0	607	91.42857	-300	0
28	614.5455	270	0	318	1130	165	0	608	137.1429	-300	0
29	647.2727	270	0	319	1170	165	0	609	182.8571	-300	0
30	680	270	0	320	1210	165	0	610	228.5714	-300	0
31	710	270	0	321	1250	165	0	611	274.2857	-300	0
32	740	270	0	322	1290	165	0	612	320	-300	0
33	770	270	0	323	1330	165	0	613	415	-300	0
34	800	270	0	324	1370	165	0	614	510	-300	0
35	830	270	0	325	1410	165	0	615	605	-300	0
36	850	270	0	326	1450	165	0	616	700	-300	0
37	890	270	0	327	1490	165	0	617	795	-300	0
38	930	270	0	328	1530	165	0	618	890	-300	0
39	970	270	0	329	1570	165	0	619	992.8571	-300	0
40	1010	270	0	330	1610	165	0	620	1095.714	-300	0
41	1050	270	0	331	0	140	0	621	1198.571	-300	0
42	1090	270	0	332	16.36	140	0	622	1301.429	-300	0
43	1130	270	0	333	32.7273	140	0	623	1404.286	-300	0
44	1170	270	0	334	49.0909	140	0	624	1507.143	-300	0
45	1210	270	0	335	65.4545	140	0	625	1610	-300	0
46	1250	270	0	336	81.8182	140	0	626	0	-400	0
47	1290	270	0	337	98.1818	140	0	627	53.33333	-400	0
48	1330	270	0	338	114.5455	140	0	628	106.6667	-400	0
49	1370	270	0	339	130.9091	140	0	629	160	-400	0
50	1410	270	0	340	147.2727	140	0	630	213.3333	-400	0
51	1450	270	0	341	163.6364	140	0	631	266.6667	-400	0
52	1490	270	0	342	180	140	0	632	320	-400	0
53	1530	270	0	343	200	140	0	633	434	-400	0
54	1570	270	0	344	220	140	0	634	548	-400	0
55	1610	270	0	345	240	140	0	635	662	-400	0
56	0	250	0	346	260	140	0	636	776	-400	0
57	10	250	0	347	280	140	0	637	890	-400	0
58	21	250	0	348	300	140	0	638	1010	-400	0
59	35.5	250	0	349	320	140	0	639	1130	-400	0
60	50	250	0	350	352.7273	140	0	640	1250	-400	0
61	59	250	0	351	385.4545	140	0	641	1370	-400	0
62	79.16667	250	0	352	418.1818	140	0	642	1490	-400	0
63	99.33333	250	0	353	450.9091	140	0	643	1610	-400	0
64	119.5	250	0	354	483.6364	140	0	644	0	-500	0
65	139.6667	250	0	355	516.3636	140	0	645	64	-500	0
66	159.8333	250	0	356	549.0909	140	0	646	128	-500	0
67	180	250	0	357	581.8182	140	0	647	192	-500	0
68	200	250	0	358	614.5455	140	0	648	256	-500	0
69	220	250	0	359	647.2727	140	0	649	320	-500	0

70	240	250	0	360	680	140	0	650	434	-500	0
71	260	250	0	361	710	140	0	651	548	-500	0
72	280	250	0	362	740	140	0	652	662	-500	0
73	300	250	0	363	770	140	0	653	776	-500	0
74	320	250	0	364	800	140	0	654	890	-500	0
75	352.7273	250	0	365	830	140	0	655	1034	-500	0
76	385.4545	250	0	366	860	140	0	656	1178	-500	0
77	418.1818	250	0	367	890	140	0	657	1322	-500	0
78	450.9091	250	0	368	930	140	0	658	1466	-500	0
79	483.6364	250	0	369	970	140	0	659	1610	-500	0
80	516.3636	250	0	370	1010	140	0	660	0	-700	0
81	549.0909	250	0	371	1050	140	0	661	80	-700	0
82	581.8182	250	0	372	1090	140	0	662	160	-700	0
83	614.5455	250	0	373	1130	140	0	663	240	-700	0
84	647.2727	250	0	374	1170	140	0	664	320	-700	0
85	680	250	0	375	1210	140	0	665	462.5	-700	0
86	710	250	0	376	1250	140	0	666	605	-700	0
87	740	250	0	377	1290	140	0	667	747.5	-700	0
88	770	250	0	378	1330	140	0	668	890	-700	0
89	800	250	0	379	1370	140	0	669	1070	-700	0
90	830	250	0	380	1410	140	0	670	1250	-700	0
91	860	250	0	381	1450	140	0	671	1430	-700	0
92	890	250	0	382	1490	140	0	672	1610	-700	0
93	930	250	0	383	1530	140	0	673	1670	270	0
94	970	250	0	384	1570	140	0	674	1718	270	0
95	1010	250	0	385	1610	140	0	675	1766	270	0
96	1050	250	0	386	0	100	0	676	1814	270	0
97	1090	250	0	387	18	100	0	677	1862	270	0
98	1130	250	0	388	36	100	0	678	1910	270	0
99	1170	250	0	389	54	100	0	679	1985	270	0
100	1210	250	0	390	72	100	0	680	2060	270	0
101	1250	250	0	391	90	100	0	681	2135	270	0
102	1290	250	0	392	108	100	0	682	2210	270	0
103	1330	250	0	393	126	100	0	683	2285	270	0
104	1370	250	0	394	144	100	0	684	2385	270	0
105	1410	250	0	395	162	100	0	685	2485	270	0
106	1450	250	0	396	180	100	0	686	2585	270	0
107	1490	250	0	397	203.3333	100	0	687	2685	270	0
108	1530	250	0	398	226.6667	100	0	688	2785	270	0
109	1570	250	0	399	250	100	0	689	1670	250	0
110	1610	250	0	400	273.3333	100	0	690	1718	250	0
111	0	230	0	401	296.6667	100	0	691	1766	250	0
112	10	230	0	402	320	100	0	692	1814	250	0
113	21	230	0	403	356	100	0	693	1862	250	0
114	35.5	230	0	404	392	100	0	694	1910	250	0
115	50	230	0	405	428	100	0	695	1985	250	0
116	59	230	0	406	464	100	0	696	2060	250	0
117	79.16667	230	0	407	500	100	0	697	2135	250	0
118	99.33333	230	0	408	536	100	0	698	2210	250	0
119	119.5	230	0	409	572	100	0	699	2285	250	0
120	139.6667	230	0	410	608	100	0	700	2385	250	0
121	159.8333	230	0	411	644	100	0	701	2485	250	0
122	180	230	0	412	680	100	0	702	2585	250	0
123	200	230	0	413	710	100	0	703	2685	250	0
124	220	230	0	414	741.4286	100	0	704	2785	250	0
125	240	230	0	415	778.5714	100	0	705	1670	230	0
126	260	230	0	416	815.7143	100	0	706	1718	230	0
127	280	230	0	417	852.8571	100	0	707	1766	230	0
128	300	230	0	418	890	100	0	708	1814	230	0
129	320	230	0	419	932.3529	100	0	709	1862	230	0
130	352.7273	230	0	420	974.7059	100	0	710	1910	230	0
131	385.4545	230	0	421	1017.059	100	0	711	1985	230	0
132	418.1818	230	0	422	1059.412	100	0	712	2060	230	0
133	450.9091	230	0	423	1101.765	100	0	713	2135	230	0
134	483.6364	230	0	424	1144.118	100	0	714	2210	230	0
135	516.3636	230	0	425	1186.471	100	0	715	2285	230	0
136	549.0909	230	0	426	1228.824	100	0	716	2385	230	0
137	581.8182	230	0	427	1271.176	100	0	717	2485	230	0
138	614.5455	230	0	428	1313.529	100	0	718	2585	230	0
139	647.2727	230	0	429	1355.882	100	0	719	2685	230	0
140	680	230	0	430	1398.235	100	0	720	2785	230	0
141	710	230	0	431	1440.588	100	0	721	1670	210	0
142	740	230	0	432	1482.941	100	0	722	1718	210	0
143	770	230	0	433	1525.294	100	0	723	1766	210	0

144	800	230	0	434	1567.647	100	0	724	1814	210	0
145	830	230	0	435	1610	100	0	725	1862	210	0
146	860	230	0	436	0	60	0	726	1910	210	0
147	890	230	0	437	20	60	0	727	1985	210	0
148	930	230	0	438	40	60	0	728	2060	210	0
149	970	230	0	439	60	60	0	729	2135	210	0
150	1010	230	0	440	80	60	0	730	2210	210	0
151	1050	230	0	441	100	60	0	731	2285	210	0
152	1090	230	0	442	120	60	0	732	2385	210	0
153	1130	230	0	443	140	60	0	733	2485	210	0
154	1170	230	0	444	160	60	0	734	2585	210	0
155	1210	230	0	445	180	60	0	735	2685	210	0
156	1250	230	0	446	208	60	0	736	2785	210	0
157	1290	230	0	447	236	60	0	737	1670	190	0
158	1330	230	0	448	264	60	0	738	1718	190	0
159	1370	230	0	449	292	60	0	739	1766	190	0
160	1410	230	0	450	320	60	0	740	1814	190	0
161	1450	230	0	451	360	60	0	741	1862	190	0
162	1490	230	0	452	400	60	0	742	1910	190	0
163	1530	230	0	453	440	60	0	743	1985	190	0
164	1570	230	0	454	480	60	0	744	2060	190	0
165	1610	230	0	455	520	60	0	745	2135	190	0
166	0	210	0	455	560	60	0	746	2210	190	0
167	10	210	0	457	600	60	0	747	2285	190	0
168	21	210	0	458	640	60	0	748	2385	190	0
169	35.5	210	0	459	680	60	0	749	2485	190	0
170	50	210	0	460	716.6667	60	0	750	2585	190	0
171	65	210	0	461	760	60	0	751	2685	190	0
172	79.16667	210	0	462	803.3333	60	0	752	2785	190	0
173	99.33333	210	0	463	846.6667	60	0	753	1670	165	0
174	119.5	210	0	464	890	60	0	754	1718	165	0
175	139.6667	210	0	465	935	60	0	755	1766	165	0
176	159.8333	210	0	466	980	60	0	756	1814	165	0
177	180	210	0	467	1025	60	0	757	1862	165	0
178	200	210	0	468	1070	60	0	758	1910	165	0
179	220	210	0	469	1115	60	0	759	1985	165	0
180	240	210	0	470	1160	60	0	760	2060	165	0
181	260	210	0	471	1205	60	0	761	2135	165	0
182	280	210	0	472	1250	60	0	762	2210	165	0
183	300	210	0	473	1295	60	0	763	2285	165	0
184	320	210	0	474	1340	60	0	764	2385	165	0
185	352.7273	210	0	475	1385	60	0	765	2485	165	0
186	385.4545	210	0	476	1430	60	0	766	2585	165	0
187	418.1818	210	0	477	1475	60	0	767	2685	165	0
188	450.9091	210	0	478	1520	60	0	768	2785	165	0
189	483.6364	210	0	479	1565	60	0	769	1670	140	0
190	516.3636	210	0	480	1610	60	0	770	1718	140	0
191	549.0909	210	0	481	0	20	0	771	1766	140	0
192	581.8182	210	0	482	22.5	20	0	772	1814	140	0
193	614.5455	210	0	483	45	20	0	773	1862	140	0
194	647.2727	210	0	484	67.5	20	0	774	1910	140	0
195	680	210	0	485	90	20	0	775	1985	140	0
196	710	210	0	486	112.5	20	0	776	2060	140	0
197	740	210	0	487	135	20	0	777	2135	140	0
198	770	210	0	488	157.5	20	0	778	2210	140	0
199	800	210	0	489	180	20	0	779	2285	140	0
200	830	210	0	490	215	20	0	780	2385	140	0
201	860	210	0	491	250	20	0	781	2485	140	0
202	890	210	0	492	285	20	0	782	2585	140	0
203	930	210	0	493	320	20	0	783	2685	140	0
204	970	210	0	494	364.2857	20	0	784	2785	140	0
205	1010	210	0	495	408.5714	20	0	785	1670	100	0
206	1050	210	0	496	452.8571	20	0	786	1730	100	0
207	1090	210	0	497	497.1429	20	0	787	1790	100	0
208	1130	210	0	498	541.4286	20	0	788	1850	100	0
209	1170	210	0	499	585.7143	20	0	789	1910	100	0
210	1210	210	0	500	630	20	0	790	2005	100	0
211	1250	210	0	501	680	20	0	791	2100	100	0
212	1290	210	0	502	734	20	0	792	2195	100	0
213	1330	210	0	503	786	20	0	793	2290	100	0
214	1370	210	0	504	838	20	0	794	2385	100	0
215	1410	210	0	505	890	20	0	795	2485	100	0
216	1450	210	0	506	941.4286	20	0	796	2585	100	0
217	1490	210	0	507	992.8571	20	0	797	2685	100	0

218	1530	210	0	508	1044.286	20	0	798	2785	100	0
219	1570	210	0	509	1095.714	20	0	799	1685	60	0
220	1610	210	0	510	1147.143	20	0	800	1760	60	0
221	0	190	0	511	1198.571	20	0	801	1835	60	0
222	12	190	0	512	1250	20	0	802	1910	60	0
223	25	190	0	513	1301.429	20	0	803	2019.375	60	0
224	40	190	0	514	1352.857	20	0	804	2128.75	60	0
225	52	190	0	515	1404.286	20	0	805	2238.125	60	0
226	65	190	0	516	1455.714	20	0	806	2347.5	60	0
227	82	190	0	517	1507.143	20	0	807	2456.875	60	0
228	99.33333	190	0	518	1558.571	20	0	808	2566.25	60	0
229	119.5	190	0	519	1610	20	0	809	2675.625	60	0
230	139.6667	190	0	520	0	-40	0	810	2785	60	0
231	159.8333	190	0	521	25.71429	-40	0	811	1710	20	0
232	180	190	0	522	51.42857	-40	0	812	1810	20	0
233	200	190	0	523	77.14286	-40	0	813	1910	20	0
234	220	190	0	524	102.8571	-40	0	814	2019.375	20	0
235	240	190	0	525	128.5714	-40	0	815	2128.75	20	0
236	260	190	0	526	154.2857	-40	0	816	2238.125	20	0
237	280	190	0	527	180	-40	0	817	2347.5	20	0
238	300	190	0	528	226.6667	-40	0	818	2456.875	20	0
239	320	190	0	529	273.3333	-40	0	819	2566.25	20	0
240	352.7273	190	0	530	320	-40	0	820	2675.625	20	0
241	385.4545	190	0	531	371.6667	-40	0	821	2785	20	0
242	418.1818	190	0	532	423.3333	-40	0	822	1727.5	-40	0
243	450.9091	190	0	533	475	-40	0	823	1845	-40	0
244	483.6364	190	0	534	526.6667	-40	0	824	1962.5	-40	0
245	516.3636	190	0	535	578.3333	-40	0	825	2080	-40	0
246	549.0909	190	0	536	630	-40	0	826	2197.5	-40	0
247	581.8182	190	0	537	695	-40	0	827	2315	-40	0
248	614.5455	190	0	538	760	-40	0	828	2432.5	-40	0
249	647.2727	190	0	539	825	-40	0	829	2550	-40	0
250	680	190	0	540	890	-40	0	830	2667.5	-40	0
251	710	190	0	541	950	-40	0	831	2785	-40	0
252	740	190	0	542	1010	-40	0	832	1740.556	-100	0
253	770	190	0	543	1070	-40	0	833	1871.111	-100	0
254	800	190	0	544	1130	-40	0	834	2001.667	-100	0
255	830	190	0	545	1190	-40	0	835	2132.222	-100	0
256	860	190	0	546	1250	-40	0	836	2262.778	-100	0
257	890	190	0	547	1310	-40	0	837	2393.333	-100	0
258	930	190	0	548	1370	-40	0	838	2523.889	-100	0
259	970	190	0	549	1430	-40	0	839	2654.444	-100	0
260	1010	190	0	550	1490	-40	0	840	2785	-100	0
261	1050	190	0	551	1550	-40	0	841	1756.875	-200	0
262	1090	190	0	552	1610	-40	0	842	1903.75	-200	0
263	1130	190	0	553	0	-100	0	843	2050.625	-200	0
264	1170	190	0	554	30	-100	0	844	2197.5	-200	0
265	1210	190	0	555	60	-100	0	845	2344.375	-200	0
266	1250	190	0	556	90	-100	0	846	2491.25	-200	0
267	1290	190	0	557	120	-100	0	847	2638.125	-200	0
268	1330	190	0	558	150	-100	0	848	2785	-200	0
269	1370	190	0	559	180	-100	0	849	1777.857	-300	0
270	1410	190	0	560	226.6667	-100	0	850	1945.714	-300	0
271	1450	190	0	561	273.3333	-100	0	851	2113.571	-300	0
272	1490	190	0	562	320	-100	0	852	2281.429	-300	0
273	1530	190	0	563	382	-100	0	853	2449.286	-300	0
274	1570	190	0	564	444	-100	0	854	2617.143	-300	0
275	1610	190	0	565	506	-100	0	855	2785	-300	0
276	0	165	0	566	568	-100	0	856	1805.833	-400	0
277	12	165	0	567	630	-100	0	857	2001.667	-400	0
278	25	165	0	568	716.6667	-100	0	858	2197.5	-400	0
279	40	165	0	569	803.3333	-100	0	859	2393.333	-400	0
280	52	165	0	570	890	-100	0	860	2589.167	-400	0
281	65	165	0	571	962	-100	0	861	2785	-400	0
282	82	165	0	572	1034	-100	0	862	1845	-500	0
283	99.33333	165	0	573	1106	-100	0	863	2080	-500	0
284	119.5	165	0	574	1178	-100	0	864	2315	-500	0
285	139.6667	165	0	575	1250	-100	0	865	2550	-500	0
286	159.8333	165	0	576	1322	-100	0	866	2785	-500	0
287	180	165	0	577	1394	-100	0	867	1903.75	-700	0
288	200	165	0	578	1466	-100	0	868	2197.5	-700	0
289	220	165	0	579	1538	-100	0	869	2491.25	-700	0
290	240	165	0	580	1610	-100	0	870	2785	-700	0

Model 2
2D Axisymmetric

Elements

ELEM							MAT							TYP							REL							ESY							SEC							NODES						
ELEM	MAT	TYP	REL	ESY	SEC	NODES	ELEM	MAT	TYP	REL	ESY	SEC	NODES	ELEM	MAT	TYP	REL	ESY	SEC	NODES	ELEM	MAT	TYP	REL	ESY	SEC	NODES	ELEM	MAT	TYP	REL	ESY	SEC	NODES	ELEM	MAT	TYP	REL	ESY	SEC	NODES							
1	1	1	1	0	1	1 2 57 56	342	4	1	1	0	1 292 293 348 347	640	7	1	1	0	1 570 571 597 596																														
2	1	1	1	0	1	2 3 58 57	343	4	1	1	0	1 293 294 349 348	641	7	1	1	0	1 571 572 598 597																														
3	1	1	1	0	1	3 4 59 58	344	4	1	1	0	1 294 295 350 349	642	7	1	1	0	1 572 573 598 598																														
4	1	1	1	0	1	4 5 60 59	345	4	1	1	0	1 295 296 351 350	643	7	1	1	0	1 573 574 599 598																														
5	1	1	1	0	1	5 6 61 60	346	4	1	1	0	1 296 297 352 351	644	7	1	1	0	1 574 575 600 599																														
6	1	1	1	0	1	6 7 62 61	347	4	1	1	0	1 297 298 353 352	645	7	1	1	0	1 575 576 601 600																														
7	1	1	1	0	1	7 8 63 62	348	4	1	1	0	1 298 299 354 353	646	7	1	1	0	1 576 577 602 601																														
8	1	1	1	0	1	8 9 64 63	349	4	1	1	0	1 299 300 355 354	647	7	1	1	0	1 577 578 602 602																														
9	1	1	1	0	1	9 10 65 64	350	4	1	1	0	1 300 301 356 355	648	7	1	1	0	1 578 579 603 602																														
10	1	1	1	0	1	10 11 66 65	351	4	1	1	0	1 301 302 357 356	649	7	1	1	0	1 579 580 604 603																														
11	1	1	1	0	1	11 12 67 66	352	4	1	1	0	1 302 303 358 357	650	7	1	1	0	1 581 582 606 605																														
12	1	1	1	0	1	12 13 68 67	353	4	1	1	0	1 303 304 359 358	651	7	1	1	0	1 582 583 607 606																														
13	1	1	1	0	1	13 14 69 68	354	4	1	1	0	1 304 305 360 359	652	7	1	1	0	1 583 584 608 607																														
14	1	1	1	0	1	14 15 70 69	355	4	1	1	0	1 305 306 361 360	653	7	1	1	0	1 584 585 609 608																														
15	1	1	1	0	1	15 16 71 70	356	4	1	1	0	1 306 307 362 361	654	7	1	1	0	1 585 586 609 609																														
16	1	1	1	0	1	16 17 72 71	357	4	1	1	0	1 307 308 363 362	655	7	1	1	0	1 586 587 610 609																														
17	1	1	1	0	1	17 18 73 72	358	4	1	1	0	1 308 309 364 363	656	7	1	1	0	1 587 588 611 610																														
18	1	1	1	0	1	18 19 74 73	359	4	1	1	0	1 309 310 365 364	657	7	1	1	0	1 588 589 612 611																														
19	1	1	1	0	1	19 20 75 74	360	4	1	1	0	1 310 311 366 365	658	7	1	1	0	1 589 590 613 612																														
20	1	1	1	0	1	20 21 76 75	361	4	1	1	0	1 311 312 367 366	659	7	1	1	0	1 590 591 614 613																														
21	1	1	1	0	1	21 22 77 76	362	4	1	1	0	1 312 313 368 367	660	7	1	1	0	1 591 592 615 614																														
22	1	1	1	0	1	22 23 78 77	363	4	1	1	0	1 313 314 369 368	661	7	1	1	0	1 592 593 615 615																														
23	1	1	1	0	1	23 24 79 78	364	4	1	1	0	1 314 315 370 369	662	7	1	1	0	1 593 594 616 615																														
24	1	1	1	0	1	24 25 80 79	365	4	1	1	0	1 315 316 371 370	663	7	1	1	0	1 594 595 617 616																														
26	1	1	1	0	1	25 26 81 80	366	4	1	1	0	1 316 317 372 371	664	7	1	1	0	1 595 596 618 617																														
27	1	1	1	0	1	26 27 82 81	367	4	1	1	0	1 317 318 373 372	665	7	1	1	0	1 596 597 619 618																														
28	1	1	1	0	1	27 28 83 82	368	4	1	1	0	1 318 319 374 373	666	7	1	1	0	1 597 598 620 619																														
29	1	1	1	0	1	28 29 84 83	369	4	1	1	0	1 319 320 375 374	667	7	1	1	0	1 598 599 621 620																														
30	1	1	1	0	1	29 30 85 84	370	4	1	1	0	1 320 321 376 375	668	7	1	1	0	1 599 600 622 621																														
31	1	1	1	0	1	30 31 86 85	371	4	1	1	0	1 321 322 377 376	669	7	1	1	0	1 600 601 622 622																														
32	1	1	1	0	1	31 32 87 86	372	4	1	1	0	1 322 323 378 377	670	7	1	1	0	1 601 602 623 622																														
33	1	1	1	0	1	32 33 88 87	373	4	1	1	0	1 323 324 379 378	671	7	1	1	0	1 602 603 624 623																														
34	1	1	1	0	1	33 34 89 88	374	4	1	1	0	1 324 325 380 379	672	7	1	1	0	1 603 604 625 624																														
35	1	1	1	0	1	34 35 90 89	375	4	1	1	0	1 325 326 381 380	673	8	1	1	0	1 605 606 627 626																														
36	1	1	1	0	1	35 36 91 90	376	4	1	1	0	1 326 327 382 381	674	8	1	1	0	1 606 607 628 627																														
37	1	1	1	0	1	36 37 92 91	377	4	1	1	0	1 327 328 383 382	675	8	1	1	0	1 607 608 629 628																														
38	1	1	1	0	1	37 38 93 92	378	4	1	1	0	1 328 329 384 383	676	8	1	1	0	1 608 609 629 629																														
39	1	1	1	0	1	38 39 94 93	379	4	1	1	0	1 329 330 385 384	677	8	1	1	0	1 609 610 630 629																														
40	1	1	1	0	1	39 40 95 94	390	5	1	1	0	1 331 332 387 386	678	8	1	1	0	1 610 611 631 630																														
41	1	1	1	0	1	40 41 96 95	391	5	1	1	0	1 332 333 388 387	679	8	1	1	0	1 611 612 632 631																														
42	1	1	1	0	1	41 42 97 96	392	5	1	1	0	1 333 334 389 388	680	8	1	1	0	1 612 613 633 632																														
43	1	1	1	0	1	42 43 98 97	397	5	1	1	0	1 338 339 393 392	681	8	1	1	0	1 613 614 634 633																														
44	1	1	1	0	1	43 44 99 98	401	4	1	1	0	1 279 280 335 334	682	8	1	1	0	1 614 615 635 634																														
45	1	1	1	0	1	44 45 100 99	402	4	1	1	0	1 280 281 336 335	683	8	1	1	0	1 615 616 635 635																														
46	1	1	1	0	1	45 46 101 100	403	4	1	1	0	1 281 282 337 336	684	8	1	1	0	1 616 617 636 635																														
47	1	1	1	0	1	46 47 102 101	404	4	1	1	0	1 282 283 338 337	685	8	1	1	0	1 617 618 637 636																														
48	1	1	1	0	1	47 48 103 102	405	4	1	1	0	1 284 285 340 339	686	8	1	1	0	1 618 619 638 637																														
49	1	1	1	0	1	48 49 104 103	406	4	1	1	0	1 285 286 341 340	687	8	1	1	0	1 619 620 639 638																														
50	1	1	1	0	1	49 50 105 104	407	4	1	1	0	1 286 287 342 341	688	8	1	1	0	1 620 621 640 639																														
51	1	1	1	0	1	50 51 106 105	408	5	1	1	0	1 334 335 390 389	689	8	1	1	0	1 621 622 640 640																														
52	1	1	1	0	1	51 52 107 106	409	5	1	1	0	1 335 336 391 390	690	8	1	1	0	1 622 623 641 640																														
53	1	1	1	0	1	52 53 108 107	410	5	1	1	0	1 336 337 391 391	691	8	1	1	0	1 623 624 642 641																														
54	1	1	1	0	1	53 54 109 108	411	5	1	1	0	1 337 338 392 391	692	8	1	1	0	1 624 625 643 642																														
55	1	1	1	0	1	54 55 110 109	412	5	1	1	0	1 339 340 394 393	693	8	1	1	0	1 626 627 645 644																														
56	2	1	1	0	1	56 57 112 111	413	5	1	1	0	1 340 341 395 394	694	8	1	1	0	1 627 628 646 645																														
57	2	1	1	0	1	57 58 113 112	414	5	1	1	0	1 341 342 396 395	695	8	1	1	0	1 628 629 647 646																														
58	2	1	1	0	1	58 59 114 113	415	5	1	1	0	1 342 343 397 396	696	8	1	1	0	1 629 630 647 647																														
59	2	1	1	0	1	59 60 115 114	416	5	1	1	0	1 343 344 398 397	697	8	1	1	0	1 630 631 648 647																														
60	2	1	1	0	1	60 61 116 115	417	5	1	1	0	1 344 345 399 398	698	8	1	1	0	1 631 632 649 648																														
61	2	1	1	0	1	61 62 117 116	418	5	1	1	0	1 345 346 399 399	699	8	1	1	0	1 632 633 650 649																														
62	2	1	1	0	1	62 63 118 117	419	5	1	1	0	1 346 347 400 399	700	8	1	1	0	1 633 634 651 650																														
63	2	1	1	0	1	63 64 119 118	420	5	1	1	0	1 347 348 401 400	701	8	1	1	0	1 634 635 652 651																														
64	2	1	1	0	1	64 65 120 119	421	5	1	1	0	1 348 349 402 401	702	8	1	1	0	1 635 636 653 652																														
65	2	1	1	0	1	65 66 121 120	422	5	1	1	0	1 349 350 403 402	703	8	1	1	0	1 636 637 654 653																														
66	2	1	1	0	1	66 67 122 121	423	5	1	1	0	1 350 351 404 403	704	8	1	1	0	1 637 638 655 654																														
67	2	1	1	0	1	67 68 123 122	424	5	1	1	0	1 351 352 405 404	705	8	1	1	0	1 638 639 656 655																														
68	2	1	1	0	1	68 69 124 123	425	5	1	1	0	1 352 353 406 405	706	8	1	1	0	1 639 640 657 656																														
69	2	1	1	0	1	69 70 125 124	426	5	1	1	0	1 353 354 406 406	707	8	1	1	0	1 640 641 657 657																														
70	2	1	1	0	1	70 71 126 125	427	5	1	1	0	1 354 355 407 406	708	8	1	1	0	1 641 642 658 657																														
71	2	1	1	0	1	71 72 127 126	428	5	1	1	0	1 355 356 408 407	709	8	1	1	0	1 642 643 659 658																														
72	2	1	1	0	1	72 73 128 127	429	5	1	1	0	1 356 357 409 408	710	9	1	1	0	1 644 645																														

76	2	1	1	0	1	76	77	132	131	433	5	1	1	0	1	360	361	413	412	714	9	1	1	0	1	648	649	664	663
77	2	1	1	0	1	77	78	133	132	434	5	1	1	0	1	361	362	414	413	715	9	1	1	0	1	649	650	665	664
78	2	1	1	0	1	78	79	134	133	435	5	1	1	0	1	362	363	415	414	716	9	1	1	0	1	650	651	666	665
79	2	1	1	0	1	79	80	135	134	436	5	1	1	0	1	363	364	415	415	717	9	1	1	0	1	651	652	666	666
80	2	1	1	0	1	80	81	136	135	437	5	1	1	0	1	364	365	416	415	718	9	1	1	0	1	652	653	667	666
81	2	1	1	0	1	81	82	137	136	438	5	1	1	0	1	365	366	417	416	719	9	1	1	0	1	653	654	668	667
82	2	1	1	0	1	82	83	138	137	439	5	1	1	0	1	366	367	418	417	720	9	1	1	0	1	654	655	669	668
83	2	1	1	0	1	83	84	139	138	440	5	1	1	0	1	367	368	419	418	721	9	1	1	0	1	655	656	670	669
84	2	1	1	0	1	84	85	140	139	441	5	1	1	0	1	368	369	420	419	722	9	1	1	0	1	656	657	670	670
85	2	1	1	0	1	85	86	141	140	442	5	1	1	0	1	369	370	421	420	723	9	1	1	0	1	657	658	671	670
86	2	1	1	0	1	86	87	142	141	443	5	1	1	0	1	370	371	422	421	724	9	1	1	0	1	658	659	672	671
87	2	1	1	0	1	87	88	143	142	444	5	1	1	0	1	371	372	423	422	725	1	1	1	0	1	659	660	673	672
88	2	1	1	0	1	88	89	144	143	445	5	1	1	0	1	372	373	424	423	726	1	1	1	0	1	673	674	690	689
89	2	1	1	0	1	89	90	145	144	446	5	1	1	0	1	373	374	425	424	727	1	1	1	0	1	674	675	691	690
90	2	1	1	0	1	90	91	146	145	447	5	1	1	0	1	374	375	426	425	728	1	1	1	0	1	675	676	692	691
91	2	1	1	0	1	91	92	147	146	448	5	1	1	0	1	375	376	426	426	729	1	1	1	0	1	676	677	693	692
92	2	1	1	0	1	92	93	148	147	449	5	1	1	0	1	376	377	427	426	730	1	1	1	0	1	677	678	694	693
93	2	1	1	0	1	93	94	149	148	450	5	1	1	0	1	377	378	428	427	731	1	1	1	0	1	678	679	695	694
94	2	1	1	0	1	94	95	150	149	451	5	1	1	0	1	378	379	429	428	732	1	1	1	0	1	679	680	696	695
95	2	1	1	0	1	95	96	151	150	452	5	1	1	0	1	379	380	430	429	733	1	1	1	0	1	680	681	697	696
96	2	1	1	0	1	96	97	152	151	453	5	1	1	0	1	380	381	431	430	734	1	1	1	0	1	681	682	698	697
97	2	1	1	0	1	97	98	153	152	454	5	1	1	0	1	381	382	432	431	735	1	1	1	0	1	682	683	699	698
98	2	1	1	0	1	98	99	154	153	455	5	1	1	0	1	382	383	433	432	736	1	1	1	0	1	683	684	700	699
99	2	1	1	0	1	99	100	155	154	456	5	1	1	0	1	383	384	434	433	737	1	1	1	0	1	684	685	701	700
100	2	1	1	0	1	100	101	156	155	457	5	1	1	0	1	384	385	435	434	738	1	1	1	0	1	685	686	702	701
101	2	1	1	0	1	101	102	157	156	458	5	1	1	0	1	386	387	437	436	739	1	1	1	0	1	686	687	703	702
102	2	1	1	0	1	102	103	158	157	459	5	1	1	0	1	387	388	438	437	740	1	1	1	0	1	687	688	704	703
103	2	1	1	0	1	103	104	159	158	460	5	1	1	0	1	388	389	439	438	741	2	1	1	0	1	689	690	705	165
104	2	1	1	0	1	104	105	160	159	461	5	1	1	0	1	389	390	440	439	742	2	1	1	0	1	689	690	706	705
105	2	1	1	0	1	105	106	161	160	462	5	1	1	0	1	390	391	440	440	743	2	1	1	0	1	690	691	707	706
106	2	1	1	0	1	106	107	162	161	463	5	1	1	0	1	391	392	441	440	744	2	1	1	0	1	691	692	708	707
107	2	1	1	0	1	107	108	163	162	464	5	1	1	0	1	392	393	442	441	745	2	1	1	0	1	692	693	709	708
108	2	1	1	0	1	108	109	164	163	465	5	1	1	0	1	393	394	443	442	746	2	1	1	0	1	693	694	710	709
109	2	1	1	0	1	109	110	165	164	466	5	1	1	0	1	394	395	444	443	747	2	1	1	0	1	694	695	711	710
110	3	1	1	0	1	111	112	167	166	467	5	1	1	0	1	395	396	445	444	748	2	1	1	0	1	695	696	712	711
111	3	1	1	0	1	112	113	168	167	468	5	1	1	0	1	396	397	446	445	749	2	1	1	0	1	696	697	713	712
112	3	1	1	0	1	113	114	169	168	469	5	1	1	0	1	397	398	447	446	750	2	1	1	0	1	697	698	714	713
113	3	1	1	0	1	114	115	170	169	470	5	1	1	0	1	398	399	448	447	751	2	1	1	0	1	698	699	715	714
114	3	1	1	0	1	115	116	171	170	471	5	1	1	0	1	399	400	448	448	752	2	1	1	0	1	699	700	716	715
115	3	1	1	0	1	116	117	172	171	472	5	1	1	0	1	400	401	449	448	753	2	1	1	0	1	700	701	717	716
116	3	1	1	0	1	117	118	173	172	473	5	1	1	0	1	401	402	450	449	754	2	1	1	0	1	701	702	718	717
117	3	1	1	0	1	118	119	174	173	474	5	1	1	0	1	402	403	451	450	755	2	1	1	0	1	702	703	719	718
118	3	1	1	0	1	119	120	175	174	475	5	1	1	0	1	403	404	452	451	756	2	1	1	0	1	703	704	720	719
119	3	1	1	0	1	120	121	176	175	476	5	1	1	0	1	404	405	453	452	817	3	1	1	0	1	165	705	721	220
120	3	1	1	0	1	121	122	177	176	477	5	1	1	0	1	405	406	454	453	818	3	1	1	0	1	705	706	722	721
121	3	1	1	0	1	122	123	178	177	478	5	1	1	0	1	406	407	454	454	819	3	1	1	0	1	706	707	723	722
122	3	1	1	0	1	123	124	179	178	479	5	1	1	0	1	407	408	455	454	820	3	1	1	0	1	707	708	724	723
123	3	1	1	0	1	124	125	180	179	480	5	1	1	0	1	408	409	456	455	821	3	1	1	0	1	708	709	725	724
124	3	1	1	0	1	125	126	181	180	481	5	1	1	0	1	409	410	457	456	822	3	1	1	0	1	709	710	726	725
125	3	1	1	0	1	126	127	182	181	482	5	1	1	0	1	410	411	458	457	823	3	1	1	0	1	710	711	727	726
126	3	1	1	0	1	127	128	183	182	483	5	1	1	0	1	411	412	459	458	824	3	1	1	0	1	711	712	728	727
127	3	1	1	0	1	128	129	184	183	484	5	1	1	0	1	412	413	460	459	825	3	1	1	0	1	712	713	729	728
128	3	1	1	0	1	129	130	185	184	485	5	1	1	0	1	413	414	461	460	826	3	1	1	0	1	713	714	730	729
129	3	1	1	0	1	130	131	186	185	486	5	1	1	0	1	414	415	461	461	827	3	1	1	0	1	714	715	731	730
130	3	1	1	0	1	131	132	187	186	487	5	1	1	0	1	415	416	462	461	828	3	1	1	0	1	715	716	732	731
131	3	1	1	0	1	132	133	188	187	488	5	1	1	0	1	416	417	463	462	829	3	1	1	0	1	716	717	733	732
132	3	1	1	0	1	133	134	189	188	489	5	1	1	0	1	417	418	464	463	830	3	1	1	0	1	717	718	734	733
133	3	1	1	0	1	134	135	190	189	490</																			

157	3	1	1	0	1	158	159	214	213	514	5	1	1	0	1	443	444	488	487	855	4	1	1	0	1	742	743	759	758
158	3	1	1	0	1	159	160	215	214	515	5	1	1	0	1	444	445	489	488	856	4	1	1	0	1	743	744	760	759
159	3	1	1	0	1	160	161	216	215	516	5	1	1	0	1	445	446	490	489	857	4	1	1	0	1	744	745	761	760
160	3	1	1	0	1	161	162	217	216	517	5	1	1	0	1	446	447	491	490	858	4	1	1	0	1	745	746	762	761
161	3	1	1	0	1	162	163	218	217	518	5	1	1	0	1	447	448	491	491	859	4	1	1	0	1	746	747	763	762
162	3	1	1	0	1	163	164	219	218	519	5	1	1	0	1	448	449	492	491	860	4	1	1	0	1	747	748	764	763
163	3	1	1	0	1	164	165	220	219	520	5	1	1	0	1	449	450	493	492	861	4	1	1	0	1	748	749	765	764
164	3	1	1	0	1	166	167	222	221	521	5	1	1	0	1	450	451	494	493	862	4	1	1	0	1	749	750	766	765
165	3	1	1	0	1	167	168	223	222	522	5	1	1	0	1	451	452	495	494	863	4	1	1	0	1	750	751	767	766
166	3	1	1	0	1	168	169	224	223	523	5	1	1	0	1	452	453	496	495	864	4	1	1	0	1	751	752	768	767
167	3	1	1	0	1	169	170	225	224	524	5	1	1	0	1	453	454	497	496	865	4	1	1	0	1	752	753	769	768
168	3	1	1	0	1	170	171	226	225	525	5	1	1	0	1	454	455	497	497	866	4	1	1	0	1	753	754	770	769
169	3	1	1	0	1	171	172	227	226	526	5	1	1	0	1	455	456	498	497	867	4	1	1	0	1	754	755	771	770
170	3	1	1	0	1	172	173	228	227	527	5	1	1	0	1	456	457	499	498	868	4	1	1	0	1	755	756	772	771
171	3	1	1	0	1	173	174	229	228	528	5	1	1	0	1	457	458	500	499	869	4	1	1	0	1	756	757	773	772
172	3	1	1	0	1	174	175	230	229	529	5	1	1	0	1	458	459	501	500	870	4	1	1	0	1	757	758	774	773
173	3	1	1	0	1	175	176	231	230	530	5	1	1	0	1	459	460	502	501	871	4	1	1	0	1	758	759	775	774
174	3	1	1	0	1	176	177	232	231	531	5	1	1	0	1	460	461	503	502	872	4	1	1	0	1	759	760	776	775
175	3	1	1	0	1	177	178	233	232	532	5	1	1	0	1	461	462	503	503	873	4	1	1	0	1	760	761	777	776
176	3	1	1	0	1	178	179	234	233	533	5	1	1	0	1	462	463	504	503	874	4	1	1	0	1	761	762	778	777
177	3	1	1	0	1	179	180	235	234	534	5	1	1	0	1	463	464	505	504	875	4	1	1	0	1	762	763	779	778
178	3	1	1	0	1	180	181	236	235	535	5	1	1	0	1	464	465	506	505	876	4	1	1	0	1	763	764	780	779
179	3	1	1	0	1	181	182	237	236	536	5	1	1	0	1	465	466	507	506	877	4	1	1	0	1	764	765	781	780
180	3	1	1	0	1	182	183	238	237	537	5	1	1	0	1	466	467	508	507	878	4	1	1	0	1	765	766	782	781
181	3	1	1	0	1	183	184	239	238	538	5	1	1	0	1	467	468	509	508	879	4	1	1	0	1	766	767	783	782
182	3	1	1	0	1	184	185	240	239	539	5	1	1	0	1	468	469	509	509	880	4	1	1	0	1	767	768	784	783
183	3	1	1	0	1	185	186	241	240	540	5	1	1	0	1	469	470	510	509	881	5	1	1	0	1	768	769	785	784
184	3	1	1	0	1	186	187	242	241	541	5	1	1	0	1	470	471	511	510	882	5	1	1	0	1	769	770	786	785
185	3	1	1	0	1	187	188	243	242	542	5	1	1	0	1	471	472	512	511	883	5	1	1	0	1	770	771	787	786
186	3	1	1	0	1	188	189	244	243	543	5	1	1	0	1	472	473	513	512	884	5	1	1	0	1	771	772	788	787
187	3	1	1	0	1	189	190	245	244	544	5	1	1	0	1	473	474	514	513	885	5	1	1	0	1	772	773	789	788
188	3	1	1	0	1	190	191	246	245	545	5	1	1	0	1	474	475	515	514	886	5	1	1	0	1	773	774	790	789
189	3	1	1	0	1	191	192	247	246	546	5	1	1	0	1	475	476	516	515	887	5	1	1	0	1	774	775	791	790
190	3	1	1	0	1	192	193	248	247	547	5	1	1	0	1	476	477	516	516	888	5	1	1	0	1	775	776	792	791
191	3	1	1	0	1	193	194	249	248	548	5	1	1	0	1	477	478	517	516	889	5	1	1	0	1	776	777	793	792
192	3	1	1	0	1	194	195	250	249	549	5	1	1	0	1	478	479	518	517	890	5	1	1	0	1	777	778	794	793
193	3	1	1	0	1	195	196	251	250	550	5	1	1	0	1	479	480	519	518	891	5	1	1	0	1	778	779	795	794
194	3	1	1	0	1	196	197	252	251	551	6	1	1	0	1	481	482	521	520	892	5	1	1	0	1	779	780	796	795
195	3	1	1	0	1	197	198	253	252	552	6	1	1	0	1	482	483	522	521	893	5	1	1	0	1	780	781	797	796
196	3	1	1	0	1	198	199	254	253	553	6	1	1	0	1	483	484	523	522	894	5	1	1	0	1	781	782	798	797
197	3	1	1	0	1	199	200	255	254	554	6	1	1	0	1	484	485	523	523	895	5	1	1	0	1	782	783	799	798
198	3	1	1	0	1	200	201	256	255	555	6	1	1	0	1	485	486	524	523	896	5	1	1	0	1	783	784	800	799
199	3	1	1	0	1	201	202	257	256	556	6	1	1	0	1	486	487	525	524	897	5	1	1	0	1	784	785	801	800
200	3	1	1	0	1	202	203	258	257	557	6	1	1	0	1	487	488	526	525	898	5	1	1	0	1	785	786	802	801
201	3	1	1	0	1	203	204	259	258	558	6	1	1	0	1	488	489	527	526	899	5	1	1	0	1	786	787	803	802
202	3	1	1	0	1	204	205	260	259	559	6	1	1	0	1	489	490	528	527	900	5	1	1	0	1	787	788	804	803
203	3	1	1	0	1	205	206	261	260	560	6	1	1	0	1	490	491	529	528	901	5	1	1	0	1	788	789	805	804
204	3	1	1	0	1	206	207	262	261	561	6	1	1	0	1	491	492	529	529	902	5	1	1	0	1	789	790	806	805
205	3	1	1	0	1	207	208	263	262	562	6	1	1	0	1	492	493	530	529	903	5	1	1	0	1	790	791	807	806
206	3	1	1	0	1	208	209	264	263	563	6	1	1	0	1	493	494	531	530	904	5	1	1	0	1	791	792	808	807
207	3	1	1	0	1	209	210	265	264	564	6	1	1	0	1	494	495	532	531	905	5	1	1	0	1	792	793	809	808
208	3	1	1	0	1	210	211	266	265	565	6	1	1	0	1	495	496	533	532	906	5	1	1	0	1	793	794	810	809
209	3	1	1	0	1	211	212	267	266	566	6	1	1	0	1	496	497	533	533	907	5	1	1	0	1	794	795	811	810
210	3	1	1	0	1	212	213	268	267	567	6	1	1	0	1	497	498	534	533	908	5	1	1	0	1	795	796	812	811
211	3	1	1	0	1	213	214	269	268	568	6	1	1	0	1	498	499	535	534	909	5	1	1	0	1	796	797	813	812
212	3	1	1	0	1	214	215	270	269	569	6	1	1	0	1	499	500	536	535	910	5	1	1	0	1	797	798	814	813
213	3	1	1	0	1	215	216	271	270	570	6	1	1	0	1	500	501	537	536	911	5	1	1	0	1	798	799	815	814
214																													

238	4	1	1	0	1	241	242	297	296	595	6	1	1	0	1	526	527	559	558	943	6	1	1	0	1	823	824	834	833
239	4	1	1	0	1	242	243	298	297	596	6	1	1	0	1	527	528	560	559	944	6	1	1	0	1	824	825	835	834
240	4	1	1	0	1	243	244	299	298	597	6	1	1	0	1	528	529	561	560	945	6	1	1	0	1	825	826	835	835
241	4	1	1	0	1	244	245	300	299	598	6	1	1	0	1	529	530	562	561	946	6	1	1	0	1	826	827	836	835
242	4	1	1	0	1	245	246	301	300	599	6	1	1	0	1	530	531	563	562	947	6	1	1	0	1	827	828	837	836
243	4	1	1	0	1	246	247	302	301	600	6	1	1	0	1	531	532	564	563	948	6	1	1	0	1	828	829	838	837
244	4	1	1	0	1	247	248	303	302	601	6	1	1	0	1	532	533	564	564	949	6	1	1	0	1	829	830	839	838
245	4	1	1	0	1	248	249	304	303	602	6	1	1	0	1	533	534	565	564	950	6	1	1	0	1	830	831	840	839
246	4	1	1	0	1	249	250	305	304	603	6	1	1	0	1	534	535	566	565	951	7	1	1	0	1	580	832	841	804
247	4	1	1	0	1	250	251	306	305	604	6	1	1	0	1	535	536	567	566	952	7	1	1	0	1	832	833	842	841
248	4	1	1	0	1	251	252	307	306	605	6	1	1	0	1	536	537	568	567	953	7	1	1	0	1	833	834	843	842
249	4	1	1	0	1	252	253	308	307	606	6	1	1	0	1	537	538	569	568	954	7	1	1	0	1	834	835	844	843
250	4	1	1	0	1	253	254	309	308	607	6	1	1	0	1	538	539	569	569	955	7	1	1	0	1	835	836	844	844
251	4	1	1	0	1	254	255	310	309	608	6	1	1	0	1	539	540	570	569	956	7	1	1	0	1	836	837	845	844
252	4	1	1	0	1	255	256	311	310	609	6	1	1	0	1	540	541	571	570	957	7	1	1	0	1	837	838	846	845
253	4	1	1	0	1	256	257	312	311	610	6	1	1	0	1	541	542	572	571	958	7	1	1	0	1	838	839	847	846
254	4	1	1	0	1	257	258	313	312	611	6	1	1	0	1	542	543	572	572	959	7	1	1	0	1	839	840	848	847
255	4	1	1	0	1	258	259	314	313	612	6	1	1	0	1	543	544	573	572	960	7	1	1	0	1	604	841	849	625
256	4	1	1	0	1	259	260	315	314	613	6	1	1	0	1	544	545	574	573	961	7	1	1	0	1	841	842	850	849
257	4	1	1	0	1	260	261	316	315	614	6	1	1	0	1	545	546	575	574	962	7	1	1	0	1	842	843	851	850
258	4	1	1	0	1	261	262	317	316	615	6	1	1	0	1	546	547	576	575	963	7	1	1	0	1	843	844	851	851
259	4	1	1	0	1	262	263	318	317	616	6	1	1	0	1	547	548	577	576	964	7	1	1	0	1	844	845	852	851
260	4	1	1	0	1	263	264	319	318	617	6	1	1	0	1	548	549	578	577	966	7	1	1	0	1	845	846	853	852
261	4	1	1	0	1	264	265	320	319	618	6	1	1	0	1	549	550	578	578	967	7	1	1	0	1	846	847	854	853
262	4	1	1	0	1	265	266	321	320	619	6	1	1	0	1	550	551	579	578	968	7	1	1	0	1	847	848	855	854
263	4	1	1	0	1	266	267	322	321	620	6	1	1	0	1	551	552	580	579	969	8	1	1	0	1	625	849	856	643
264	4	1	1	0	1	267	268	323	322	621	7	1	1	0	1	553	554	582	581	970	8	1	1	0	1	849	850	857	856
265	4	1	1	0	1	268	269	324	323	622	7	1	1	0	1	554	555	583	582	971	8	1	1	0	1	850	851	858	857
266	4	1	1	0	1	269	270	325	324	623	7	1	1	0	1	555	556	584	583	972	8	1	1	0	1	851	852	858	858
267	4	1	1	0	1	270	271	326	325	624	7	1	1	0	1	556	557	584	584	973	8	1	1	0	1	852	853	859	858
268	4	1	1	0	1	271	272	327	326	625	7	1	1	0	1	557	558	585	584	974	8	1	1	0	1	853	854	860	859
269	4	1	1	0	1	272	273	328	327	626	7	1	1	0	1	558	559	586	585	975	8	1	1	0	1	854	855	861	860
270	4	1	1	0	1	273	274	329	328	627	7	1	1	0	1	559	560	587	586	976	8	1	1	0	1	643	856	862	659
271	4	1	1	0	1	274	275	330	329	628	7	1	1	0	1	560	561	588	587	977	8	1	1	0	1	856	857	863	862
326	4	1	1	0	1	276	277	332	331	629	7	1	1	0	1	561	562	589	588	978	8	1	1	0	1	857	858	863	863
327	4	1	1	0	1	277	278	333	332	630	7	1	1	0	1	562	563	590	589	979	8	1	1	0	1	858	859	864	863
328	4	1	1	0	1	278	279	334	333	631	7	1	1	0	1	563	564	591	590	980	8	1	1	0	1	859	860	865	864
333	4	1	1	0	1	283	284	339	338	632	7	1	1	0	1	564	565	592	591	981	8	1	1	0	1	860	861	866	865
337	4	1	1	0	1	287	288	343	342	633	7	1	1	0	1	565	566	592	592	982	9	1	1	0	1	659	862	867	672
338	4	1	1	0	1	288	289	344	343	634	7	1	1	0	1	566	567	593	592	983	9	1	1	0	1	862	863	868	867
339	4	1	1	0	1	289	290	345	344	635	7	1	1	0	1	567	568	594	593	984	9	1	1	0	1	863	864	868	868
340	4	1	1	0	1	290	291	346	345	636	7	1	1	0	1	568	569	595	594	985	9	1	1	0	1	864	865	869	868
341	4	1	1	0	1	291	292	347	346	637	7	1	1	0	1	569	570	596	595	986	9	1	1	0	1	865	866	870	869

LIST CONSTRAINTS FOR SELECTED NODES
CURRENTLY SELECTED DOF SET= UX UY

1 TO 870 BY

1

503

T-CLC-2-00006, Rev. 0

NODE	LABEL	REAL	IMAG
660	UX	0.00000000	0.00000000
660	UY	0.00000000	0.00000000
661	UX	0.00000000	0.00000000
661	UY	0.00000000	0.00000000
662	UX	0.00000000	0.00000000
662	UY	0.00000000	0.00000000
663	UX	0.00000000	0.00000000
663	UY	0.00000000	0.00000000
664	UX	0.00000000	0.00000000
664	UY	0.00000000	0.00000000
665	UX	0.00000000	0.00000000
665	UY	0.00000000	0.00000000
666	UX	0.00000000	0.00000000
666	UY	0.00000000	0.00000000
667	UX	0.00000000	0.00000000
667	UY	0.00000000	0.00000000
668	UX	0.00000000	0.00000000
668	UY	0.00000000	0.00000000
669	UX	0.00000000	0.00000000
669	UY	0.00000000	0.00000000

NODE	LABEL	REAL	IMAG
570	UX	0.00000000	0.00000000
570	UY	0.00000000	0.00000000
571	UX	0.00000000	0.00000000
571	UY	0.00000000	0.00000000
572	UX	0.00000000	0.00000000
572	UY	0.00000000	0.00000000
588	UX	0.00000000	0.00000000
704	UX	0.00000000	0.00000000
720	UX	0.00000000	0.00000000
736	UX	0.00000000	0.00000000
752	UX	0.00000000	0.00000000
768	UX	0.00000000	0.00000000
784	UX	0.00000000	0.00000000
798	UX	0.00000000	0.00000000
810	UX	0.00000000	0.00000000
821	UX	0.00000000	0.00000000
831	UX	0.00000000	0.00000000
840	UX	0.00000000	0.00000000
848	UX	0.00000000	0.00000000
855	UX	0.00000000	0.00000000

NODE	LABEL	REAL	IMAG
861	UX	0.00000000	0.00000000
866	UX	0.00000000	0.00000000
867	UX	0.00000000	0.00000000
867	UY	0.00000000	0.00000000
868	UX	0.00000000	0.00000000
868	UY	0.00000000	0.00000000
869	UX	0.00000000	0.00000000
869	UY	0.00000000	0.00000000
870	UX	0.00000000	0.00000000
870	UY	0.00000000	0.00000000

EVALUATE MATERIAL PROPERTIES FOR MATERIALS 1 TO 9 IN INCREMENTS OF 1

504

MATERIAL NUMBER = 1 EVALUATED AT TEMPERATURE OF 0.0000
EX = 3522.5
NUXY = 0.31000
PRXY = 0.31000

T-LLC-2-00006
Paso

MATERIAL NUMBER = 2 EVALUATED AT TEMPERATURE OF 0.0000
EX = 3365.0
NUXY = 0.48600
PRXY = 0.48600

MATERIAL NUMBER = 3 EVALUATED AT TEMPERATURE OF 0.0000
EX = 2253.8
NUXY = 0.48200
PRXY = 0.48200

MATERIAL NUMBER = 4 EVALUATED AT TEMPERATURE OF 0.0000
EX = 5460.0
NUXY = 0.47700
PRXY = 0.47700

MATERIAL NUMBER = 5 EVALUATED AT TEMPERATURE OF 0.0000
EX = 8065.0
NUXY = 0.46600
PRXY = 0.46600

MATERIAL NUMBER = 6 EVALUATED AT TEMPERATURE OF 0.0000
EX = 11188.
NUXY = 0.45100
PRXY = 0.45100

MATERIAL NUMBER = 7 EVALUATED AT TEMPERATURE OF 0.0000
EX = 13265.
NUXY = 0.43000
PRXY = 0.43000

MATERIAL NUMBER = 8 EVALUATED AT TEMPERATURE OF 0.0000
EX = 18062.
NUXY = 0.41600
PRXY = 0.41600

MATERIAL NUMBER = 9 EVALUATED AT TEMPERATURE OF 0.0000
EX = 20965.
NUXY = 0.40800
PRXY = 0.40800

Node	Ux	Uy	Node	Ux	Uy	Node	Ux	Uy	Node	Ux	Uy
1	2.92E-07	-0.18945	219	1.37E-03	5.75E-04	437	3.20E-03	-6.28E-02	655	1.20E-03	-4.75E-05
2	2.10E-03	-0.18942	220	1.29E-03	5.50E-04	438	6.33E-03	-6.17E-02	656	8.75E-04	2.29E-05
3	4.38E-03	-0.18929	221	-3.22E-06	-0.12387	439	9.27E-03	-6.00E-02	657	7.20E-04	1.87E-05
4	7.37E-03	-0.189	222	2.78E-03	-0.12368	440	1.22E-02	-5.76E-02	658	5.30E-04	1.27E-05
5	1.02E-02	-0.18852	223	5.83E-03	-0.1231	441	1.42E-02	-5.50E-02	659	3.96E-04	1.03E-05
6	1.19E-02	-0.18808	224	9.45E-03	-0.12196	442	1.63E-02	-5.14E-02	660	0	0
7	1.51E-02	-0.18652	225	1.24E-02	-0.12054	443	1.80E-02	-4.76E-02	661	0	0
8	1.72E-02	-0.18334	226	1.57E-02	-0.1186	444	1.92E-02	-4.36E-02	662	0	0
9	1.75E-02	-0.1773	227	2.02E-02	-0.11502	445	1.99E-02	-3.94E-02	663	0	0
10	1.55E-02	-0.16507	228	2.49E-02	-0.10995	446	2.02E-02	-3.36E-02	664	0	0
11	1.11E-02	-0.14432	229	3.01E-02	-0.10193	447	1.96E-02	-2.81E-02	665	0	0
12	9.24E-03	-9.51E-02	230	3.46E-02	-9.13E-02	448	1.89E-02	-2.36E-02	666	0	0
13	1.29E-02	-4.91E-02	231	3.75E-02	-7.84E-02	449	1.75E-02	-1.94E-02	667	0	0
14	1.78E-02	-3.12E-02	232	3.82E-02	-6.45E-02	450	1.61E-02	-1.59E-02	668	0	0
15	2.09E-02	-2.13E-02	233	3.67E-02	-5.13E-02	451	1.41E-02	-1.19E-02	669	0	0
16	2.01E-02	-1.64E-02	234	3.36E-02	-3.99E-02	452	1.23E-02	-8.97E-03	670	0	0
17	1.90E-02	-1.36E-02	235	2.97E-02	-3.10E-02	453	1.08E-02	-6.74E-03	671	0	0
18	1.74E-02	-1.18E-02	236	2.59E-02	-2.45E-02	454	9.51E-03	-5.08E-03	672	0	0
19	1.58E-02	-1.03E-02	237	2.25E-02	-1.98E-02	455	8.52E-03	-3.75E-03	673	1.22E-03	5.65E-04
20	1.33E-02	-8.28E-03	238	1.97E-02	-1.63E-02	456	7.61E-03	-2.77E-03	674	1.13E-03	5.38E-04
21	1.14E-02	-6.55E-03	239	1.74E-02	-1.37E-02	457	6.84E-03	-1.98E-03	675	1.05E-03	5.12E-04
22	9.87E-03	-5.14E-03	240	1.46E-02	-1.05E-02	458	6.20E-03	-1.37E-03	676	9.78E-04	4.87E-04
23	8.71E-03	-4.00E-03	241	1.25E-02	-8.12E-03	459	5.64E-03	-8.79E-04	677	9.05E-04	4.64E-04
24	7.80E-03	-3.08E-03	242	1.10E-02	-6.32E-03	460	5.20E-03	-5.22E-04	678	8.36E-04	4.43E-04
25	7.05E-03	-2.34E-03	243	9.73E-03	-4.91E-03	461	4.74E-03	-2.00E-04	679	7.36E-04	4.12E-04
26	6.44E-03	-1.74E-03	244	8.72E-03	-3.80E-03	462	4.35E-03	4.97E-05	680	6.43E-04	3.85E-04
27	5.92E-03	-1.25E-03	245	7.86E-03	-2.91E-03	463	4.00E-03	2.31E-04	681	5.56E-04	3.62E-04
28	5.49E-03	-8.36E-04	246	7.16E-03	-2.19E-03	464	3.69E-03	3.71E-04	682	4.76E-04	3.41E-04
29	5.12E-03	-4.98E-04	247	6.55E-03	-1.61E-03	465	3.41E-03	4.73E-04	683	4.01E-04	3.24E-04
30	4.80E-03	-2.18E-04	248	6.04E-03	-1.13E-03	466	3.16E-03	5.43E-04	684	3.09E-04	3.06E-04
31	4.54E-03	-4.73E-06	249	5.59E-03	-7.37E-04	467	2.93E-03	5.88E-04	685	2.24E-04	2.92E-04
32	4.31E-03	1.74E-04	250	5.21E-03	-4.14E-04	468	2.72E-03	6.12E-04	686	1.45E-04	2.83E-04
33	4.10E-03	3.22E-04	251	4.90E-03	-1.73E-04	469	2.53E-03	6.20E-04	687	7.07E-05	2.77E-04
34	3.92E-03	4.46E-04	252	4.62E-03	2.96E-05	470	2.36E-03	6.19E-04	688	0	2.75E-04
35	3.74E-03	5.47E-04	253	4.37E-03	1.96E-04	471	2.20E-03	6.09E-04	689	1.21E-03	5.55E-04
36	3.58E-03	6.30E-04	254	4.14E-03	3.33E-04	472	2.05E-03	5.93E-04	690	1.12E-03	5.28E-04
37	3.44E-03	6.98E-04	255	3.93E-03	4.45E-04	473	1.91E-03	5.73E-04	691	1.04E-03	5.03E-04
38	3.26E-03	7.66E-04	256	3.74E-03	5.37E-04	474	1.79E-03	5.50E-04	692	9.67E-04	4.78E-04
39	3.09E-03	8.14E-04	257	3.57E-03	6.11E-04	475	1.67E-03	5.25E-04	693	8.96E-04	4.56E-04
40	2.93E-03	8.46E-04	258	3.35E-03	6.85E-04	476	1.56E-03	5.00E-04	694	8.28E-04	4.34E-04
41	2.79E-03	8.64E-04	259	3.16E-03	7.38E-04	477	1.45E-03	4.74E-04	695	7.28E-04	4.04E-04
42	2.65E-03	8.71E-04	260	2.98E-03	7.71E-04	478	1.36E-03	4.49E-04	696	6.36E-04	3.77E-04
43	2.52E-03	8.69E-04	261	2.81E-03	7.90E-04	479	1.27E-03	4.25E-04	697	5.50E-04	3.54E-04
44	2.40E-03	8.60E-04	262	2.66E-03	7.97E-04	480	1.18E-03	4.01E-04	698	4.71E-04	3.34E-04
45	2.28E-03	8.46E-04	263	2.52E-03	7.95E-04	481	-6.57E-07	-5.08E-02	699	3.97E-04	3.17E-04
46	2.17E-03	8.28E-04	264	2.38E-03	7.86E-04	482	2.57E-03	-5.04E-02	700	3.05E-04	2.99E-04
47	2.06E-03	8.06E-04	265	2.25E-03	7.71E-04	483	5.07E-03	-4.94E-02	701	2.21E-04	2.85E-04
48	1.95E-03	7.83E-04	266	2.13E-03	7.53E-04	484	7.45E-03	-4.78E-02	702	1.43E-04	2.76E-04
49	1.85E-03	7.58E-04	267	2.02E-03	7.31E-04	485	9.26E-03	-4.57E-02	703	6.99E-05	2.71E-04
50	1.76E-03	7.32E-04	268	1.91E-03	7.08E-04	486	1.13E-02	-4.32E-02	704	0	2.69E-04
51	1.66E-03	7.05E-04	269	1.80E-03	6.82E-04	487	1.27E-02	-4.02E-02	705	1.19E-03	5.35E-04
52	1.58E-03	6.78E-04	270	1.70E-03	6.57E-04	488	1.39E-02	-3.70E-02	706	1.11E-03	5.08E-04
53	1.49E-03	6.52E-04	271	1.61E-03	6.30E-04	489	1.47E-02	-3.36E-02	707	1.03E-03	4.83E-04
54	1.41E-03	6.26E-04	272	1.52E-03	6.04E-04	490	1.52E-02	-2.83E-02	708	9.57E-04	4.59E-04
55	1.33E-03	6.01E-04	273	1.44E-03	5.79E-04	491	1.51E-02	-2.34E-02	709	8.86E-04	4.37E-04
56	4.73E-07	-0.16338	274	1.35E-03	5.54E-04	492	1.45E-02	-1.91E-02	710	8.18E-04	4.16E-04
57	2.28E-03	-0.16333	275	1.28E-03	5.29E-04	493	1.36E-02	-1.53E-02	711	7.19E-04	3.87E-04
58	4.80E-03	-0.16322	276	-2.48E-06	-0.1101	494	1.22E-02	-1.14E-02	712	6.28E-04	3.61E-04
59	8.09E-03	-0.16293	277	2.88E-03	-0.10985	495	1.09E-02	-8.52E-03	713	5.43E-04	3.38E-04
60	1.14E-02	-0.16249	278	5.95E-03	-0.10923	496	9.61E-03	-6.28E-03	714	4.65E-04	3.19E-04
61	1.35E-02	-0.16212	279	9.56E-03	-0.10789	497	8.66E-03	-4.67E-03	715	3.92E-04	3.02E-04
62	1.82E-02	-0.16068	280	1.25E-02	-0.10639	498	7.70E-03	-3.36E-03	716	3.02E-04	2.85E-04
63	2.29E-02	-0.15797	281	1.56E-02	-0.10429	499	6.92E-03	-2.40E-03	717	2.19E-04	2.72E-04
64	2.78E-02	-0.15225	282	1.99E-02	-0.10057	500	6.22E-03	-1.65E-03	718	1.42E-04	2.63E-04
65	3.29E-02	-0.14145	283	2.39E-02	-9.58E-02	501	5.56E-03	-1.00E-03	719	6.90E-05	2.58E-04
66	4.00E-02	-0.11887	284	2.81E-02	-8.86E-02	502	4.95E-03	-4.87E-04	720	0	2.56E-04
67	4.37E-02	-8.30E-02	285	3.16E-02	-7.96E-02	503	4.48E-03	-1.50E-04	721	1.18E-03	5.15E-04
68	3.89E-02	-4.94E-02	286	3.38E-02	-6.95E-02	504	4.04E-03	1.08E-04	722	1.10E-03	4.89E-04
69	3.22E-02	-3.00E-02	287	3.45E-02	-5.89E-02	505	3.67E-03	2.88E-04	723	1.02E-03	4.64E-04
70	2.80E-02	-2.12E-02	288	3.36E-02	-4.87E-02	506	3.35E-03	4.08E-04	724	9.45E-04	4.41E-04
71	2.45E-02	-1.65E-02	289	3.15E-02	-3.95E-02	507	3.06E-03	4.87E-04	725	8.74E-04	4.19E-04
72	2.16E-02	-1.40E-02	290	2.88E-02	-3.20E-02	508	2.81E-03	5.33E-04	726	8.07E-04	3.99E-04
73	1.92E-02	-1.21E-02	291	2.56E-02	-2.60E-02	509	2.58E-03	5.55E-04	727	7.09E-04	3.70E-04
74	1.71E-02	-1.07E-02	292	2.28E-02	-2.12E-02	510	2.37E-03	5.61E-04	728	6.19E-04	3.45E-04
75	1.43E-02	-8.56E-03	293	2.02E-02	-1.76E-02	511	2.18E-03	5.55E-04	729	5.36E-04	3.23E-04
76	1.22E-02	-6.76E-03	294	1.80E-02	-1.47E-02	512	2.01E-03	5.40E-04	730	4.58E-04	3.04E-04
77	1.06E-02	-5.29E-03	295	1.52E-02	-1.12E-02	513	1.86E-03	5.18E-04	731	3.86E-04	2.88E-04
78	9.28E-03	-4.11E-03	296	1.31E-02	-8.61E-03	514	1.71E-03	4.94E-04	732	2.97E-04	2.71E-04
79	8.26E-03	-3.17E-03	297	1.14E-02	-6.68E-03	515	1.58E-03	4.66E-04	733	2.15E-04	2.59E-04

80	7.43E-03	-2.41E-03	298	1.01E-02	-5.20E-03	516	1.46E-03	4.40E-04	734	1.39E-04	2.50E-04
81	6.75E-03	-1.79E-03	299	9.04E-03	-4.04E-03	517	1.34E-03	4.14E-04	735	6.80E-05	2.46E-04
82	6.18E-03	-1.29E-03	300	8.16E-03	-3.10E-03	518	1.24E-03	3.88E-04	736	0	2.44E-04
83	5.70E-03	-8.70E-04	301	7.40E-03	-2.35E-03	519	1.14E-03	3.62E-04	737	1.17E-03	4.95E-04
84	5.30E-03	-5.24E-04	302	6.77E-03	-1.74E-03	520	1.47E-06	-3.75E-02	738	1.08E-03	4.70E-04
85	4.95E-03	-2.39E-04	303	6.22E-03	-1.24E-03	521	2.18E-03	-3.71E-02	739	1.01E-03	4.45E-04
86	4.66E-03	-2.22E-05	304	5.75E-03	-8.30E-04	522	4.28E-03	-3.64E-02	740	9.32E-04	4.23E-04
87	4.41E-03	1.59E-04	305	5.35E-03	-4.96E-04	523	6.21E-03	-3.50E-02	741	8.62E-04	4.01E-04
88	4.19E-03	3.09E-04	306	5.01E-03	-2.42E-04	524	7.66E-03	-3.35E-02	742	7.95E-04	3.82E-04
89	3.99E-03	4.34E-04	307	4.72E-03	-3.35E-05	525	9.30E-03	-3.14E-02	743	6.99E-04	3.54E-04
90	3.80E-03	5.37E-04	308	4.45E-03	1.41E-04	526	1.05E-02	-2.92E-02	744	6.10E-04	3.29E-04
91	3.63E-03	6.21E-04	309	4.21E-03	2.83E-04	527	1.13E-02	-2.66E-02	745	5.27E-04	3.08E-04
92	3.48E-03	6.89E-04	310	3.99E-03	3.99E-04	528	1.22E-02	-2.20E-02	746	4.51E-04	2.89E-04
93	3.29E-03	7.58E-04	311	3.79E-03	4.95E-04	529	1.22E-02	-1.77E-02	747	3.80E-04	2.74E-04
94	3.11E-03	8.06E-04	312	3.61E-03	5.72E-04	530	1.17E-02	-1.38E-02	748	2.92E-04	2.58E-04
95	2.95E-03	8.38E-04	313	3.38E-03	6.49E-04	531	1.07E-02	-1.03E-02	749	2.12E-04	2.46E-04
96	2.80E-03	8.55E-04	314	3.18E-03	7.03E-04	532	9.61E-03	-7.41E-03	750	1.37E-04	2.38E-04
97	2.65E-03	8.62E-04	315	2.99E-03	7.39E-04	533	8.71E-03	-5.39E-03	751	6.69E-05	2.33E-04
98	2.52E-03	8.60E-04	316	2.82E-03	7.59E-04	534	7.76E-03	-3.86E-03	752	0	2.32E-04
99	2.39E-03	8.51E-04	317	2.66E-03	7.66E-04	535	6.85E-03	-2.67E-03	753	1.15E-03	4.71E-04
100	2.27E-03	8.36E-04	318	2.51E-03	7.65E-04	536	6.14E-03	-1.78E-03	754	1.07E-03	4.46E-04
101	2.16E-03	8.18E-04	319	2.37E-03	7.56E-04	537	5.32E-03	-9.90E-04	755	9.91E-04	4.22E-04
102	2.05E-03	7.97E-04	320	2.24E-03	7.42E-04	538	4.66E-03	-4.34E-04	756	9.18E-04	4.00E-04
103	1.94E-03	7.73E-04	321	2.12E-03	7.24E-04	539	4.12E-03	-7.10E-05	757	8.48E-04	3.80E-04
104	1.84E-03	7.48E-04	322	2.00E-03	7.03E-04	540	3.63E-03	1.67E-04	758	7.83E-04	3.61E-04
105	1.74E-03	7.22E-04	323	1.89E-03	6.79E-04	541	3.25E-03	3.15E-04	759	6.88E-04	3.34E-04
106	1.65E-03	6.95E-04	324	1.79E-03	6.55E-04	542	2.92E-03	4.06E-04	760	6.00E-04	3.10E-04
107	1.56E-03	6.68E-04	325	1.69E-03	6.29E-04	543	2.64E-03	4.51E-04	761	5.19E-04	2.89E-04
108	1.48E-03	6.42E-04	326	1.59E-03	6.03E-04	544	2.38E-03	4.72E-04	762	4.43E-04	2.72E-04
109	1.40E-03	6.16E-04	327	1.50E-03	5.77E-04	545	2.16E-03	4.73E-04	763	3.73E-04	2.57E-04
110	1.32E-03	5.91E-04	328	1.42E-03	5.52E-04	546	1.95E-03	4.61E-04	764	2.87E-04	2.42E-04
111	-1.65E-06	-0.15178	329	1.34E-03	5.28E-04	547	1.77E-03	4.41E-04	765	2.08E-04	2.30E-04
112	2.48E-03	-0.15174	330	1.26E-03	5.04E-04	548	1.60E-03	4.15E-04	766	1.35E-04	2.23E-04
113	5.21E-03	-0.15155	331	-4.15E-06	-9.72E-02	549	1.45E-03	3.89E-04	767	6.58E-05	2.18E-04
114	8.95E-03	-0.15116	332	3.42E-03	-9.67E-02	550	1.32E-03	3.61E-04	768	0	2.17E-04
115	1.28E-02	-0.15046	333	6.88E-03	-9.57E-02	551	1.20E-03	3.34E-04	769	1.13E-03	4.46E-04
116	1.54E-02	-0.14992	334	1.02E-02	-9.39E-02	552	1.09E-03	3.08E-04	770	1.05E-03	4.22E-04
117	2.17E-02	-0.14795	335	1.35E-02	-9.13E-02	553	1.17E-06	-2.78E-02	771	9.75E-04	3.99E-04
118	2.91E-02	-0.14433	336	1.70E-02	-8.81E-02	554	1.74E-03	-2.75E-02	772	9.02E-04	3.78E-04
119	3.76E-02	-0.13797	337	1.97E-02	-8.41E-02	555	3.43E-03	-2.68E-02	773	8.34E-04	3.58E-04
120	4.77E-02	-0.12563	338	2.24E-02	-7.89E-02	556	5.00E-03	-2.58E-02	774	7.69E-04	3.40E-04
121	5.59E-02	-0.10441	339	2.47E-02	-7.31E-02	557	6.08E-03	-2.47E-02	775	6.08E-04	3.14E-04
122	5.80E-02	-7.76E-02	340	2.65E-02	-6.89E-02	558	7.24E-03	-2.28E-02	776	5.89E-04	2.91E-04
123	5.34E-02	-5.23E-02	341	2.75E-02	-6.03E-02	559	8.24E-03	-2.09E-02	777	5.09E-04	2.71E-04
124	4.44E-02	-3.40E-02	342	2.80E-02	-5.36E-02	560	9.06E-03	-1.79E-02	778	4.35E-04	2.55E-04
125	3.55E-02	-2.40E-02	343	2.77E-02	-4.56E-02	561	9.42E-03	-1.48E-02	779	3.66E-04	2.41E-04
126	2.90E-02	-1.88E-02	344	2.65E-02	-3.82E-02	562	9.39E-03	-1.20E-02	780	2.82E-04	2.26E-04
127	2.42E-02	-1.56E-02	345	2.49E-02	-3.16E-02	563	8.88E-03	-8.67E-03	781	2.04E-04	2.15E-04
128	2.07E-02	-1.34E-02	346	2.33E-02	-2.65E-02	564	8.11E-03	-6.17E-03	782	1.32E-04	2.08E-04
129	1.81E-02	-1.16E-02	347	2.12E-02	-2.20E-02	565	7.26E-03	-4.20E-03	783	6.45E-05	2.04E-04
130	1.50E-02	-9.21E-03	348	1.93E-02	-1.84E-02	566	6.55E-03	-2.86E-03	784	0	2.02E-04
131	1.28E-02	-7.25E-03	349	1.76E-02	-1.54E-02	567	5.75E-03	-1.83E-03	785	1.11E-03	4.09E-04
132	1.11E-02	-5.66E-03	350	1.52E-02	-1.18E-02	568	4.87E-03	-8.61E-04	786	1.01E-03	3.81E-04
133	9.70E-03	-4.39E-03	351	1.32E-02	-9.07E-03	569	4.13E-03	-2.96E-04	787	9.13E-04	3.54E-04
134	8.61E-03	-3.38E-03	352	1.16E-02	-7.04E-03	570	3.51E-03	6.40E-05	788	8.28E-04	3.30E-04
135	7.72E-03	-2.58E-03	353	1.03E-02	-5.48E-03	571	3.08E-03	2.27E-04	789	7.48E-04	3.08E-04
136	7.00E-03	-1.93E-03	354	9.23E-03	-4.28E-03	572	2.70E-03	3.29E-04	790	6.33E-04	2.78E-04
137	6.39E-03	-1.39E-03	355	8.31E-03	-3.30E-03	573	2.39E-03	3.75E-04	791	5.29E-04	2.52E-04
138	5.88E-03	-9.53E-04	356	7.57E-03	-2.52E-03	574	2.11E-03	3.89E-04	792	4.36E-04	2.31E-04
139	5.45E-03	-5.92E-04	357	6.91E-03	-1.88E-03	575	1.87E-03	3.81E-04	793	3.51E-04	2.15E-04
140	5.07E-03	-2.94E-04	358	6.35E-03	-1.36E-03	576	1.65E-03	3.80E-04	794	2.74E-04	2.02E-04
141	4.77E-03	-6.89E-05	359	5.87E-03	-9.35E-04	577	1.46E-03	3.38E-04	795	1.98E-04	1.92E-04
142	4.51E-03	1.19E-04	360	5.44E-03	-5.84E-04	578	1.30E-03	3.09E-04	796	1.28E-04	1.86E-04
143	4.27E-03	2.75E-04	361	5.10E-03	-3.19E-04	579	1.15E-03	2.81E-04	797	6.26E-05	1.82E-04
144	4.05E-03	4.04E-04	362	4.80E-03	-1.02E-04	580	1.02E-03	2.54E-04	798	0	1.81E-04
145	3.86E-03	5.10E-04	363	4.52E-03	7.68E-05	581	1.85E-05	-1.73E-02	799	1.05E-03	3.65E-04
146	3.68E-03	5.96E-04	364	4.26E-03	2.26E-04	582	1.47E-03	-1.70E-02	800	9.30E-04	3.33E-04
147	3.51E-03	6.65E-04	365	4.04E-03	3.49E-04	583	2.83E-03	-1.84E-02	801	8.22E-04	3.03E-04
148	3.31E-03	7.36E-04	366	3.83E-03	4.47E-04	584	4.06E-03	-1.54E-02	802	7.23E-04	2.78E-04
149	3.13E-03	7.85E-04	367	3.64E-03	5.28E-04	585	5.17E-03	-1.44E-02	803	5.95E-04	2.46E-04
150	2.96E-03	8.17E-04	368	3.41E-03	6.09E-04	586	5.83E-03	-1.31E-02	804	4.82E-04	2.19E-04
151	2.80E-03	8.35E-04	369	3.19E-03	6.66E-04	587	6.42E-03	-1.16E-02	805	3.82E-04	1.99E-04
152	2.66E-03	8.42E-04	370	3.00E-03	7.03E-04	588	6.81E-03	-1.02E-02	806	2.92E-04	1.83E-04
153	2.52E-03	8.40E-04	371	2.82E-03	7.24E-04	589	7.00E-03	-8.76E-03	807	2.11E-04	1.73E-04
154	2.39E-03	8.30E-04	372	2.66E-03	7.33E-04	590	6.85E-03	-6.14E-03	808	1.36E-04	1.65E-04
155	2.26E-03	8.16E-04	373	2.51E-03	7.32E-04	591	6.32E-03	-4.09E-03	809	6.51E-05	1.61E-04
156	2.15E-03	7.97E-04	374	2.36E-03	7.25E-04	592	5.61E-03	-2.54E-03	810	0	1.60E-04
157	2.04E-03	7.75E-04	375	2.23E-03	7.11E-04	593	5.01E-03	-1.55E-03	811	9.74E-04	3.19E-04
158	1.93E-03	7.52E-04	376	2.10E-03	6.93E-04	594	4.32E-03	-8.54E-04	812	8.25E-04	2.79E-04
159	1.83E-03	7.26E-04	377	1.99E-03	6.73E-04	595	3.73E-03	-3.76E-04	813	6.96E-04	2.47E-04

160	1.73E-03	7.00E-04	378	1.88E-03	6.50E-04	596	3.22E-03	-7.83E-05	814	5.71E-04	2.18E-04
161	1.64E-03	6.74E-04	379	1.77E-03	6.26E-04	597	2.72E-03	1.23E-04	815	4.63E-04	1.94E-04
162	1.55E-03	6.47E-04	380	1.67E-03	6.01E-04	598	2.32E-03	2.17E-04	816	3.66E-04	1.75E-04
163	1.46E-03	6.21E-04	381	1.58E-03	5.76E-04	599	1.97E-03	2.59E-04	817	2.80E-04	1.61E-04
164	1.38E-03	5.95E-04	382	1.49E-03	5.50E-04	600	1.67E-03	2.63E-04	818	2.02E-04	1.51E-04
165	1.30E-03	5.71E-04	383	1.40E-03	5.26E-04	601	1.44E-03	2.49E-04	819	1.30E-04	1.45E-04
166	-1.36E-06	-0.13765	384	1.32E-03	5.02E-04	602	1.23E-03	2.25E-04	820	6.34E-05	1.41E-04
167	2.50E-03	-0.13751	385	1.24E-03	4.79E-04	603	1.05E-03	2.01E-04	821	0	1.39E-04
168	5.29E-03	-0.13725	386	-6.80E-07	-7.91E-02	604	8.97E-04	1.76E-04	822	8.96E-04	2.62E-04
169	9.08E-03	-0.13651	387	3.48E-03	-7.86E-02	605	7.14E-08	-1.03E-02	823	7.35E-04	2.24E-04
170	1.31E-02	-0.13543	388	6.90E-03	-7.75E-02	606	9.61E-04	-1.01E-02	824	5.97E-04	1.94E-04
171	1.78E-02	-0.1336	389	1.03E-02	-7.57E-02	607	1.91E-03	-9.76E-03	825	4.79E-04	1.68E-04
172	2.25E-02	-0.13126	390	1.34E-02	-7.32E-02	608	2.68E-03	-9.23E-03	826	3.77E-04	1.48E-04
173	3.01E-02	-0.12642	391	1.61E-02	-6.98E-02	609	3.28E-03	-8.48E-03	827	2.86E-04	1.35E-04
174	3.90E-02	-0.11844	392	1.89E-02	-6.59E-02	610	3.91E-03	-7.67E-03	828	2.06E-04	1.24E-04
175	4.75E-02	-0.10625	393	2.09E-02	-6.15E-02	611	4.29E-03	-6.79E-03	829	1.32E-04	1.18E-04
176	5.36E-02	-8.98E-02	394	2.25E-02	-5.66E-02	612	4.54E-03	-5.88E-03	830	6.40E-05	1.14E-04
177	5.51E-02	-7.07E-02	395	2.37E-02	-5.14E-02	613	4.73E-03	-4.11E-03	831	0	1.13E-04
178	5.13E-02	-5.27E-02	396	2.43E-02	-4.62E-02	614	4.52E-03	-2.66E-03	832	8.19E-04	2.11E-04
179	4.43E-02	-3.83E-02	397	2.43E-02	-3.95E-02	615	4.10E-03	-1.63E-03	833	6.53E-04	1.76E-04
180	3.65E-02	-2.83E-02	398	2.37E-02	-3.33E-02	616	3.64E-03	-9.07E-04	834	5.15E-04	1.49E-04
181	2.96E-02	-2.20E-02	399	2.22E-02	-2.78E-02	617	3.14E-03	-4.45E-04	835	3.98E-04	1.27E-04
182	2.46E-02	-1.79E-02	400	2.09E-02	-2.31E-02	618	2.67E-03	-1.46E-04	836	3.01E-04	1.12E-04
183	2.09E-02	-1.50E-02	401	1.92E-02	-1.92E-02	619	2.24E-03	3.45E-05	837	2.14E-04	1.00E-04
184	1.81E-02	-1.27E-02	402	1.75E-02	-1.59E-02	620	1.86E-03	1.21E-04	838	1.36E-04	9.32E-05
185	1.50E-02	-9.87E-03	403	1.52E-02	-1.20E-02	621	1.54E-03	1.58E-04	839	6.59E-05	8.92E-05
186	1.28E-02	-7.71E-03	404	1.32E-02	-9.16E-03	622	1.29E-03	1.49E-04	840	0	8.79E-05
187	1.11E-02	-6.01E-03	405	1.15E-02	-7.01E-03	623	1.07E-03	1.41E-04	841	6.93E-04	1.41E-04
188	9.80E-03	-4.66E-03	406	1.02E-02	-5.33E-03	624	8.89E-04	1.26E-04	842	5.32E-04	1.13E-04
189	8.72E-03	-3.60E-03	407	9.09E-03	-4.09E-03	625	7.38E-04	1.05E-04	843	4.01E-04	9.41E-05
190	7.84E-03	-2.75E-03	408	8.12E-03	-3.09E-03	626	2.41E-06	-6.11E-03	844	3.00E-04	7.59E-05
191	7.11E-03	-2.06E-03	409	7.34E-03	-2.29E-03	627	7.66E-04	-6.01E-03	845	2.10E-04	6.66E-05
192	6.50E-03	-1.50E-03	410	6.67E-03	-1.66E-03	628	1.44E-03	-5.71E-03	846	1.33E-04	6.00E-05
193	5.98E-03	-1.04E-03	411	6.09E-03	-1.14E-03	629	2.19E-03	-5.28E-03	847	6.36E-05	5.61E-05
194	5.54E-03	-6.63E-04	412	5.60E-03	-7.30E-04	630	2.60E-03	-4.92E-03	848	0	5.50E-05
195	5.15E-03	-3.55E-04	413	5.23E-03	-4.51E-04	631	3.02E-03	-4.34E-03	849	5.41E-04	8.11E-05
196	4.84E-03	-1.19E-04	414	4.89E-03	-2.04E-04	632	3.32E-03	-3.74E-03	850	3.95E-04	6.38E-05
197	4.57E-03	2.20E-05	415	4.54E-03	2.23E-05	633	3.56E-03	-2.50E-03	851	2.82E-04	4.81E-05
198	4.32E-03	2.37E-04	416	4.22E-03	2.02E-04	634	3.45E-03	-1.54E-03	852	1.97E-04	3.95E-05
199	4.10E-03	3.70E-04	417	3.94E-03	3.45E-04	635	3.09E-03	-8.92E-04	853	1.23E-04	3.34E-05
200	3.90E-03	4.79E-04	418	3.68E-03	4.52E-04	636	2.63E-03	-4.27E-04	854	5.85E-05	3.00E-05
201	3.71E-03	5.68E-04	419	3.42E-03	5.44E-04	637	2.20E-03	-1.68E-04	855	0	2.87E-05
202	3.54E-03	6.39E-04	420	3.19E-03	6.07E-04	638	1.77E-03	-1.24E-05	856	4.01E-04	3.58E-05
203	3.33E-03	7.12E-04	421	2.98E-03	6.47E-04	639	1.43E-03	5.56E-05	857	2.70E-04	3.07E-05
204	3.14E-03	7.62E-04	422	2.78E-03	6.70E-04	640	1.13E-03	6.80E-05	858	1.86E-04	1.78E-05
205	2.97E-03	7.95E-04	423	2.60E-03	6.79E-04	641	9.23E-04	7.76E-05	859	1.14E-04	1.55E-05
206	2.81E-03	8.14E-04	424	2.44E-03	6.78E-04	642	7.35E-04	6.27E-05	860	5.36E-05	1.15E-05
207	2.66E-03	8.20E-04	425	2.29E-03	6.68E-04	643	5.84E-04	5.04E-05	861	0	1.02E-05
208	2.52E-03	8.18E-04	426	2.15E-03	6.54E-04	644	-5.80E-07	-3.05E-03	862	2.48E-04	7.41E-05
209	2.38E-03	8.09E-04	427	2.02E-03	6.35E-04	645	6.32E-04	-2.98E-03	863	1.47E-04	7.08E-05
210	2.26E-03	7.94E-04	428	1.89E-03	6.13E-04	646	1.23E-03	-2.89E-03	864	9.96E-05	5.43E-05
211	2.14E-03	7.75E-04	429	1.78E-03	5.89E-04	647	1.45E-03	-2.66E-03	865	4.23E-05	-1.54E-05
212	2.03E-03	7.54E-04	430	1.67E-03	5.64E-04	648	1.89E-03	-2.33E-03	866	0	8.19E-05
213	1.92E-03	7.30E-04	431	1.57E-03	5.38E-04	649	2.19E-03	-1.98E-03	867	0	0
214	1.82E-03	7.05E-04	432	1.47E-03	5.13E-04	650	2.42E-03	-1.40E-03	868	0	0
215	1.72E-03	6.79E-04	433	1.38E-03	4.88E-04	651	2.33E-03	-8.73E-04	869	0	0
216	1.62E-03	6.52E-04	434	1.29E-03	4.63E-04	652	2.15E-03	-5.75E-04	870	0	0
217	1.54E-03	6.26E-04	435	1.21E-03	4.40E-04	653	1.88E-03	-3.08E-04			
218	1.45E-03	6.00E-04	436	-8.30E-07	-6.33E-02	654	1.57E-03	-1.53E-04			

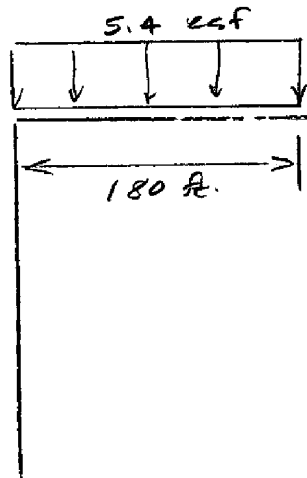
MAXIMUM ABSOLUTE VALUES
 NODE 122 1
 VALUE -5.80E-02 0.18945

Calculation Sheet

SRS	Project <i>See Cover</i>					Calculation No. <i>T-CLL-2-00006</i>			
	Subject <i>" "</i>					Sheet No. <i>508</i>			
Rev	Originator	Date	Checker	Date	Rev	Originator	Date	Checker	Date
<i>0</i>	<i>wrp</i>	<i>2/1/03</i>	<i>[Signature]</i>	<i>7/10/03</i>					

CASE PD 2D Axisymmetric Creep

DWPF Loads file ssv 70



- STEP 1 Ramp to 1.0 ksf over 400 days
- STEP 2 Ramp to 5.4 ksf over 1500 days
- STEP 3 Creep to 6500 days

Model 70

Setting elastic & creep properties

*SET,c1,0.0015 } adjust parameters
*SET,k,3
*SET,e,-1.
!*

```

MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,1
MPDE,PRXY,1
MPDATA,EX,1,,14090/k
MPDATA,PRXY,1,,0.31
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,2
MPDE,PRXY,2
MPDATA,EX,2,,13460/k
MPDATA,PRXY,2,,0.486
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,3
MPDE,PRXY,3
MPDATA,EX,3,,9015/k
MPDATA,PRXY,3,,0.482
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,4
MPDE,PRXY,4
MPDATA,EX,4,,21840/k
MPDATA,PRXY,4,,0.477
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,5
MPDE,PRXY,5
MPDATA,EX,5,,32260/k
MPDATA,PRXY,5,,0.466
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,6
MPDE,PRXY,6
MPDATA,EX,6,,44750/k
MPDATA,PRXY,6,,0.451
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,7
MPDE,PRXY,7
MPDATA,EX,7,,53060/k
MPDATA,PRXY,7,,0.43
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,8
MPDE,PRXY,8
MPDATA,EX,8,,72250/k
MPDATA,PRXY,8,,0.416
MPTEMP,,,,,,,,
MPTEMP,1,0
MPDE,EX,9
MPDE,PRXY,9
MPDATA,EX,9,,83860/k
MPDATA,PRXY,9,,0.408
TBDE,CREE,1,,,
TB,CREE,1,1,4,2
TBTEMP,0
TBDATA,,c1/20,1,e,,,
TBDE,CREE,2,,,
TB,CREE,2,1,4,2
TBTEMP,0
TBDATA,,c1/20,1,e,0,,
TBDE,CREE,3,,,
TB,CREE,3,1,4,2
TBTEMP,0
TBDATA,,c1/20,1,e,0,,
TBDE,CREE,4,,,
TB,CREE,4,1,4,2
TBTEMP,0
TBDATA,,c1/25,1,e,0,,
TBDE,CREE,5,,,

```

TB,CREE,5,1,4,2
TBTEMP,0
TBDATA,,c1/40,1,e,0,,
TBDE,CREE,6,,,
TB,CREE,6,1,4,2
TBTEMP,0
TBDATA,,c1/60,1,e,0,,
TBDE,CREE,7,,,
TB,CREE,7,1,4,2
TBTEMP,0
TBDATA,,c1/100,1,e,0,,
TBDE,CREE,8,,,
TB,CREE,8,1,4,2
TBTEMP,0
TBDATA,,c1/100,1,e,0,,
TBDE,CREE,9,,,
TB,CREE,9,1,4,2
TBTEMP,0
TBDATA,,c1/200,1,e,0,,

T-CLC-2-00006, Rev. 0

511

ssv7p0loads.txt

```
ANTYPE,0
OUTRES,ALL,ALL
RATE,1
SFEDELE,ALL,ALL,ALL
NLGEOM,1
NSUBST,4,10,4
TIME,400
FLST,2,11,2,ORDE,2
FITEM,2,1
FITEM,2,-11
/GO
!*
SFE,P51X,1,PRES, ,1.0, , ,
/STATUS,SOLU
SOLVE
NSUBST,5,10,4
TIME,1500
FLST,2,11,2,ORDE,2
FITEM,2,1
FITEM,2,-11
/GO
!*
SFE,P51X,1,PRES, ,5.4, , ,
/STATUS,SOLU
SOLVE
NSUBST,8,20,8
TIME,6500
/STATUS,SOLU
SOLVE
```

load input file for
creep model ,

Crawl Model Displacement Output

T-44-2-00006
Rev. 0

512

Node	Ux	Uy	Node	Ux	Uy	Node	Ux	Uy	Node	Ux	Uy
1	-6.21E-08	-0.27379	219	2.54E-03	1.21E-03	437	5.71E-03	-8.88E-02	655	1.57E-03	6.47E-05
2	3.33E-03	-0.27365	220	2.39E-03	1.16E-03	438	1.13E-02	-8.72E-02	656	1.15E-03	1.17E-04
3	6.93E-03	-0.27314	221	-4.29E-06	-0.19251	439	1.65E-02	-8.45E-02	657	9.59E-04	8.22E-05
4	1.17E-02	-0.27197	222	5.80E-03	-0.19217	440	2.19E-02	-8.09E-02	658	7.07E-04	5.50E-05
5	1.63E-02	-0.27011	223	1.21E-02	-0.1911	441	2.54E-02	-7.73E-02	659	5.33E-04	4.06E-05
6	1.90E-02	-0.26854	224	1.96E-02	-0.18912	442	2.91E-02	-7.17E-02	660	0	0
7	2.47E-02	-0.2637	225	2.55E-02	-0.18659	443	3.23E-02	-6.60E-02	661	0	0
8	2.96E-02	-0.25592	226	3.22E-02	-0.18323	444	3.44E-02	-6.01E-02	662	0	0
9	3.34E-02	-0.24456	227	4.08E-02	-0.17713	445	3.58E-02	-5.39E-02	663	0	0
10	3.51E-02	-0.22517	228	4.98E-02	-0.1687	446	3.64E-02	-4.53E-02	664	0	0
11	3.62E-02	-0.19802	229	5.95E-02	-0.15556	447	3.56E-02	-3.71E-02	665	0	0
12	3.81E-02	-0.13222	230	6.76E-02	-0.13841	448	3.45E-02	-3.05E-02	666	0	0
13	3.83E-02	-7.07E-02	231	7.30E-02	-0.11782	449	3.22E-02	-2.45E-02	667	0	0
14	3.90E-02	-4.71E-02	232	7.44E-02	-9.58E-02	450	2.96E-02	-1.93E-02	668	0	0
15	3.91E-02	-3.15E-02	233	7.21E-02	-7.47E-02	451	2.62E-02	-1.38E-02	669	0	0
16	3.77E-02	-2.27E-02	234	6.70E-02	-5.67E-02	452	2.29E-02	-9.67E-03	670	0	0
17	3.57E-02	-1.67E-02	235	6.02E-02	-4.25E-02	453	2.02E-02	-6.72E-03	671	0	0
18	3.35E-02	-1.27E-02	236	5.35E-02	-3.20E-02	454	1.77E-02	-4.65E-03	672	0	0
19	3.12E-02	-9.81E-03	237	4.71E-02	-2.45E-02	455	1.59E-02	-2.93E-03	673	2.26E-03	1.21E-03
20	2.77E-02	-6.42E-03	238	4.19E-02	-1.90E-02	456	1.42E-02	-1.84E-03	674	2.10E-03	1.14E-03
21	2.47E-02	-4.07E-03	239	3.74E-02	-1.49E-02	457	1.27E-02	-9.06E-04	675	1.94E-03	1.09E-03
22	2.21E-02	-2.38E-03	240	3.17E-02	-1.01E-02	458	1.15E-02	-2.46E-04	676	1.80E-03	1.04E-03
23	1.95E-02	-1.14E-03	241	2.73E-02	-6.90E-03	459	1.05E-02	2.82E-04	677	1.66E-03	9.87E-04
24	1.80E-02	-2.16E-04	242	2.40E-02	-4.62E-03	460	9.65E-03	6.48E-04	678	1.53E-03	9.42E-04
25	1.64E-02	4.79E-04	243	2.12E-02	-2.97E-03	461	8.77E-03	9.53E-04	679	1.34E-03	8.78E-04
26	1.51E-02	1.01E-03	244	1.90E-02	-1.74E-03	462	8.05E-03	1.20E-03	680	1.17E-03	8.21E-04
27	1.39E-02	1.41E-03	245	1.71E-02	-8.19E-04	463	7.40E-03	1.34E-03	681	1.01E-03	7.72E-04
28	1.28E-02	1.72E-03	246	1.56E-02	-8.85E-05	464	6.81E-03	1.45E-03	682	8.63E-04	7.30E-04
29	1.19E-02	1.95E-03	247	1.42E-02	4.48E-04	465	6.29E-03	1.51E-03	683	7.26E-04	6.95E-04
30	1.11E-02	2.12E-03	248	1.30E-02	8.89E-04	466	5.81E-03	1.53E-03	684	5.58E-04	6.57E-04
31	1.04E-02	2.24E-03	249	1.20E-02	1.21E-03	467	5.38E-03	1.53E-03	685	4.04E-04	6.29E-04
32	9.77E-03	2.32E-03	250	1.11E-02	1.47E-03	468	4.98E-03	1.51E-03	686	2.62E-04	6.10E-04
33	9.21E-03	2.38E-03	251	1.04E-02	1.65E-03	469	4.64E-03	1.47E-03	687	1.28E-04	5.99E-04
34	8.70E-03	2.42E-03	252	9.73E-03	1.79E-03	470	4.31E-03	1.42E-03	688	0	5.95E-04
35	8.23E-03	2.43E-03	253	9.14E-03	1.89E-03	471	4.01E-03	1.36E-03	689	2.24E-03	1.17E-03
36	7.80E-03	2.44E-03	254	8.61E-03	1.97E-03	472	3.73E-03	1.30E-03	690	2.07E-03	1.11E-03
37	7.41E-03	2.43E-03	255	8.12E-03	2.02E-03	473	3.48E-03	1.24E-03	691	1.92E-03	1.05E-03
38	6.93E-03	2.41E-03	256	7.68E-03	2.06E-03	474	3.24E-03	1.18E-03	692	1.78E-03	1.00E-03
39	6.49E-03	2.37E-03	257	7.27E-03	2.08E-03	475	3.02E-03	1.12E-03	693	1.64E-03	9.56E-04
40	6.09E-03	2.32E-03	258	6.77E-03	2.08E-03	476	2.81E-03	1.06E-03	694	1.51E-03	9.11E-04
41	5.72E-03	2.26E-03	259	6.32E-03	2.07E-03	477	2.62E-03	1.00E-03	695	1.39E-03	8.49E-04
42	5.38E-03	2.19E-03	260	5.92E-03	2.03E-03	478	2.44E-03	9.47E-04	696	1.16E-03	7.94E-04
43	5.06E-03	2.12E-03	261	5.55E-03	1.99E-03	479	2.27E-03	8.96E-04	697	9.98E-04	7.48E-04
44	4.77E-03	2.05E-03	262	5.20E-03	1.94E-03	480	2.12E-03	8.46E-04	698	8.52E-04	7.05E-04
45	4.50E-03	1.97E-03	263	4.89E-03	1.88E-03	481	-6.05E-07	-6.98E-02	699	7.17E-04	6.71E-04
46	4.24E-03	1.90E-03	264	4.59E-03	1.81E-03	482	4.47E-03	-6.92E-02	700	5.52E-04	6.34E-04
47	4.00E-03	1.82E-03	265	4.32E-03	1.75E-03	483	8.81E-03	-6.77E-02	701	3.99E-04	6.07E-04
48	3.77E-03	1.75E-03	266	4.07E-03	1.68E-03	484	1.29E-02	-6.55E-02	702	2.58E-04	5.88E-04
49	3.55E-03	1.67E-03	267	3.83E-03	1.61E-03	485	1.59E-02	-6.23E-02	703	1.26E-04	5.78E-04
50	3.35E-03	1.60E-03	268	3.60E-03	1.54E-03	486	1.97E-02	-5.86E-02	704	0	5.74E-04
51	3.16E-03	1.53E-03	269	3.39E-03	1.47E-03	487	2.21E-02	-5.44E-02	705	2.21E-03	1.13E-03
52	2.98E-03	1.47E-03	270	3.19E-03	1.41E-03	488	2.42E-02	-4.96E-02	706	2.05E-03	1.07E-03
53	2.80E-03	1.40E-03	271	3.01E-03	1.35E-03	489	2.56E-02	-4.48E-02	707	1.89E-03	1.02E-03
54	2.64E-03	1.34E-03	272	2.83E-03	1.28E-03	490	2.67E-02	-3.71E-02	708	1.75E-03	9.65E-04
55	2.48E-03	1.29E-03	273	2.66E-03	1.23E-03	491	2.65E-02	-3.00E-02	709	1.52E-03	9.19E-04
56	7.91E-07	-0.2508	274	2.50E-03	1.17E-03	492	2.56E-02	-2.40E-02	710	1.49E-03	8.76E-04
57	3.93E-03	-0.2506	275	2.35E-03	1.12E-03	493	2.40E-02	-1.86E-02	711	1.31E-03	8.15E-04
58	8.31E-03	-0.25017	276	-4.86E-06	-0.168	494	2.17E-02	-1.33E-02	712	1.14E-03	7.82E-04
59	1.40E-02	-0.24903	277	5.68E-03	-0.16758	495	1.94E-02	-9.36E-03	713	9.84E-04	7.15E-04
60	1.98E-02	-0.24728	278	1.18E-02	-0.16653	496	1.71E-02	-6.41E-03	714	8.40E-04	6.76E-04
61	2.33E-02	-0.24586	279	1.89E-02	-0.16426	497	1.55E-02	-4.36E-03	715	7.07E-04	6.43E-04
62	3.15E-02	-0.24117	280	2.47E-02	-0.16177	498	1.37E-02	-2.73E-03	716	5.44E-04	6.07E-04
63	3.98E-02	-0.23412	281	3.06E-02	-0.15832	499	1.23E-02	-1.51E-03	717	3.94E-04	5.81E-04
64	4.86E-02	-0.22257	282	3.87E-02	-0.15216	500	1.11E-02	-7.41E-04	718	2.55E-04	5.64E-04
65	5.82E-02	-0.20517	283	4.61E-02	-0.1446	501	9.91E-03	-9.07E-06	719	1.24E-04	5.53E-04
66	7.14E-02	-0.17293	284	5.39E-02	-0.13294	502	8.81E-03	5.53E-04	720	0	5.50E-04
67	7.84E-02	-0.12161	285	6.03E-02	-0.11874	503	8.00E-03	8.76E-04	721	2.18E-03	1.09E-03
68	7.02E-02	-7.34E-02	286	6.43E-02	-0.10275	504	7.21E-03	1.12E-03	722	2.02E-03	1.03E-03
69	5.83E-02	-4.58E-02	287	6.58E-02	-8.61E-02	505	6.58E-03	1.27E-03	723	1.87E-03	9.77E-04
70	5.11E-02	-3.17E-02	288	6.44E-02	-7.01E-02	506	5.99E-03	1.35E-03	724	1.73E-03	9.28E-04
71	4.55E-02	-2.27E-02	289	6.10E-02	-5.57E-02	507	5.49E-03	1.38E-03	725	1.59E-03	8.83E-04
72	4.09E-02	-1.72E-02	290	5.65E-02	-4.40E-02	508	5.02E-03	1.38E-03	726	1.47E-03	8.41E-04
73	3.71E-02	-1.32E-02	291	5.09E-02	-3.44E-02	509	4.62E-03	1.35E-03	727	1.29E-03	7.82E-04
74	3.38E-02	-1.04E-02	292	4.60E-02	-2.70E-02	510	4.25E-03	1.31E-03	728	1.12E-03	7.31E-04
75	2.94E-02	-6.93E-03	293	4.12E-02	-2.13E-02	511	3.91E-03	1.25E-03	729	9.99E-04	6.86E-04
76	2.58E-02	-4.52E-03	294	3.72E-02	-1.68E-02	512	3.60E-03	1.19E-03	730	8.27E-04	6.48E-04
77	2.29E-02	-2.77E-03	295	3.17E-02	-1.16E-02	513	3.32E-03	1.13E-03	731	6.96E-04	6.16E-04
78	2.05E-02	-1.47E-03	296	2.74E-02	-8.01E-03	514	3.06E-03	1.06E-03	732	5.35E-04	5.81E-04
79	1.85E-02	-5.00E-04	297	2.40E-02	-5.45E-03	515	2.81E-03	9.98E-04	733	3.98E-04	5.57E-04

80	1.68E-02	2.38E-04	298	2.13E-02	-3.64E-03	516	2.60E-03	9.34E-04	734	2.51E-04	5.39E-04
81	1.53E-02	7.94E-04	299	1.90E-02	-2.32E-03	517	2.39E-03	8.76E-04	735	1.22E-04	5.29E-04
82	1.41E-02	1.23E-03	300	1.72E-02	-1.27E-03	518	2.20E-03	8.20E-04	736	0	5.26E-04
83	1.29E-02	1.55E-03	301	1.56E-02	-5.12E-04	519	2.03E-03	7.66E-04	737	2.14E-03	1.04E-03
84	1.20E-02	1.80E-03	302	1.42E-02	1.17E-04	520	1.27E-06	-4.90E-02	738	1.99E-03	9.90E-04
85	1.11E-02	1.99E-03	303	1.30E-02	5.75E-04	521	3.66E-03	-4.85E-02	739	1.84E-03	9.39E-04
86	1.04E-02	2.12E-03	304	1.20E-02	9.57E-04	522	7.16E-03	-4.75E-02	740	1.70E-03	8.91E-04
87	9.80E-03	2.21E-03	305	1.11E-02	1.24E-03	523	1.04E-02	-4.57E-02	741	1.57E-03	8.48E-04
88	9.23E-03	2.28E-03	306	1.03E-02	1.45E-03	524	1.28E-02	-4.36E-02	742	1.45E-03	8.07E-04
89	8.71E-03	2.32E-03	307	9.68E-03	1.60E-03	525	1.54E-02	-4.06E-02	743	1.27E-03	7.50E-04
90	8.23E-03	2.35E-03	308	9.09E-03	1.73E-03	526	1.74E-02	-3.76E-02	744	1.10E-03	7.00E-04
91	7.80E-03	2.36E-03	309	8.55E-03	1.81E-03	527	1.88E-02	-3.41E-02	745	9.52E-04	6.56E-04
92	7.39E-03	2.36E-03	310	8.06E-03	1.88E-03	528	2.03E-02	-2.78E-02	746	8.13E-04	6.20E-04
93	6.90E-03	2.34E-03	311	7.62E-03	1.93E-03	529	2.04E-02	-2.19E-02	747	6.84E-04	5.89E-04
94	6.46E-03	2.30E-03	312	7.21E-03	1.96E-03	530	1.95E-02	-1.86E-02	748	5.26E-04	5.56E-04
95	6.06E-03	2.26E-03	313	6.71E-03	1.97E-03	531	1.79E-02	-1.19E-02	749	3.81E-04	5.32E-04
96	5.69E-03	2.20E-03	314	6.26E-03	1.96E-03	532	1.60E-02	-8.09E-03	750	2.47E-04	5.16E-04
97	5.34E-03	2.14E-03	315	5.85E-03	1.94E-03	533	1.46E-02	-5.53E-03	751	1.20E-04	5.06E-04
98	5.03E-03	2.07E-03	316	5.49E-03	1.90E-03	534	1.30E-02	-3.62E-03	752	0	5.03E-04
99	4.73E-03	2.00E-03	317	5.14E-03	1.85E-03	535	1.15E-02	-2.13E-03	753	2.10E-03	9.93E-04
100	4.46E-03	1.92E-03	318	4.83E-03	1.79E-03	536	1.03E-02	-1.08E-03	754	1.95E-03	9.40E-04
101	4.20E-03	1.85E-03	319	4.53E-03	1.73E-03	537	9.00E-03	-1.73E-04	755	1.80E-03	8.92E-04
102	3.96E-03	1.77E-03	320	4.26E-03	1.67E-03	538	7.92E-03	4.55E-04	756	1.67E-03	8.46E-04
103	3.73E-03	1.70E-03	321	4.01E-03	1.61E-03	539	7.06E-03	8.18E-04	757	1.54E-03	8.04E-04
104	3.52E-03	1.63E-03	322	3.77E-03	1.54E-03	540	6.25E-03	1.02E-03	758	1.42E-03	7.65E-04
105	3.32E-03	1.56E-03	323	3.55E-03	1.47E-03	541	5.63E-03	1.14E-03	759	1.24E-03	7.10E-04
106	3.12E-03	1.49E-03	324	3.34E-03	1.41E-03	542	5.07E-03	1.18E-03	760	1.08E-03	6.62E-04
107	2.94E-03	1.43E-03	325	3.14E-03	1.35E-03	543	4.60E-03	1.17E-03	761	9.33E-04	6.20E-04
108	2.77E-03	1.36E-03	326	2.96E-03	1.28E-03	544	4.16E-03	1.14E-03	762	7.97E-04	5.85E-04
109	2.61E-03	1.30E-03	327	2.78E-03	1.23E-03	545	3.77E-03	1.09E-03	763	6.70E-04	5.56E-04
110	2.45E-03	1.25E-03	328	2.62E-03	1.17E-03	546	3.41E-03	1.03E-03	764	5.15E-04	5.25E-04
111	-2.56E-06	-0.23314	329	2.46E-03	1.11E-03	547	3.10E-03	9.83E-04	765	3.73E-04	5.02E-04
112	4.55E-03	-0.23299	330	2.31E-03	1.06E-03	548	2.81E-03	8.93E-04	766	2.42E-04	4.86E-04
113	9.58E-03	-0.23243	331	-6.50E-06	-0.14812	549	2.55E-03	8.29E-04	767	1.18E-04	4.77E-04
114	1.63E-02	-0.23125	332	6.48E-03	-0.14537	550	2.32E-03	7.68E-04	768	0	4.74E-04
115	2.31E-02	-0.22924	333	1.30E-02	-0.14361	551	2.10E-03	7.08E-04	769	2.06E-03	9.42E-04
116	2.76E-02	-0.22763	334	1.92E-02	-0.14078	552	1.90E-03	6.53E-04	770	1.91E-03	8.92E-04
117	3.77E-02	-0.22252	335	2.53E-02	-0.13645	553	9.00E-07	-3.52E-02	771	1.76E-03	8.45E-04
118	4.90E-02	-0.21439	336	3.18E-02	-0.13143	554	2.50E-03	-3.48E-02	772	1.63E-03	8.01E-04
119	6.11E-02	-0.20225	337	3.68E-02	-0.12515	555	4.98E-03	-3.39E-02	773	1.50E-03	7.61E-04
120	7.50E-02	-0.18239	338	4.16E-02	-0.11692	556	7.28E-03	-3.26E-02	774	1.39E-03	7.23E-04
121	8.60E-02	-0.15114	339	4.59E-02	-0.10772	557	8.81E-03	-3.11E-02	775	1.21E-03	6.71E-04
122	8.90E-02	-0.11338	340	4.91E-02	-9.80E-02	558	1.05E-02	-2.85E-02	776	1.06E-03	6.25E-04
123	8.36E-02	-7.76E-02	341	5.12E-02	-8.77E-02	559	1.20E-02	-2.60E-02	777	9.12E-04	5.85E-04
124	7.24E-02	-5.07E-02	342	5.21E-02	-7.73E-02	560	1.33E-02	-2.21E-02	778	7.78E-04	5.51E-04
125	6.09E-02	-3.48E-02	343	5.19E-02	-6.49E-02	561	1.39E-02	-1.80E-02	779	6.55E-04	5.23E-04
126	5.24E-02	-2.53E-02	344	5.01E-02	-5.34E-02	562	1.39E-02	-1.43E-02	780	5.03E-04	4.94E-04
127	4.56E-02	-1.80E-02	345	4.75E-02	-4.31E-02	563	1.34E-02	-9.89E-03	781	3.65E-04	4.73E-04
128	4.04E-02	-1.47E-02	346	4.49E-02	-3.52E-02	564	1.23E-02	-6.67E-03	782	2.36E-04	4.58E-04
129	3.61E-02	-1.16E-02	347	4.13E-02	-2.83E-02	565	1.12E-02	-4.13E-03	783	1.15E-04	4.49E-04
130	3.08E-02	-7.83E-03	348	3.80E-02	-2.27E-02	566	1.02E-02	-2.48E-03	784	0	4.46E-04
131	2.67E-02	-5.22E-03	349	3.49E-02	-1.82E-02	567	9.09E-03	-1.24E-03	785	1.99E-03	8.64E-04
132	2.35E-02	-3.32E-03	350	3.05E-02	-1.28E-02	568	7.85E-03	-9.83E-05	786	1.81E-03	8.05E-04
133	2.09E-02	-1.93E-03	351	2.66E-02	-8.98E-03	569	6.74E-03	4.81E-04	787	1.64E-03	7.51E-04
134	1.88E-02	-8.81E-04	352	2.36E-02	-6.25E-03	570	5.81E-03	8.33E-04	788	1.48E-03	7.03E-04
135	1.70E-02	-9.35E-05	353	2.09E-02	-4.29E-03	571	5.15E-03	9.44E-04	789	1.34E-03	6.59E-04
136	1.55E-02	5.18E-04	354	1.88E-02	-2.87E-03	572	4.55E-03	9.94E-04	790	1.13E-03	5.98E-04
137	1.42E-02	9.79E-04	355	1.69E-02	-1.75E-03	573	4.05E-03	9.80E-04	791	9.43E-04	5.47E-04
138	1.30E-02	1.34E-03	356	1.54E-02	-9.05E-04	574	3.59E-03	9.35E-04	792	7.75E-04	5.05E-04
139	1.20E-02	1.61E-03	357	1.40E-02	-2.50E-04	575	3.19E-03	8.70E-04	793	6.24E-04	4.72E-04
140	1.12E-02	1.83E-03	358	1.29E-02	2.85E-04	576	2.83E-03	7.95E-04	794	4.86E-04	4.47E-04
141	1.05E-02	1.97E-03	359	1.19E-02	6.81E-04	577	2.51E-03	7.33E-04	795	3.52E-04	4.27E-04
142	9.81E-03	2.08E-03	360	1.10E-02	1.01E-03	578	2.23E-03	6.65E-04	796	2.28E-04	4.14E-04
143	9.23E-03	2.15E-03	361	1.02E-02	1.24E-03	579	1.98E-03	6.01E-04	797	1.11E-04	4.06E-04
144	8.70E-03	2.21E-03	362	9.58E-03	1.41E-03	580	1.76E-03	5.43E-04	798	0	4.03E-04
145	8.22E-03	2.24E-03	363	8.99E-03	1.55E-03	581	2.68E-06	-2.16E-02	799	1.88E-03	7.73E-04
146	7.78E-03	2.26E-03	364	8.45E-03	1.68E-03	582	2.14E-03	-2.12E-02	800	1.66E-03	7.06E-04
147	7.37E-03	2.27E-03	365	7.97E-03	1.74E-03	583	4.08E-03	-2.04E-02	801	1.46E-03	6.47E-04
148	6.87E-03	2.25E-03	366	7.53E-03	1.80E-03	584	5.89E-03	-1.90E-02	802	1.28E-03	5.97E-04
149	6.43E-03	2.22E-03	367	7.12E-03	1.84E-03	585	7.61E-03	-1.77E-02	803	1.06E-03	5.32E-04
150	6.02E-03	2.18E-03	368	6.63E-03	1.86E-03	586	8.62E-03	-1.60E-02	804	8.54E-04	4.80E-04
151	5.65E-03	2.13E-03	369	6.18E-03	1.86E-03	587	9.46E-03	-1.40E-02	805	6.78E-04	4.40E-04
152	5.30E-03	2.07E-03	370	5.78E-03	1.84E-03	588	1.01E-02	-1.20E-02	806	5.16E-04	4.09E-04
153	4.99E-03	2.00E-03	371	5.41E-03	1.81E-03	589	1.04E-02	-1.02E-02	807	3.72E-04	3.88E-04
154	4.69E-03	1.93E-03	372	5.07E-03	1.77E-03	590	1.03E-02	-6.73E-03	808	2.40E-04	3.73E-04
155	4.42E-03	1.86E-03	373	4.76E-03	1.71E-03	591	9.71E-03	-4.09E-03	809	1.17E-04	3.65E-04
156	4.15E-03	1.79E-03	374	4.47E-03	1.68E-03	592	8.75E-03	-2.16E-03	810	0	3.62E-04
157	3.92E-03	1.72E-03	375	4.19E-03	1.60E-03	593	7.90E-03	-9.96E-04	811	1.72E-03	6.77E-04
158	3.69E-03	1.65E-03	376	3.94E-03	1.53E-03	594	6.90E-03	-2.23E-04	812	1.46E-03	5.99E-04
159	3.48E-03	1.58E-03	377	3.71E-03	1.47E-03	595	6.03E-03	2.72E-04	813	1.23E-03	5.35E-04

160	3.28E-03	1.51E-03	378	3.49E-03	1.41E-03	596	5.25E-03	5.36E-04	814	1.00E-03	4.78E-04
161	3.09E-03	1.44E-03	379	3.28E-03	1.34E-03	597	4.49E-03	6.84E-04	815	8.14E-04	4.30E-04
162	2.91E-03	1.38E-03	380	3.09E-03	1.28E-03	598	3.85E-03	7.08E-04	816	6.42E-04	3.92E-04
163	2.74E-03	1.32E-03	381	2.90E-03	1.22E-03	599	3.30E-03	6.86E-04	817	4.91E-04	3.66E-04
164	2.58E-03	1.26E-03	382	2.73E-03	1.17E-03	600	2.81E-03	6.26E-04	818	3.54E-04	3.46E-04
165	2.42E-03	1.20E-03	383	2.57E-03	1.11E-03	601	2.42E-03	5.66E-04	819	2.28E-04	3.32E-04
166	-2.69E-06	-0.21312	384	2.41E-03	1.06E-03	602	2.08E-03	4.95E-04	820	1.11E-04	3.25E-04
167	4.88E-03	-0.21284	385	2.26E-03	1.01E-03	603	1.78E-03	4.36E-04	821	0	3.22E-04
168	1.03E-02	-0.21228	386	-6.47E-07	-0.11553	604	1.53E-03	3.82E-04	822	1.57E-03	5.61E-04
169	1.75E-02	-0.21072	387	6.37E-03	-0.11479	605	2.42E-06	-1.26E-02	823	1.28E-03	4.85E-04
170	2.50E-02	-0.20846	388	1.26E-02	-0.11301	606	1.58E-03	-1.23E-02	824	1.04E-03	4.25E-04
171	3.28E-02	-0.20484	389	1.89E-02	-0.11022	607	3.17E-03	-1.18E-02	825	8.33E-04	3.78E-04
172	4.09E-02	-0.20032	390	2.45E-02	-0.10653	608	4.41E-03	-1.11E-02	826	6.55E-04	3.37E-04
173	5.25E-02	-0.19139	391	2.91E-02	-0.10118	609	5.35E-03	-9.98E-03	827	4.97E-04	3.10E-04
174	6.51E-02	-0.17782	392	3.43E-02	-9.51E-02	610	6.45E-03	-8.91E-03	828	3.57E-04	2.91E-04
175	7.66E-02	-0.15825	393	3.81E-02	-8.84E-02	611	7.07E-03	-7.75E-03	829	2.29E-04	2.77E-04
176	8.46E-02	-0.13306	394	4.10E-02	-8.08E-02	612	7.49E-03	-6.55E-03	830	1.11E-04	2.70E-04
177	8.69E-02	-0.10435	395	4.31E-02	-7.29E-02	613	7.81E-03	-4.26E-03	831	0	2.67E-04
178	8.26E-02	-7.72E-02	396	4.43E-02	-6.49E-02	614	7.45E-03	-2.43E-03	832	1.41E-03	4.56E-04
179	7.41E-02	-5.52E-02	397	4.46E-02	-5.46E-02	615	6.75E-03	-1.21E-03	833	1.12E-03	3.88E-04
180	6.43E-02	-3.94E-02	398	4.37E-02	-4.52E-02	616	5.99E-03	-4.04E-04	834	8.86E-04	3.34E-04
181	5.52E-02	-2.89E-02	399	4.14E-02	-3.70E-02	617	5.17E-03	4.41E-05	835	6.83E-04	2.91E-04
182	4.80E-02	-2.18E-02	400	3.92E-02	-2.99E-02	618	4.41E-03	3.13E-04	836	5.17E-04	2.63E-04
183	4.21E-02	-1.69E-02	401	3.63E-02	-2.40E-02	619	3.70E-03	4.29E-04	837	3.67E-04	2.40E-04
184	3.75E-02	-1.32E-02	402	3.34E-02	-1.92E-02	620	3.07E-03	4.54E-04	838	2.34E-04	2.27E-04
185	3.16E-02	-8.94E-03	403	2.92E-02	-1.36E-02	621	2.56E-03	4.42E-04	839	1.13E-04	2.19E-04
186	2.73E-02	-6.04E-03	404	2.56E-02	-9.56E-03	622	2.15E-03	3.72E-04	840	0	2.16E-04
187	2.39E-02	-3.96E-03	405	2.24E-02	-6.69E-03	623	1.78E-03	3.31E-04	841	1.19E-03	3.10E-04
188	2.12E-02	-2.43E-03	406	1.98E-02	-4.52E-03	624	1.49E-03	2.86E-04	842	9.13E-04	2.56E-04
189	1.90E-02	-1.31E-03	407	1.77E-02	-3.07E-03	625	1.24E-03	2.37E-04	843	6.90E-04	2.20E-04
190	1.71E-02	-4.39E-04	408	1.58E-02	-1.90E-03	626	2.08E-06	-6.48E-03	844	5.17E-04	1.85E-04
191	1.56E-02	2.10E-04	409	1.43E-02	-9.73E-04	627	1.23E-03	-6.42E-03	845	3.81E-04	1.68E-04
192	1.42E-02	7.29E-04	410	1.30E-02	-3.16E-04	628	2.28E-03	-6.00E-03	846	2.29E-04	1.55E-04
193	1.31E-02	1.11E-03	411	1.18E-02	2.26E-04	629	3.51E-03	-5.49E-03	847	1.10E-04	1.47E-04
194	1.21E-02	1.42E-03	412	1.08E-02	6.31E-04	630	4.06E-03	-5.13E-03	848	0	1.45E-04
195	1.12E-02	1.65E-03	413	1.01E-02	8.99E-04	631	4.74E-03	-4.39E-03	849	9.18E-04	1.87E-04
196	1.04E-02	1.81E-03	414	9.41E-03	1.13E-03	632	5.22E-03	-3.69E-03	850	6.76E-04	1.53E-04
197	9.79E-03	1.93E-03	415	8.71E-03	1.32E-03	633	5.58E-03	-2.23E-03	851	4.84E-04	1.22E-04
198	9.20E-03	2.03E-03	416	8.07E-03	1.47E-03	634	5.37E-03	-1.18E-03	852	3.42E-04	1.07E-04
199	8.66E-03	2.09E-03	417	7.51E-03	1.58E-03	635	4.79E-03	-5.35E-04	853	2.12E-04	9.45E-05
200	8.18E-03	2.14E-03	418	7.01E-03	1.64E-03	636	4.06E-03	-6.82E-05	854	1.01E-04	8.83E-05
201	7.73E-03	2.16E-03	419	6.48E-03	1.68E-03	637	3.38E-03	1.22E-04	855	0	8.56E-05
202	7.33E-03	2.17E-03	420	6.02E-03	1.70E-03	638	2.72E-03	2.30E-04	856	6.36E-04	8.76E-05
203	6.83E-03	2.17E-03	421	5.60E-03	1.68E-03	639	2.20E-03	2.43E-04	857	4.28E-04	8.06E-05
204	6.38E-03	2.15E-03	422	5.22E-03	1.66E-03	640	1.73E-03	2.08E-04	858	3.02E-04	5.35E-05
205	5.97E-03	2.11E-03	423	4.87E-03	1.61E-03	641	1.44E-03	2.04E-04	859	1.83E-04	5.06E-05
206	5.60E-03	2.06E-03	424	4.55E-03	1.57E-03	642	1.15E-03	1.50E-04	860	8.74E-05	4.30E-05
207	5.26E-03	2.00E-03	425	4.25E-03	1.51E-03	643	9.15E-04	1.23E-04	861	0	4.06E-05
208	4.94E-03	1.94E-03	426	3.98E-03	1.45E-03	644	-1.17E-06	-2.71E-03	862	3.37E-04	3.06E-05
209	4.64E-03	1.87E-03	427	3.72E-03	1.39E-03	645	8.26E-04	-2.63E-03	863	1.99E-04	2.70E-05
210	4.37E-03	1.80E-03	428	3.48E-03	1.33E-03	646	1.62E-03	-2.60E-03	864	1.42E-04	2.42E-05
211	4.11E-03	1.73E-03	429	3.26E-03	1.28E-03	647	1.85E-03	-2.35E-03	865	5.87E-05	1.09E-05
212	3.87E-03	1.66E-03	430	3.05E-03	1.20E-03	648	2.44E-03	-1.99E-03	866	0	1.54E-05
213	3.65E-03	1.59E-03	431	2.86E-03	1.14E-03	649	2.84E-03	-1.63E-03	867	0	0
214	3.44E-03	1.53E-03	432	2.68E-03	1.08E-03	650	3.15E-03	-1.06E-03	868	0	0
215	3.24E-03	1.46E-03	433	2.51E-03	1.03E-03	651	3.04E-03	-5.68E-04	869	0	0
216	3.05E-03	1.39E-03	434	2.35E-03	9.77E-04	652	2.81E-03	-3.15E-04	870	0	0
217	2.87E-03	1.33E-03	435	2.19E-03	9.29E-04	653	2.46E-03	-9.58E-05			
218	2.70E-03	1.27E-03	436	-1.09E-06	-8.95E-02	654	2.05E-03	1.60E-05			

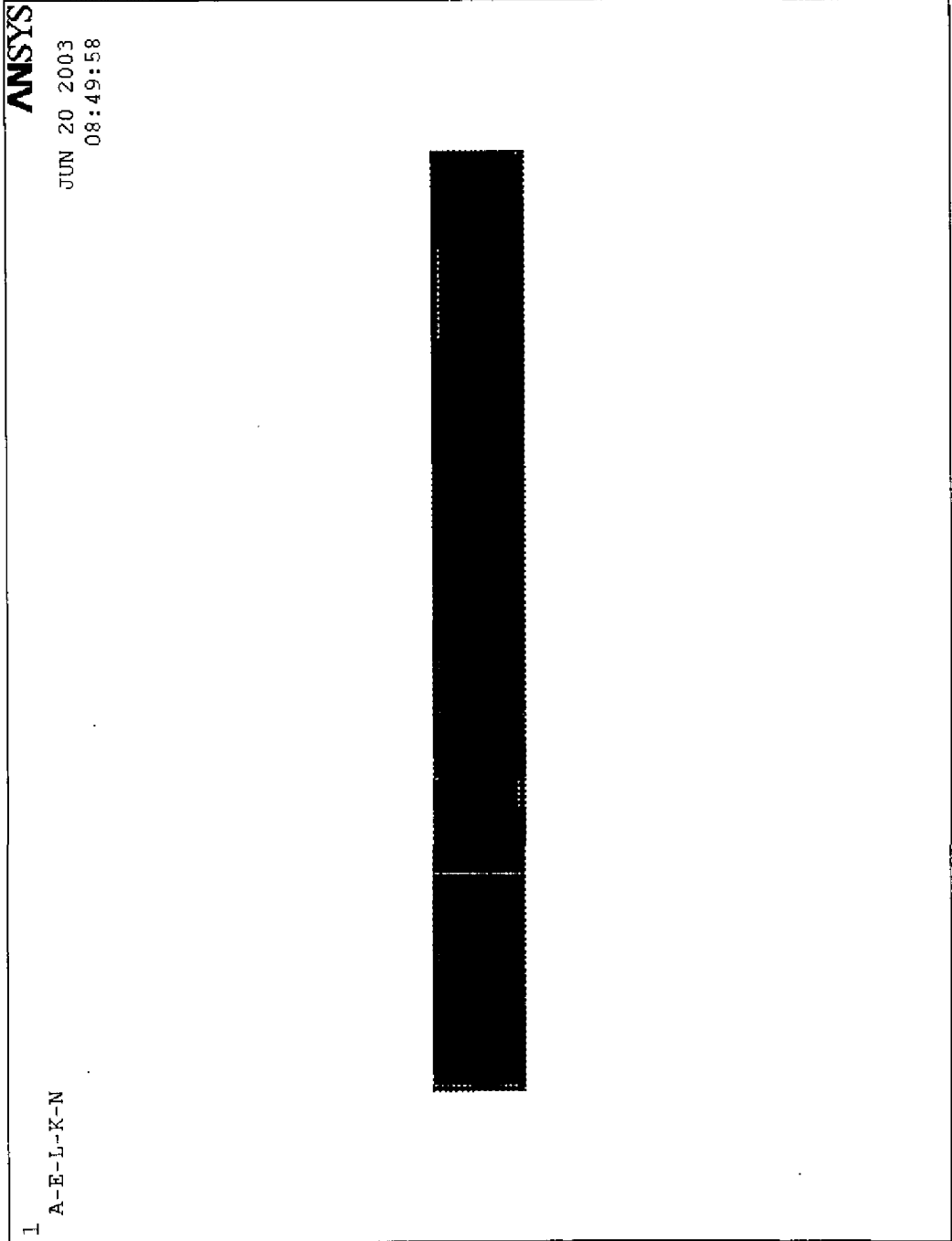
MAXIMUM ABSOLUTE VALUES
 NODE 122 1
 VALUE -8.90E-02 0.27379

T-CLC-2-00006, Rev. 0

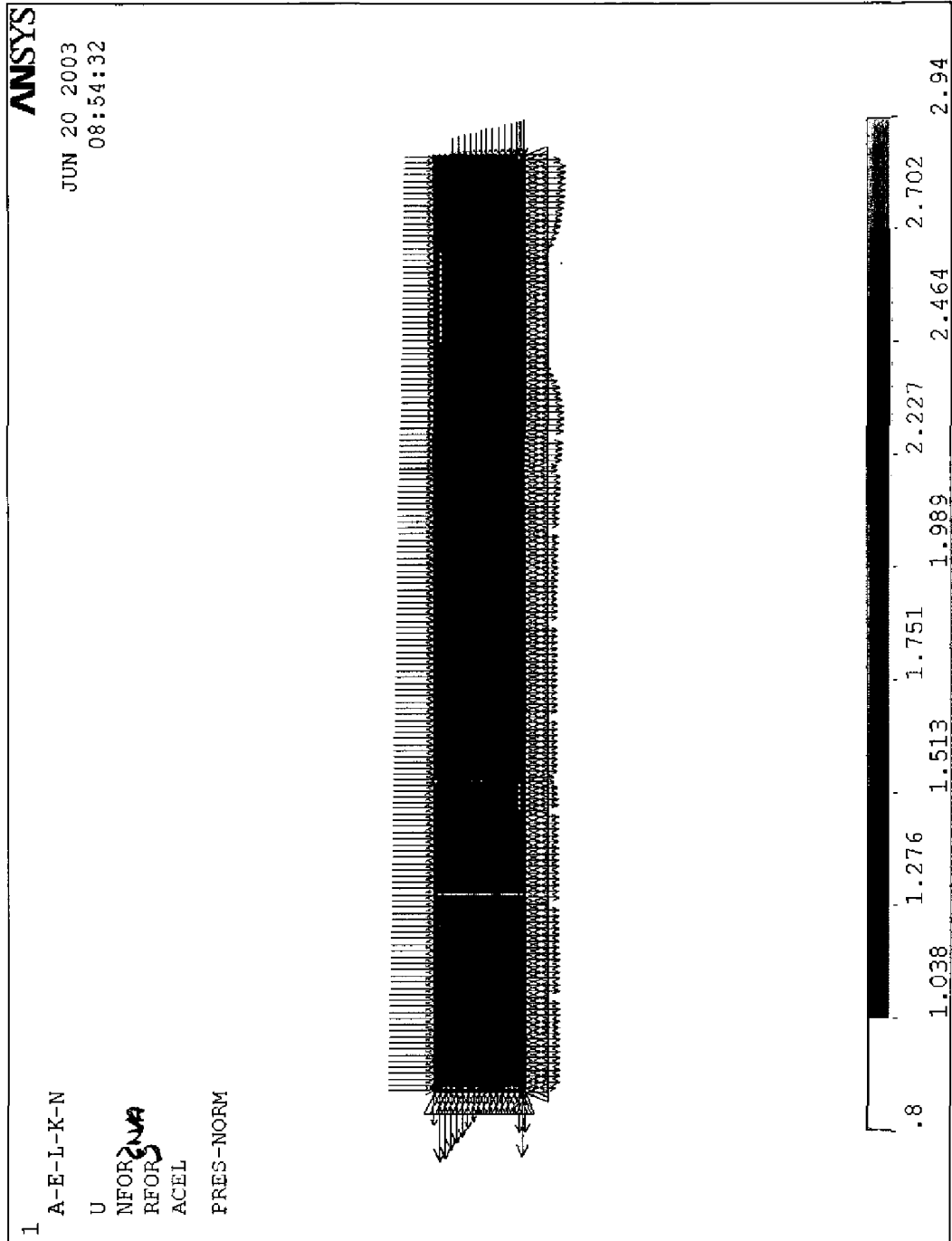
515

MODEL 300

Model 300 Element Layout



Model 300 - Applied Loads and Boundary Conditions



MODEL 300 Nodal Coordinates
Calculation Continuation Sheet

Node	X	Y	Node	X	Y	Node	X	Y	Node	X	Y	Node	X	Y	Node	X	Y
1	0.00	0.00	21043	5.40	1.00	51453	40.75	8.67	52736	260.75	13.67	52090	240.75	12.00	53205	134.75	18.67
2	1.50	0.00	21044	7.35	1.00	51454	40.75	10.33	52737	260.75	15.33	52091	240.75	13.67	53206	134.75	20.33
3	1.50	2.00	21045	9.30	1.00	51455	40.75	12.00	52738	260.75	17.00	52092	240.75	15.33	53207	134.75	22.00
4	1.50	1.00	21046	11.25	1.00	51456	40.75	13.67	52739	260.75	18.67	52093	240.75	17.00	53208	134.75	23.67
5	0.00	2.00	21047	13.20	1.00	51457	40.75	15.33	52740	260.75	20.33	52094	240.75	18.67	53209	134.75	25.33
6	0.00	1.00	21048	15.15	1.00	51458	40.75	17.00	52741	260.75	22.00	52095	240.75	20.33	53210	136.75	3.67
178	101.50	0.00	21049	17.10	1.00	51459	40.75	18.67	52742	260.75	23.67	52096	240.75	22.00	53211	136.75	5.33
191	101.50	2.00	21050	19.05	1.00	51460	40.75	20.33	52743	260.75	25.33	52097	240.75	23.67	53212	136.75	7.00
201	101.50	1.00	21051	21.00	1.00	51461	40.75	22.00	52744	262.75	3.67	52098	240.75	25.33	53213	136.75	8.67
211	100.00	0.00	21052	22.95	1.00	51462	40.75	23.67	52745	262.75	5.33	52099	212.75	27.00	53214	136.75	10.33
212	100.00	2.00	21053	24.90	1.00	51463	40.75	25.33	52746	262.75	7.00	52100	214.75	27.00	53215	136.75	12.00
213	100.00	1.00	21054	26.85	1.00	51464	42.75	3.67	52747	262.75	8.67	52101	216.75	27.00	53216	136.75	13.67
214	200.00	0.00	21055	28.80	1.00	51465	42.75	5.33	52748	262.75	10.33	52102	218.75	27.00	53217	136.75	15.33
215	201.50	0.00	21056	30.75	0.00	51466	42.75	7.00	52749	262.75	12.00	52103	220.75	27.00	53218	136.75	17.00
216	201.50	2.00	21057	32.70	0.00	51467	42.75	8.67	52750	262.75	13.67	52104	222.75	27.00	53219	136.75	18.67
217	201.50	1.00	21058	34.65	0.00	51468	42.75	10.33	52751	262.75	15.33	52105	224.75	27.00	53220	136.75	20.33
218	200.00	2.00	21059	36.60	0.00	51469	42.75	12.00	52752	262.75	17.00	52106	226.75	27.00	53221	136.75	22.00
219	200.00	1.00	21060	38.55	0.00	51470	42.75	13.67	52753	262.75	18.67	52107	228.75	27.00	53222	136.75	23.67
361	300.00	0.00	21061	40.50	2.00	51471	42.75	15.33	52754	262.75	20.33	52108	230.75	27.00	53223	136.75	25.33
362	301.50	0.00	21062	42.45	2.00	51472	42.75	17.00	52755	262.75	22.00	52109	232.75	27.00	53224	138.75	3.67
363	301.50	2.00	21063	44.40	2.00	51473	42.75	18.67	52756	262.75	23.67	52110	234.75	27.00	53225	138.75	5.33
364	301.50	1.00	21064	46.35	2.00	51474	42.75	20.33	52757	262.75	25.33	52111	236.75	27.00	53226	138.75	7.00
365	300.00	2.00	21065	48.30	2.00	51475	42.75	22.00	52758	264.75	3.67	52112	238.75	27.00	53227	138.75	8.67
366	300.00	1.00	21066	50.25	1.00	51476	42.75	23.67	52759	264.75	5.33	52113	240.75	3.67	53228	138.75	10.33
10603	301.50	29.00	21067	52.20	1.00	51477	42.75	25.33	52760	264.75	7.00	52114	242.75	5.33	53229	138.75	12.00
10604	301.50	3.80	21068	54.15	1.00	51478	44.75	3.67	52761	264.75	8.67	52115	244.75	7.00	53230	138.75	13.67
10605	301.50	5.60	21069	56.10	1.00	51479	44.75	5.33	52762	264.75	10.33	52116	246.75	8.67	53231	138.75	15.33
10606	301.50	7.40	21070	58.05	1.00	51480	44.75	7.00	52763	264.75	12.00	52117	248.75	10.33	53232	138.75	17.00
10607	301.50	9.20	30001	0.00	0.00	51481	44.75	8.67	52764	264.75	13.67	52118	250.75	12.00	53233	138.75	18.67
10608	301.50	11.00	30002	1.50	0.00	51482	44.75	10.33	52765	264.75	15.33	52119	252.75	13.67	53234	138.75	20.33
10609	301.50	12.80	30178	101.50	0.00	51483	44.75	12.00	52766	264.75	17.00	52120	254.75	15.33	53235	138.75	22.00
10610	301.50	14.60	30211	100.00	0.00	51484	44.75	13.67	52767	264.75	18.67	52121	256.75	17.00	53236	138.75	23.67
10611	301.50	16.40	30214	200.00	0.00	51485	44.75	15.33	52768	264.75	20.33	52122	258.75	18.67	53237	138.75	25.33
10612	301.50	18.20	30215	201.50	0.00	51486	44.75	17.00	52769	264.75	22.00	52123	260.75	20.33	53238	140.75	3.67
10613	301.50	20.00	30361	300.00	0.00	51487	44.75	18.67	52770	264.75	23.67	52124	262.75	22.00	53239	140.75	5.33
10614	301.50	21.80	30362	301.50	0.00	51488	44.75	20.33	52771	264.75	25.33	52125	264.75	23.67	53240	140.75	7.00
10615	301.50	23.60	50603	120.75	0.00	51489	44.75	22.00	52772	266.75	3.67	52126	266.75	25.33	53241	140.75	8.67
10616	301.50	25.40	50604	103.43	0.00	51490	44.75	23.67	52773	266.75	5.33	52127	268.75	3.67	53242	140.75	10.33
10617	301.50	27.20	50605	105.35	0.00	51491	44.75	25.33	52774	266.75	7.00	52128	270.75	5.33	53243	140.75	12.00
10618	300.00	29.00	50606	107.28	0.00	51492	46.75	3.67	52775	266.75	8.67	52129	272.75	7.00	53244	140.75	13.67
10619	300.00	3.80	50607	109.20	0.00	51493	46.75	5.33	52776	266.75	10.33	52130	274.75	8.67	53245	140.75	15.33
10620	300.00	5.60	50608	111.13	0.00	51494	46.75	7.00	52777	266.75	12.00	52131	276.75	10.33	53246	140.75	17.00
10621	300.00	7.40	50609	113.05	0.00	51495	46.75	8.67	52778	266.75	13.67	52132	278.75	12.00	53247	140.75	18.67
10622	300.00	9.20	50610	114.98	0.00	51496	46.75	10.33	52779	266.75	15.33	52133	280.75	13.67	53248	140.75	20.33
10623	300.00	11.00	50611	116.90	0.00	51497	46.75	12.00	52780	266.75	17.00	52134	282.75	15.33	53249	140.75	22.00
10624	300.00	12.80	50612	118.83	0.00	51498	46.75	13.67	52781	266.75	18.67	52135	284.75	17.00	53250	140.75	23.67
10625	300.00	14.60	50633	30.75	0.00	51499	46.75	15.33	52782	266.75	20.33	52136	286.75	18.67	53251	140.75	25.33
10626	300.00	16.40	50634	60.75	0.00	51500	46.75	17.00	52783	266.75	22.00	52137	288.75	20.33	53252	142.75	3.67
10627	300.00	18.20	50635	32.75	0.00	51501	46.75	18.67	52784	266.75	23.67	52138	290.75	22.00	53253	142.75	5.33
10628	300.00	20.00	50636	34.75	0.00	51502	46.75	20.33	52785	266.75	25.33	52139	292.75	23.67	53254	142.75	7.00
10629	300.00	21.80	50637	36.75	0.00	51503	46.75	22.00	52786	268.75	3.67	52140	294.75	25.33	53255	142.75	8.67
10630	300.00	23.60	50638	38.75	0.00	51504	46.75	23.67	52787	268.75	5.33	52141	296.75	3.67	53256	142.75	10.33
10631	300.00	25.40	50639	40.75	0.00	51505	46.75	25.33	52788	268.75	7.00	52142	298.75	5.33	53257	142.75	12.00
10632	300.00	27.20	50640	42.75	0.00	51506	48.75	3.67	52789	268.75	8.67	52143	300.75	7.00	53258	142.75	13.67
10633	101.50	29.00	50641	44.75	0.00	51507	48.75	5.33	52790	268.75	10.33	52144	302.75	8.67	53259	142.75	15.33
10634	101.50	3.80	50642	46.75	0.00	51508	48.75	7.00	52791	268.75	12.00	52145	304.75	10.33	53260	142.75	17.00
10635	101.50	5.60	50643	48.75	0.00	51509	48.75	8.67	52792	268.75	13.67	52146	306.75	12.00	53261	142.75	18.67
10636	101.50	7.40	50644	50.75	0.00	51510	48.75	10.33	52793	268.75	15.33	52147	308.75	13.67	53262	142.75	20.33
10637	101.50	9.20	50645	52.75	0.00	51511	48.75	12.00	52794	268.75	17.00	52148	310.75	15.33	53263	142.75	22.00
10638	101.50	11.00	50646	54.75	0.00	51512	48.75	13.67	52795	268.75	18.67	52149	312.75	17.00	53264	142.75	23.67
10639	101.50	12.80	50647	56.75	0.00	51513	48.75	15.33	52796	268.75	20.33	52150	314.75	18.67	53265	142.75	25.33
10640	101.50	14.60	50648	58.75	0.00	51514	48.75	17.00	52797	268.75	22.00	52151	316.75	20.33	53266	144.75	3.67
10641	101.50	16.40	50681	60.75	0.00	51515	48.75	18.67	52798	268.75	23.67	52152	318.75	22.00	53267	144.75	5.33
10642	101.50	18.20	50682	62.75	0.00	51516	48.75	20.33	52799	268.75	25.33	52153	320.75	23.67	53268	144.75	7.00
10643	101.50	20.00	50683	64.75	0.00	51517	48.75	22.00	52800	300.00	27.00	52154	322.75	25.33	53269	144.75	8.67
1																	

10655	100.00	14.60	50695	86.75	0.00	51529	50.75	18.67	52812	300.00	22.00	52166	216.75	22.00	53281	146.75	5.33
10656	100.00	16.40	50696	88.75	0.00	51530	50.75	20.33	52813	300.00	23.67	52167	216.75	23.67	53282	146.75	7.00
10657	100.00	18.20	50729	210.75	0.00	51531	50.75	22.00	52814	300.00	25.33	52168	216.75	25.33	53283	146.75	8.67
10658	100.00	20.00	50730	203.35	0.00	51532	50.75	23.67	52815	272.70	27.00	52169	218.75	3.67	53284	146.75	10.33
10659	100.00	21.80	50731	205.20	0.00	51533	50.75	25.33	52816	274.65	27.00	52170	218.75	5.33	53285	146.75	12.00
10660	100.00	23.60	50732	207.05	0.00	51534	52.75	3.67	52817	276.60	27.00	52171	218.75	7.00	53286	146.75	13.67
10661	100.00	25.40	50733	208.90	0.00	51535	52.75	5.33	52818	278.55	27.00	52172	218.75	8.67	53287	146.75	15.33
10662	100.00	27.20	50744	120.75	0.00	51536	52.75	7.00	52819	280.50	27.00	52173	218.75	10.33	53288	146.75	17.00
10663	201.50	29.00	50745	150.75	0.00	51537	52.75	8.67	52820	282.45	27.00	52174	218.75	12.00	53289	146.75	18.67
10664	201.50	3.80	50746	122.75	0.00	51538	52.75	10.33	52821	284.40	27.00	52175	218.75	13.67	53290	146.75	20.33
10665	201.50	5.60	50747	124.75	0.00	51539	52.75	12.00	52822	286.35	27.00	52176	218.75	15.33	53291	146.75	22.00
10666	201.50	7.40	50748	126.75	0.00	51540	52.75	13.67	52823	288.30	27.00	52177	218.75	17.00	53292	146.75	23.67
10667	201.50	9.20	50749	128.75	0.00	51541	52.75	15.33	52824	290.25	27.00	52178	218.75	18.67	53293	146.75	25.33
10668	201.50	11.00	50750	130.75	0.00	51542	52.75	17.00	52825	292.20	27.00	52179	218.75	20.33	53294	148.75	3.67
10669	201.50	12.80	50751	132.75	0.00	51543	52.75	18.67	52826	294.15	27.00	52180	218.75	22.00	53295	148.75	5.33
10670	201.50	14.60	50752	134.75	0.00	51544	52.75	20.33	52827	296.10	27.00	52181	218.75	23.67	53296	148.75	7.00
10671	201.50	16.40	50753	136.75	0.00	51545	52.75	22.00	52828	298.05	27.00	52182	218.75	25.33	53297	148.75	8.67
10672	201.50	18.20	50754	138.75	0.00	51546	52.75	23.67	52829	270.75	3.67	52183	220.75	3.67	53298	148.75	10.33
10673	201.50	20.00	50755	140.75	0.00	51547	52.75	25.33	52830	270.75	5.33	52184	220.75	5.33	53299	148.75	12.00
10674	201.50	21.80	50756	142.75	0.00	51548	54.75	3.67	52831	270.75	7.00	52185	220.75	7.00	53300	148.75	13.67
10675	201.50	23.60	50757	144.75	0.00	51549	54.75	5.33	52832	270.75	8.67	52186	220.75	8.67	53301	148.75	15.33
10676	201.50	25.40	50758	146.75	0.00	51550	54.75	7.00	52833	270.75	10.33	52187	220.75	10.33	53302	148.75	17.00
10677	201.50	27.20	50759	148.75	0.00	51551	54.75	8.67	52834	270.75	12.00	52188	220.75	12.00	53303	148.75	18.67
10678	200.00	29.00	50792	150.75	0.00	51552	54.75	10.33	52835	270.75	13.67	52189	220.75	13.67	53304	148.75	20.33
10679	200.00	3.80	50793	180.75	0.00	51553	54.75	12.00	52836	270.75	15.33	52190	220.75	15.33	53305	148.75	22.00
10680	200.00	5.60	50794	152.75	0.00	51554	54.75	13.67	52837	270.75	17.00	52191	220.75	17.00	53306	148.75	23.67
10681	200.00	7.40	50795	154.75	0.00	51555	54.75	15.33	52838	270.75	18.67	52192	220.75	18.67	53307	148.75	25.33
10682	200.00	9.20	50796	156.75	0.00	51556	54.75	17.00	52839	270.75	20.33	52193	220.75	20.33	53308	120.75	3.67
10683	200.00	11.00	50797	158.75	0.00	51557	54.75	18.67	52840	270.75	22.00	52194	220.75	22.00	53309	120.75	5.33
10684	200.00	12.80	50798	160.75	0.00	51558	54.75	20.33	52841	270.75	23.67	52195	220.75	23.67	53310	120.75	7.00
10685	200.00	14.60	50799	162.75	0.00	51559	54.75	22.00	52842	270.75	25.33	52196	220.75	25.33	53311	120.75	8.67
10686	200.00	16.40	50800	164.75	0.00	51560	54.75	23.67	52843	272.70	3.67	52197	222.75	3.67	53312	120.75	10.33
10687	200.00	18.20	50801	166.75	0.00	51561	54.75	25.33	52844	272.70	5.33	52198	222.75	5.33	53313	120.75	12.00
10688	200.00	20.00	50802	168.75	0.00	51562	56.75	3.67	52845	272.70	7.00	52199	222.75	7.00	53314	120.75	13.67
10689	200.00	21.80	50803	170.75	0.00	51563	56.75	5.33	52846	272.70	8.67	52200	222.75	8.67	53315	120.75	15.33
10690	200.00	23.60	50804	172.75	0.00	51564	56.75	7.00	52847	272.70	10.33	52201	222.75	10.33	53316	120.75	17.00
10691	200.00	25.40	50805	174.75	0.00	51565	56.75	8.67	52848	272.70	12.00	52202	222.75	12.00	53317	120.75	18.67
10692	200.00	27.20	50806	176.75	0.00	51566	56.75	10.33	52849	272.70	13.67	52203	222.75	13.67	53318	120.75	20.33
10693	1.50	29.00	50807	178.75	0.00	51567	56.75	12.00	52850	272.70	15.33	52204	222.75	15.33	53319	120.75	22.00
10694	1.50	3.80	50840	180.75	0.00	51568	56.75	13.67	52851	272.70	17.00	52205	222.75	17.00	53320	120.75	23.67
10695	1.50	5.60	50841	182.68	0.00	51569	56.75	15.33	52852	272.70	18.67	52206	222.75	18.67	53321	120.75	25.33
10696	1.50	7.40	50842	184.60	0.00	51570	56.75	17.00	52853	272.70	20.33	52207	222.75	20.33	53322	101.50	27.00
10697	1.50	9.20	50843	186.53	0.00	51571	56.75	18.67	52854	272.70	22.00	52208	222.75	22.00	53323	103.43	27.00
10698	1.50	11.00	50844	188.45	0.00	51572	56.75	20.33	52855	272.70	23.67	52209	222.75	23.67	53324	105.35	27.00
10699	1.50	12.80	50845	190.38	0.00	51573	56.75	22.00	52856	272.70	25.33	52210	222.75	25.33	53325	107.28	27.00
10700	1.50	14.60	50846	192.30	0.00	51574	56.75	23.67	52857	274.65	3.67	52211	224.75	3.67	53326	109.20	27.00
10701	1.50	16.40	50847	194.23	0.00	51575	56.75	25.33	52858	274.65	5.33	52212	224.75	5.33	53327	111.13	27.00
10702	1.50	18.20	50848	196.15	0.00	51576	58.75	3.67	52859	274.65	7.00	52213	224.75	7.00	53328	113.05	27.00
10703	1.50	20.00	50849	198.08	0.00	51577	58.75	5.33	52860	274.65	8.67	52214	224.75	8.67	53329	114.98	27.00
10704	1.50	21.80	50870	210.75	0.00	51578	58.75	7.00	52861	274.65	10.33	52215	224.75	10.33	53330	116.90	27.00
10705	1.50	23.60	50871	240.75	0.00	51579	58.75	8.67	52862	274.65	12.00	52216	224.75	12.00	53331	118.83	27.00
10706	1.50	25.40	50872	212.75	0.00	51580	58.75	10.33	52863	274.65	13.67	52217	224.75	13.67	53332	101.50	3.67
10707	1.50	27.20	50873	214.75	0.00	51581	58.75	12.00	52864	274.65	15.33	52218	224.75	15.33	53333	101.50	5.33
10708	0.00	29.00	50874	216.75	0.00	51582	58.75	13.67	52865	274.65	17.00	52219	224.75	17.00	53334	101.50	7.00
10709	0.00	3.80	50875	218.75	0.00	51583	58.75	15.33	52866	274.65	18.67	52220	224.75	18.67	53335	101.50	8.67
10710	0.00	5.60	50876	220.75	0.00	51584	58.75	17.00	52867	274.65	20.33	52221	224.75	20.33	53336	101.50	10.33
10711	0.00	7.40	50877	222.75	0.00	51585	58.75	18.67	52868	274.65	22.00	52222	224.75	22.00	53337	101.50	12.00
10712	0.00	9.20	50878	224.75	0.00	51586	58.75	20.33	52869	274.65	23.67	52223	224.75	23.67	53338	101.50	13.67
10713	0.00	11.00	50879	226.75	0.00	51587	58.75	22.00	52870	274.65	25.33	52224	224.75	25.33	53339	101.50	15.33
10714	0.00	12.80	50880	228.75	0.00	51588	58.75	23.67	52871	276.60	3.67	52225	226.75	3.67	53340	101.50	17.00
10715	0.00	14.60	50881	230.75	0.00	51589	58.75	25.33	52872	276.60	5.33	52226	226.75	5.33	53341	101.50	18.67
10716	0.00	16.40	50882	232.75	0.00	51590	180.75	27.00	52873	276.60	7.00	52227	226.75	7.00	53342	101.50	20.33
10717	0.00	18.20	50883	234.75	0.00	51591	180.75	3.67	52874	276.60	8.67	52228	226.75	8.67	53343	101.50	22.00
10718	0.00	20.00	50884	236.75	0.00	51592	180.75	5.33	52875	276.60	10.33	52229	226.75	10.33	53344	101.50	23.67
10719	0.00	21.80	50885	238.75	0.00	51593	180.75	7.00	52876	276.60	12.00	52230	226.75	12.00	53345	101.50	25.33
10720	0.00	23.6															

20613	120.75	2.00	50931	264.75	0.00	51607	154.75	27.00	52890	278.55	12.00	52244	228.75	12.00	53359	103.43	25.33
20614	120.75	1.00	50932	266.75	0.00	51608	156.75	27.00	52891	278.55	13.67	52245	228.75	13.67	53360	105.35	3.67
20615	103.43	2.00	50933	268.75	0.00	51609	158.75	27.00	52892	278.55	15.33	52246	228.75	15.33	53361	105.35	5.33
20616	105.35	2.00	50966	270.75	0.00	51610	160.75	27.00	52893	278.55	17.00	52247	228.75	17.00	53362	105.35	7.00
20617	107.28	2.00	50967	272.70	0.00	51611	162.75	27.00	52894	278.55	18.67	52248	228.75	18.67	53363	105.35	8.67
20618	109.20	2.00	50968	274.65	0.00	51612	164.75	27.00	52895	278.55	20.33	52249	228.75	20.33	53364	105.35	10.33
20619	111.13	2.00	50969	276.60	0.00	51613	166.75	27.00	52896	278.55	22.00	52250	228.75	22.00	53365	105.35	12.00
20620	113.05	2.00	50970	278.55	0.00	51614	168.75	27.00	52897	278.55	23.67	52251	228.75	23.67	53366	105.35	13.67
20621	114.98	2.00	50971	280.50	0.00	51615	170.75	27.00	52898	278.55	25.33	52252	228.75	25.33	53367	105.35	15.33
20622	116.90	2.00	50972	282.45	0.00	51616	172.75	27.00	52899	280.50	3.67	52253	230.75	3.67	53368	105.35	17.00
20623	118.83	2.00	50973	284.40	0.00	51617	174.75	27.00	52900	280.50	5.33	52254	230.75	5.33	53369	105.35	18.67
20624	103.43	1.00	50974	286.35	0.00	51618	176.75	27.00	52901	280.50	7.00	52255	230.75	7.00	53370	105.35	20.33
20625	105.35	1.00	50975	288.30	0.00	51619	178.75	27.00	52902	280.50	8.67	52256	230.75	8.67	53371	105.35	22.00
20626	107.28	1.00	50976	290.25	0.00	51620	150.75	3.67	52903	280.50	10.33	52257	230.75	10.33	53372	105.35	23.67
20627	109.20	1.00	50977	292.20	0.00	51621	150.75	5.33	52904	280.50	12.00	52258	230.75	12.00	53373	105.35	25.33
20628	111.13	1.00	50978	294.15	0.00	51622	150.75	7.00	52905	280.50	13.67	52259	230.75	13.67	53374	107.28	3.67
20629	113.05	1.00	50979	296.10	0.00	51623	150.75	8.67	52906	280.50	15.33	52260	230.75	15.33	53375	107.28	5.33
20630	114.98	1.00	50980	298.05	0.00	51624	150.75	10.33	52907	280.50	17.00	52261	230.75	17.00	53376	107.28	7.00
20631	116.90	1.00	51011	30.75	0.00	51625	150.75	12.00	52908	280.50	18.67	52262	230.75	18.67	53377	107.28	8.67
20632	118.83	1.00	51012	3.45	0.00	51626	150.75	13.67	52909	280.50	20.33	52263	230.75	20.33	53378	107.28	10.33
20633	30.75	0.00	51013	5.40	0.00	51627	150.75	15.33	52910	280.50	22.00	52264	230.75	22.00	53379	107.28	12.00
20634	60.75	0.00	51014	7.35	0.00	51628	150.75	17.00	52911	280.50	23.67	52265	230.75	23.67	53380	107.28	13.67
20635	32.75	0.00	51015	9.30	0.00	51629	150.75	18.67	52912	280.50	25.33	52266	230.75	25.33	53381	107.28	15.33
20636	34.75	0.00	51016	11.25	0.00	51630	150.75	20.33	51683	158.75	15.33	52267	232.75	3.67	53382	107.28	17.00
20637	36.75	0.00	51017	13.20	0.00	51631	150.75	22.00	51684	158.75	17.00	52268	232.75	5.33	53383	107.28	18.67
20638	38.75	0.00	51018	15.15	0.00	51632	150.75	23.67	51685	158.75	18.67	52269	232.75	7.00	53384	107.28	20.33
20639	40.75	0.00	51019	17.10	0.00	51633	150.75	25.33	51686	158.75	20.33	52270	232.75	8.67	53385	107.28	22.00
20640	42.75	0.00	51020	19.05	0.00	51634	152.75	3.67	51687	158.75	22.00	52271	232.75	10.33	53386	107.28	23.67
20641	44.75	0.00	51021	21.00	0.00	51635	152.75	5.33	51688	158.75	23.67	52272	232.75	12.00	53387	107.28	25.33
20642	46.75	0.00	51022	22.95	0.00	51636	152.75	7.00	51689	158.75	25.33	52273	232.75	13.67	53388	109.20	3.67
20643	48.75	0.00	51023	24.90	0.00	51637	152.75	8.67	51690	160.75	3.67	52274	232.75	15.33	53389	109.20	5.33
20644	50.75	0.00	51024	26.85	0.00	51638	152.75	10.33	51691	160.75	5.33	52275	232.75	17.00	53390	109.20	7.00
20645	52.75	0.00	51025	28.80	0.00	51639	152.75	12.00	51692	160.75	7.00	52276	232.75	18.67	53391	109.20	8.67
20646	54.75	0.00	51056	90.75	0.00	51640	152.75	13.67	51693	160.75	8.67	52277	232.75	20.33	53392	109.20	10.33
20647	56.75	0.00	51057	98.15	0.00	51641	152.75	15.33	51694	160.75	10.33	52278	232.75	22.00	53393	109.20	12.00
20648	58.75	0.00	51058	96.30	0.00	51642	152.75	17.00	51695	160.75	12.00	52279	232.75	23.67	53394	109.20	13.67
20649	60.75	2.00	51059	94.45	0.00	51643	152.75	18.67	51696	160.75	13.67	52280	232.75	25.33	53395	109.20	15.33
20650	60.75	1.00	51060	92.60	0.00	51644	152.75	20.33	51697	160.75	15.33	52281	234.75	3.67	53396	109.20	17.00
20651	30.75	2.00	51061	30.75	29.00	51645	152.75	22.00	51698	160.75	17.00	52282	234.75	5.33	53397	109.20	18.67
20652	58.75	2.00	51062	30.75	27.00	51646	152.75	23.67	51699	160.75	18.67	52283	234.75	7.00	53398	109.20	20.33
20653	56.75	2.00	51063	30.75	28.00	51647	152.75	25.33	51700	160.75	20.33	52284	234.75	8.67	53399	109.20	22.00
20654	54.75	2.00	51064	1.50	29.00	51648	154.75	3.67	51701	160.75	22.00	52285	234.75	10.33	53400	109.20	23.67
20655	52.75	2.00	51065	28.80	29.00	51649	154.75	5.33	51702	160.75	23.67	52286	234.75	12.00	53401	109.20	25.33
20656	50.75	2.00	51066	26.85	29.00	51650	154.75	7.00	51703	160.75	25.33	52287	234.75	13.67	53402	111.13	3.67
20657	48.75	2.00	51067	24.90	29.00	51651	154.75	8.67	51704	162.75	3.67	52288	234.75	15.33	53403	111.13	5.33
20658	46.75	2.00	51068	22.95	29.00	51652	154.75	10.33	51705	162.75	5.33	52289	234.75	17.00	53404	111.13	7.00
20659	44.75	2.00	51069	21.00	29.00	51653	154.75	12.00	51706	162.75	7.00	52290	234.75	18.67	53405	111.13	8.67
20660	42.75	2.00	51070	19.05	29.00	51654	154.75	13.67	51707	162.75	8.67	52291	234.75	20.33	53406	111.13	10.33
20661	40.75	2.00	51071	17.10	29.00	51655	154.75	15.33	51708	162.75	10.33	52292	234.75	22.00	53407	111.13	12.00
20662	38.75	2.00	51072	15.15	29.00	51656	154.75	17.00	51709	162.75	12.00	52293	234.75	23.67	53408	111.13	13.67
20663	36.75	2.00	51073	13.20	29.00	51657	154.75	18.67	51710	162.75	13.67	52294	234.75	25.33	53409	111.13	15.33
20664	34.75	2.00	51074	11.25	29.00	51658	154.75	20.33	51711	162.75	15.33	52295	236.75	3.67	53410	111.13	17.00
20665	32.75	2.00	51075	9.30	29.00	51659	154.75	22.00	51712	162.75	17.00	52296	236.75	5.33	53411	111.13	18.67
20666	30.75	1.00	51076	7.35	29.00	51660	154.75	23.67	51713	162.75	18.67	52297	236.75	7.00	53412	111.13	20.33
20667	32.75	1.00	51077	5.40	29.00	51661	154.75	25.33	51714	162.75	20.33	52298	236.75	8.67	53413	111.13	22.00
20668	34.75	1.00	51078	3.45	29.00	51662	156.75	3.67	51715	162.75	22.00	52299	236.75	10.33	53414	111.13	23.67
20669	36.75	1.00	51079	1.50	27.00	51663	156.75	5.33	51716	162.75	23.67	52300	236.75	12.00	53415	111.13	25.33
20670	38.75	1.00	51080	1.50	28.00	51664	156.75	7.00	51717	162.75	25.33	52301	236.75	13.67	53416	113.05	3.67
20671	40.75	1.00	51081	3.45	27.00	51665	156.75	8.67	51718	164.75	3.67	52302	236.75	15.33	53417	113.05	5.33
20672	42.75	1.00	51082	5.40	27.00	51666	156.75	10.33	51719	164.75	5.33	52303	236.75	17.00	53418	113.05	7.00
20673	44.75	1.00	51083	7.35	27.00	51667	156.75	12.00	51720	164.75	7.00	52304	236.75	18.67	53419	113.05	8.67
20674	46.75	1.00	51084	9.30	27.00	51668	156.75	13.67	51721	164.75	8.67	52305	236.75	20.33	53420	113.05	10.33
20675	48.75	1.00	51085	11.25	27.00	51669	156.75	15.33	51722	164.75	10.33	52306	236.75	22.00	53421	113.05	12.00
20676	50.75	1.00	51086	13.20	27.00	51670	156.75	17.00	51723	164.75	12.00	52307	236.75	23.67	53422	113.05	13.67
20677	52.75	1.00	51087	15.15	27.00	51671	156.75	18.67	51724	164.75	13.67	52308	236.75	25.33	53423	113.05	15.33
20678	54.75	1.00	5108														

20691	78.75	0.00	51101	17.10	28.00	52384	64.75	12.00	51738	166.75	13.67	52322	238.75	25.33	53437	114.98	15.33
20692	80.75	0.00	51102	15.15	28.00	52385	64.75	13.67	51739	166.75	15.33	52323	90.75	3.67	53438	114.98	17.00
20693	82.75	0.00	51103	13.20	28.00	52386	64.75	15.33	51740	166.75	17.00	52324	90.75	5.33	53439	114.98	18.67
20694	84.75	0.00	51104	11.25	28.00	52387	64.75	17.00	51741	166.75	18.67	52325	90.75	7.00	53440	114.98	20.33
20695	86.75	0.00	51105	9.30	28.00	52388	64.75	18.67	51742	166.75	20.33	52326	90.75	8.67	53441	114.98	22.00
20696	88.75	0.00	51106	7.35	28.00	52389	64.75	20.33	51743	166.75	22.00	52327	90.75	10.33	53442	114.98	23.67
20697	90.75	2.00	51107	5.40	28.00	52390	64.75	22.00	51744	166.75	23.67	52328	90.75	12.00	53443	114.98	25.33
20698	90.75	1.00	51108	3.45	28.00	52391	64.75	23.67	51745	166.75	25.33	52329	90.75	13.67	53444	116.90	3.67
20699	60.75	2.00	51109	30.75	3.67	52392	64.75	25.33	51746	168.75	3.67	52330	90.75	15.33	53445	116.90	5.33
20700	88.75	2.00	51110	30.75	5.33	52393	66.75	3.67	51747	168.75	5.33	52331	90.75	17.00	53446	116.90	7.00
20701	86.75	2.00	51111	30.75	7.00	52394	66.75	5.33	51748	168.75	7.00	52332	90.75	18.67	53447	116.90	8.67
20702	84.75	2.00	51112	30.75	8.67	52395	66.75	7.00	51749	168.75	8.67	52333	90.75	20.33	53448	116.90	10.33
20703	82.75	2.00	51113	30.75	10.33	52396	66.75	8.67	51750	168.75	10.33	52334	90.75	22.00	53449	116.90	12.00
20704	80.75	2.00	51114	30.75	12.00	52397	66.75	10.33	51751	168.75	12.00	52335	90.75	23.67	53450	116.90	13.67
20705	78.75	2.00	51115	30.75	13.67	52398	66.75	12.00	51752	168.75	13.67	52336	90.75	25.33	53451	116.90	15.33
20706	76.75	2.00	51116	30.75	15.33	52399	66.75	13.67	51753	168.75	15.33	52337	62.75	27.00	53452	116.90	17.00
20707	74.75	2.00	51117	30.75	17.00	52400	66.75	15.33	51754	168.75	17.00	52338	64.75	27.00	53453	116.90	18.67
20708	72.75	2.00	51118	30.75	18.67	52401	66.75	17.00	51755	168.75	18.67	52339	66.75	27.00	53454	116.90	20.33
20709	70.75	2.00	51119	30.75	20.33	52402	66.75	18.67	51756	168.75	20.33	52340	68.75	27.00	53455	116.90	22.00
20710	68.75	2.00	51120	30.75	22.00	52403	66.75	20.33	51757	168.75	22.00	52341	70.75	27.00	53456	116.90	23.67
20711	66.75	2.00	51121	30.75	23.67	52404	66.75	22.00	51758	168.75	23.67	52342	72.75	27.00	53457	116.90	25.33
20712	64.75	2.00	51122	30.75	25.33	52405	66.75	23.67	51759	168.75	25.33	52343	74.75	27.00	53458	118.83	3.67
20713	62.75	2.00	51123	1.50	3.67	52406	66.75	25.33	51760	170.75	3.67	52344	76.75	27.00	53459	118.83	5.33
20714	60.75	1.00	51124	1.50	5.33	52407	68.75	3.67	51761	170.75	5.33	52345	78.75	27.00	53460	118.83	7.00
20715	62.75	1.00	51125	1.50	7.00	52408	68.75	5.33	51762	170.75	7.00	52346	80.75	27.00	53461	118.83	8.67
20716	64.75	1.00	51126	1.50	8.67	52409	68.75	7.00	51763	170.75	8.67	52347	82.75	27.00	53462	118.83	10.33
20717	66.75	1.00	51127	1.50	10.33	52410	68.75	8.67	51764	170.75	10.33	52348	84.75	27.00	53463	118.83	12.00
20718	68.75	1.00	51128	1.50	12.00	52411	68.75	10.33	51765	170.75	12.00	52349	86.75	27.00	53464	118.83	13.67
20719	70.75	1.00	51129	1.50	13.67	52412	68.75	12.00	51766	170.75	13.67	52350	88.75	27.00	53465	118.83	15.33
20720	72.75	1.00	51130	1.50	15.33	52413	68.75	13.67	51767	170.75	15.33	52351	60.75	3.67	53466	118.83	17.00
20721	74.75	1.00	51131	1.50	17.00	52414	68.75	15.33	51768	170.75	17.00	52352	60.75	5.33	53467	118.83	18.67
20722	76.75	1.00	51132	1.50	18.67	52415	68.75	17.00	51769	170.75	18.67	52353	60.75	7.00	53468	118.83	20.33
20723	78.75	1.00	51133	1.50	20.33	52416	68.75	18.67	51770	170.75	20.33	52354	60.75	8.67	53469	118.83	22.00
20724	80.75	1.00	51134	1.50	22.00	52417	68.75	20.33	51771	170.75	22.00	52355	60.75	10.33	53470	118.83	23.67
20725	82.75	1.00	51135	1.50	23.67	52418	68.75	22.00	51772	170.75	23.67	52356	60.75	12.00	53471	118.83	25.33
20726	84.75	1.00	51136	1.50	25.33	52419	68.75	23.67	51773	170.75	25.33	52357	60.75	13.67	53472	150.75	29.00
20727	86.75	1.00	51137	3.45	3.67	52420	68.75	25.33	51774	172.75	3.67	52358	60.75	15.33	53473	150.75	28.00
20728	88.75	1.00	51138	3.45	5.33	52421	70.75	3.67	51775	172.75	5.33	52359	60.75	17.00	53474	120.75	29.00
20729	210.75	0.00	51139	3.45	7.00	52422	70.75	5.33	51776	172.75	7.00	52360	60.75	18.67	53475	122.75	29.00
20730	203.35	0.00	51140	3.45	8.67	52423	70.75	7.00	51777	172.75	8.67	52361	60.75	20.33	53476	122.75	29.00
20731	205.20	0.00	51141	3.45	10.33	52424	70.75	8.67	51778	172.75	10.33	52362	60.75	22.00	53477	126.75	29.00
20732	207.05	0.00	51142	3.45	12.00	52425	70.75	10.33	51779	172.75	12.00	52363	60.75	23.67	53478	128.75	29.00
20733	208.90	0.00	51143	3.45	13.67	52426	70.75	12.00	51780	172.75	13.67	52364	60.75	25.33	53479	130.75	29.00
20734	210.75	2.00	51144	3.45	15.33	52427	70.75	13.67	51781	172.75	15.33	52365	62.75	3.67	53480	132.75	29.00
20735	210.75	1.00	51145	3.45	17.00	52428	70.75	15.33	51782	172.75	17.00	52366	62.75	5.33	53481	134.75	29.00
20736	203.35	2.00	51146	3.45	18.67	52429	70.75	17.00	51783	172.75	18.67	52367	62.75	7.00	53482	136.75	29.00
20737	205.20	2.00	51147	3.45	20.33	52430	70.75	18.67	51784	172.75	20.33	52368	62.75	8.67	53483	138.75	29.00
20738	207.05	2.00	51148	3.45	22.00	52431	70.75	20.33	51785	172.75	22.00	52369	62.75	10.33	53484	140.75	29.00
20739	208.90	2.00	51149	3.45	23.67	52432	70.75	22.00	51786	172.75	23.67	52370	62.75	12.00	53485	142.75	29.00
20740	203.35	1.00	51150	3.45	25.33	52433	70.75	23.67	51787	172.75	25.33	52371	62.75	13.67	53486	144.75	29.00
20741	205.20	1.00	51151	5.40	3.67	52434	70.75	25.33	51788	174.75	3.67	52372	62.75	15.33	53487	146.75	29.00
20742	207.05	1.00	51152	5.40	5.33	52435	72.75	3.67	51789	174.75	5.33	52373	62.75	17.00	53488	148.75	29.00
20743	208.90	1.00	51153	5.40	7.00	52436	72.75	5.33	51790	174.75	7.00	52374	62.75	18.67	53489	120.75	28.00
20744	120.75	0.00	51154	5.40	8.67	52437	72.75	7.00	51791	174.75	8.67	52375	62.75	20.33	53490	148.75	28.00
20745	150.75	0.00	51155	5.40	10.33	52438	72.75	8.67	51792	174.75	10.33	52376	62.75	22.00	53491	146.75	28.00
20746	122.75	0.00	51156	5.40	12.00	52439	72.75	10.33	51793	174.75	12.00	52377	62.75	23.67	53492	144.75	28.00
20747	124.75	0.00	51157	5.40	13.67	52440	72.75	12.00	51794	174.75	13.67	52378	62.75	25.33	53493	142.75	28.00
20748	126.75	0.00	51158	5.40	15.33	52441	72.75	13.67	51795	174.75	15.33	52379	64.75	3.67	53494	140.75	28.00
20749	128.75	0.00	51159	5.40	17.00	52442	72.75	15.33	51796	174.75	17.00	52380	64.75	5.33	53495	138.75	28.00
20750	130.75	0.00	51160	5.40	18.67	52443	72.75	17.00	51797	174.75	18.67	52381	64.75	7.00	53496	136.75	28.00
20751	132.75	0.00	51161	5.40	20.33	52444	72.75	18.67	51798	174.75	20.33	52913	282.45	3.67	53497	134.75	28.00
20752	134.75	0.00	51162	5.40	22.00	52445	72.75	20.33	51799	174.75	22.00	52914	282.45	5.33	53498	132.75	28.00
20753	136.75	0.00	51163	5.40	23.67	52446	72.75	22.00	51800	174.75	23.67	52915	282.45	7.00	53499	130.75	28.00
20754	138.75	0.00	51164	5.40	25.33	52447	72.75	23.67	51801	174.75	25.33	52916	282.45	8.67	53500	128.75	28.00
20755	140.75	0.00	51165	7.35	3.67	52448	72.75	25.33	51802	176.75	3.67	52917	282.45	10.33	53501	126.75	28.00
20756	142.75	0.00	51166	7.35	5.33	52449	74.75	3.67	51803	176.75	5.33	52918	282.45	12.00	53502	124.75	28

20769	136.75	2.00	51179	9.30	3.67	52462	74.75	25.33	51816	178.75	3.67	52931	284.40	10.33	53515	170.75	29.00
20770	134.75	2.00	51180	9.30	5.33	52463	76.75	3.67	51817	178.75	5.33	52932	284.40	12.00	53516	172.75	29.00
20771	132.75	2.00	51181	9.30	7.00	52464	76.75	5.33	51818	178.75	7.00	52933	284.40	13.67	53517	174.75	29.00
20772	130.75	2.00	51182	9.30	8.67	52465	76.75	7.00	51819	178.75	8.67	52934	284.40	15.33	53518	176.75	29.00
20773	128.75	2.00	51183	9.30	10.33	52466	76.75	8.67	51820	178.75	10.33	52935	284.40	17.00	53519	178.75	29.00
20774	126.75	2.00	51184	9.30	12.00	52467	76.75	10.33	51821	178.75	12.00	52936	284.40	18.67	53520	178.75	28.00
20775	124.75	2.00	51185	9.30	13.67	52468	76.75	12.00	51822	178.75	13.67	52937	284.40	20.33	53521	176.75	28.00
20776	122.75	2.00	51186	9.30	15.33	52469	76.75	13.67	51823	178.75	15.33	52938	284.40	22.00	53522	174.75	28.00
20777	120.75	1.00	51187	9.30	17.00	52470	76.75	15.33	51824	178.75	17.00	52939	284.40	23.67	53523	172.75	28.00
20778	122.75	1.00	51188	9.30	18.67	52471	76.75	17.00	51825	178.75	18.67	52940	284.40	25.33	53524	170.75	28.00
20779	124.75	1.00	51189	9.30	20.33	52472	76.75	18.67	51826	178.75	20.33	52941	286.35	3.67	53525	188.75	28.00
20780	126.75	1.00	51190	9.30	22.00	52473	76.75	20.33	51827	178.75	22.00	52942	286.35	5.33	53526	166.75	28.00
20781	123.75	1.00	51191	9.30	23.67	52474	76.75	22.00	51828	178.75	23.67	52943	286.35	7.00	53527	164.75	28.00
20782	130.75	1.00	51192	9.30	25.33	52475	76.75	23.67	51829	178.75	25.33	52944	286.35	8.67	53528	162.75	28.00
20783	132.75	1.00	51193	11.25	3.67	52476	76.75	25.33	51830	200.00	27.00	52945	286.35	10.33	53529	160.75	28.00
20784	134.75	1.00	51194	11.25	5.33	52477	78.75	3.67	51831	200.00	3.67	52946	286.35	12.00	53530	158.75	28.00
20785	136.75	1.00	51195	11.25	7.00	52478	78.75	5.33	51832	200.00	5.33	52947	286.35	13.67	53531	156.75	28.00
20786	133.75	1.00	51196	11.25	8.67	52479	78.75	7.00	51833	200.00	7.00	52948	286.35	15.33	53532	154.75	28.00
20787	140.75	1.00	51197	11.25	10.33	52480	78.75	8.67	51834	200.00	8.67	52949	286.35	17.00	53533	152.75	28.00
20788	142.75	1.00	51198	11.25	12.00	52481	78.75	10.33	51835	200.00	10.33	52950	286.35	18.67	53534	100.00	3.67
20789	144.75	1.00	51199	11.25	13.67	52482	78.75	12.00	51836	200.00	12.00	52951	286.35	20.33	53535	100.00	5.33
20790	146.75	1.00	51200	11.25	15.33	52483	78.75	13.67	51837	200.00	13.67	52952	286.35	22.00	53536	100.00	7.00
20791	148.75	1.00	51201	11.25	17.00	52484	78.75	15.33	51838	200.00	15.33	52953	286.35	23.67	53537	100.00	8.67
20792	150.75	0.00	51202	11.25	18.67	52485	78.75	17.00	51839	200.00	17.00	52954	286.35	25.33	53538	100.00	10.33
20793	160.75	0.00	51203	11.25	20.33	52486	78.75	18.67	51840	200.00	18.67	52955	288.30	3.67	53539	100.00	12.00
20794	152.75	0.00	51204	11.25	22.00	52487	78.75	20.33	51841	200.00	20.33	52956	288.30	5.33	53540	100.00	13.67
20795	154.75	0.00	51205	11.25	23.67	52488	78.75	22.00	51842	200.00	22.00	52957	288.30	7.00	53541	100.00	15.33
20796	156.75	0.00	51206	11.25	25.33	52489	78.75	23.67	51843	200.00	23.67	52958	288.30	8.67	53542	100.00	17.00
20797	158.75	0.00	51207	13.20	3.67	52490	78.75	25.33	51844	200.00	25.33	52959	288.30	10.33	53543	100.00	18.67
20798	160.75	0.00	51208	13.20	5.33	52491	80.75	3.67	51845	182.68	27.00	52960	288.30	12.00	53544	100.00	20.33
20799	162.75	0.00	51209	13.20	7.00	52492	80.75	5.33	51846	184.60	27.00	52961	288.30	13.67	53545	100.00	22.00
20800	164.75	0.00	51210	13.20	8.67	52493	80.75	7.00	51847	186.53	27.00	52962	288.30	15.33	53546	100.00	23.67
20801	166.75	0.00	51211	13.20	10.33	52494	80.75	8.67	51848	188.45	27.00	52963	288.30	17.00	53547	100.00	25.33
20802	168.75	0.00	51212	13.20	12.00	52495	80.75	10.33	51849	190.38	27.00	52964	288.30	18.67	53548	90.75	3.67
20803	170.75	0.00	51213	13.20	13.67	52496	80.75	12.00	51850	192.30	27.00	52965	288.30	20.33	53549	90.75	5.33
20804	172.75	0.00	51214	13.20	15.33	52497	80.75	13.67	51851	194.23	27.00	52966	288.30	22.00	53550	90.75	7.00
20805	174.75	0.00	51215	13.20	17.00	52498	80.75	15.33	51852	196.15	27.00	52967	288.30	23.67	53551	90.75	8.67
20806	176.75	0.00	51216	13.20	18.67	52499	80.75	17.00	51853	198.08	27.00	52968	288.30	25.33	53552	90.75	10.33
20807	178.75	0.00	51217	13.20	20.33	52500	80.75	18.67	51854	180.75	3.67	52969	290.25	3.67	53553	90.75	12.00
20808	180.75	2.00	51218	13.20	22.00	52501	80.75	20.33	51855	180.75	5.33	52970	290.25	5.33	53554	90.75	13.67
20809	180.75	1.00	51219	13.20	23.67	52502	80.75	22.00	51856	180.75	7.00	52971	290.25	7.00	53555	90.75	15.33
20810	150.75	2.00	51220	13.20	25.33	52503	80.75	23.67	51857	180.75	8.67	52972	290.25	8.67	53556	90.75	17.00
20811	178.75	2.00	51221	15.15	3.67	52504	80.75	25.33	51858	180.75	10.33	52973	290.25	10.33	53557	90.75	18.67
20812	176.75	2.00	51222	15.15	5.33	52505	82.75	3.67	51859	180.75	12.00	52974	290.25	12.00	53558	90.75	20.33
20813	174.75	2.00	51223	15.15	7.00	52506	82.75	5.33	51860	180.75	13.67	52975	290.25	13.67	53559	90.75	22.00
20814	172.75	2.00	51224	15.15	8.67	52507	82.75	7.00	51861	180.75	15.33	52976	290.25	15.33	53560	90.75	23.67
20815	170.75	2.00	51225	15.15	10.33	52508	82.75	8.67	51862	180.75	17.00	52977	290.25	17.00	53561	90.75	25.33
20816	168.75	2.00	51226	15.15	12.00	52509	82.75	10.33	51863	180.75	18.67	52978	290.25	18.67	53562	92.60	3.67
20817	166.75	2.00	51227	15.15	13.67	52510	82.75	12.00	51864	180.75	20.33	52979	290.25	20.33	53563	92.60	5.33
20818	164.75	2.00	51228	15.15	15.33	52511	82.75	13.67	51865	180.75	22.00	52980	290.25	22.00	53564	92.60	7.00
20819	162.75	2.00	51229	15.15	17.00	52512	82.75	15.33	51866	180.75	23.67	52981	290.25	23.67	53565	92.60	8.67
20820	160.75	2.00	51230	15.15	18.67	52513	82.75	17.00	51867	180.75	25.33	52982	290.25	25.33	53566	92.60	10.33
20821	158.75	2.00	51231	15.15	20.33	52514	82.75	18.67	51868	182.68	3.67	52983	292.20	3.67	53567	92.60	12.00
20822	156.75	2.00	51232	15.15	22.00	52515	82.75	20.33	51869	182.68	5.33	52984	292.20	5.33	53568	92.60	13.67
20823	154.75	2.00	51233	15.15	23.67	52516	82.75	22.00	51870	182.68	7.00	52985	292.20	7.00	53569	92.60	15.33
20824	152.75	2.00	51234	15.15	25.33	52517	82.75	23.67	51871	182.68	8.67	52986	292.20	8.67	53570	92.60	17.00
20825	150.75	1.00	51235	17.10	3.67	52518	82.75	25.33	51872	182.68	10.33	52987	292.20	10.33	53571	92.60	18.67
20826	152.75	1.00	51236	17.10	5.33	52519	84.75	3.67	51873	182.68	12.00	52988	292.20	12.00	53572	92.60	20.33
20827	154.75	1.00	51237	17.10	7.00	52520	84.75	5.33	51874	182.68	13.67	52989	292.20	13.67	53573	92.60	22.00
20828	156.75	1.00	51238	17.10	8.67	52521	84.75	7.00	51875	182.68	15.33	52990	292.20	15.33	53574	92.60	23.67
20829	158.75	1.00	51239	17.10	10.33	52522	84.75	8.67	51876	182.68	17.00	52991	292.20	17.00	53575	92.60	25.33
20830	160.75	1.00	51240	17.10	12.00	52523	84.75	10.33	51877	182.68	18.67	52992	292.20	18.67	53576	94.45	3.67
20831	162.75	1.00	51241	17.10	13.67	52524	84.75	12.00	51878	182.68	20.33	52993	292.20	20.33	53577	94.45	5.33
20832	164.75	1.00	51242	17.10	15.33	52525	84.75	13.67	51879	182.68	22.00	52994	292.20	22.00	53578	94.45	7.00
20833	166.75	1.00	51243	17.10	17.00	52526	84.75	15.33	51880	182.68	23.67	52995	292.20	23.67	53579	94.45	8.67
20834	168.75	1.00	51244	17.10	18.67	52527	84.75	17.0									

20847	194.23	0.00	51257	19.05	17.00	52540	86.75	15.33	51894	184.60	23.67	53009	294.15	23.67	53593	96.30	8.67
20848	196.15	0.00	51258	19.05	18.67	52541	86.75	17.00	51895	184.60	25.33	53010	294.15	25.33	53594	96.30	10.33
20849	198.08	0.00	51259	19.05	20.33	52542	86.75	18.67	51896	186.53	3.67	53011	296.10	3.67	53595	96.30	12.00
20850	180.75	2.00	51260	19.05	22.00	52543	86.75	20.33	51897	186.53	5.33	53012	296.10	5.33	53596	96.30	13.67
20851	198.08	2.00	51261	19.05	23.67	52544	86.75	22.00	51898	186.53	7.00	53013	296.10	7.00	53597	96.30	15.33
20852	196.15	2.00	51262	19.05	25.33	52545	86.75	23.67	51899	186.53	8.67	53014	296.10	8.67	53598	96.30	17.00
20853	194.23	2.00	51263	21.00	3.67	52546	86.75	25.33	51900	186.53	10.33	53015	296.10	10.33	53599	96.30	18.67
20854	192.30	2.00	51264	21.00	5.33	52547	88.75	3.67	51901	186.53	12.00	53016	296.10	12.00	53600	96.30	20.33
20855	190.38	2.00	51265	21.00	7.00	52548	88.75	5.33	51902	186.53	13.67	53017	296.10	13.67	53601	96.30	22.00
20856	188.45	2.00	51266	21.00	8.67	52549	88.75	7.00	51903	186.53	15.33	53018	296.10	15.33	53602	96.30	23.67
20857	186.53	2.00	51267	21.00	10.33	52550	88.75	8.67	51904	186.53	17.00	53019	296.10	17.00	53603	96.30	25.33
20858	184.60	2.00	51268	21.00	12.00	52551	88.75	10.33	51905	186.53	18.67	53020	296.10	18.67	53604	98.15	3.67
20859	182.68	2.00	51269	21.00	13.67	52552	88.75	12.00	51906	186.53	20.33	53021	296.10	20.33	53605	98.15	5.33
20860	180.75	1.00	51270	21.00	15.33	52553	88.75	13.67	51907	186.53	22.00	53022	296.10	22.00	53606	98.15	7.00
20861	182.68	1.00	51271	21.00	17.00	52554	88.75	15.33	51908	186.53	23.67	53023	296.10	23.67	53607	98.15	8.67
20862	184.60	1.00	51272	21.00	18.67	52555	88.75	17.00	51909	186.53	25.33	53024	296.10	25.33	53608	98.15	10.33
20863	186.53	1.00	51273	21.00	20.33	52556	88.75	18.67	51910	188.45	3.67	53025	298.05	3.67	53609	98.15	12.00
20864	188.45	1.00	51274	21.00	22.00	52557	88.75	20.33	51911	188.45	5.33	53026	298.05	5.33	53610	98.15	13.67
20865	190.38	1.00	51275	21.00	23.67	52558	88.75	22.00	51912	188.45	7.00	53027	298.05	7.00	53611	98.15	15.33
20866	192.30	1.00	51276	21.00	25.33	52559	88.75	23.67	51913	188.45	8.67	53028	298.05	8.67	53612	98.15	17.00
20867	194.23	1.00	51277	22.95	3.67	52560	88.75	25.33	51914	188.45	10.33	53029	298.05	10.33	53613	98.15	18.67
20868	196.15	1.00	51278	22.95	5.33	52561	270.75	27.00	51915	188.45	12.00	53030	298.05	12.00	53614	98.15	20.33
20869	198.08	1.00	51279	22.95	7.00	52562	270.75	3.67	51916	188.45	13.67	53031	298.05	13.67	53615	98.15	22.00
20870	210.75	0.00	51280	22.95	8.67	52563	270.75	5.33	51917	188.45	15.33	53032	298.05	15.33	53616	98.15	23.67
20871	240.75	0.00	51281	22.95	10.33	52564	270.75	7.00	51918	188.45	17.00	53033	298.05	17.00	53617	98.15	25.33
20872	212.75	0.00	51282	22.95	12.00	52565	270.75	8.67	51919	188.45	18.67	53034	298.05	18.67	53618	101.50	29.00
20873	214.75	0.00	51283	22.95	13.67	52566	270.75	10.33	51920	188.45	20.33	53035	298.05	20.33	53619	118.83	29.00
20874	216.75	0.00	51284	22.95	15.33	52567	270.75	12.00	51921	188.45	22.00	53036	298.05	22.00	53620	116.90	29.00
20875	218.75	0.00	51285	22.95	17.00	52568	270.75	13.67	51922	188.45	23.67	53037	298.05	23.67	53621	114.98	29.00
20876	220.75	0.00	51286	22.95	18.67	52569	270.75	15.33	51923	188.45	25.33	53038	298.05	25.33	53622	113.05	29.00
20877	222.75	0.00	51287	22.95	20.33	52570	270.75	17.00	51924	190.38	3.67	53039	60.75	29.00	53623	111.13	29.00
20878	224.75	0.00	51288	22.95	22.00	52571	270.75	18.67	51925	190.38	5.33	53040	62.75	29.00	53624	109.20	29.00
20879	226.75	0.00	51289	22.95	23.67	52572	270.75	20.33	51926	190.38	7.00	53041	64.75	29.00	53625	107.28	29.00
20880	228.75	0.00	51290	22.95	25.33	52573	270.75	22.00	51927	190.38	8.67	53042	66.75	29.00	53626	105.35	29.00
20881	230.75	0.00	51291	24.90	3.67	52574	270.75	23.67	51928	190.38	10.33	53043	68.75	29.00	53627	103.43	29.00
20882	232.75	0.00	51292	24.90	5.33	52575	270.75	25.33	51929	190.38	12.00	53044	70.75	29.00	53628	101.50	28.00
20883	234.75	0.00	51293	24.90	7.00	52576	242.75	27.00	51930	190.38	13.67	53045	72.75	29.00	53629	118.83	28.00
20884	236.75	0.00	51294	24.90	8.67	52577	244.75	27.00	51931	190.38	15.33	53046	74.75	29.00	53630	116.90	28.00
20885	238.75	0.00	51295	24.90	10.33	52578	246.75	27.00	51932	190.38	17.00	53047	76.75	29.00	53631	114.98	28.00
20886	240.75	2.00	51296	24.90	12.00	52579	248.75	27.00	51933	190.38	18.67	53048	78.75	29.00	53632	113.05	28.00
20887	240.75	1.00	51297	24.90	13.67	52580	250.75	27.00	51934	190.38	20.33	53049	80.75	29.00	53633	111.13	28.00
20888	210.75	2.00	51298	24.90	15.33	52581	252.75	27.00	51935	190.38	22.00	53050	82.75	29.00	53634	109.20	28.00
20889	238.75	2.00	51299	24.90	17.00	52582	254.75	27.00	51936	190.38	23.67	53051	84.75	29.00	53635	107.28	28.00
20890	236.75	2.00	51300	24.90	18.67	52583	256.75	27.00	51937	190.38	25.33	53052	86.75	29.00	53636	105.35	28.00
20891	234.75	2.00	51301	24.90	20.33	52584	258.75	27.00	51938	192.30	3.67	53053	88.75	29.00	53637	103.43	28.00
20892	232.75	2.00	51302	24.90	22.00	52585	260.75	27.00	51939	192.30	5.33	53054	60.75	28.00	53638	240.75	29.00
20893	230.75	2.00	51303	24.90	23.67	52586	262.75	27.00	51940	192.30	7.00	53055	88.75	28.00	53639	240.75	28.00
20894	228.75	2.00	51304	24.90	25.33	52587	264.75	27.00	51941	192.30	8.67	53056	86.75	28.00	53640	210.75	29.00
20895	226.75	2.00	51305	26.85	3.67	52588	266.75	27.00	51942	192.30	10.33	53057	84.75	28.00	53641	212.75	29.00
20896	224.75	2.00	51306	26.85	5.33	52589	268.75	27.00	51943	192.30	12.00	53058	82.75	28.00	53642	214.75	29.00
20897	222.75	2.00	51307	26.85	7.00	52590	240.75	3.67	51944	192.30	13.67	53059	80.75	28.00	53643	216.75	29.00
20898	220.75	2.00	51308	26.85	8.67	52591	240.75	5.33	51945	192.30	15.33	53060	78.75	28.00	53644	218.75	29.00
20899	218.75	2.00	51309	26.85	10.33	52592	240.75	7.00	51946	192.30	17.00	53061	76.75	28.00	53645	220.75	29.00
20900	216.75	2.00	51310	26.85	12.00	52593	240.75	8.67	51947	192.30	18.67	53062	74.75	28.00	53646	222.75	29.00
20901	214.75	2.00	51311	26.85	13.67	52594	240.75	10.33	51948	192.30	20.33	53063	72.75	28.00	53647	224.75	29.00
20902	212.75	2.00	51312	26.85	15.33	52595	240.75	12.00	51949	192.30	22.00	53064	70.75	28.00	53648	226.75	29.00
20903	210.75	1.00	51313	26.85	17.00	52596	240.75	13.67	51950	192.30	23.67	53065	68.75	28.00	53649	228.75	29.00
20904	212.75	1.00	51314	26.85	18.67	52597	240.75	15.33	51951	192.30	25.33	53066	66.75	28.00	53650	230.75	29.00
20905	214.75	1.00	51315	26.85	20.33	52598	240.75	17.00	51952	194.23	3.67	53067	64.75	28.00	53651	232.75	29.00
20906	216.75	1.00	51316	26.85	22.00	52599	240.75	18.67	51953	194.23	5.33	53068	62.75	28.00	53652	234.75	29.00
20907	218.75	1.00	51317	26.85	23.67	52600	240.75	20.33	51954	194.23	7.00	53069	150.75	3.67	53653	236.75	29.00
20908	220.75	1.00	51318	26.85	25.33	52601	240.75	22.00	51955	194.23	8.67	53070	150.75	5.33	53654	238.75	29.00
20909	222.75	1.00	51319	28.80	3.67	52602	240.75	23.67	51956	194.23	10.33	53071	150.75	7.00	53655	210.75	28.00
20910	224.75	1.00	51320	28.80	5.33	52603	240.75	25.33	51957	194.23	12.00	53072	150.75	8.67	53656	238.75	28.00
20911	226.75	1.00	51321	28.80	7.00	52604	242.75	3.67	51958	194.23	13.67	53073	150.75	10.33	53657	236.75	28.00
20912	228.75	1.00															

20925	252.75	0.00	51335	100.00	28.00	52618	244.75	3.67	51972	196.15	13.67	53087	128.75	27.00	53671	270.75	28.00
20926	254.75	0.00	51336	90.75	29.00	52619	244.75	5.33	51973	196.15	15.33	53088	130.75	27.00	53672	242.75	29.00
20927	256.75	0.00	51337	98.15	29.00	52620	244.75	7.00	51974	196.15	17.00	53089	132.75	27.00	53673	244.75	29.00
20928	258.75	0.00	51338	96.30	29.00	52621	244.75	8.67	51975	196.15	18.67	53090	134.75	27.00	53674	246.75	29.00
20929	260.75	0.00	51339	94.45	29.00	52622	244.75	10.33	51976	196.15	20.33	53091	136.75	27.00	53675	248.75	29.00
20930	262.75	0.00	51340	92.60	29.00	52623	244.75	12.00	51977	196.15	22.00	53092	138.75	27.00	53676	250.75	29.00
20931	264.75	0.00	51341	90.75	27.00	52624	244.75	13.67	51978	196.15	23.67	53093	140.75	27.00	53677	252.75	29.00
20932	266.75	0.00	51342	90.75	28.00	52625	244.75	15.33	51979	196.15	25.33	53094	142.75	27.00	53678	254.75	29.00
20933	268.75	0.00	51343	92.60	27.00	52626	244.75	17.00	51980	198.08	3.67	53095	144.75	27.00	53679	256.75	29.00
20934	270.75	2.00	51344	94.45	27.00	52627	244.75	18.67	51981	198.08	5.33	53096	146.75	27.00	53680	258.75	29.00
20935	270.75	1.00	51345	96.30	27.00	52628	244.75	20.33	51982	198.08	7.00	53097	148.75	27.00	53681	260.75	29.00
20936	240.75	2.00	51346	98.15	27.00	52629	244.75	22.00	51983	198.08	8.67	53098	120.75	3.67	53682	262.75	29.00
20937	268.75	2.00	51347	98.15	28.00	52630	244.75	23.67	51984	198.08	10.33	53099	120.75	5.33	53683	264.75	29.00
20938	266.75	2.00	51348	96.30	28.00	52631	244.75	25.33	51985	198.08	12.00	53100	120.75	7.00	53684	266.75	29.00
20939	264.75	2.00	51349	94.45	28.00	52632	246.75	3.67	51986	198.08	13.67	53101	120.75	8.67	53685	268.75	29.00
20940	262.75	2.00	51350	92.60	28.00	52633	246.75	5.33	51987	198.08	15.33	53102	120.75	10.33	53686	268.75	28.00
20941	260.75	2.00	51351	60.75	27.00	52634	246.75	7.00	51988	198.08	17.00	53103	120.75	12.00	53687	266.75	28.00
20942	258.75	2.00	51352	60.75	3.67	52635	246.75	8.67	51989	198.08	18.67	53104	120.75	13.67	53688	264.75	28.00
20943	256.75	2.00	51353	60.75	5.33	52636	246.75	10.33	51990	198.08	20.33	53105	120.75	15.33	53689	262.75	28.00
20944	254.75	2.00	51354	60.75	7.00	52637	246.75	12.00	51991	198.08	22.00	53106	120.75	17.00	53690	260.75	28.00
20945	252.75	2.00	51355	60.75	8.67	52638	246.75	13.67	51992	198.08	23.67	53107	120.75	18.67	53691	258.75	28.00
20946	250.75	2.00	51356	60.75	10.33	52639	246.75	15.33	51993	198.08	25.33	53108	120.75	20.33	53692	256.75	28.00
20947	248.75	2.00	51357	60.75	12.00	52640	246.75	17.00	51994	210.75	27.00	53109	120.75	22.00	53693	254.75	28.00
20948	246.75	2.00	51358	60.75	13.67	52641	246.75	18.67	51995	210.75	3.67	53110	120.75	23.67	53694	252.75	28.00
20949	244.75	2.00	51359	60.75	15.33	52642	246.75	20.33	51996	210.75	5.33	53111	120.75	25.33	53695	250.75	28.00
20950	242.75	2.00	51360	60.75	17.00	52643	246.75	22.00	51997	210.75	7.00	53112	122.75	3.67	53696	248.75	28.00
20951	240.75	1.00	51361	60.75	18.67	52644	246.75	23.67	51998	210.75	8.67	53113	122.75	5.33	53697	246.75	28.00
20952	242.75	1.00	51362	60.75	20.33	52645	246.75	25.33	51999	210.75	10.33	53114	122.75	7.00	53698	244.75	28.00
20953	244.75	1.00	51363	60.75	22.00	52646	248.75	3.67	52000	210.75	12.00	53115	122.75	8.67	53699	242.75	28.00
20954	246.75	1.00	51364	60.75	23.67	52647	248.75	5.33	52001	210.75	13.67	53116	122.75	10.33	53700	300.00	29.00
20955	248.75	1.00	51365	60.75	25.33	52648	248.75	7.00	52002	210.75	15.33	53117	122.75	12.00	53701	300.00	28.00
20956	250.75	1.00	51366	32.75	27.00	52649	248.75	8.67	52003	210.75	17.00	53118	122.75	13.67	53702	272.75	29.00
20957	252.75	1.00	51367	34.75	27.00	52650	248.75	10.33	52004	210.75	18.67	53119	122.75	15.33	53703	274.65	29.00
20958	254.75	1.00	51368	36.75	27.00	52651	248.75	12.00	52005	210.75	20.33	53120	122.75	17.00	53704	276.60	29.00
20959	256.75	1.00	51369	38.75	27.00	52652	248.75	13.67	52006	210.75	22.00	53121	122.75	18.67	53705	278.55	29.00
20960	258.75	1.00	51370	40.75	27.00	52653	248.75	15.33	52007	210.75	23.67	53122	122.75	20.33	53706	280.50	29.00
20961	260.75	1.00	51371	42.75	27.00	52654	248.75	17.00	52008	210.75	25.33	53123	122.75	22.00	53707	282.45	29.00
20962	262.75	1.00	51372	44.75	27.00	52655	248.75	18.67	52009	201.50	27.00	53124	122.75	23.67	53708	284.40	29.00
20963	264.75	1.00	51373	46.75	27.00	52656	248.75	20.33	52010	203.35	27.00	53125	122.75	25.33	53709	286.35	29.00
20964	266.75	1.00	51374	48.75	27.00	52657	248.75	22.00	52011	205.20	27.00	53126	124.75	3.67	53710	288.30	29.00
20965	268.75	1.00	51375	50.75	27.00	52658	248.75	23.67	52012	207.05	27.00	53127	124.75	5.33	53711	290.25	29.00
20966	270.75	0.00	51376	52.75	27.00	52659	248.75	25.33	52013	208.90	27.00	53128	124.75	7.00	53712	292.20	29.00
20967	272.70	0.00	51377	54.75	27.00	52660	250.75	3.67	52014	201.50	3.67	53129	124.75	8.67	53713	294.15	29.00
20968	274.65	0.00	51378	56.75	27.00	52661	250.75	5.33	52015	201.50	5.33	53130	124.75	10.33	53714	296.10	29.00
20969	276.60	0.00	51379	58.75	27.00	52662	250.75	7.00	52016	201.50	7.00	53131	124.75	12.00	53715	298.05	29.00
20970	278.55	0.00	51380	30.75	3.67	52663	250.75	8.67	52017	201.50	8.67	53132	124.75	13.67	53716	298.05	28.00
20971	280.50	0.00	51381	30.75	5.33	52664	250.75	10.33	52018	201.50	10.33	53133	124.75	15.33	53717	296.10	28.00
20972	282.45	0.00	51382	30.75	7.00	52665	250.75	12.00	52019	201.50	12.00	53134	124.75	17.00	53718	294.15	28.00
20973	284.40	0.00	51383	30.75	8.67	52666	250.75	13.67	52020	201.50	13.67	53135	124.75	18.67	53719	292.20	28.00
20974	286.35	0.00	51384	30.75	10.33	52667	250.75	15.33	52021	201.50	15.33	53136	124.75	20.33	53720	290.25	28.00
20975	288.30	0.00	51385	30.75	12.00	52668	250.75	17.00	52022	201.50	17.00	53137	124.75	22.00	53721	288.30	28.00
20976	290.25	0.00	51386	30.75	13.67	52669	250.75	18.67	52023	201.50	18.67	53138	124.75	23.67	53722	286.35	28.00
20977	292.20	0.00	51387	30.75	15.33	52670	250.75	20.33	52024	201.50	20.33	53139	124.75	25.33	53723	284.40	28.00
20978	294.15	0.00	51388	30.75	17.00	52671	250.75	22.00	52025	201.50	22.00	53140	126.75	3.67	53724	282.45	28.00
20979	296.10	0.00	51389	30.75	18.67	52672	250.75	23.67	52026	201.50	23.67	53141	126.75	5.33	53725	280.50	28.00
20980	298.05	0.00	51390	30.75	20.33	52673	250.75	25.33	52027	201.50	25.33	53142	126.75	7.00	53726	278.55	28.00
20981	270.75	2.00	51391	30.75	22.00	52674	252.75	3.67	52028	203.35	3.67	53143	126.75	8.67	53727	276.60	28.00
20982	298.05	2.00	51392	30.75	23.67	52675	252.75	5.33	52029	203.35	5.33	53144	126.75	10.33	53728	274.65	28.00
20983	296.10	2.00	51393	30.75	25.33	52676	252.75	7.00	52030	203.35	7.00	53145	126.75	12.00	53729	272.70	28.00
20984	294.15	2.00	51394	32.75	3.67	52677	252.75	8.67	52031	203.35	8.67	53146	126.75	13.67	53730	201.50	29.00
20985	292.20	2.00	51395	32.75	5.33	52678	252.75	10.33	52032	203.35	10.33	53147	126.75	15.33	53731	208.90	29.00
20986	290.25	2.00	51396	32.75	7.00	52679	252.75	12.00	52033	203.35	12.00	53148	126.75	17.00	53732	207.05	29.00
20987	288.30	2.00	51397	32.75	8.67	52680	252.75	13.67	52034	203.35	13.67	53149	126.75	18.67	53733	205.20	29.00
20988	286.35	2.00	51398	32.75	10.33	52681	252.75	15.33	52035	203.35	15.33	53150	126.75	20.33	53734	203.35	29.00
20989	284.40	2.00	51399	32.75	12.00	52682	252.75	17.00	52036	203.35	17.00	53151	126.7				

21003	284.40	1.00	51413	34.75	12.00	52696	254.75	17.00	52050	205.20	17.00	53165	128.75	22.00	53749	50.75	29.00
21004	286.35	1.00	51414	34.75	13.67	52697	254.75	18.67	52051	205.20	18.67	53166	128.75	23.67	53750	52.75	29.00
21005	288.30	1.00	51415	34.75	15.33	52698	254.75	20.33	52052	205.20	20.33	53167	128.75	25.33	53751	54.75	29.00
21006	290.25	1.00	51416	34.75	17.00	52699	254.75	22.00	52053	205.20	22.00	53168	130.75	3.67	53752	56.75	29.00
21007	292.20	1.00	51417	34.75	18.67	52700	254.75	23.67	52054	205.20	23.67	53169	130.75	5.33	53753	58.75	29.00
21008	294.15	1.00	51418	34.75	20.33	52701	254.75	25.33	52055	205.20	25.33	53170	130.75	7.00	53754	58.75	28.00
21009	296.10	1.00	51419	34.75	22.00	52702	256.75	3.67	52056	207.05	3.67	53171	130.75	8.67	53755	56.75	28.00
21010	298.05	1.00	51420	34.75	23.67	52703	256.75	5.33	52057	207.05	5.33	53172	130.75	10.33	53756	54.75	28.00
21011	30.75	0.00	51421	34.75	25.33	52704	256.75	7.00	52058	207.05	7.00	53173	130.75	12.00	53757	52.75	28.00
21012	3.45	0.00	51422	36.75	3.67	52705	256.75	8.67	52059	207.05	8.67	53174	130.75	13.67	53758	50.75	28.00
21013	5.40	0.00	51423	36.75	5.33	52706	256.75	10.33	52060	207.05	10.33	53175	130.75	15.33	53759	48.75	28.00
21014	7.35	0.00	51424	36.75	7.00	52707	256.75	12.00	52061	207.05	12.00	53176	130.75	17.00	53760	46.75	28.00
21015	9.30	0.00	51425	36.75	8.67	52708	256.75	13.67	52062	207.05	13.67	53177	130.75	18.67	53761	44.75	28.00
21016	11.25	0.00	51426	36.75	10.33	52709	256.75	15.33	52063	207.05	15.33	53178	130.75	20.33	53762	42.75	28.00
21017	13.20	0.00	51427	36.75	12.00	52710	256.75	17.00	52064	207.05	17.00	53179	130.75	22.00	53763	40.75	28.00
21018	15.15	0.00	51428	36.75	13.67	52711	256.75	18.67	52065	207.05	18.67	53180	130.75	23.67	53764	38.75	28.00
21019	17.10	0.00	51429	36.75	15.33	52712	256.75	20.33	52066	207.05	20.33	53181	130.75	25.33	53765	36.75	28.00
21020	19.05	0.00	51430	36.75	17.00	52713	256.75	22.00	52067	207.05	22.00	53182	132.75	3.67	53766	34.75	28.00
21021	21.00	0.00	51431	36.75	18.67	52714	256.75	23.67	52068	207.05	23.67	53183	132.75	5.33	53767	32.75	28.00
21022	22.95	0.00	51432	36.75	20.33	52715	256.75	25.33	52069	207.05	25.33	53184	132.75	7.00	53768	200.00	29.00
21023	24.90	0.00	51433	36.75	22.00	52716	258.75	3.67	52070	208.90	3.67	53185	132.75	8.67	53769	200.00	28.00
21024	26.85	0.00	51434	36.75	23.67	52717	258.75	5.33	52071	208.90	5.33	53186	132.75	10.33	53770	182.68	29.00
21025	28.80	0.00	51435	36.75	25.33	52718	258.75	7.00	52072	208.90	7.00	53187	132.75	12.00	53771	184.60	29.00
21026	30.75	2.00	51436	38.75	3.67	52719	258.75	8.67	52073	208.90	8.67	53188	132.75	13.67	53772	186.53	29.00
21027	30.75	1.00	51437	38.75	5.33	52720	258.75	10.33	52074	208.90	10.33	53189	132.75	15.33	53773	188.45	29.00
21028	3.45	2.00	51438	38.75	7.00	52721	258.75	12.00	52075	208.90	12.00	53190	132.75	17.00	53774	190.38	29.00
21029	5.40	2.00	51439	38.75	8.67	52722	258.75	13.67	52076	208.90	13.67	53191	132.75	18.67	53775	192.30	29.00
21030	7.35	2.00	51440	38.75	10.33	52723	258.75	15.33	52077	208.90	15.33	53192	132.75	20.33	53776	194.23	29.00
21031	9.30	2.00	51441	38.75	12.00	52724	258.75	17.00	52078	208.90	17.00	53193	132.75	22.00	53777	196.15	29.00
21032	11.25	2.00	51442	38.75	13.67	52725	258.75	18.67	52079	208.90	18.67	53194	132.75	23.67	53778	198.08	29.00
21033	13.20	2.00	51443	38.75	15.33	52726	258.75	20.33	52080	208.90	20.33	53195	132.75	25.33	53779	198.08	28.00
21034	15.15	2.00	51444	38.75	17.00	52727	258.75	22.00	52081	208.90	22.00	53196	134.75	3.67	53780	196.15	28.00
21035	17.10	2.00	51445	38.75	18.67	52728	258.75	23.67	52082	208.90	23.67	53197	134.75	5.33	53781	194.23	28.00
21036	19.05	2.00	51446	38.75	20.33	52729	258.75	25.33	52083	208.90	25.33	53198	134.75	7.00	53782	192.30	28.00
21037	21.00	2.00	51447	38.75	22.00	52730	260.75	3.67	52084	240.75	27.00	53199	134.75	8.67	53783	190.38	28.00
21038	22.95	2.00	51448	38.75	23.67	52731	260.75	5.33	52085	240.75	3.67	53200	134.75	10.33	53784	188.45	28.00
21039	24.90	2.00	51449	38.75	25.33	52732	260.75	7.00	52086	240.75	5.33	53201	134.75	12.00	53785	186.53	28.00
21040	26.85	2.00	51450	40.75	3.67	52733	260.75	8.67	52087	240.75	7.00	53202	134.75	13.67	53786	184.60	28.00
21041	28.80	2.00	51451	40.75	5.33	52734	260.75	10.33	52088	240.75	8.67	53203	134.75	15.33	53787	182.68	28.00
21042	3.45	1.00	51452	40.75	7.00	52735	260.75	12.00	52089	240.75	10.33	53204	134.75	17.00			

7-CIC-00006, Rev. 0

10451	2	86	47	0	1	20877	50877
58.5000						0.00000	
10452	2	86	47	0	1	20878	50878
58.5000						0.00000	
10453	2	86	47	0	1	20879	50879
58.5000						0.00000	
10454	2	86	47	0	1	20880	50880
58.5000						0.00000	
10455	2	86	47	0	1	20881	50881
58.5000						0.00000	
10456	2	86	47	0	1	20882	50882
58.5000						0.00000	
10457	2	86	47	0	1	20883	50883
58.5000						0.00000	
10458	2	86	47	0	1	20884	50884
58.5000						0.00000	
10459	2	86	47	0	1	20885	50885
58.5000						0.00000	

ELEM MAT TYP REL ESX SEC TSHA

10467	2	86	47	0	1	20920	50920
58.5000						0.00000	
10468	2	86	47	0	1	20921	50921
58.5000						0.00000	
10469	2	86	47	0	1	20922	50922
58.5000						0.00000	
10470	2	86	47	0	1	20923	50923
58.5000						0.00000	
10471	2	86	47	0	1	20924	50924
58.5000						0.00000	
10472	2	86	47	0	1	20925	50925
58.5000						0.00000	
10473	2	86	47	0	1	20926	50926
58.5000						0.00000	
10474	2	86	47	0	1	20927	50927
58.5000						0.00000	
10475	2	86	47	0	1	20928	50928
58.5000						0.00000	
10476	2	86	47	0	1	20929	50929
58.5000						0.00000	
10477	2	86	47	0	1	20930	50930
58.5000						0.00000	
10478	2	86	47	0	1	20931	50931
58.5000						0.00000	
10479	2	86	47	0	1	20932	50932
58.5000						0.00000	
10480	2	86	47	0	1	20933	50933
58.5000						0.00000	
10488	2	86	47	0	1	20967	50967
58.5000						0.00000	
10489	2	86	47	0	1	20968	50968
58.5000						0.00000	
10490	2	86	47	0	1	20969	50969
58.5000						0.00000	
10491	2	86	47	0	1	20970	50970
58.5000						0.00000	
10492	2	86	47	0	1	20971	50971
58.5000						0.00000	
10493	2	86	47	0	1	20972	50972
58.5000						0.00000	

ELEM MAT TYP REL ESX SEC TSHA

10494	2	86	47	0	1	20973	50973
58.5000						0.00000	
10495	2	86	47	0	1	20974	50974
58.5000						0.00000	
10496	2	86	47	0	1	20975	50975
58.5000						0.00000	
10497	2	86	47	0	1	20976	50976
58.5000						0.00000	
10498	2	86	47	0	1	20977	50977
58.5000						0.00000	
10499	2	86	47	0	1	20978	50978
58.5000						0.00000	

7-CIC-00006, Rev. 0

58.5000						0.00000	
10404	2	86	47	0	1	20795	50795
58.5000						0.00000	
10405	2	86	47	0	1	20796	50796
58.5000						0.00000	

ELEM MAT TYP REL ESX SEC TSHA

10406	2	86	47	0	1	20797	50797
58.5000						0.00000	
10407	2	86	47	0	1	20798	50798
58.5000						0.00000	
10408	2	86	47	0	1	20799	50799
58.5000						0.00000	
10409	2	86	47	0	1	20800	50800
58.5000						0.00000	
10410	2	86	47	0	1	20801	50801
58.5000						0.00000	
10411	2	86	47	0	1	20802	50802
58.5000						0.00000	
10412	2	86	47	0	1	20803	50803
58.5000						0.00000	
10413	2	86	47	0	1	20804	50804
58.5000						0.00000	
10414	2	86	47	0	1	20805	50805
58.5000						0.00000	
10415	2	86	47	0	1	20806	50806
58.5000						0.00000	
10416	2	86	47	0	1	20807	50807
58.5000						0.00000	
10424	2	86	47	0	1	20841	50841
58.5000						0.00000	
10425	2	86	47	0	1	20842	50842
58.5000						0.00000	
10426	2	86	47	0	1	20843	50843
58.5000						0.00000	
10427	2	86	47	0	1	20844	50844
58.5000						0.00000	
10428	2	86	47	0	1	20845	50845
58.5000						0.00000	
10429	2	86	47	0	1	20846	50846
58.5000						0.00000	
10430	2	86	47	0	1	20847	50847
58.5000						0.00000	
10431	2	86	47	0	1	20848	50848
58.5000						0.00000	
10432	2	86	47	0	1	20849	50849
58.5000						0.00000	

ELEM MAT TYP REL ESX SEC TSHA

10433	2	86	46	0	1	CV2	214 30214
58.5000						0.00000	
51.7500						0.00000	
10434	2	86	46	0	1	CV2	215 30215
51.7500						0.00000	
10435	2	86	47	0	1	CV2	20730 50730
58.5000						0.00000	
10436	2	86	47	0	1	CV2	20731 50731
58.5000						0.00000	
10437	2	86	47	0	1	CV2	20732 50732
58.5000						0.00000	
10438	2	86	47	0	1	CV2	20733 50733
58.5000						0.00000	
10446	2	86	47	0	1	CV2	20872 50872
58.5000						0.00000	
10447	2	86	47	0	1	CV2	20873 50873
58.5000						0.00000	
10448	2	86	47	0	1	CV2	20874 50874
58.5000						0.00000	
10449	2	86	47	0	1	CV2	20875 50875
58.5000						0.00000	
10450	2	86	47	0	1	CV2	20876 50876
58.5000						0.00000	

T-CGA-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
58.5000	2	86	44	0	1	0.00000	51104 51074 51075 51105
10500	2	86	47	0	1	20979 50979	51084 51105 51106 51083
58.5000	2	86	47	0	1	0.00000	51105 51075 51076 51106
10501	2	86	47	0	1	20980 50980	51083 51106 51107 51082
58.5000	2	86	46	0	1	0.00000	51104 51076 51077 51107
10502	2	86	46	0	1	361 30361	51082 51107 51108 51081
51.7500	2	86	45	0	1	CV2 362 30362	51107 51107 51078 51108
10503	2	86	45	0	1	0.00000	51081 51108 51080 51079
22.5000	2	86	44	0	1	CV2 20633 50633	51108 51078 51064 51080
10506	2	86	44	0	1	0.00000	3 21028 51137 51123
29.2500	2	86	44	0	1	CV2 21011 51011	21028 21029 51151 51137
10507	2	86	44	0	1	0.00000	21029 21030 51165 51151
29.2500	2	86	44	0	1	0.00000	21030 21031 51179 51165
10508	2	86	44	0	1	20634 50634	21031 21032 51193 51179
29.2500	2	86	44	0	1	0.00000	21032 21033 51207 51193
10509	2	86	44	0	1	20681 50681	21033 21034 51221 51207
29.2500	2	86	44	0	1	0.00000	21034 21035 51235 51221
10510	2	86	44	0	1	20682 50682	21035 21036 51249 51235
29.2500	2	86	44	0	1	0.00000	21036 21037 51263 51249
10511	2	86	44	0	1	21056 51056	21037 21038 51277 51263
29.2500	2	86	44	0	1	0.00000	21038 21039 51291 51277
10512	2	86	44	0	1	20603 50603	21039 21040 51305 51291
29.2500	2	86	44	0	1	0.00000	21040 21041 51319 51305
10513	2	86	44	0	1	20744 50744	21041 21042 51109 51319
29.2500	2	86	44	0	1	0.00000	51123 51137 51138 51124
10514	2	86	44	0	1	20745 50745	51137 51151 51152 51138
29.2500	2	86	44	0	1	0.00000	51151 51165 51166 51152
10515	2	86	44	0	1	20792 50792	51165 51179 51180 51166
29.2500	2	86	44	0	1	0.00000	51179 51193 51194 51180
10516	2	86	44	0	1	20793 50793	51193 51207 51208 51194
29.2500	2	86	44	0	1	0.00000	51207 51221 51222 51208

ELEM MAT TYP REL ESY SEC TSHA NODES

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10640	2	1	2	0	1	51089 51100 51101 51088	51221 51235 51236 51222
10641	2	1	2	0	1	51100 51070 51071 51101	51235 51249 51250 51236
10642	2	1	2	0	1	51088 51101 51102 51087	51249 51263 51264 51250
10643	2	1	2	0	1	51101 51071 51072 51102	51263 51277 51278 51264
10644	2	1	2	0	1	51087 51072 51073 51086	51277 51291 51292 51278
10645	2	1	2	0	1	51102 51072 51073 51103	51291 51305 51306 51292
10646	2	1	2	0	1	51086 51103 51104 51086	51305 51319 51320 51306
10647	2	1	2	0	1	51103 51073 51074 51104	51319 51109 51110 51320
10648	2	1	2	0	1	51085 51104 51105 51088	51124 51138 51139 51125
10649	2	1	2	0	1	51089 51100 51101 51088	51138 51152 51153 51139
10650	2	1	2	0	1	51100 51070 51071 51101	51152 51166 51167 51153
10651	2	1	2	0	1	51088 51101 51102 51087	51166 51180 51181 51167
10652	2	1	2	0	1	51101 51071 51072 51102	51180 51194 51195 51181
10653	2	1	2	0	1	51087 51072 51073 51086	51194 51208 51209 51195
10654	2	1	2	0	1	51102 51072 51073 51103	51208 51222 51223 51209
10655	2	1	2	0	1	51086 51103 51104 51086	51222 51236 51237 51223
10656	2	1	2	0	1	51103 51073 51074 51104	51236 51250 51251 51237
10657	2	1	2	0	1	51085 51104 51105 51088	51250 51264 51265 51251
10658	2	1	2	0	1	51089 51100 51101 51088	51264 51278 51279 51265
10659	2	1	2	0	1	51100 51070 51071 51101	51278 51292 51293 51279

ELEM MAT TYP REL ESY SEC TSHA NODES

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10660	2	1	2	0	1	51292 51306 51307 51293	51292 51306 51307 51293
10661	2	1	2	0	1	51306 51320 51321 51307	51306 51320 51321 51307
10662	2	1	2	0	1	51320 51110 51111 51321	51320 51110 51111 51321
10663	2	1	2	0	1	51125 51139 51140 51126	51125 51139 51140 51126
10664	2	1	2	0	1	51139 51153 51154 51140	51139 51153 51154 51140
10665	2	1	2	0	1	51153 51167 51168 51154	51153 51167 51168 51154
10666	2	1	2	0	1	51167 51181 51182 51168	51167 51181 51182 51168
10667	2	1	2	0	1	51181 51195 51196 51182	51181 51195 51196 51182
10668	2	1	2	0	1	51195 51209 51210 51196	51195 51209 51210 51196
10669	2	1	2	0	1	51209 51223 51224 51210	51209 51223 51224 51210
10670	2	1	2	0	1	51223 51237 51238 51224	51223 51237 51238 51224
10671	2	1	2	0	1	51237 51251 51252 51238	51237 51251 51252 51238
10672	2	1	2	0	1	51251 51265 51266 51252	51251 51265 51266 51252
10673	2	1	2	0	1	51265 51279 51280 51266	51265 51279 51280 51266
10674	2	1	2	0	1	51279 51293 51294 51280	51279 51293 51294 51280

T-CGA-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10649	2	1	2	0	1	51104 51074 51075 51105	51104 51074 51075 51105
10650	2	1	2	0	1	51084 51105 51106 51083	51084 51105 51106 51083
10651	2	1	2	0	1	51105 51075 51076 51106	51105 51075 51076 51106
10652	2	1	2	0	1	51083 51106 51107 51082	51083 51106 51107 51082
10653	2	1	2	0	1	51104 51076 51077 51107	51104 51076 51077 51107
10654	2	1	2	0	1	51082 51107 51108 51081	51082 51107 51108 51081
10655	2	1	2	0	1	51107 51107 51078 51108	51107 51107 51078 51108
10656	2	1	2	0	1	51081 51108 51080 51079	51081 51108 51080 51079
10657	2	1	2	0	1	51108 51078 51064 51080	51108 51078 51064 51080
10658	2	1	2	0	1	3 21028 51137 51123	3 21028 51137 51123
10659	2	1	2	0	1	21028 21029 51151 51137	21028 21029 51151 51137

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10660	2	1	2	0	1	21029 21030 51165 51151	21029 21030 51165 51151
10661	2	1	2	0	1	21030 21031 51179 51165	21030 21031 51179 51165
10662	2	1	2	0	1	21031 21032 51193 51179	21031 21032 51193 51179
10663	2	1	2	0	1	21032 21033 51207 51193	21032 21033 51207 51193
10664	2	1	2	0	1	21033 21034 51221 51207	21033 21034 51221 51207
10665	2	1	2	0	1	21034 21035 51235 51221	21034 21035 51235 51221
10666	2	1	2	0	1	21035 21036 51249 51235	21035 21036 51249 51235
10667	2	1	2	0	1	21036 21037 51263 51249	21036 21037 51263 51249
10668	2	1	2	0	1	21037 21038 51277 51263	21037 21038 51277 51263
10669	2	1	2	0	1	21038 21039 51291 51277	21038 21039 51291 51277
10670	2	1	2	0	1	21039 21040 51305 51291	21039 21040 51305 51291
10671	2	1	2	0	1	21040 21041 51319 51305	21040 21041 51319 51305
10672	2	1	2	0	1	21041 21042 51109 51319	21041 21042 51109 51319
10673	2	1	2	0	1	51123 51137 51138 51124	51123 51137 51138 51124
10674	2	1	2	0	1	51137 51151 51152 51138	51137 51151 51152 51138
10675	2	1	2	0	1	51151 51165 51166 51152	51151 51165 51166 51152
10676	2	1	2	0	1	51165 51179 51180 51166	51165 51179 51180 51166
10677	2	1	2	0	1	51179 51193 51194 51180	51179 51193 51194 51180
10678	2	1	2	0	1	51193 51207 51208 51194	51193 51207 51208 51194
10679	2	1	2	0	1	51207 51221 51222 51208	51207 51221 51222 51208

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10680	2	1	2	0	1	51221 51235 51236 51222	51221 51235 51236 51222
10681	2	1	2	0	1	51235 51249 51250 51236	51235 51249 51250 51236
10682	2	1	2	0	1	51249 51263 51264 51250	51249 51263 51264 51250
10683	2	1	2	0	1	51263 51277 51278 51264	51263 51277 51278 51264
10684	2	1	2	0	1	51277 51291 51292 51278	51277 51291 51292 51278
10685	2	1	2	0	1	51291 51305 51306 51292	51291 51305 51306 51292
10686	2	1	2	0	1	51305 51319 51320 51306	51305 51319 51320 51306
10687	2	1	2	0	1	51319 51109 51110 51320	51319 51109 51110 51320
10688	2	1	2	0	1	51124 51138 51139 51125	51124 51138 51139 51125
10689	2	1	2	0	1	51138 51152 51153 51139	51138 51152 51153 51139
10690	2	1	2	0	1	51152 51166 51167 51153	51152 51166 51167 51153
10691	2	1	2	0	1	51166 51180 51181 51167	51166 51180 51181 51167
10692	2	1	2	0	1	51180 51194 51195 51181	51180 51194 51195 51181
10693	2	1	2	0	1	51194 51208 51209 51195	51194 51208 51209 51195
10694	2	1	2	0	1	51208 51222 51223 51209	51208 51222 51223 51209
10695	2	1	2	0	1	51222 51236 51237 51223	51222 51236 51237 51223
10696	2	1	2	0	1	51236 51250 51251 51237	51236 51250 51251 51237
10697	2	1	2	0	1	51250 51264 51265 51251	51250 51264 51265 51251
10698	2	1	2	0	1	51264 51278 51279 51265	51264 51278

T-CAC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10780	2	1	2	0	1	1	51158 51172 51173 51159
10781	2	1	2	0	1	1	51172 51186 51187 51173
10782	2	1	2	0	1	1	51186 51200 51201 51167
10783	2	1	2	0	1	1	51200 51214 51215 51201
10784	2	1	2	0	1	1	51214 51228 51229 51213
10785	2	1	2	0	1	1	51228 51242 51243 51229
10786	2	1	2	0	1	1	51242 51256 51257 51243
10787	2	1	2	0	1	1	51256 51270 51271 51257
10788	2	1	2	0	1	1	51270 51284 51285 51271
10789	2	1	2	0	1	1	51284 51298 51299 51285
10790	2	1	2	0	1	1	51298 51312 51313 51299
10791	2	1	2	0	1	1	51312 51326 51327 51313
10792	2	1	2	0	1	1	51326 51116 51117 51327
10793	2	1	2	0	1	1	51131 51145 51146 51132
10794	2	1	2	0	1	1	51145 51159 51160 51146
10795	2	1	2	0	1	1	51159 51173 51174 51160
10796	2	1	2	0	1	1	51173 51187 51188 51174
10797	2	1	2	0	1	1	51187 51201 51202 51188
10798	2	1	2	0	1	1	51201 51215 51216 51202
10799	2	1	2	0	1	1	51215 51229 51230 51216

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10800	2	1	2	0	1	1	51229 51243 51244 51230
10801	2	1	2	0	1	1	51243 51257 51258 51244
10802	2	1	2	0	1	1	51257 51271 51272 51258
10803	2	1	2	0	1	1	51271 51285 51286 51272
10804	2	1	2	0	1	1	51285 51299 51300 51286
10805	2	1	2	0	1	1	51299 51313 51314 51300
10806	2	1	2	0	1	1	51313 51327 51328 51314
10807	2	1	2	0	1	1	51327 51117 51118 51328
10808	2	1	2	0	1	1	51132 51146 51147 51133
10809	2	1	2	0	1	1	51146 51160 51161 51147
10810	2	1	2	0	1	1	51160 51174 51175 51161
10811	2	1	2	0	1	1	51174 51188 51189 51175
10812	2	1	2	0	1	1	51188 51202 51203 51189
10813	2	1	2	0	1	1	51202 51216 51217 51203
10814	2	1	2	0	1	1	51216 51230 51231 51217
10815	2	1	2	0	1	1	51230 51244 51245 51231
10816	2	1	2	0	1	1	51244 51258 51259 51245
10817	2	1	2	0	1	1	51258 51272 51273 51259
10818	2	1	2	0	1	1	51272 51286 51287 51273
10819	2	1	2	0	1	1	51286 51300 51301 51287

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10820	2	1	2	0	1	1	51300 51314 51315 51301
10821	2	1	2	0	1	1	51314 51328 51329 51315
10822	2	1	2	0	1	1	51328 51118 51119 51329
10823	2	1	2	0	1	1	51133 51147 51148 51134
10824	2	1	2	0	1	1	51147 51161 51162 51148
10825	2	1	2	0	1	1	51161 51175 51176 51162
10826	2	1	2	0	1	1	51175 51189 51190 51176
10827	2	1	2	0	1	1	51189 51203 51204 51190
10828	2	1	2	0	1	1	51203 51217 51218 51204
10829	2	1	2	0	1	1	51217 51231 51232 51218
10830	2	1	2	0	1	1	51231 51245 51246 51232
10831	2	1	2	0	1	1	51245 51259 51260 51246
10832	2	1	2	0	1	1	51259 51273 51274 51260
10833	2	1	2	0	1	1	51273 51287 51288 51274
10834	2	1	2	0	1	1	51287 51301 51302 51288
10835	2	1	2	0	1	1	51301 51315 51316 51302
10836	2	1	2	0	1	1	51315 51329 51330 51316
10837	2	1	2	0	1	1	51329 51119 51120 51330
10838	2	1	2	0	1	1	51134 51148 51149 51135
10839	2	1	2	0	1	1	51148 51162 51163 51149

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10840	2	1	2	0	1	1	51162 51176 51177 51163
10841	2	1	2	0	1	1	51176 51190 51191 51177
10842	2	1	2	0	1	1	51190 51204 51205 51191
10843	2	1	2	0	1	1	51204 51218 51219 51205

T-CAC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10715	2	1	2	0	1	1	51293 51307 51308 51294
10716	2	1	2	0	1	1	51307 51321 51322 51308
10717	2	1	2	0	1	1	51321 51111 51112 51322
10718	2	1	2	0	1	1	51126 51140 51141 51127
10719	2	1	2	0	1	1	51140 51154 51155 51141

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10720	2	1	2	0	1	1	51154 51168 51169 51155
10721	2	1	2	0	1	1	51168 51182 51183 51169
10722	2	1	2	0	1	1	51182 51196 51197 51183
10723	2	1	2	0	1	1	51196 51210 51211 51197
10724	2	1	2	0	1	1	51210 51224 51225 51211
10725	2	1	2	0	1	1	51224 51238 51239 51225
10726	2	1	2	0	1	1	51238 51252 51253 51239
10727	2	1	2	0	1	1	51252 51266 51267 51253
10728	2	1	2	0	1	1	51266 51280 51281 51267
10729	2	1	2	0	1	1	51280 51294 51295 51281
10730	2	1	2	0	1	1	51294 51308 51309 51295
10731	2	1	2	0	1	1	51308 51322 51323 51309
10732	2	1	2	0	1	1	51322 51112 51113 51323
10733	2	1	2	0	1	1	51127 51141 51142 51128
10734	2	1	2	0	1	1	51141 51155 51156 51142
10735	2	1	2	0	1	1	51155 51169 51170 51156
10736	2	1	2	0	1	1	51169 51183 51184 51170
10737	2	1	2	0	1	1	51183 51197 51198 51184
10738	2	1	2	0	1	1	51197 51211 51212 51198
10739	2	1	2	0	1	1	51211 51225 51226 51212

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10740	2	1	2	0	1	1	51225 51239 51240 51226
10741	2	1	2	0	1	1	51239 51253 51254 51240
10742	2	1	2	0	1	1	51253 51267 51268 51254
10743	2	1	2	0	1	1	51267 51281 51282 51268
10744	2	1	2	0	1	1	51281 51295 51296 51282
10745	2	1	2	0	1	1	51295 51309 51310 51296
10746	2	1	2	0	1	1	51309 51323 51324 51310
10747	2	1	2	0	1	1	51323 51113 51114 51324
10748	2	1	2	0	1	1	51128 51142 51143 51129
10749	2	1	2	0	1	1	51142 51156 51157 51143
10750	2	1	2	0	1	1	51156 51170 51171 51157
10751	2	1	2	0	1	1	51170 51184 51185 51171
10752	2	1	2	0	1	1	51184 51198 51199 51185
10753	2	1	2	0	1	1	51198 51212 51213 51199
10754	2	1	2	0	1	1	51212 51226 51227 51213
10755	2	1	2	0	1	1	51226 51240 51241 51227
10756	2	1	2	0	1	1	51240 51254 51255 51241
10757	2	1	2	0	1	1	51254 51268 51269 51255
10758	2	1	2	0	1	1	51268 51282 51283 51269
10759	2	1	2	0	1	1	51282 51296 51297 51283

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
10760	2	1	2	0	1	1	51296 51310 51311 51297
10761	2	1	2	0	1	1	51310 51324 51325 51311
10762	2	1	2	0	1	1	51324 51114 51115 51325
10763	2	1	2	0	1	1	51129 51143 51144 51130
10764	2	1	2	0	1	1	51143 51157 51158 51144
10765	2	1	2	0	1	1	51157 51171 51172 51158
10766	2	1	2	0	1	1	51171 51185 51186 51172
10767	2	1	2	0	1	1	51185 51199 51200 51186
10768	2	1	2	0	1	1	51199 51213 51214 51200
10769	2	1	2	0	1	1	51213 51227 51228 51214
10770	2	1	2	0	1	1	51227 51241 51242 51228
10771	2	1	2	0	1	1	51241 51255 51256 51242
10772	2	1	2	0	1	1	51255 51269 51270 51256
10773	2	1	2	0	1	1	51269 51283 51284 51270
10774	2	1	2	0	1	1	51283 51297 51298 51284
10775	2	1	2	0	1	1	51297 51311 51312 51298
10776	2	1	2	0	1	1	51311 51325 51326 51312
10777	2	1	2	0	1	1	51325 51115 51116 51326
10778	2	1	2	0	1	1	51130 51144 51145 51131
10779	2	1	2	0	1	1	51144 51158 51159 51145

T-CAL-00006, Rev. 0

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10910	2	1	2	0	1	51408 51422 51423 51409	
10911	2	1	2	0	1	51422 51436 51437 51423	
10912	2	1	2	0	1	51436 51450 51451 51437	
10913	2	1	2	0	1	51450 51464 51465 51451	
10914	2	1	2	0	1	51464 51478 51479 51465	
10915	2	1	2	0	1	51478 51492 51493 51479	
10916	2	1	2	0	1	51492 51506 51507 51493	
10917	2	1	2	0	1	51506 51520 51521 51507	
10918	2	1	2	0	1	51520 51534 51535 51521	
10919	2	1	2	0	1	51534 51548 51549 51535	

ELEM NAT TYP REL ESY SEC TSHA

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10920	2	1	2	0	1	51548 51562 51563 51549	
10921	2	1	2	0	1	51562 51576 51577 51563	
10922	2	1	2	0	1	51576 51590 51591 51577	
10923	2	1	2	0	1	51590 51604 51605 51591	
10924	2	1	2	0	1	51604 51618 51619 51605	
10925	2	1	2	0	1	51618 51632 51633 51619	
10926	2	1	2	0	1	51632 51646 51647 51633	
10927	2	1	2	0	1	51646 51660 51661 51647	
10928	2	1	2	0	1	51660 51674 51675 51661	
10929	2	1	2	0	1	51674 51688 51689 51675	
10930	2	1	2	0	1	51688 51702 51703 51689	
10931	2	1	2	0	1	51702 51716 51717 51703	
10932	2	1	2	0	1	51716 51730 51731 51717	
10933	2	1	2	0	1	51730 51744 51745 51731	
10934	2	1	2	0	1	51744 51758 51759 51745	
10935	2	1	2	0	1	51758 51772 51773 51759	
10936	2	1	2	0	1	51772 51786 51787 51773	
10937	2	1	2	0	1	51786 51800 51801 51787	
10938	2	1	2	0	1	51800 51814 51815 51801	
10939	2	1	2	0	1	51814 51828 51829 51815	

ELEM NAT TYP REL ESY SEC TSHA

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10940	2	1	2	0	1	51410 51424 51425 51411	
10941	2	1	2	0	1	51424 51438 51439 51425	
10942	2	1	2	0	1	51438 51452 51453 51439	
10943	2	1	2	0	1	51452 51466 51467 51453	
10944	2	1	2	0	1	51466 51480 51481 51467	
10945	2	1	2	0	1	51480 51494 51495 51481	
10946	2	1	2	0	1	51494 51508 51509 51495	
10947	2	1	2	0	1	51508 51522 51523 51509	
10948	2	1	2	0	1	51522 51536 51537 51523	
10949	2	1	2	0	1	51536 51550 51551 51537	
10950	2	1	2	0	1	51550 51564 51565 51551	
10951	2	1	2	0	1	51564 51578 51579 51565	
10952	2	1	2	0	1	51578 51592 51593 51579	
10953	2	1	2	0	1	51592 51606 51607 51593	
10954	2	1	2	0	1	51606 51620 51621 51607	
10955	2	1	2	0	1	51620 51634 51635 51621	
10956	2	1	2	0	1	51634 51648 51649 51635	
10957	2	1	2	0	1	51648 51662 51663 51649	
10958	2	1	2	0	1	51662 51676 51677 51663	
10959	2	1	2	0	1	51676 51690 51691 51677	
10960	2	1	2	0	1	51690 51704 51705 51691	

ELEM NAT TYP REL ESY SEC TSHA

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10960	2	1	2	0	1	51481 51495 51496 51482	
10961	2	1	2	0	1	51495 51509 51510 51496	
10962	2	1	2	0	1	51509 51523 51524 51510	
10963	2	1	2	0	1	51523 51537 51538 51524	
10964	2	1	2	0	1	51537 51551 51552 51538	
10965	2	1	2	0	1	51551 51565 51566 51552	
10966	2	1	2	0	1	51565 51579 51580 51566	
10967	2	1	2	0	1	51579 51593 51594 51580	
10968	2	1	2	0	1	51593 51607 51608 51594	
10969	2	1	2	0	1	51607 51621 51622 51608	
10970	2	1	2	0	1	51621 51635 51636 51622	
10971	2	1	2	0	1	51635 51649 51650 51636	
10972	2	1	2	0	1	51649 51663 51664 51650	
10973	2	1	2	0	1	51663 51677 51678 51664	
10974	2	1	2	0	1	51677 51691 51692 51678	
10975	2	1	2	0	1	51691 51705 51706 51692	

T-CAL-00006, Rev. 0

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10844	2	1	2	0	1	51218 51232 51233 51219	
10845	2	1	2	0	1	51232 51246 51247 51233	
10846	2	1	2	0	1	51246 51260 51261 51247	
10847	2	1	2	0	1	51260 51274 51275 51261	
10848	2	1	2	0	1	51274 51288 51289 51275	
10849	2	1	2	0	1	51288 51302 51303 51289	
10850	2	1	2	0	1	51302 51316 51317 51303	
10851	2	1	2	0	1	51316 51330 51331 51317	
10852	2	1	2	0	1	51330 51344 51345 51331	
10853	2	1	2	0	1	51344 51358 51359 51345	
10854	2	1	2	0	1	51358 51372 51373 51359	
10855	2	1	2	0	1	51372 51386 51387 51373	
10856	2	1	2	0	1	51386 51400 51401 51387	
10857	2	1	2	0	1	51400 51414 51415 51401	
10858	2	1	2	0	1	51414 51428 51429 51415	
10859	2	1	2	0	1	51428 51442 51443 51429	

ELEM NAT TYP REL ESY SEC TSHA

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10860	2	1	2	0	1	51233 51247 51248 51234	
10861	2	1	2	0	1	51247 51261 51262 51248	
10862	2	1	2	0	1	51261 51275 51276 51262	
10863	2	1	2	0	1	51275 51289 51290 51276	
10864	2	1	2	0	1	51289 51303 51304 51290	
10865	2	1	2	0	1	51303 51317 51318 51304	
10866	2	1	2	0	1	51317 51331 51332 51318	
10867	2	1	2	0	1	51331 51345 51346 51332	
10868	2	1	2	0	1	51345 51359 51360 51346	
10869	2	1	2	0	1	51359 51373 51374 51360	
10870	2	1	2	0	1	51373 51387 51388 51374	
10871	2	1	2	0	1	51387 51401 51402 51388	
10872	2	1	2	0	1	51401 51415 51416 51402	
10873	2	1	2	0	1	51415 51429 51430 51416	
10874	2	1	2	0	1	51429 51443 51444 51430	
10875	2	1	2	0	1	51443 51457 51458 51444	
10876	2	1	2	0	1	51457 51471 51472 51458	
10877	2	1	2	0	1	51471 51485 51486 51472	
10878	2	1	2	0	1	51485 51499 51500 51486	
10879	2	1	2	0	1	51499 51513 51514 51500	

ELEM NAT TYP REL ESY SEC TSHA

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10880	2	1	2	0	1	51304 51318 51319 51302	
10881	2	1	2	0	1	51318 51332 51333 51302	
10882	2	1	2	0	1	51332 51346 51347 51333	
10883	2	1	2	0	1	51346 51360 51361 51347	
10884	2	1	2	0	1	51360 51374 51375 51361	
10885	2	1	2	0	1	51374 51388 51389 51375	
10886	2	1	2	0	1	51388 51402 51403 51389	
10887	2	1	2	0	1	51402 51416 51417 51403	
10888	2	1	2	0	1	51416 51430 51431 51417	
10889	2	1	2	0	1	51430 51444 51445 51431	
10890	2	1	2	0	1	51444 51458 51459 51445	
10891	2	1	2	0	1	51458 51472 51473 51459	
10892	2	1	2	0	1	51472 51486 51487 51473	
10893	2	1	2	0	1	51486 51500 51501 51487	
10894	2	1	2	0	1	51500 51514 51515 51501	
10895	2	1	2	0	1	51514 51528 51529 51515	
10896	2	1	2	0	1	51528 51542 51543 51529	
10897	2	1	2	0	1	51542 51556 51557 51543	
10898	2	1	2	0	1	51556 51570 51571 51557	
10899	2	1	2	0	1	51570 51584 51585 51571	

ELEM NAT TYP REL ESY SEC TSHA

ELEM	NAT	TYP	REL	ESY	SEC	TSHA	NODES
10900	2	1	2	0	1	20659 20658 51492 51478	
10901	2	1	2	0	1	20658 20657 51506 51492	
10902	2	1	2	0	1	20657 20656 51520 51506	
10903	2	1	2	0	1	20656 20655 51534 51520	
10904	2	1	2	0	1	20655 20654 51548 51534	
10905	2	1	2	0	1	20654 20653 51562 51548	
10906	2	1	2	0	1	20653 20652 51576 51562	
10907	2	1	2	0	1	20652 20649 51576 51562	
10908	2	1	2	0	1	51380 51394 51395 51381	
10909	2	1	2	0	1	51394 51408 51409 51395	

T-CCC-00006, Rev. 0

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
11040	2	1	2	0	1	51556 51570 51571 51577
11041	2	1	2	0	1	51570 51584 51585 51571
11042	2	1	2	0	1	51584 51360 51361 51585
11043	2	1	2	0	1	51389 51403 51404 51390
11044	2	1	2	0	1	51403 51417 51418 51404
11045	2	1	2	0	1	51417 51431 51432 51418
11046	2	1	2	0	1	51431 51445 51446 51432
11047	2	1	2	0	1	51445 51459 51460 51446
11048	2	1	2	0	1	51459 51473 51474 51460
11049	2	1	2	0	1	51473 51487 51488 51474
11050	2	1	2	0	1	51487 51501 51502 51488
11051	2	1	2	0	1	51501 51515 51516 51502
11052	2	1	2	0	1	51515 51529 51530 51516
11053	2	1	2	0	1	51529 51543 51544 51530
11054	2	1	2	0	1	51543 51557 51558 51544
11055	2	1	2	0	1	51557 51571 51572 51558
11056	2	1	2	0	1	51571 51585 51586 51572
11057	2	1	2	0	1	51585 51381 51382 51586
11058	2	1	2	0	1	51390 51404 51405 51391
11059	2	1	2	0	1	51404 51418 51419 51405

ELEM MAT TYP REL ESY SEC TSHA

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
11060	2	1	2	0	1	51418 51432 51433 51419
11061	2	1	2	0	1	51432 51446 51447 51433
11062	2	1	2	0	1	51446 51460 51461 51447
11063	2	1	2	0	1	51460 51474 51475 51461
11064	2	1	2	0	1	51474 51488 51489 51475
11065	2	1	2	0	1	51488 51502 51503 51489
11066	2	1	2	0	1	51502 51516 51517 51503
11067	2	1	2	0	1	51516 51530 51531 51517
11068	2	1	2	0	1	51530 51544 51545 51531
11069	2	1	2	0	1	51544 51558 51559 51545
11070	2	1	2	0	1	51558 51572 51573 51559
11071	2	1	2	0	1	51572 51586 51587 51573
11072	2	1	2	0	1	51586 51600 51601 51587
11073	2	1	2	0	1	51591 51405 51406 51392
11074	2	1	2	0	1	51405 51419 51420 51406
11075	2	1	2	0	1	51419 51433 51434 51420
11076	2	1	2	0	1	51433 51447 51448 51434
11077	2	1	2	0	1	51447 51461 51462 51448
11078	2	1	2	0	1	51461 51475 51476 51462
11079	2	1	2	0	1	51475 51489 51490 51476

ELEM MAT TYP REL ESY SEC TSHA

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
11080	2	1	2	0	1	51489 51503 51504 51490
11081	2	1	2	0	1	51503 51517 51518 51504
11082	2	1	2	0	1	51517 51531 51532 51518
11083	2	1	2	0	1	51531 51545 51546 51532
11084	2	1	2	0	1	51545 51559 51560 51546
11085	2	1	2	0	1	51559 51573 51574 51560
11086	2	1	2	0	1	51573 51587 51588 51574
11087	2	1	2	0	1	51587 51383 51384 51588
11088	2	1	2	0	1	51392 51406 51407 51393
11089	2	1	2	0	1	51406 51420 51421 51407
11090	2	1	2	0	1	51420 51434 51435 51421
11091	2	1	2	0	1	51434 51448 51449 51435
11092	2	1	2	0	1	51448 51462 51463 51449
11093	2	1	2	0	1	51462 51476 51477 51463
11094	2	1	2	0	1	51476 51490 51491 51477
11095	2	1	2	0	1	51490 51504 51505 51491
11096	2	1	2	0	1	51504 51518 51519 51505
11097	2	1	2	0	1	51518 51532 51533 51519
11098	2	1	2	0	1	51532 51546 51547 51533
11099	2	1	2	0	1	51546 51560 51561 51547

ELEM MAT TYP REL ESY SEC TSHA

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
11100	2	1	2	0	1	51560 51574 51575 51561
11101	2	1	2	0	1	51574 51588 51589 51575
11102	2	1	2	0	1	51588 51364 51365 51589
11103	2	1	2	0	1	51393 51407 51366 51062
11104	2	1	2	0	1	51407 51421 51367 51366

T-CCC-00006, Rev. 0

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
10976	2	1	2	0	1	51496 51510 51511 51497
10977	2	1	2	0	1	51510 51524 51525 51511
10978	2	1	2	0	1	51524 51538 51539 51525
10979	2	1	2	0	1	51538 51552 51553 51539

ELEM MAT TYP REL ESY SEC TSHA

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
10980	2	1	2	0	1	51552 51566 51567 51553
10981	2	1	2	0	1	51566 51580 51581 51567
10982	2	1	2	0	1	51580 51356 51357 51581
10983	2	1	2	0	1	51385 51399 51400 51386
10984	2	1	2	0	1	51399 51413 51414 51400
10985	2	1	2	0	1	51413 51427 51428 51414
10986	2	1	2	0	1	51427 51441 51442 51428
10987	2	1	2	0	1	51441 51455 51456 51442
10988	2	1	2	0	1	51455 51469 51470 51456
10989	2	1	2	0	1	51469 51483 51484 51470
10990	2	1	2	0	1	51483 51497 51498 51484
10991	2	1	2	0	1	51497 51511 51512 51498
10992	2	1	2	0	1	51511 51525 51526 51512
10993	2	1	2	0	1	51525 51539 51540 51526
10994	2	1	2	0	1	51539 51553 51554 51540
10995	2	1	2	0	1	51553 51567 51568 51554
10996	2	1	2	0	1	51567 51581 51582 51568
10997	2	1	2	0	1	51581 51357 51358 51582
10998	2	1	2	0	1	51386 51400 51401 51387
10999	2	1	2	0	1	51400 51414 51415 51401

ELEM MAT TYP REL ESY SEC TSHA

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
11000	2	1	2	0	1	51414 51428 51429 51415
11001	2	1	2	0	1	51428 51442 51443 51429
11002	2	1	2	0	1	51442 51456 51457 51443
11003	2	1	2	0	1	51456 51470 51471 51457
11004	2	1	2	0	1	51470 51484 51485 51471
11005	2	1	2	0	1	51484 51498 51499 51485
11006	2	1	2	0	1	51498 51512 51513 51499
11007	2	1	2	0	1	51512 51526 51527 51513
11008	2	1	2	0	1	51526 51540 51541 51527
11009	2	1	2	0	1	51540 51554 51555 51541
11010	2	1	2	0	1	51554 51568 51569 51555
11011	2	1	2	0	1	51568 51582 51583 51569
11012	2	1	2	0	1	51582 51386 51387 51583
11013	2	1	2	0	1	51387 51401 51402 51388
11014	2	1	2	0	1	51401 51415 51416 51402
11015	2	1	2	0	1	51415 51429 51430 51416
11016	2	1	2	0	1	51429 51443 51444 51430
11017	2	1	2	0	1	51443 51457 51458 51444
11018	2	1	2	0	1	51457 51471 51472 51458
11019	2	1	2	0	1	51471 51485 51486 51472

ELEM MAT TYP REL ESY SEC TSHA

ELEM MAT	TYP	REL	ESY	SEC	TSHA	NODES
11020	2	1	2	0	1	51485 51499 51500 51486
11021	2	1	2	0	1	51499 51513 51514 51500
11022	2	1	2	0	1	51513 51527 51528 51514
11023	2	1	2	0	1	51527 51541 51542 51528
11024	2	1	2	0	1	51541 51555 51556 51542
11025	2	1	2	0	1	51555 51569 51570 51556
11026	2	1	2	0	1	51569 51583 51584 51570
11027	2	1	2	0	1	51583 51359 51360 51584
11028	2	1	2	0	1	51388 51402 51403 51389
11029	2	1	2	0	1	51402 51416 51417 51403
11030	2	1	2	0	1	51416 51430 51431 51417
11031	2	1	2	0	1	51430 51444 51445 51431
11032	2	1	2	0	1	51444 51458 51459 51445
11033	2	1	2	0	1	51458 51472 51473 51459
11034	2	1	2	0	1	51472 51486 51487 51473
11035	2	1	2	0	1	51486 51500 51501 51487
11036	2	1	2	0	1	51500 51514 51515 51501
11037	2	1	2	0	1	51514 51528 51529 51515
11038	2	1	2	0	1	51528 51542 51543 51529
11039	2	1	2	0	1	51542 51556 51557 51543

ELEM MAT TYP REL ESY SEC TSHA

T-CLC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11105	2	1	2	0	1	51421 51435 51368 51367	
11106	2	1	2	0	1	51435 51449 51369 51368	
11107	2	1	2	0	1	51449 51463 51370 51369	
11108	2	1	2	0	1	51463 51477 51371 51370	
11109	2	1	2	0	1	51477 51491 51372 51371	
11110	2	1	2	0	1	51491 51505 51373 51372	
11111	2	1	2	0	1	51505 51519 51374 51373	
11112	2	1	2	0	1	51519 51533 51375 51374	
11113	2	1	2	0	1	51533 51547 51376 51375	
11114	2	1	2	0	1	51547 51561 51377 51376	
11115	2	1	2	0	1	51561 51575 51378 51377	
11116	2	1	2	0	1	51575 51589 51379 51378	
11117	2	1	2	0	1	51589 51385 51351 51379	
11118	2	1	2	0	1	20810 20824 51634 51620	
11119	2	1	2	0	1	20824 20823 51648 51634	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11120	2	1	2	0	1	20823 20822 51662 51648	
11121	2	1	2	0	1	20822 20821 51676 51662	
11122	2	1	2	0	1	20821 20820 51690 51676	
11123	2	1	2	0	1	20820 20819 51704 51690	
11124	2	1	2	0	1	20819 20818 51718 51704	
11125	2	1	2	0	1	20818 20817 51732 51718	
11126	2	1	2	0	1	20817 20816 51746 51732	
11127	2	1	2	0	1	20816 20815 51760 51746	
11128	2	1	2	0	1	20815 20814 51774 51760	
11129	2	1	2	0	1	20814 20813 51788 51774	
11130	2	1	2	0	1	20813 20812 51802 51788	
11131	2	1	2	0	1	20812 20811 51816 51802	
11132	2	1	2	0	1	20811 20808 51591 51816	
11133	2	1	2	0	1	51620 51634 51635 51621	
11134	2	1	2	0	1	51634 51648 51649 51635	
11135	2	1	2	0	1	51648 51662 51663 51649	
11136	2	1	2	0	1	51662 51676 51677 51663	
11137	2	1	2	0	1	51676 51690 51691 51677	
11138	2	1	2	0	1	51690 51704 51705 51691	
11139	2	1	2	0	1	51704 51718 51719 51705	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11140	2	1	2	0	1	51718 51732 51733 51719	
11141	2	1	2	0	1	51732 51746 51747 51733	
11142	2	1	2	0	1	51746 51760 51761 51747	
11143	2	1	2	0	1	51760 51774 51775 51761	
11144	2	1	2	0	1	51774 51788 51789 51775	
11145	2	1	2	0	1	51788 51802 51803 51789	
11146	2	1	2	0	1	51802 51816 51817 51803	
11147	2	1	2	0	1	51816 51591 51592 51817	
11148	2	1	2	0	1	51621 51635 51636 51622	
11149	2	1	2	0	1	51635 51649 51650 51636	
11150	2	1	2	0	1	51649 51663 51664 51650	
11151	2	1	2	0	1	51663 51677 51678 51664	
11152	2	1	2	0	1	51677 51691 51692 51678	
11153	2	1	2	0	1	51691 51705 51706 51692	
11154	2	1	2	0	1	51705 51719 51720 51706	
11155	2	1	2	0	1	51719 51733 51734 51720	
11156	2	1	2	0	1	51733 51747 51748 51734	
11157	2	1	2	0	1	51747 51761 51762 51748	
11158	2	1	2	0	1	51761 51775 51776 51762	
11159	2	1	2	0	1	51775 51789 51790 51776	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11160	2	1	2	0	1	51789 51803 51804 51790	
11161	2	1	2	0	1	51803 51817 51818 51804	
11162	2	1	2	0	1	51817 51582 51593 51818	
11163	2	1	2	0	1	51622 51636 51637 51623	
11164	2	1	2	0	1	51636 51650 51651 51637	
11165	2	1	2	0	1	51650 51664 51665 51651	
11166	2	1	2	0	1	51664 51678 51679 51665	
11167	2	1	2	0	1	51678 51692 51693 51679	
11168	2	1	2	0	1	51692 51706 51707 51693	
11169	2	1	2	0	1	51706 51720 51721 51707	
11170	2	1	2	0	1	51720 51734 51735 51721	

T-CLC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11171	2	1	2	0	1	51734 51748 51749 51735	
11172	2	1	2	0	1	51748 51762 51763 51749	
11173	2	1	2	0	1	51762 51776 51777 51763	
11174	2	1	2	0	1	51776 51790 51791 51777	
11175	2	1	2	0	1	51790 51804 51805 51791	
11176	2	1	2	0	1	51804 51818 51819 51805	
11177	2	1	2	0	1	51818 51593 51594 51819	
11178	2	1	2	0	1	51623 51637 51638 51624	
11179	2	1	2	0	1	51637 51651 51652 51638	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11180	2	1	2	0	1	51651 51665 51666 51652	
11181	2	1	2	0	1	51665 51679 51680 51666	
11182	2	1	2	0	1	51679 51693 51694 51680	
11183	2	1	2	0	1	51693 51707 51708 51694	
11184	2	1	2	0	1	51707 51721 51722 51708	
11185	2	1	2	0	1	51721 51735 51736 51722	
11186	2	1	2	0	1	51735 51749 51750 51736	
11187	2	1	2	0	1	51749 51763 51764 51750	
11188	2	1	2	0	1	51763 51777 51778 51764	
11189	2	1	2	0	1	51777 51791 51792 51778	
11190	2	1	2	0	1	51791 51805 51806 51792	
11191	2	1	2	0	1	51805 51819 51820 51806	
11192	2	1	2	0	1	51819 51594 51595 51820	
11193	2	1	2	0	1	51624 51638 51639 51625	
11194	2	1	2	0	1	51638 51652 51653 51639	
11195	2	1	2	0	1	51652 51666 51667 51653	
11196	2	1	2	0	1	51666 51680 51681 51667	
11197	2	1	2	0	1	51680 51694 51695 51681	
11198	2	1	2	0	1	51694 51708 51709 51695	
11199	2	1	2	0	1	51708 51722 51723 51709	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11200	2	1	2	0	1	51722 51736 51737 51723	
11201	2	1	2	0	1	51736 51750 51751 51737	
11202	2	1	2	0	1	51750 51764 51765 51751	
11203	2	1	2	0	1	51764 51778 51779 51765	
11204	2	1	2	0	1	51778 51792 51793 51779	
11205	2	1	2	0	1	51792 51806 51807 51793	
11206	2	1	2	0	1	51806 51820 51821 51807	
11207	2	1	2	0	1	51820 51595 51596 51821	
11208	2	1	2	0	1	51625 51639 51640 51626	
11209	2	1	2	0	1	51639 51653 51654 51640	
11210	2	1	2	0	1	51653 51667 51668 51654	
11211	2	1	2	0	1	51667 51681 51682 51668	
11212	2	1	2	0	1	51681 51695 51696 51682	
11213	2	1	2	0	1	51695 51709 51710 51696	
11214	2	1	2	0	1	51709 51723 51724 51710	
11215	2	1	2	0	1	51723 51737 51738 51724	
11216	2	1	2	0	1	51737 51751 51752 51738	
11217	2	1	2	0	1	51751 51765 51766 51752	
11218	2	1	2	0	1	51765 51779 51780 51766	
11219	2	1	2	0	1	51779 51793 51794 51780	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11220	2	1	2	0	1	51793 51807 51808 51794	
11221	2	1	2	0	1	51807 51821 51822 51808	
11222	2	1	2	0	1	51821 51596 51597 51822	
11223	2	1	2	0	1	51626 51640 51641 51627	
11224	2	1	2	0	1	51640 51654 51655 51641	
11225	2	1	2	0	1	51654 51668 51669 51655	
11226	2	1	2	0	1	51668 51682 51683 51669	
11227	2	1	2	0	1	51682 51696 51697 51683	
11228	2	1	2	0	1	51696 51710 51711 51697	
11229	2	1	2	0	1	51710 51724 51725 51711	
11230	2	1	2	0	1	51724 51738 51739 51725	
11231	2	1	2	0	1	51738 51752 51753 51739	
11232	2	1	2	0	1	51752 51766 51767 51753	
11233	2	1	2	0	1	51766 51780 51781 51767	
11234	2	1	2	0	1	51780 51794 51795 51781	
11235	2	1	2	0	1	51794 51808 51809 51795	
11236	2	1	2	0	1	51808 51822 51823 51809	

T-C-C-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11237	2	1	2	0	1	51822 51597 51598 51823	
11238	2	1	2	0	1	51627 51641 51642 51628	
11239	2	1	2	0	1	51641 51655 51656 51642	

ELEM MAT TYP REL ESY SEC TSHA

11240	2	1	2	0	1	51655 51669 51670 51656	
11241	2	1	2	0	1	51669 51683 51684 51670	
11242	2	1	2	0	1	51683 51697 51698 51684	
11243	2	1	2	0	1	51697 51711 51712 51698	
11244	2	1	2	0	1	51711 51725 51726 51712	
11245	2	1	2	0	1	51725 51739 51740 51726	
11246	2	1	2	0	1	51739 51753 51754 51740	
11247	2	1	2	0	1	51753 51767 51768 51754	
11248	2	1	2	0	1	51767 51781 51782 51768	
11249	2	1	2	0	1	51781 51795 51796 51782	
11250	2	1	2	0	1	51795 51809 51810 51796	
11251	2	1	2	0	1	51809 51823 51824 51810	
11252	2	1	2	0	1	51823 51837 51838 51824	
11253	2	1	2	0	1	51837 51851 51852 51838	
11254	2	1	2	0	1	51851 51865 51866 51852	
11255	2	1	2	0	1	51865 51879 51880 51866	
11256	2	1	2	0	1	51879 51893 51894 51880	
11257	2	1	2	0	1	51893 51907 51908 51894	
11258	2	1	2	0	1	51907 51921 51922 51908	
11259	2	1	2	0	1	51921 51935 51936 51922	

ELEM MAT TYP REL ESY SEC TSHA

11260	2	1	2	0	1	51726 51740 51741 51727	
11261	2	1	2	0	1	51740 51754 51755 51741	
11262	2	1	2	0	1	51754 51768 51769 51755	
11263	2	1	2	0	1	51768 51782 51783 51769	
11264	2	1	2	0	1	51782 51796 51797 51783	
11265	2	1	2	0	1	51796 51810 51811 51797	
11266	2	1	2	0	1	51810 51824 51825 51811	
11267	2	1	2	0	1	51824 51838 51839 51825	
11268	2	1	2	0	1	51838 51852 51853 51839	
11269	2	1	2	0	1	51852 51866 51867 51853	
11270	2	1	2	0	1	51866 51880 51881 51867	
11271	2	1	2	0	1	51880 51894 51895 51881	
11272	2	1	2	0	1	51894 51908 51909 51895	
11273	2	1	2	0	1	51908 51922 51923 51909	
11274	2	1	2	0	1	51922 51936 51937 51923	
11275	2	1	2	0	1	51936 51950 51951 51937	
11276	2	1	2	0	1	51950 51964 51965 51951	
11277	2	1	2	0	1	51964 51978 51979 51965	
11278	2	1	2	0	1	51978 51992 51993 51979	
11279	2	1	2	0	1	51992 52006 52007 51993	

ELEM MAT TYP REL ESY SEC TSHA

11280	2	1	2	0	1	51797 51811 51812 51798	
11281	2	1	2	0	1	51811 51825 51826 51812	
11282	2	1	2	0	1	51825 51839 51840 51826	
11283	2	1	2	0	1	51839 51853 51854 51840	
11284	2	1	2	0	1	51853 51867 51868 51854	
11285	2	1	2	0	1	51867 51881 51882 51868	
11286	2	1	2	0	1	51881 51895 51896 51882	
11287	2	1	2	0	1	51895 51909 51910 51896	
11288	2	1	2	0	1	51909 51923 51924 51910	
11289	2	1	2	0	1	51923 51937 51938 51924	
11290	2	1	2	0	1	51937 51951 51952 51938	
11291	2	1	2	0	1	51951 51965 51966 51952	
11292	2	1	2	0	1	51965 51979 51980 51966	
11293	2	1	2	0	1	51979 51993 51994 51980	
11294	2	1	2	0	1	51993 52007 52008 51994	
11295	2	1	2	0	1	52007 52021 52022 52008	
11296	2	1	2	0	1	52021 52035 52036 52022	
11297	2	1	2	0	1	52035 52049 52050 52036	
11298	2	1	2	0	1	52049 52063 52064 52050	
11299	2	1	2	0	1	52063 52077 52078 52050	

ELEM MAT TYP REL ESY SEC TSHA

T-C-C-00006, REV. 0

11300	2	1	2	0	1	51659 51673 51674 51660	
11301	2	1	2	0	1	51673 51687 51688 51674	
11302	2	1	2	0	1	51687 51701 51702 51688	
11303	2	1	2	0	1	51701 51715 51716 51702	
11304	2	1	2	0	1	51715 51729 51730 51716	
11305	2	1	2	0	1	51729 51743 51744 51730	
11306	2	1	2	0	1	51743 51757 51758 51744	
11307	2	1	2	0	1	51757 51771 51772 51758	
11308	2	1	2	0	1	51771 51785 51786 51772	
11309	2	1	2	0	1	51785 51799 51800 51786	
11310	2	1	2	0	1	51799 51813 51814 51800	
11311	2	1	2	0	1	51813 51827 51828 51814	
11312	2	1	2	0	1	51827 51841 51842 51828	
11313	2	1	2	0	1	51841 51855 51856 51842	
11314	2	1	2	0	1	51855 51869 51870 51856	
11315	2	1	2	0	1	51869 51883 51884 51870	
11316	2	1	2	0	1	51883 51897 51898 51884	
11317	2	1	2	0	1	51897 51911 51912 51898	
11318	2	1	2	0	1	51911 51925 51926 51912	
11319	2	1	2	0	1	51925 51939 51940 51926	

ELEM MAT TYP REL ESY SEC TSHA

11320	2	1	2	0	1	51730 51744 51745 51731	
11321	2	1	2	0	1	51744 51758 51759 51745	
11322	2	1	2	0	1	51758 51772 51773 51759	
11323	2	1	2	0	1	51772 51786 51787 51773	
11324	2	1	2	0	1	51786 51800 51801 51787	
11325	2	1	2	0	1	51800 51814 51815 51801	
11326	2	1	2	0	1	51814 51828 51829 51815	
11327	2	1	2	0	1	51828 51842 51843 51829	
11328	2	1	2	0	1	51842 51856 51857 51843	
11329	2	1	2	0	1	51856 51870 51871 51857	
11330	2	1	2	0	1	51870 51884 51885 51871	
11331	2	1	2	0	1	51884 51898 51899 51885	
11332	2	1	2	0	1	51898 51912 51913 51899	
11333	2	1	2	0	1	51912 51926 51927 51913	
11334	2	1	2	0	1	51926 51940 51941 51927	
11335	2	1	2	0	1	51940 51954 51955 51941	
11336	2	1	2	0	1	51954 51968 51969 51955	
11337	2	1	2	0	1	51968 51982 51983 51969	
11338	2	1	2	0	1	51982 51996 51997 51983	
11339	2	1	2	0	1	51996 52010 52011 51997	

ELEM MAT TYP REL ESY SEC TSHA

11340	2	1	2	0	1	51801 51815 51816 51617	
11341	2	1	2	0	1	51815 51829 51830 51618	
11342	2	1	2	0	1	51829 51843 51844 51619	
11343	2	1	2	0	1	51843 51857 51858 51844	
11344	2	1	2	0	1	51857 51871 51872 51858	
11345	2	1	2	0	1	51871 51885 51886 51872	
11346	2	1	2	0	1	51885 51899 51900 51886	
11347	2	1	2	0	1	51899 51913 51914 51900	
11348	2	1	2	0	1	51913 51927 51928 51914	
11349	2	1	2	0	1	51927 51941 51942 51928	
11350	2	1	2	0	1	51941 51955 51956 51942	
11351	2	1	2	0	1	51955 51969 51970 51956	
11352	2	1	2	0	1	51969 51983 51984 51970	
11353	2	1	2	0	1	51983 51997 51998 51984	
11354	2	1	2	0	1	51997 52011 52012 51998	
11355	2	1	2	0	1	52011 52025 52026 52012	
11356	2	1	2	0	1	52025 52039 52040 52026	
11357	2	1	2	0	1	52039 52053 52054 52040	
11358	2	1	2	0	1	52053 52067 52068 52054	
11359	2	1	2	0	1	52067 52081 52082 52068	

ELEM MAT TYP REL ESY SEC TSHA

11360	2	1	2	0	1	51952 51966 51967 51953	
11361	2	1	2	0	1	51966 51980 51981 51967	
11362	2	1	2	0	1	51980 51994 51995 51981	
11363	2	1	2	0	1	51994 52008 52009 51995	
11364	2	1	2	0	1	52008 52022 52023 52009	
11365	2	1	2	0	1	52022 52036 52037 52023	

ELEM MAT TYP REL ESY SEC TSHA

11366	2	1	2	0	1	51952 51966 51967 51953	
11367	2	1	2	0	1	51966 51980 51981 51967	
11368	2	1	2	0	1	51980 51994 51995 51981	
11369	2	1	2	0	1	51994 52008 52009 51995	
11370	2	1	2	0	1	52008 52022 52023 52009	
11371	2	1	2	0	1	52022 52036 52037 52023	

T-C-C-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11432	2	1	2	0	1	51907 51838 51839 51988	
11433	2	1	2	0	1	51862 51876 51877 51863	
11434	2	1	2	0	1	51876 51890 51891 51877	
11435	2	1	2	0	1	51890 51904 51905 51891	
11436	2	1	2	0	1	51904 51938 51939 51905	
11437	2	1	2	0	1	51938 51946 51947 51933	
11438	2	1	2	0	1	51946 51960 51961 51947	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11440	2	1	2	0	1	51960 51974 51975 51961	
11441	2	1	2	0	1	51974 51988 51989 51975	
11442	2	1	2	0	1	51988 51839 51840 51989	
11443	2	1	2	0	1	51863 51877 51878 51864	
11444	2	1	2	0	1	51877 51891 51892 51878	
11445	2	1	2	0	1	51891 51905 51906 51892	
11446	2	1	2	0	1	51905 51939 51940 51906	
11447	2	1	2	0	1	51939 51933 51934 51930	
11448	2	1	2	0	1	51933 51947 51948 51934	
11449	2	1	2	0	1	51947 51961 51962 51948	
11450	2	1	2	0	1	51961 51975 51976 51962	
11451	2	1	2	0	1	51975 51989 51990 51976	
11452	2	1	2	0	1	51989 51840 51841 51990	
11453	2	1	2	0	1	51864 51878 51879 51865	
11454	2	1	2	0	1	51878 51892 51893 51879	
11455	2	1	2	0	1	51892 51906 51907 51893	
11456	2	1	2	0	1	51906 51920 51921 51907	
11457	2	1	2	0	1	51920 51934 51935 51921	
11458	2	1	2	0	1	51934 51948 51949 51935	
11459	2	1	2	0	1	51948 51962 51963 51949	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11460	2	1	2	0	1	51962 51976 51977 51963	
11461	2	1	2	0	1	51976 51990 51991 51977	
11462	2	1	2	0	1	51990 51841 51842 51991	
11463	2	1	2	0	1	51865 51879 51880 51866	
11464	2	1	2	0	1	51879 51893 51894 51880	
11465	2	1	2	0	1	51893 51907 51908 51894	
11466	2	1	2	0	1	51907 51921 51922 51908	
11467	2	1	2	0	1	51921 51935 51936 51922	
11468	2	1	2	0	1	51935 51949 51950 51936	
11469	2	1	2	0	1	51949 51963 51964 51950	
11470	2	1	2	0	1	51963 51977 51978 51964	
11471	2	1	2	0	1	51977 51991 51992 51978	
11472	2	1	2	0	1	51991 51842 51843 51992	
11473	2	1	2	0	1	51866 51880 51881 51867	
11474	2	1	2	0	1	51880 51894 51895 51881	
11475	2	1	2	0	1	51894 51908 51909 51895	
11476	2	1	2	0	1	51908 51922 51923 51909	
11477	2	1	2	0	1	51922 51936 51937 51923	
11478	2	1	2	0	1	51936 51950 51951 51937	
11479	2	1	2	0	1	51950 51964 51965 51951	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11480	2	1	2	0	1	51964 51978 51979 51965	
11481	2	1	2	0	1	51978 51992 51993 51979	
11482	2	1	2	0	1	51992 51843 51844 51993	
11483	2	1	2	0	1	51867 51881 51845 51590	
11484	2	1	2	0	1	51881 51895 51846 51845	
11485	2	1	2	0	1	51895 51909 51847 51846	
11486	2	1	2	0	1	51909 51923 51848 51847	
11487	2	1	2	0	1	51923 51937 51849 51848	
11488	2	1	2	0	1	51937 51951 51850 51849	
11489	2	1	2	0	1	51951 51965 51851 51850	
11490	2	1	2	0	1	51965 51979 51852 51851	
11491	2	1	2	0	1	51979 51993 51853 51852	
11492	2	1	2	0	1	51993 51844 51830 51853	
11493	2	1	2	0	1	216 20736 2028 20314	
11494	2	1	2	0	1	20736 20737 20842 2028	
11495	2	1	2	0	1	20737 20738 20856 20284	
11496	2	1	2	0	1	20738 20739 20750 20286	
11497	2	1	2	0	1	20739 20734 51995 52070	

T-C-C-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11366	2	1	2	0	1	51897 51911 51912 51898	
11367	2	1	2	0	1	51911 51925 51926 51912	
11368	2	1	2	0	1	51925 51939 51940 51926	
11369	2	1	2	0	1	51939 51953 51954 51940	
11370	2	1	2	0	1	51953 51967 51968 51954	
11371	2	1	2	0	1	51967 51981 51982 51968	
11372	2	1	2	0	1	51981 51832 51833 51982	
11373	2	1	2	0	1	51856 51870 51871 51857	
11374	2	1	2	0	1	51870 51884 51885 51871	
11375	2	1	2	0	1	51884 51898 51899 51885	
11376	2	1	2	0	1	51898 51912 51913 51899	
11377	2	1	2	0	1	51912 51926 51927 51913	
11378	2	1	2	0	1	51926 51940 51941 51927	
11379	2	1	2	0	1	51940 51954 51955 51941	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11380	2	1	2	0	1	51954 51968 51969 51955	
11381	2	1	2	0	1	51968 51982 51983 51969	
11382	2	1	2	0	1	51982 51833 51834 51983	
11383	2	1	2	0	1	51857 51871 51872 51858	
11384	2	1	2	0	1	51871 51885 51886 51872	
11385	2	1	2	0	1	51885 51899 51900 51886	
11386	2	1	2	0	1	51899 51913 51914 51900	
11387	2	1	2	0	1	51913 51927 51928 51914	
11388	2	1	2	0	1	51927 51941 51942 51928	
11389	2	1	2	0	1	51941 51955 51956 51942	
11390	2	1	2	0	1	51955 51969 51970 51956	
11391	2	1	2	0	1	51969 51983 51984 51970	
11392	2	1	2	0	1	51983 51934 51935 51984	
11393	2	1	2	0	1	51934 51948 51949 51935	
11394	2	1	2	0	1	51948 51962 51963 51949	
11395	2	1	2	0	1	51962 51976 51977 51963	
11396	2	1	2	0	1	51976 51990 51991 51977	
11397	2	1	2	0	1	51990 51842 51843 51991	
11398	2	1	2	0	1	51865 51879 51880 51866	
11399	2	1	2	0	1	51879 51893 51894 51880	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11400	2	1	2	0	1	51956 51970 51971 51957	
11401	2	1	2	0	1	51970 51984 51985 51971	
11402	2	1	2	0	1	51984 51835 51836 51985	
11403	2	1	2	0	1	51859 51873 51874 51860	
11404	2	1	2	0	1	51873 51887 51888 51874	
11405	2	1	2	0	1	51887 51901 51902 51888	
11406	2	1	2	0	1	51901 51915 51916 51902	
11407	2	1	2	0	1	51915 51929 51930 51916	
11408	2	1	2	0	1	51929 51943 51944 51930	
11409	2	1	2	0	1	51943 51957 51958 51944	
11410	2	1	2	0	1	51957 51971 51972 51958	
11411	2	1	2	0	1	51971 51985 51986 51972	
11412	2	1	2	0	1	51985 51836 51837 51986	
11413	2	1	2	0	1	51860 51874 51875 51861	
11414	2	1	2	0	1	51874 51888 51889 51875	
11415	2	1	2	0	1	51888 51902 51903 51889	
11416	2	1	2	0	1	51902 51916 51917 51903	
11417	2	1	2	0	1	51916 51930 51931 51917	
11418	2	1	2	0	1	51930 51944 51945 51931	
11419	2	1	2	0	1	51944 51958 51959 51945	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11420	2	1	2	0	1	51958 51972 51973 51959	
11421	2	1	2	0	1	51972 51986 51987 51973	
11422	2	1	2	0	1	51986 51837 51838 51987	
11423	2	1	2	0	1	51861 51875 51876 51862	
11424	2	1	2	0	1	51875 51889 51890 51876	
11425	2	1	2	0	1	51889 51903 51904 51890	
11426	2	1	2	0	1	51903 51917 51918 51904	
11427	2	1	2	0	1	51917 51931 51932 51918	
11428	2	1	2	0	1	51931 51945 51946 51932	
11429	2	1	2	0	1	51945 51959 51960 51946	
11430	2	1	2	0	1	51959 51973 51974 51960	
11431	2	1	2	0	1	51973 51987 51988 51974	

T-C-C-A-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11561	2	1	2	0	1	52068 52082 52083 52089	
11562	2	1	2	0	1	52082 52007 52008 52083	
11563	2	1	2	0	1	52027 52041 52010 52089	
11564	2	1	2	0	1	52041 52055 52011 52010	
11565	2	1	2	0	1	52055 52069 52012 52011	
11566	2	1	2	0	1	52069 52081 52013 52012	
11567	2	1	2	0	1	52083 52088 51994 52013	
11568	2	1	2	0	1	20888 20892 52127 52113	
11569	2	1	2	0	1	20902 20901 52141 52127	
11570	2	1	2	0	1	20901 20900 52155 52141	
11571	2	1	2	0	1	20900 20899 52169 52155	
11572	2	1	2	0	1	20899 20898 52183 52169	
11573	2	1	2	0	1	20898 20897 52197 52183	
11574	2	1	2	0	1	20897 20896 52211 52197	
11575	2	1	2	0	1	20896 20895 52225 52211	
11576	2	1	2	0	1	20895 20894 52239 52225	
11577	2	1	2	0	1	20894 20893 52253 52239	
11578	2	1	2	0	1	20893 20892 52267 52253	
11579	2	1	2	0	1	20892 20891 52281 52267	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11580	2	1	2	0	1	20891 20890 52295 52281	
11581	2	1	2	0	1	20890 20889 52309 52295	
11582	2	1	2	0	1	20889 20888 52085 52309	
11583	2	1	2	0	1	52113 52127 52128 52114	
11584	2	1	2	0	1	52127 52141 52142 52128	
11585	2	1	2	0	1	52141 52155 52156 52142	
11586	2	1	2	0	1	52155 52169 52170 52156	
11587	2	1	2	0	1	52169 52183 52184 52170	
11588	2	1	2	0	1	52183 52197 52198 52184	
11589	2	1	2	0	1	52197 52211 52212 52198	
11590	2	1	2	0	1	52211 52225 52226 52212	
11591	2	1	2	0	1	52225 52239 52240 52226	
11592	2	1	2	0	1	52239 52253 52254 52240	
11593	2	1	2	0	1	52253 52267 52268 52254	
11594	2	1	2	0	1	52267 52281 52282 52268	
11595	2	1	2	0	1	52281 52295 52296 52282	
11596	2	1	2	0	1	52295 52309 52310 52296	
11597	2	1	2	0	1	52309 52085 52086 52310	
11598	2	1	2	0	1	52114 52128 52129 52115	
11599	2	1	2	0	1	52128 52142 52143 52129	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11600	2	1	2	0	1	52142 52156 52157 52143	
11601	2	1	2	0	1	52156 52170 52171 52157	
11602	2	1	2	0	1	52170 52184 52185 52171	
11603	2	1	2	0	1	52184 52198 52199 52185	
11604	2	1	2	0	1	52198 52212 52213 52199	
11605	2	1	2	0	1	52212 52226 52227 52213	
11606	2	1	2	0	1	52226 52240 52241 52227	
11607	2	1	2	0	1	52240 52254 52255 52241	
11608	2	1	2	0	1	52254 52268 52269 52255	
11609	2	1	2	0	1	52268 52282 52283 52269	
11610	2	1	2	0	1	52282 52296 52297 52283	
11611	2	1	2	0	1	52296 52310 52311 52297	
11612	2	1	2	0	1	52310 52086 52087 52311	
11613	2	1	2	0	1	52115 52129 52130 52116	
11614	2	1	2	0	1	52129 52143 52144 52130	
11615	2	1	2	0	1	52143 52157 52158 52144	
11616	2	1	2	0	1	52157 52171 52172 52158	
11617	2	1	2	0	1	52171 52185 52186 52172	
11618	2	1	2	0	1	52185 52199 52200 52186	
11619	2	1	2	0	1	52199 52213 52214 52200	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11620	2	1	2	0	1	52213 52227 52228 52214	
11621	2	1	2	0	1	52227 52241 52242 52228	
11622	2	1	2	0	1	52241 52255 52256 52242	
11623	2	1	2	0	1	52255 52269 52270 52256	
11624	2	1	2	0	1	52269 52283 52284 52270	
11625	2	1	2	0	1	52283 52297 52298 52284	
11626	2	1	2	0	1	52297 52311 52312 52298	

T-C-C-A-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11498	2	1	2	0	1	52014 52038 52029 52015	
11499	2	1	2	0	1	52028 52042 52043 52029	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11500	2	1	2	0	1	52042 52056 52057 52043	
11501	2	1	2	0	1	52056 52070 52071 52057	
11502	2	1	2	0	1	52070 51995 51996 52071	
11503	2	1	2	0	1	52015 52029 52030 52016	
11504	2	1	2	0	1	52029 52043 52044 52030	
11505	2	1	2	0	1	52043 52057 52058 52044	
11506	2	1	2	0	1	52057 52071 52072 52058	
11507	2	1	2	0	1	52071 51996 51997 52072	
11508	2	1	2	0	1	52016 52030 52031 52017	
11509	2	1	2	0	1	52030 52044 52045 52031	
11510	2	1	2	0	1	52044 52058 52059 52045	
11511	2	1	2	0	1	52058 52072 52073 52059	
11512	2	1	2	0	1	52072 51997 51998 52073	
11513	2	1	2	0	1	52017 52031 52032 52018	
11514	2	1	2	0	1	52031 52045 52046 52032	
11515	2	1	2	0	1	52045 52059 52060 52046	
11516	2	1	2	0	1	52059 52073 52074 52060	
11517	2	1	2	0	1	52073 51998 51999 52074	
11518	2	1	2	0	1	52018 52032 52033 52019	
11519	2	1	2	0	1	52032 52046 52047 52033	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11520	2	1	2	0	1	52046 52060 52061 52047	
11521	2	1	2	0	1	52060 52074 52075 52061	
11522	2	1	2	0	1	52074 51999 52000 52075	
11523	2	1	2	0	1	52019 52033 52034 52020	
11524	2	1	2	0	1	52033 52047 52048 52034	
11525	2	1	2	0	1	52047 52061 52062 52048	
11526	2	1	2	0	1	52061 52075 52076 52062	
11527	2	1	2	0	1	52075 52000 52001 52076	
11528	2	1	2	0	1	52020 52034 52035 52021	
11529	2	1	2	0	1	52034 52048 52049 52035	
11530	2	1	2	0	1	52048 52062 52063 52049	
11531	2	1	2	0	1	52062 52076 52077 52063	
11532	2	1	2	0	1	52076 52001 52002 52077	
11533	2	1	2	0	1	52021 52035 52036 52022	
11534	2	1	2	0	1	52035 52049 52050 52036	
11535	2	1	2	0	1	52049 52063 52064 52050	
11536	2	1	2	0	1	52063 52077 52078 52064	
11537	2	1	2	0	1	52077 52002 52003 52078	
11538	2	1	2	0	1	52022 52036 52037 52023	
11539	2	1	2	0	1	52036 52050 52051 52037	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11540	2	1	2	0	1	52050 52064 52065 52051	
11541	2	1	2	0	1	52064 52078 52079 52065	
11542	2	1	2	0	1	52078 52003 52004 52079	
11543	2	1	2	0	1	52023 52037 52038 52024	
11544	2	1	2	0	1	52037 52051 52052 52038	
11545	2	1	2	0	1	52051 52065 52066 52052	
11546	2	1	2	0	1	52065 52079 52080 52066	
11547	2	1	2	0	1	52079 52004 52005 52080	
11548	2	1	2	0	1	52024 52038 52039 52025	
11549	2	1	2	0	1	52038 52052 52053 52039	
11550	2	1	2	0	1	52052 52066 52067 52053	
11551	2	1	2	0	1	52066 52080 52081 52067	
11552	2	1	2	0	1	52080 52005 52006 52081	
11553	2	1	2	0	1	52025 52038 52040 52026	
11554	2	1	2	0	1	52039 52053 52054 52040	
11555	2	1	2	0	1	52053 52067 52068 52054	
11556	2	1	2	0	1	52067 52081 52082 52068	
11557	2	1	2	0	1	52081 52006 52007 52082	
11558	2	1	2	0	1	52026 52040 52041 52027	
11559	2	1	2	0	1	52040 52054 52055 52041	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11560	2	1	2	0	1	52054 52068 52069 52055	

T-CLC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11627	2	1	2	0	1	52311 52087 52088 52312	
11628	2	1	2	0	1	52116 52130 52131 52117	
11629	2	1	2	0	1	52130 52144 52145 52117	
11630	2	1	2	0	1	52144 52158 52159 52145	
11631	2	1	2	0	1	52158 52172 52173 52145	
11632	2	1	2	0	1	52172 52186 52187 52173	
11633	2	1	2	0	1	52186 52200 52201 52187	
11634	2	1	2	0	1	52200 52214 52215 52201	
11635	2	1	2	0	1	52214 52228 52229 52215	
11636	2	1	2	0	1	52228 52242 52243 52229	
11637	2	1	2	0	1	52242 52256 52257 52243	
11638	2	1	2	0	1	52256 52270 52271 52257	
11639	2	1	2	0	1	52270 52284 52285 52271	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11640	2	1	2	0	1	52284 52298 52299 52285	
11641	2	1	2	0	1	52298 52312 52313 52299	
11642	2	1	2	0	1	52312 52326 52327 52313	
11643	2	1	2	0	1	52312 52326 52327 52313	
11644	2	1	2	0	1	52313 52145 52146 52146	
11645	2	1	2	0	1	52145 52159 52160 52146	
11646	2	1	2	0	1	52159 52173 52174 52160	
11647	2	1	2	0	1	52173 52187 52188 52174	
11648	2	1	2	0	1	52187 52201 52202 52188	
11649	2	1	2	0	1	52201 52215 52216 52202	
11650	2	1	2	0	1	52215 52229 52230 52216	
11651	2	1	2	0	1	52229 52243 52244 52240	
11652	2	1	2	0	1	52243 52257 52258 52244	
11653	2	1	2	0	1	52257 52271 52272 52258	
11654	2	1	2	0	1	52271 52285 52286 52272	
11655	2	1	2	0	1	52285 52299 52300 52286	
11656	2	1	2	0	1	52299 52313 52314 52300	
11657	2	1	2	0	1	52313 52089 52090 52314	
11658	2	1	2	0	1	52118 52132 52133 52119	
11659	2	1	2	0	1	52132 52146 52147 52133	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11660	2	1	2	0	1	52146 52160 52161 52147	
11661	2	1	2	0	1	52160 52174 52175 52161	
11662	2	1	2	0	1	52174 52188 52189 52175	
11663	2	1	2	0	1	52188 52202 52203 52189	
11664	2	1	2	0	1	52202 52216 52217 52203	
11665	2	1	2	0	1	52216 52230 52231 52217	
11666	2	1	2	0	1	52230 52244 52245 52231	
11667	2	1	2	0	1	52244 52258 52259 52245	
11668	2	1	2	0	1	52258 52272 52273 52259	
11669	2	1	2	0	1	52272 52286 52287 52273	
11670	2	1	2	0	1	52286 52300 52301 52287	
11671	2	1	2	0	1	52300 52314 52315 52301	
11672	2	1	2	0	1	52314 52090 52091 52315	
11673	2	1	2	0	1	52119 52133 52134 52120	
11674	2	1	2	0	1	52133 52147 52148 52134	
11675	2	1	2	0	1	52147 52161 52162 52148	
11676	2	1	2	0	1	52161 52175 52176 52162	
11677	2	1	2	0	1	52175 52189 52190 52176	
11678	2	1	2	0	1	52189 52203 52204 52190	
11679	2	1	2	0	1	52203 52217 52218 52204	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11680	2	1	2	0	1	52217 52231 52232 52218	
11681	2	1	2	0	1	52231 52245 52246 52232	
11682	2	1	2	0	1	52245 52259 52260 52246	
11683	2	1	2	0	1	52259 52273 52274 52260	
11684	2	1	2	0	1	52273 52287 52288 52274	
11685	2	1	2	0	1	52287 52301 52302 52288	
11686	2	1	2	0	1	52301 52315 52316 52302	
11687	2	1	2	0	1	52315 52091 52092 52316	
11688	2	1	2	0	1	52120 52134 52135 52121	
11689	2	1	2	0	1	52134 52148 52149 52135	
11690	2	1	2	0	1	52148 52162 52163 52149	
11691	2	1	2	0	1	52162 52176 52177 52163	
11692	2	1	2	0	1	52176 52190 52191 52177	

T-CLC-00006, REV. 0

11693	2	1	2	0	1	52190 52204 52205 52191	
11694	2	1	2	0	1	52204 52218 52219 52205	
11695	2	1	2	0	1	52218 52232 52233 52219	
11696	2	1	2	0	1	52232 52246 52247 52233	
11697	2	1	2	0	1	52246 52260 52261 52247	
11698	2	1	2	0	1	52260 52274 52275 52261	
11699	2	1	2	0	1	52274 52288 52289 52275	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11700	2	1	2	0	1	52288 52302 52303 52289	
11701	2	1	2	0	1	52302 52316 52317 52303	
11702	2	1	2	0	1	52316 52092 52093 52317	
11703	2	1	2	0	1	52121 52135 52136 52122	
11704	2	1	2	0	1	52135 52149 52150 52136	
11705	2	1	2	0	1	52149 52163 52164 52150	
11706	2	1	2	0	1	52163 52177 52178 52164	
11707	2	1	2	0	1	52177 52191 52192 52178	
11708	2	1	2	0	1	52191 52205 52206 52192	
11709	2	1	2	0	1	52205 52219 52220 52206	
11710	2	1	2	0	1	52219 52233 52234 52220	
11711	2	1	2	0	1	52233 52247 52248 52234	
11712	2	1	2	0	1	52247 52261 52262 52248	
11713	2	1	2	0	1	52261 52275 52276 52262	
11714	2	1	2	0	1	52275 52289 52290 52276	
11715	2	1	2	0	1	52289 52303 52304 52290	
11716	2	1	2	0	1	52303 52317 52318 52304	
11717	2	1	2	0	1	52317 52093 52094 52318	
11718	2	1	2	0	1	52122 52136 52137 52123	
11719	2	1	2	0	1	52136 52150 52151 52137	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11720	2	1	2	0	1	52150 52164 52165 52151	
11721	2	1	2	0	1	52164 52178 52179 52165	
11722	2	1	2	0	1	52178 52192 52193 52179	
11723	2	1	2	0	1	52192 52206 52207 52193	
11724	2	1	2	0	1	52206 52220 52221 52207	
11725	2	1	2	0	1	52220 52234 52235 52221	
11726	2	1	2	0	1	52234 52248 52249 52235	
11727	2	1	2	0	1	52248 52262 52263 52249	
11728	2	1	2	0	1	52262 52276 52277 52263	
11729	2	1	2	0	1	52276 52290 52291 52277	
11730	2	1	2	0	1	52290 52304 52305 52291	
11731	2	1	2	0	1	52304 52318 52319 52305	
11732	2	1	2	0	1	52318 52094 52095 52319	
11733	2	1	2	0	1	52123 52137 52138 52124	
11734	2	1	2	0	1	52137 52151 52152 52138	
11735	2	1	2	0	1	52151 52165 52166 52152	
11736	2	1	2	0	1	52165 52179 52180 52166	
11737	2	1	2	0	1	52179 52193 52194 52180	
11738	2	1	2	0	1	52193 52207 52208 52194	
11739	2	1	2	0	1	52207 52221 52222 52208	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11740	2	1	2	0	1	52221 52235 52236 52222	
11741	2	1	2	0	1	52235 52249 52250 52236	
11742	2	1	2	0	1	52249 52263 52264 52250	
11743	2	1	2	0	1	52263 52277 52278 52264	
11744	2	1	2	0	1	52277 52291 52292 52278	
11745	2	1	2	0	1	52291 52305 52306 52292	
11746	2	1	2	0	1	52305 52319 52320 52306	
11747	2	1	2	0	1	52319 52095 52096 52320	
11748	2	1	2	0	1	52124 52138 52139 52125	
11749	2	1	2	0	1	52138 52152 52153 52139	
11750	2	1	2	0	1	52152 52166 52167 52153	
11751	2	1	2	0	1	52166 52180 52181 52167	
11752	2	1	2	0	1	52180 52194 52195 52181	
11753	2	1	2	0	1	52194 52208 52209 52195	
11754	2	1	2	0	1	52208 52222 52223 52209	
11755	2	1	2	0	1	52222 52236 52237 52223	
11756	2	1	2	0	1	52236 52250 52251 52237	
11757	2	1	2	0	1	52250 52264 52265 52251	
11758	2	1	2	0	1	52264 52278 52279 52265	

T-CALC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11759	2	1	2	0	1	52278 52292 52293 52279	
11760	2	1	2	0	1	52292 52306 52307 52293	
11761	2	1	2	0	1	52306 52320 52321 52307	
11762	2	1	2	0	1	52320 52096 52097 52321	
11763	2	1	2	0	1	52125 52139 52140 52146	
11764	2	1	2	0	1	52139 52153 52154 52140	
11765	2	1	2	0	1	52153 52167 52168 52154	
11766	2	1	2	0	1	52167 52181 52182 52168	
11767	2	1	2	0	1	52181 52195 52196 52182	
11768	2	1	2	0	1	52195 52209 52210 52196	
11769	2	1	2	0	1	52209 52223 52224 52210	
11770	2	1	2	0	1	52223 52237 52238 52224	
11771	2	1	2	0	1	52237 52251 52252 52238	
11772	2	1	2	0	1	52251 52265 52266 52252	
11773	2	1	2	0	1	52265 52279 52280 52266	
11774	2	1	2	0	1	52279 52293 52294 52280	
11775	2	1	2	0	1	52293 52307 52308 52294	
11776	2	1	2	0	1	52307 52321 52322 52308	
11777	2	1	2	0	1	52321 52097 52098 52322	
11778	2	1	2	0	1	52126 52140 52099 51984	
11779	2	1	2	0	1	52140 52154 52100 52099	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11780	2	1	2	0	1	52154 52168 52101 52100	
11781	2	1	2	0	1	52168 52182 52102 52101	
11782	2	1	2	0	1	52182 52196 52103 52102	
11783	2	1	2	0	1	52196 52210 52104 52103	
11784	2	1	2	0	1	52210 52224 52105 52104	
11785	2	1	2	0	1	52224 52238 52106 52105	
11786	2	1	2	0	1	52238 52252 52107 52106	
11787	2	1	2	0	1	52252 52266 52108 52107	
11788	2	1	2	0	1	52266 52280 52109 52108	
11789	2	1	2	0	1	52280 52294 52110 52109	
11790	2	1	2	0	1	52294 52308 52111 52110	
11791	2	1	2	0	1	52308 52322 52112 52111	
11792	2	1	2	0	1	52322 52098 52084 52112	
11793	2	1	2	0	1	20699 20713 52365 52351	
11794	2	1	2	0	1	20713 20712 52379 52365	
11795	2	1	2	0	1	20712 20711 52393 52379	
11796	2	1	2	0	1	20711 20710 52407 52393	
11797	2	1	2	0	1	20710 20709 52421 52407	
11798	2	1	2	0	1	20709 20708 52435 52421	
11799	2	1	2	0	1	20708 20707 52449 52435	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11800	2	1	2	0	1	20707 20706 52463 52449	
11801	2	1	2	0	1	20706 20705 52477 52463	
11802	2	1	2	0	1	20705 20704 52491 52477	
11803	2	1	2	0	1	20704 20703 52505 52491	
11804	2	1	2	0	1	20703 20702 52519 52505	
11805	2	1	2	0	1	20702 20701 52533 52519	
11806	2	1	2	0	1	20701 20700 52547 52533	
11807	2	1	2	0	1	20700 20697 52523 52547	
11808	2	1	2	0	1	52351 52365 52366 52352	
11809	2	1	2	0	1	52365 52379 52380 52366	
11810	2	1	2	0	1	52379 52393 52394 52380	
11811	2	1	2	0	1	52393 52407 52408 52394	
11812	2	1	2	0	1	52407 52421 52422 52408	
11813	2	1	2	0	1	52421 52435 52436 52422	
11814	2	1	2	0	1	52435 52449 52450 52436	
11815	2	1	2	0	1	52449 52463 52464 52450	
11816	2	1	2	0	1	52463 52477 52478 52464	
11817	2	1	2	0	1	52477 52491 52492 52478	
11818	2	1	2	0	1	52491 52505 52506 52492	
11819	2	1	2	0	1	52505 52519 52520 52506	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11820	2	1	2	0	1	52519 52533 52534 52520	
11821	2	1	2	0	1	52533 52547 52548 52534	

T-CALC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11822	2	1	2	0	1	52547 52323 52324 52548	
11823	2	1	2	0	1	52352 52366 52367 52353	
11824	2	1	2	0	1	52366 52380 52381 52367	
11825	2	1	2	0	1	52380 52394 52395 52381	
11826	2	1	2	0	1	52394 52408 52409 52395	
11827	2	1	2	0	1	52408 52422 52423 52409	
11828	2	1	2	0	1	52422 52436 52437 52423	
11829	2	1	2	0	1	52436 52450 52451 52437	
11830	2	1	2	0	1	52450 52464 52465 52451	
11831	2	1	2	0	1	52464 52478 52479 52465	
11832	2	1	2	0	1	52478 52492 52493 52479	
11833	2	1	2	0	1	52492 52506 52507 52493	
11834	2	1	2	0	1	52506 52520 52521 52507	
11835	2	1	2	0	1	52520 52534 52535 52521	
11836	2	1	2	0	1	52534 52548 52549 52535	
11837	2	1	2	0	1	52548 52562 52563 52549	
11838	2	1	2	0	1	52562 52576 52577 52563	
11839	2	1	2	0	1	52576 52590 52591 52577	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11840	2	1	2	0	1	52381 52395 52396 52382	
11841	2	1	2	0	1	52395 52409 52410 52396	
11842	2	1	2	0	1	52409 52423 52424 52410	
11843	2	1	2	0	1	52423 52437 52438 52424	
11844	2	1	2	0	1	52437 52451 52452 52438	
11845	2	1	2	0	1	52451 52465 52466 52452	
11846	2	1	2	0	1	52465 52479 52480 52466	
11847	2	1	2	0	1	52479 52493 52494 52480	
11848	2	1	2	0	1	52493 52507 52508 52494	
11849	2	1	2	0	1	52507 52521 52522 52508	
11850	2	1	2	0	1	52521 52535 52536 52522	
11851	2	1	2	0	1	52535 52549 52550 52536	
11852	2	1	2	0	1	52549 52563 52564 52550	
11853	2	1	2	0	1	52563 52577 52578 52564	
11854	2	1	2	0	1	52577 52591 52592 52578	
11855	2	1	2	0	1	52591 52605 52606 52592	
11856	2	1	2	0	1	52605 52619 52620 52606	
11857	2	1	2	0	1	52619 52633 52634 52620	
11858	2	1	2	0	1	52633 52647 52648 52634	
11859	2	1	2	0	1	52647 52661 52662 52648	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11860	2	1	2	0	1	52452 52466 52467 52453	
11861	2	1	2	0	1	52466 52480 52481 52467	
11862	2	1	2	0	1	52480 52494 52495 52481	
11863	2	1	2	0	1	52494 52508 52509 52495	
11864	2	1	2	0	1	52508 52522 52523 52509	
11865	2	1	2	0	1	52522 52536 52537 52523	
11866	2	1	2	0	1	52536 52550 52551 52537	
11867	2	1	2	0	1	52550 52564 52565 52551	
11868	2	1	2	0	1	52564 52578 52579 52565	
11869	2	1	2	0	1	52578 52592 52593 52579	
11870	2	1	2	0	1	52592 52606 52607 52593	
11871	2	1	2	0	1	52606 52620 52621 52607	
11872	2	1	2	0	1	52620 52634 52635 52621	
11873	2	1	2	0	1	52634 52648 52649 52635	
11874	2	1	2	0	1	52648 52662 52663 52649	
11875	2	1	2	0	1	52662 52676 52677 52663	
11876	2	1	2	0	1	52676 52690 52691 52677	
11877	2	1	2	0	1	52690 52704 52705 52691	
11878	2	1	2	0	1	52704 52718 52719 52705	
11879	2	1	2	0	1	52718 52732 52733 52719	

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
11880	2	1	2	0	1	52523 52537 52538 52524	
11881	2	1	2	0	1	52537 52551 52552 52538	
11882	2	1	2	0	1	52551 52565 52566 52552	
11883	2	1	2	0	1	52565 52579 52580 52566	
11884	2	1	2	0	1	52579 52593 52594 52580	
11885	2	1	2	0	1	52593 52607 52608 52594	
11886	2	1	2	0	1	52607 52621 52622 52608	
11887	2	1	2	0	1	52621 52635 52636 52622	

T-CG-00006, REV. 0

11954	2	1	2	0	1	52514	52528	52529	52515
11955	2	1	2	0	1	52528	52542	52543	52529
11956	2	1	2	0	1	52542	52556	52557	52543
11957	2	1	2	0	1	52556	52332	52333	52557
11958	2	1	2	0	1	52332	52335	52336	52362
11959	2	1	2	0	1	52335	52389	52390	52376

ELEM MAT TYP REL ESY SEC TSHA

NODES

11960	2	1	2	0	1	52389	52403	52404	52390
11961	2	1	2	0	1	52403	52417	52418	52404
11962	2	1	2	0	1	52417	52431	52432	52418
11963	2	1	2	0	1	52431	52445	52446	52432
11964	2	1	2	0	1	52445	52459	52460	52446
11965	2	1	2	0	1	52459	52473	52474	52460
11966	2	1	2	0	1	52473	52487	52488	52474
11967	2	1	2	0	1	52487	52501	52502	52488
11968	2	1	2	0	1	52501	52515	52516	52502
11969	2	1	2	0	1	52515	52529	52530	52516
11970	2	1	2	0	1	52529	52543	52544	52530
11971	2	1	2	0	1	52543	52557	52558	52544
11972	2	1	2	0	1	52557	52333	52334	52558
11973	2	1	2	0	1	52333	52376	52377	52363
11974	2	1	2	0	1	52376	52390	52391	52377
11975	2	1	2	0	1	52390	52404	52405	52391
11976	2	1	2	0	1	52404	52418	52419	52405
11977	2	1	2	0	1	52418	52432	52433	52419
11978	2	1	2	0	1	52432	52446	52447	52433
11979	2	1	2	0	1	52446	52460	52461	52447

ELEM MAT TYP REL ESY SEC TSHA

NODES

11980	2	1	2	0	1	52460	52474	52475	52461
11981	2	1	2	0	1	52474	52488	52489	52475
11982	2	1	2	0	1	52488	52502	52503	52489
11983	2	1	2	0	1	52502	52516	52517	52503
11984	2	1	2	0	1	52516	52530	52531	52517
11985	2	1	2	0	1	52530	52544	52545	52531
11986	2	1	2	0	1	52544	52558	52559	52545
11987	2	1	2	0	1	52558	52334	52335	52559
11988	2	1	2	0	1	52334	52377	52378	52364
11989	2	1	2	0	1	52377	52391	52392	52378
11990	2	1	2	0	1	52391	52405	52406	52392
11991	2	1	2	0	1	52405	52419	52420	52406
11992	2	1	2	0	1	52419	52433	52434	52406
11993	2	1	2	0	1	52433	52447	52448	52434
11994	2	1	2	0	1	52447	52461	52462	52448
11995	2	1	2	0	1	52461	52475	52476	52462
11996	2	1	2	0	1	52475	52489	52490	52476
11997	2	1	2	0	1	52489	52503	52504	52490
11998	2	1	2	0	1	52503	52517	52518	52504
11999	2	1	2	0	1	52517	52531	52532	52518

ELEM MAT TYP REL ESY SEC TSHA

NODES

12000	2	1	2	0	1	52531	52545	52546	52532
12001	2	1	2	0	1	52545	52559	52560	52546
12002	2	1	2	0	1	52559	52336	52337	52560
12003	2	1	2	0	1	52336	52378	52379	52337
12004	2	1	2	0	1	52378	52392	52393	52337
12005	2	1	2	0	1	52392	52406	52407	52338
12006	2	1	2	0	1	52406	52420	52421	52338
12007	2	1	2	0	1	52420	52434	52435	52339
12008	2	1	2	0	1	52434	52448	52449	52340
12009	2	1	2	0	1	52448	52462	52463	52341
12010	2	1	2	0	1	52462	52476	52477	52342
12011	2	1	2	0	1	52476	52490	52491	52343
12012	2	1	2	0	1	52490	52504	52505	52344
12013	2	1	2	0	1	52504	52518	52519	52345
12014	2	1	2	0	1	52518	52532	52533	52346
12015	2	1	2	0	1	52532	52546	52547	52347
12016	2	1	2	0	1	52546	52560	52561	52348
12017	2	1	2	0	1	52560	52338	52339	52349
12018	2	1	2	0	1	52338	52352	52353	52350
12019	2	1	2	0	1	52352	52366	52367	52351
12020	2	1	2	0	1	52366	52380	52381	52352
12021	2	1	2	0	1	52380	52394	52395	52353
12022	2	1	2	0	1	52394	52408	52409	52354
12023	2	1	2	0	1	52408	52422	52423	52355
12024	2	1	2	0	1	52422	52436	52437	52356
12025	2	1	2	0	1	52436	52450	52451	52357
12026	2	1	2	0	1	52450	52464	52465	52358
12027	2	1	2	0	1	52464	52478	52479	52359
12028	2	1	2	0	1	52478	52492	52493	52360
12029	2	1	2	0	1	52492	52506	52507	52361
12030	2	1	2	0	1	52506	52520	52521	52362
12031	2	1	2	0	1	52520	52534	52535	52363
12032	2	1	2	0	1	52534	52548	52549	52364
12033	2	1	2	0	1	52548	52562	52563	52365
12034	2	1	2	0	1	52562	52366	52367	52366
12035	2	1	2	0	1	52366	52380	52381	52367
12036	2	1	2	0	1	52380	52394	52395	52368
12037	2	1	2	0	1	52394	52408	52409	52369
12038	2	1	2	0	1	52408	52422	52423	52370
12039	2	1	2	0	1	52422	52436	52437	52371
12040	2	1	2	0	1	52436	52450	52451	52372
12041	2	1	2	0	1	52450	52464	52465	52373
12042	2	1	2	0	1	52464	52478	52479	52374
12043	2	1	2	0	1	52478	52492	52493	52375
12044	2	1	2	0	1	52492	52506	52507	52376
12045	2	1	2	0	1	52506	52520	52521	52377
12046	2	1	2	0	1	52520	52534	52535	52378
12047	2	1	2	0	1	52534	52548	52549	52379
12048	2	1	2	0	1	52548	52562	52563	52380
12049	2	1	2	0	1	52562	52370	52371	52381
12050	2	1	2	0	1	52370	52384	52385	52382
12051	2	1	2	0	1	52384	52398	52399	52383
12052	2	1	2	0	1	52398	52412	52413	52384
12053	2	1	2	0	1	52412	52426	52427	52385
12054	2	1	2	0	1	52426	52440	52441	52386
12055	2	1	2	0	1	52440	52454	52455	52387
12056	2	1	2	0	1	52454	52468	52469	52388
12057	2	1	2	0	1	52468	52482	52483	52389
12058	2	1	2	0	1	52482	52496	52497	52390
12059	2	1	2	0	1	52496	52510	52511	52391
12060	2	1	2	0	1	52510	52524	52525	52392
12061	2	1	2	0	1	52524	52538	52539	52393
12062	2	1	2	0	1	52538	52552	52553	52394
12063	2	1	2	0	1	52552	52372	52373	52395
12064	2	1	2	0	1	52372	52386	52387	52396
12065	2	1	2	0	1	52386	52400	52401	52397
12066	2	1	2	0	1	52400	52414	52415	52401
12067	2	1	2	0	1	52414	52428	52429	52415
12068	2	1	2	0	1	52428	52442	52443	52429
12069	2	1	2	0	1	52442	52456	52457	52443

T-CG-00006, REV. 0

11888	2	1	2	0	1	52426	52440	52441	52427
11889	2	1	2	0	1	52440	52454	52455	52441
11890	2	1	2	0	1	52454	52468	52469	52455
11891	2	1	2	0	1	52468	52482	52483	52469
11892	2	1	2	0	1	52482	52496	52497	52483
11893	2	1	2	0	1	52496	52510	52511	52497
11894	2	1	2	0	1	52510	52524	52525	52511
11895	2	1	2	0	1	52524	52538	52539	52525
11896	2	1	2	0	1	52538	52552	52553	52539
11897	2	1	2	0	1	52552	52372	52373	52553
11898	2	1	2	0	1	52372	52386	52387	52553
11899	2	1	2	0	1	52386	52400	52401	52553

ELEM MAT TYP REL ESY SEC TSHA

NODES

11900	2	1	2	0	1	52385	52399	52400	52386
11901	2	1	2	0	1	52399	52413	52414	52400
11902	2	1	2	0	1	52413	52427	52428	52414
11903	2	1	2	0	1	52427	52441	52442	52428
11904	2	1	2	0	1	52441	52455	52456	52442
11905	2	1	2	0	1	52455	52469	52470	52456
11906	2	1	2	0	1	52469	52483	52484	52470
11907	2	1	2	0	1	52483	52497	52498	52484
11908	2	1	2	0	1	52497	52511	52512	52498
11909	2	1	2	0	1	52511	52525	52526	52512
11910	2	1	2	0	1	52525	52539	52540	52526
11911	2	1	2	0	1	52539	52553	52554	52540
11912	2								

T-C-C-C-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12083	2	1	2	0	1	52663	52677 52678 52664
12084	2	1	2	0	1	52677	52691 52692 52678
12085	2	1	2	0	1	52691	52705 52706 52692
12086	2	1	2	0	1	52705	52719 52720 52706
12087	2	1	2	0	1	52719	52733 52734 52720
12088	2	1	2	0	1	52733	52747 52748 52734
12089	2	1	2	0	1	52747	52761 52762 52748
12090	2	1	2	0	1	52761	52775 52776 52762
12091	2	1	2	0	1	52775	52789 52790 52776
12092	2	1	2	0	1	52789	52865 52866 52790
12093	2	1	2	0	1	52865	52608 52609 52608
12094	2	1	2	0	1	52608	52622 52623 52609
12095	2	1	2	0	1	52622	52636 52637 52623
12096	2	1	2	0	1	52636	52650 52651 52637
12097	2	1	2	0	1	52650	52664 52665 52651
12098	2	1	2	0	1	52664	52678 52679 52665
12099	2	1	2	0	1	52678	52692 52693 52679

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12100	2	1	2	0	1	52692	52706 52707 52693
12101	2	1	2	0	1	52706	52720 52721 52707
12102	2	1	2	0	1	52720	52734 52735 52721
12103	2	1	2	0	1	52734	52748 52749 52735
12104	2	1	2	0	1	52748	52762 52763 52749
12105	2	1	2	0	1	52762	52776 52777 52763
12106	2	1	2	0	1	52776	52790 52791 52777
12107	2	1	2	0	1	52790	52866 52867 52791
12108	2	1	2	0	1	52866	52609 52610 52867
12109	2	1	2	0	1	52609	52623 52624 52610
12110	2	1	2	0	1	52623	52637 52638 52624
12111	2	1	2	0	1	52637	52651 52652 52638
12112	2	1	2	0	1	52651	52665 52666 52652
12113	2	1	2	0	1	52665	52679 52680 52666
12114	2	1	2	0	1	52679	52693 52694 52680
12115	2	1	2	0	1	52693	52707 52708 52694
12116	2	1	2	0	1	52707	52721 52722 52708
12117	2	1	2	0	1	52721	52735 52736 52722
12118	2	1	2	0	1	52735	52749 52750 52736
12119	2	1	2	0	1	52749	52763 52764 52750

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12120	2	1	2	0	1	52763	52777 52778 52764
12121	2	1	2	0	1	52777	52791 52792 52778
12122	2	1	2	0	1	52791	52805 52806 52792
12123	2	1	2	0	1	52805	52819 52820 52806
12124	2	1	2	0	1	52819	52833 52834 52820
12125	2	1	2	0	1	52833	52847 52848 52834
12126	2	1	2	0	1	52847	52861 52862 52848
12127	2	1	2	0	1	52861	52875 52876 52862
12128	2	1	2	0	1	52875	52889 52890 52876
12129	2	1	2	0	1	52889	52903 52904 52890
12130	2	1	2	0	1	52903	52917 52918 52904
12131	2	1	2	0	1	52917	52931 52932 52918
12132	2	1	2	0	1	52931	52945 52946 52932
12133	2	1	2	0	1	52945	52959 52960 52946
12134	2	1	2	0	1	52959	52973 52974 52960
12135	2	1	2	0	1	52973	52987 52988 52974
12136	2	1	2	0	1	52987	52999 52999 52988
12137	2	1	2	0	1	52999	52612 52612 52999
12138	2	1	2	0	1	52612	52626 52626 52612
12139	2	1	2	0	1	52626	52640 52640 52626

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12140	2	1	2	0	1	52640	52654 52654 52640
12141	2	1	2	0	1	52654	52668 52668 52654
12142	2	1	2	0	1	52668	52682 52682 52668
12143	2	1	2	0	1	52682	52696 52696 52682
12144	2	1	2	0	1	52696	52710 52710 52696
12145	2	1	2	0	1	52710	52724 52724 52710
12146	2	1	2	0	1	52724	52738 52738 52724
12147	2	1	2	0	1	52738	52752 52752 52738
12148	2	1	2	0	1	52752	52766 52766 52752

T-C-C-C-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12020	2	1	2	0	1	20949	20948 52632 52618
12021	2	1	2	0	1	20948	20947 52646 52632
12022	2	1	2	0	1	20947	20946 52660 52646
12023	2	1	2	0	1	20946	20945 52674 52660
12024	2	1	2	0	1	20945	20944 52688 52674
12025	2	1	2	0	1	20944	20943 52702 52688
12026	2	1	2	0	1	20943	20942 52716 52702
12027	2	1	2	0	1	20942	20941 52730 52716
12028	2	1	2	0	1	20941	20940 52744 52730
12029	2	1	2	0	1	20940	20939 52758 52744
12030	2	1	2	0	1	20939	20938 52772 52758
12031	2	1	2	0	1	20938	20937 52786 52772
12032	2	1	2	0	1	20937	20936 52800 52786
12033	2	1	2	0	1	20936	52604 52605 52800
12034	2	1	2	0	1	52604	52618 52619 52605
12035	2	1	2	0	1	52618	52632 52633 52619
12036	2	1	2	0	1	52632	52646 52647 52633
12037	2	1	2	0	1	52646	52660 52661 52647
12038	2	1	2	0	1	52660	52674 52675 52661
12039	2	1	2	0	1	52674	52688 52689 52675

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12040	2	1	2	0	1	52688	52702 52703 52689
12041	2	1	2	0	1	52702	52716 52717 52703
12042	2	1	2	0	1	52716	52730 52731 52717
12043	2	1	2	0	1	52730	52744 52745 52731
12044	2	1	2	0	1	52744	52758 52759 52745
12045	2	1	2	0	1	52758	52772 52773 52759
12046	2	1	2	0	1	52772	52786 52787 52773
12047	2	1	2	0	1	52786	52800 52801 52787
12048	2	1	2	0	1	52800	52814 52815 52801
12049	2	1	2	0	1	52814	52828 52829 52815
12050	2	1	2	0	1	52828	52842 52843 52829
12051	2	1	2	0	1	52842	52856 52857 52843
12052	2	1	2	0	1	52856	52870 52871 52857
12053	2	1	2	0	1	52870	52884 52885 52871
12054	2	1	2	0	1	52884	52898 52899 52885
12055	2	1	2	0	1	52898	52912 52913 52899
12056	2	1	2	0	1	52912	52926 52927 52913
12057	2	1	2	0	1	52926	52940 52941 52927
12058	2	1	2	0	1	52940	52954 52955 52941
12059	2	1	2	0	1	52954	52968 52969 52955

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12060	2	1	2	0	1	52759	52773 52774 52760
12061	2	1	2	0	1	52773	52787 52788 52774
12062	2	1	2	0	1	52787	52801 52802 52788
12063	2	1	2	0	1	52801	52815 52816 52802
12064	2	1	2	0	1	52815	52829 52830 52816
12065	2	1	2	0	1	52829	52843 52844 52830
12066	2	1	2	0	1	52843	52857 52858 52844
12067	2	1	2	0	1	52857	52871 52872 52858
12068	2	1	2	0	1	52871	52885 52886 52872
12069	2	1	2	0	1	52885	52899 52900 52886
12070	2	1	2	0	1	52899	52913 52914 52900
12071	2	1	2	0	1	52913	52927 52928 52914
12072	2	1	2	0	1	52927	52941 52942 52928
12073	2	1	2	0	1	52941	52955 52956 52942
12074	2	1	2	0	1	52955	52969 52970 52956
12075	2	1	2	0	1	52969	52983 52984 52970
12076	2	1	2	0	1	52983	52997 52998 52984
12077	2	1	2	0	1	52997	52616 52616 52998
12078	2	1	2	0	1	52616	52630 52630 52616
12079	2	1	2	0	1	52630	52644 52644 52630

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12080	2	1	2	0	1	52621	52635 52636 52622
12081	2	1	2	0	1	52635	52649 52650 52636
12082	2	1	2	0	1	52649	52663 52664 52650

T-CALC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12215	2	1	2	0	1	1	52630 52644 52645 52631
12216	2	1	2	0	1	1	52644 52658 52659 52645
12217	2	1	2	0	1	1	52658 52672 52673 52659
12218	2	1	2	0	1	1	52672 52686 52687 52673
12219	2	1	2	0	1	1	52686 52700 52701 52687

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12220	2	1	2	0	1	1	52700 52714 52715 52701
12221	2	1	2	0	1	1	52714 52728 52729 52715
12222	2	1	2	0	1	1	52728 52742 52743 52729
12223	2	1	2	0	1	1	52742 52756 52757 52743
12224	2	1	2	0	1	1	52756 52770 52771 52757
12225	2	1	2	0	1	1	52770 52784 52785 52771
12226	2	1	2	0	1	1	52784 52798 52799 52785
12227	2	1	2	0	1	1	52798 52812 52813 52799
12228	2	1	2	0	1	1	52812 52826 52827 52813
12229	2	1	2	0	1	1	52826 52840 52841 52827
12230	2	1	2	0	1	1	52840 52854 52855 52827
12231	2	1	2	0	1	1	52854 52868 52869 52855
12232	2	1	2	0	1	1	52868 52882 52883 52869
12233	2	1	2	0	1	1	52882 52896 52897 52883
12234	2	1	2	0	1	1	52896 52910 52911 52897
12235	2	1	2	0	1	1	52910 52924 52925 52911
12236	2	1	2	0	1	1	52924 52938 52939 52925
12237	2	1	2	0	1	1	52938 52952 52953 52939
12238	2	1	2	0	1	1	52952 52966 52967 52953
12239	2	1	2	0	1	1	52966 52980 52981 52967

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12240	2	1	2	0	1	1	52771 52785 52588 52587
12241	2	1	2	0	1	1	52785 52799 52588 52588
12242	2	1	2	0	1	1	52799 52575 52561 52568
12243	2	1	2	0	1	1	20981 20985 52843 52843
12244	2	1	2	0	1	1	20985 20984 52857 52843
12245	2	1	2	0	1	1	20984 20983 53011 52987
12246	2	1	2	0	1	1	20983 20982 53025 53011
12247	2	1	2	0	1	1	20982 365 52801 53043
12248	2	1	2	0	1	1	20992 20991 52899 52885
12249	2	1	2	0	1	1	20991 20990 52913 52899
12250	2	1	2	0	1	1	20990 20989 52927 52913
12251	2	1	2	0	1	1	20989 20988 52941 52927
12252	2	1	2	0	1	1	20988 20987 52955 52941
12253	2	1	2	0	1	1	20987 20986 52969 52955
12254	2	1	2	0	1	1	20986 20985 52983 52969
12255	2	1	2	0	1	1	20985 20984 52997 52983
12256	2	1	2	0	1	1	20984 20983 53011 52987
12257	2	1	2	0	1	1	20983 20982 53025 53011
12258	2	1	2	0	1	1	20982 365 52801 53043
12259	2	1	2	0	1	1	52829 52843 52844 52830
12260	2	1	2	0	1	1	52843 52857 52858 52844

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12260	2	1	2	0	1	1	52857 52871 52872 52858
12261	2	1	2	0	1	1	52871 52885 52886 52872
12262	2	1	2	0	1	1	52885 52899 52900 52886
12263	2	1	2	0	1	1	52899 52913 52914 52900
12264	2	1	2	0	1	1	52913 52927 52928 52914
12265	2	1	2	0	1	1	52927 52941 52942 52928
12266	2	1	2	0	1	1	52941 52955 52956 52942
12267	2	1	2	0	1	1	52955 52969 52970 52956
12268	2	1	2	0	1	1	52969 52983 52984 52970
12269	2	1	2	0	1	1	52983 52997 52998 52984
12270	2	1	2	0	1	1	52997 53011 53012 52998
12271	2	1	2	0	1	1	53011 53025 53026 53012
12272	2	1	2	0	1	1	53025 52801 52802 53026
12273	2	1	2	0	1	1	52801 52844 52845 52831
12274	2	1	2	0	1	1	52844 52858 52859 52845
12275	2	1	2	0	1	1	52858 52872 52873 52859
12276	2	1	2	0	1	1	52872 52886 52887 52873
12277	2	1	2	0	1	1	52886 52900 52901 52887
12278	2	1	2	0	1	1	52900 52914 52915 52901
12279	2	1	2	0	1	1	52914 52928 52929 52915

T-CALC-00006, REV. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12149	2	1	2	0	1	1	52751 52765 52766 52752
12150	2	1	2	0	1	1	52765 52779 52780 52766
12151	2	1	2	0	1	1	52779 52793 52794 52780
12152	2	1	2	0	1	1	52793 52807 52808 52794
12153	2	1	2	0	1	1	52807 52821 52822 52808
12154	2	1	2	0	1	1	52821 52835 52836 52822
12155	2	1	2	0	1	1	52835 52849 52850 52836
12156	2	1	2	0	1	1	52849 52863 52864 52850
12157	2	1	2	0	1	1	52863 52877 52878 52864
12158	2	1	2	0	1	1	52877 52891 52892 52878
12159	2	1	2	0	1	1	52891 52905 52906 52892

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12160	2	1	2	0	1	1	52696 52710 52711 52697
12161	2	1	2	0	1	1	52710 52724 52725 52711
12162	2	1	2	0	1	1	52724 52738 52739 52725
12163	2	1	2	0	1	1	52738 52752 52753 52739
12164	2	1	2	0	1	1	52752 52766 52767 52753
12165	2	1	2	0	1	1	52766 52780 52781 52767
12166	2	1	2	0	1	1	52780 52794 52795 52781
12167	2	1	2	0	1	1	52794 52808 52809 52795
12168	2	1	2	0	1	1	52808 52822 52823 52809
12169	2	1	2	0	1	1	52822 52836 52837 52823
12170	2	1	2	0	1	1	52836 52850 52851 52837
12171	2	1	2	0	1	1	52850 52864 52865 52851
12172	2	1	2	0	1	1	52864 52878 52879 52865
12173	2	1	2	0	1	1	52878 52892 52893 52879
12174	2	1	2	0	1	1	52892 52906 52907 52893
12175	2	1	2	0	1	1	52906 52920 52921 52907
12176	2	1	2	0	1	1	52920 52934 52935 52921
12177	2	1	2	0	1	1	52934 52948 52949 52935
12178	2	1	2	0	1	1	52948 52962 52963 52949
12179	2	1	2	0	1	1	52962 52976 52977 52963

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12180	2	1	2	0	1	1	52767 52781 52782 52768
12181	2	1	2	0	1	1	52781 52795 52796 52782
12182	2	1	2	0	1	1	52795 52809 52810 52796
12183	2	1	2	0	1	1	52809 52823 52824 52810
12184	2	1	2	0	1	1	52823 52837 52838 52824
12185	2	1	2	0	1	1	52837 52851 52852 52838
12186	2	1	2	0	1	1	52851 52865 52866 52852
12187	2	1	2	0	1	1	52865 52879 52880 52866
12188	2	1	2	0	1	1	52879 52893 52894 52880
12189	2	1	2	0	1	1	52893 52907 52908 52894
12190	2	1	2	0	1	1	52907 52921 52922 52908
12191	2	1	2	0	1	1	52921 52935 52936 52922
12192	2	1	2	0	1	1	52935 52949 52950 52936
12193	2	1	2	0	1	1	52949 52963 52964 52950
12194	2	1	2	0	1	1	52963 52977 52978 52964
12195	2	1	2	0	1	1	52977 52991 52992 52978
12196	2	1	2	0	1	1	52991 53005 53006 52992
12197	2	1	2	0	1	1	52992 53015 53016 52993
12198	2	1	2	0	1	1	53015 53029 53030 53016
12199	2	1	2	0	1	1	53029 53043 53044 53030

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12200	2	1	2	0	1	1	52629 52643 52644 52630
12201	2	1	2	0	1	1	52643 52657 52658 52644
12202	2	1	2	0	1	1	52657 52671 52672 52658
12203	2	1	2	0	1	1	52671 52685 52686 52672
12204	2	1	2	0	1	1	52685 52699 52700 52686
12205	2	1	2	0	1	1	52699 52713 52714 52700
12206	2	1	2	0	1	1	52713 52727 52728 52714
12207	2	1	2	0	1	1	52727 52741 52742 52728
12208	2	1	2	0	1	1	52741 52755 52756 52742
12209	2	1	2	0	1	1	52755 52769 52770 52756
12210	2	1	2	0	1	1	52769 52783 52784 52770
12211	2	1	2	0	1	1	52783 52797 52798 52784
12212	2	1	2	0	1	1	52797 53011 53012 52798
12213	2	1	2	0	1	1	52801 52815 52816 52802
12214	2	1	2	0	1	1	52815 52829 52830 52816

T-CCL-F-00006, REV. 0

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12280	2 1 2 0 1	52928 52942 52943 52929	
12281	2 1 2 0 1	52942 52946 52957 52943	
12282	2 1 2 0 1	52956 52970 52971 52957	
12283	2 1 2 0 1	52970 52984 52985 52971	
12284	2 1 2 0 1	52984 52998 52999 52985	
12285	2 1 2 0 1	52998 53012 53013 52999	
12286	2 1 2 0 1	53012 53026 53027 53013	
12287	2 1 2 0 1	53026 52802 52803 53027	
12288	2 1 2 0 1	52831 52845 52846 52832	
12289	2 1 2 0 1	52859 52873 52874 52860	
12291	2 1 2 0 1	52873 52887 52888 52874	
12292	2 1 2 0 1	52887 52901 52902 52888	
12293	2 1 2 0 1	52901 52915 52916 52902	
12294	2 1 2 0 1	52915 52929 52930 52916	
12295	2 1 2 0 1	52929 52943 52944 52930	
12296	2 1 2 0 1	52943 52957 52958 52944	
12297	2 1 2 0 1	52957 52971 52972 52958	
12298	2 1 2 0 1	52971 52985 52986 52972	
12299	2 1 2 0 1	52985 52999 53000 52986	

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12300	2 1 2 0 1	52999 53013 53014 53000	
12301	2 1 2 0 1	53013 53027 53028 53014	
12302	2 1 2 0 1	53027 52803 52804 53028	
12303	2 1 2 0 1	52832 52846 52847 52833	
12304	2 1 2 0 1	52846 52860 52861 52847	
12305	2 1 2 0 1	52860 52874 52875 52861	
12306	2 1 2 0 1	52874 52888 52889 52875	
12307	2 1 2 0 1	52888 52902 52903 52889	
12308	2 1 2 0 1	52902 52916 52917 52903	
12309	2 1 2 0 1	52916 52930 52931 52917	
12310	2 1 2 0 1	52930 52944 52945 52931	
12311	2 1 2 0 1	52944 52958 52959 52945	
12312	2 1 2 0 1	52958 52972 52973 52959	
12313	2 1 2 0 1	52972 52986 52987 52973	
12314	2 1 2 0 1	52986 53000 53001 52987	
12315	2 1 2 0 1	53000 53014 53015 53001	
12316	2 1 2 0 1	53014 53028 53029 53015	
12317	2 1 2 0 1	53028 52804 52805 53029	
12318	2 1 2 0 1	52833 52847 52848 52834	
12319	2 1 2 0 1	52847 52861 52862 52848	

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12320	2 1 2 0 1	52861 52875 52876 52862	
12321	2 1 2 0 1	52875 52889 52890 52876	
12322	2 1 2 0 1	52889 52903 52904 52890	
12323	2 1 2 0 1	52903 52917 52918 52904	
12324	2 1 2 0 1	52917 52931 52932 52918	
12325	2 1 2 0 1	52931 52945 52946 52932	
12326	2 1 2 0 1	52945 52959 52960 52946	
12327	2 1 2 0 1	52959 52973 52974 52960	
12328	2 1 2 0 1	52973 52987 52988 52974	
12329	2 1 2 0 1	52987 53001 53002 52988	
12330	2 1 2 0 1	53001 53015 53016 53002	
12331	2 1 2 0 1	53015 53029 53030 53016	
12332	2 1 2 0 1	53029 52805 52806 53030	
12333	2 1 2 0 1	52834 52848 52849 52835	
12334	2 1 2 0 1	52848 52862 52863 52849	
12335	2 1 2 0 1	52862 52876 52877 52863	
12336	2 1 2 0 1	52876 52890 52891 52877	
12337	2 1 2 0 1	52890 52904 52905 52891	
12338	2 1 2 0 1	52904 52918 52919 52905	
12339	2 1 2 0 1	52918 52932 52933 52919	

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12340	2 1 2 0 1	52932 52946 52947 52933	
12341	2 1 2 0 1	52946 52960 52961 52947	
12342	2 1 2 0 1	52960 52974 52975 52961	
12343	2 1 2 0 1	52974 52988 52989 52975	

T-CCL-F-00006, REV. 0

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12344	2 1 2 0 1	52988 53002 53003 52989	
12345	2 1 2 0 1	53002 53016 53017 53003	
12346	2 1 2 0 1	53016 53030 53031 53017	
12347	2 1 2 0 1	53030 52806 52807 53031	
12348	2 1 2 0 1	52835 52849 52850 52836	
12349	2 1 2 0 1	52849 52863 52864 52850	
12350	2 1 2 0 1	52863 52877 52878 52864	
12351	2 1 2 0 1	52877 52891 52892 52878	
12352	2 1 2 0 1	52891 52905 52906 52892	
12353	2 1 2 0 1	52905 52919 52920 52906	
12354	2 1 2 0 1	52919 52933 52934 52920	
12355	2 1 2 0 1	52933 52947 52948 52934	
12356	2 1 2 0 1	52947 52961 52962 52948	
12357	2 1 2 0 1	52961 52975 52976 52962	
12358	2 1 2 0 1	52975 52989 52990 52976	
12359	2 1 2 0 1	52989 53003 53004 52990	

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12360	2 1 2 0 1	53003 53017 53018 53004	
12361	2 1 2 0 1	53017 53031 53032 53018	
12362	2 1 2 0 1	53031 52807 52808 53032	
12363	2 1 2 0 1	52836 52850 52851 52837	
12364	2 1 2 0 1	52850 52864 52865 52851	
12365	2 1 2 0 1	52864 52878 52879 52865	
12366	2 1 2 0 1	52878 52892 52893 52879	
12367	2 1 2 0 1	52892 52906 52907 52893	
12368	2 1 2 0 1	52906 52920 52921 52907	
12369	2 1 2 0 1	52920 52934 52935 52921	
12370	2 1 2 0 1	52934 52948 52949 52935	
12371	2 1 2 0 1	52948 52962 52963 52949	
12372	2 1 2 0 1	52962 52976 52977 52963	
12373	2 1 2 0 1	52976 52990 52991 52977	
12374	2 1 2 0 1	52990 53004 53005 52991	
12375	2 1 2 0 1	53004 53018 53019 53005	
12376	2 1 2 0 1	53018 53032 53033 53019	
12377	2 1 2 0 1	53032 52808 52809 53033	
12378	2 1 2 0 1	52837 52851 52852 52838	
12379	2 1 2 0 1	52851 52865 52866 52852	

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12180	2 1 2 0 1	52855 52879 52880 52866	
12181	2 1 2 0 1	52879 52893 52894 52866	
12182	2 1 2 0 1	52893 52907 52908 52894	
12183	2 1 2 0 1	52907 52921 52922 52908	
12184	2 1 2 0 1	52921 52935 52936 52922	
12185	2 1 2 0 1	52935 52949 52950 52936	
12186	2 1 2 0 1	52949 52963 52964 52950	
12187	2 1 2 0 1	52963 52977 52978 52964	
12188	2 1 2 0 1	52977 52991 52992 52978	
12189	2 1 2 0 1	52991 53005 53006 52992	
12190	2 1 2 0 1	53005 53019 53020 53006	
12191	2 1 2 0 1	53019 53033 53034 53020	
12192	2 1 2 0 1	53033 52809 52810 53034	
12193	2 1 2 0 1	52838 52852 52853 52839	
12194	2 1 2 0 1	52852 52866 52867 52853	
12195	2 1 2 0 1	52866 52880 52881 52867	
12196	2 1 2 0 1	52880 52894 52895 52867	
12197	2 1 2 0 1	52894 52908 52909 52895	
12198	2 1 2 0 1	52908 52922 52923 52909	
12199	2 1 2 0 1	52922 52936 52937 52923	

ELEM MAT TYP REL ESY SEC TSHA		NODS	
12400	2 1 2 0 1	52936 52950 52951 52937	
12401	2 1 2 0 1	52950 52964 52965 52951	
12402	2 1 2 0 1	52964 52978 52979 52965	
12403	2 1 2 0 1	52978 52992 52993 52979	
12404	2 1 2 0 1	52992 53006 53007 52993	
12405	2 1 2 0 1	53006 53020 53021 53007	
12406	2 1 2 0 1	53020 53034 53035 53021	
12407	2 1 2 0 1	53034 52810 52811 53035	
12408	2 1 2 0 1	52839 52853 52854 52840	
12409	2 1 2 0 1	52853 52867 52868 52854	

T-CLE-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12476	2	1	2	0	1	52347	53058 53059 52346
12477	2	1	2	0	1	53058 53060 53049 53059	
12478	2	1	2	0	1	52346 53058 53060 52345	
12479	2	1	2	0	1	53059 53049 53048 53060	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12480	2	1	2	0	1	52345 53060 53061 52344	
12481	2	1	2	0	1	53060 53048 53047 53061	
12482	2	1	2	0	1	52344 53061 53062 52343	
12483	2	1	2	0	1	53061 53047 53046 53062	
12484	2	1	2	0	1	52343 53062 53063 52342	
12485	2	1	2	0	1	53062 53046 53045 53063	
12486	2	1	2	0	1	52342 53063 53064 52341	
12487	2	1	2	0	1	53063 53045 53044 53064	
12488	2	1	2	0	1	52341 53064 53065 52340	
12489	2	1	2	0	1	53064 53044 53043 53065	
12490	2	1	2	0	1	52340 53065 53066 52339	
12491	2	1	2	0	1	53065 53043 53042 53066	
12492	2	1	2	0	1	52339 53066 53067 52338	
12493	2	1	2	0	1	53066 53042 53041 53067	
12494	2	1	2	0	1	52338 53067 53068 52337	
12495	2	1	2	0	1	53067 53041 53040 53068	
12496	2	1	2	0	1	52337 53068 53069 53068	
12497	2	1	2	0	1	53068 53040 53039 53069	
12498	2	1	2	0	1	20762 20776 53112 53098	
12499	2	1	2	0	1	20776 20775 53126 53112	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12500	2	1	2	0	1	20775 20774 53140 53126	
12501	2	1	2	0	1	20774 20773 53154 53140	
12502	2	1	2	0	1	20773 20772 53168 53154	
12503	2	1	2	0	1	20772 20771 53182 53168	
12504	2	1	2	0	1	20771 20770 53196 53182	
12505	2	1	2	0	1	20770 20769 53210 53196	
12506	2	1	2	0	1	20769 20768 53224 53210	
12507	2	1	2	0	1	20768 20767 53238 53224	
12508	2	1	2	0	1	20767 20766 53252 53238	
12509	2	1	2	0	1	20766 20765 53266 53252	
12510	2	1	2	0	1	20765 20764 53280 53266	
12511	2	1	2	0	1	20764 20763 53294 53280	
12512	2	1	2	0	1	20763 20762 53308 53294	
12513	2	1	2	0	1	53098 53112 53113 53099	
12514	2	1	2	0	1	53112 53126 53127 53113	
12515	2	1	2	0	1	53126 53140 53141 53127	
12516	2	1	2	0	1	53140 53154 53155 53141	
12517	2	1	2	0	1	53154 53168 53169 53155	
12518	2	1	2	0	1	53168 53182 53183 53169	
12519	2	1	2	0	1	53182 53196 53197 53183	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12520	2	1	2	0	1	53196 53210 53211 53197	
12521	2	1	2	0	1	53210 53224 53225 53211	
12522	2	1	2	0	1	53224 53238 53239 53225	
12523	2	1	2	0	1	53238 53252 53253 53239	
12524	2	1	2	0	1	53252 53266 53267 53253	
12525	2	1	2	0	1	53266 53280 53281 53267	
12526	2	1	2	0	1	53280 53294 53295 53281	
12527	2	1	2	0	1	53294 53069 53070 53295	
12528	2	1	2	0	1	53069 53113 53114 53100	
12529	2	1	2	0	1	53113 53127 53128 53114	
12530	2	1	2	0	1	53127 53141 53142 53128	
12531	2	1	2	0	1	53141 53155 53156 53142	
12532	2	1	2	0	1	53155 53169 53170 53156	
12533	2	1	2	0	1	53169 53183 53184 53170	
12534	2	1	2	0	1	53183 53197 53198 53184	
12535	2	1	2	0	1	53197 53211 53212 53198	
12536	2	1	2	0	1	53211 53225 53226 53212	
12537	2	1	2	0	1	53225 53239 53240 53226	
12538	2	1	2	0	1	53239 53253 53254 53240	
12539	2	1	2	0	1	53253 53267 53268 53254	

T-CLE-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12410	2	1	2	0	1	52867 52881 52882 52868	
12411	2	1	2	0	1	52881 52895 52896 52882	
12412	2	1	2	0	1	52895 52909 52910 52896	
12413	2	1	2	0	1	52909 52923 52924 52910	
12414	2	1	2	0	1	52923 52937 52938 52924	
12415	2	1	2	0	1	52937 52951 52952 52938	
12416	2	1	2	0	1	52951 52965 52966 52952	
12417	2	1	2	0	1	52965 52979 52980 52966	
12418	2	1	2	0	1	52979 52993 52994 52980	
12419	2	1	2	0	1	52993 53007 53008 52994	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12420	2	1	2	0	1	53007 53021 53022 53008	
12421	2	1	2	0	1	53021 53035 53036 53022	
12422	2	1	2	0	1	53035 52811 52812 53036	
12423	2	1	2	0	1	52840 52854 52855 52841	
12424	2	1	2	0	1	52854 52868 52869 52855	
12425	2	1	2	0	1	52868 52882 52883 52869	
12426	2	1	2	0	1	52882 52896 52897 52883	
12427	2	1	2	0	1	52896 52910 52911 52897	
12428	2	1	2	0	1	52910 52924 52925 52911	
12429	2	1	2	0	1	52924 52938 52939 52925	
12430	2	1	2	0	1	52938 52952 52953 52939	
12431	2	1	2	0	1	52952 52966 52967 52953	
12432	2	1	2	0	1	52966 52980 52981 52967	
12433	2	1	2	0	1	52980 52994 52995 52981	
12434	2	1	2	0	1	52994 53008 53009 52995	
12435	2	1	2	0	1	53008 53022 53023 53009	
12436	2	1	2	0	1	53022 53036 53037 53023	
12437	2	1	2	0	1	53036 52812 52813 53037	
12438	2	1	2	0	1	52841 52855 52856 52842	
12439	2	1	2	0	1	52855 52869 52870 52856	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12440	2	1	2	0	1	52869 52883 52884 52870	
12441	2	1	2	0	1	52883 52897 52898 52884	
12442	2	1	2	0	1	52897 52911 52912 52898	
12443	2	1	2	0	1	52911 52925 52926 52912	
12444	2	1	2	0	1	52925 52939 52940 52926	
12445	2	1	2	0	1	52939 52953 52954 52940	
12446	2	1	2	0	1	52953 52967 52968 52954	
12447	2	1	2	0	1	52967 52981 52982 52968	
12448	2	1	2	0	1	52981 52995 52996 52982	
12449	2	1	2	0	1	52995 53009 53010 52996	
12450	2	1	2	0	1	53009 53023 53024 53010	
12451	2	1	2	0	1	53023 53037 53038 53024	
12452	2	1	2	0	1	53037 52813 52814 53038	
12453	2	1	2	0	1	52842 52856 52857 52815	
12454	2	1	2	0	1	52856 52870 52871 52815	
12455	2	1	2	0	1	52870 52884 52885 52816	
12456	2	1	2	0	1	52884 52898 52899 52816	
12457	2	1	2	0	1	52898 52912 52913 52816	
12458	2	1	2	0	1	52912 52926 52927 52913	
12459	2	1	2	0	1	52926 52940 52941 52927	

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12460	2	1	2	0	1	52940 52954 52955 52927	
12461	2	1	2	0	1	52954 52968 52969 52927	
12462	2	1	2	0	1	52968 52982 52983 52927	
12463	2	1	2	0	1	52982 52996 52997 52927	
12464	2	1	2	0	1	52996 53010 53011 52927	
12465	2	1	2	0	1	53010 53024 53025 53027	
12466	2	1	2	0	1	53024 53038 53039 53027	
12467	2	1	2	0	1	53038 52814 52815 52927	
12468	2	1	2	0	1	53141 53142 53143 53055	
12469	2	1	2	0	1	53142 53136 53053 53055	
12470	2	1	2	0	1	53055 53056 53057 53055	
12471	2	1	2	0	1	53056 53057 53058 53055	
12472	2	1	2	0	1	53057 53058 53059 53057	
12473	2	1	2	0	1	53058 53059 53060 53057	
12474	2	1	2	0	1	53059 53060 53061 53057	
12475	2	1	2	0	1	53060 53061 53062 53057	

T-C-C-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12540	2	1	2	0	1	1	53267 53281 53282 53283
12541	2	1	2	0	1	1	53281 53295 53296 53282
12542	2	1	2	0	1	1	53295 53070 53071 53296
12543	2	1	2	0	1	1	53100 53114 53115 53101
12544	2	1	2	0	1	1	53114 53128 53129 53115
12545	2	1	2	0	1	1	53128 53142 53143 53129
12546	2	1	2	0	1	1	53142 53156 53157 53143
12547	2	1	2	0	1	1	53156 53170 53171 53157
12548	2	1	2	0	1	1	53170 53184 53185 53171
12549	2	1	2	0	1	1	53184 53198 53199 53185
12550	2	1	2	0	1	1	53198 53212 53213 53199
12551	2	1	2	0	1	1	53212 53226 53227 53213
12552	2	1	2	0	1	1	53226 53240 53241 53227
12553	2	1	2	0	1	1	53240 53254 53255 53241
12554	2	1	2	0	1	1	53254 53268 53269 53255
12555	2	1	2	0	1	1	53268 53282 53283 53269
12556	2	1	2	0	1	1	53282 53296 53297 53283
12557	2	1	2	0	1	1	53296 53071 53072 53297
12558	2	1	2	0	1	1	53101 53115 53116 53102
12559	2	1	2	0	1	1	53115 53129 53130 53116

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12560	2	1	2	0	1	1	53129 53143 53144 53130
12561	2	1	2	0	1	1	53143 53157 53158 53144
12562	2	1	2	0	1	1	53157 53171 53172 53158
12563	2	1	2	0	1	1	53171 53185 53186 53172
12564	2	1	2	0	1	1	53185 53199 53200 53186
12565	2	1	2	0	1	1	53199 53213 53214 53200
12566	2	1	2	0	1	1	53213 53227 53228 53214
12567	2	1	2	0	1	1	53227 53241 53242 53228
12568	2	1	2	0	1	1	53241 53255 53256 53242
12569	2	1	2	0	1	1	53255 53269 53270 53256
12570	2	1	2	0	1	1	53269 53283 53284 53270
12571	2	1	2	0	1	1	53283 53297 53298 53284
12572	2	1	2	0	1	1	53297 53072 53073 53298
12573	2	1	2	0	1	1	53102 53116 53117 53103
12574	2	1	2	0	1	1	53116 53130 53131 53117
12575	2	1	2	0	1	1	53130 53144 53145 53131
12576	2	1	2	0	1	1	53144 53158 53159 53145
12577	2	1	2	0	1	1	53158 53172 53173 53159
12578	2	1	2	0	1	1	53172 53186 53187 53173
12579	2	1	2	0	1	1	53186 53200 53201 53187

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12580	2	1	2	0	1	1	53200 53214 53215 53201
12581	2	1	2	0	1	1	53214 53228 53229 53215
12582	2	1	2	0	1	1	53228 53242 53243 53229
12583	2	1	2	0	1	1	53242 53256 53257 53243
12584	2	1	2	0	1	1	53256 53270 53271 53257
12585	2	1	2	0	1	1	53270 53284 53285 53271
12586	2	1	2	0	1	1	53284 53298 53299 53285
12587	2	1	2	0	1	1	53298 53073 53074 53299
12588	2	1	2	0	1	1	53103 53117 53118 53104
12589	2	1	2	0	1	1	53117 53131 53132 53118
12590	2	1	2	0	1	1	53131 53145 53146 53132
12591	2	1	2	0	1	1	53145 53159 53160 53146
12592	2	1	2	0	1	1	53159 53173 53174 53160
12593	2	1	2	0	1	1	53173 53187 53188 53174
12594	2	1	2	0	1	1	53187 53201 53202 53188
12595	2	1	2	0	1	1	53201 53215 53216 53202
12596	2	1	2	0	1	1	53215 53229 53230 53216
12597	2	1	2	0	1	1	53229 53243 53244 53230
12598	2	1	2	0	1	1	53243 53257 53258 53244
12599	2	1	2	0	1	1	53257 53271 53272 53258

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12600	2	1	2	0	1	1	53271 53285 53286 53272
12601	2	1	2	0	1	1	53285 53299 53300 53286
12602	2	1	2	0	1	1	53299 53074 53075 53300
12603	2	1	2	0	1	1	53104 53118 53119 53105
12604	2	1	2	0	1	1	53118 53132 53133 53119

T-C-C-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12605	2	1	2	0	1	1	53132 53146 53147 53133
12606	2	1	2	0	1	1	53146 53160 53161 53147
12607	2	1	2	0	1	1	53160 53174 53175 53161
12608	2	1	2	0	1	1	53174 53188 53189 53175
12609	2	1	2	0	1	1	53188 53202 53203 53189
12610	2	1	2	0	1	1	53202 53216 53217 53203
12611	2	1	2	0	1	1	53216 53230 53231 53217
12612	2	1	2	0	1	1	53230 53244 53245 53231
12613	2	1	2	0	1	1	53244 53258 53259 53245
12614	2	1	2	0	1	1	53258 53272 53273 53259
12615	2	1	2	0	1	1	53272 53286 53287 53273
12616	2	1	2	0	1	1	53286 53300 53301 53287
12617	2	1	2	0	1	1	53300 53075 53076 53301
12618	2	1	2	0	1	1	53105 53119 53120 53106
12619	2	1	2	0	1	1	53119 53133 53134 53120

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12620	2	1	2	0	1	1	53133 53147 53148 53134
12621	2	1	2	0	1	1	53147 53161 53162 53148
12622	2	1	2	0	1	1	53161 53175 53176 53162
12623	2	1	2	0	1	1	53175 53189 53190 53176
12624	2	1	2	0	1	1	53189 53203 53204 53190
12625	2	1	2	0	1	1	53203 53217 53218 53204
12626	2	1	2	0	1	1	53217 53231 53232 53218
12627	2	1	2	0	1	1	53231 53245 53246 53232
12628	2	1	2	0	1	1	53245 53259 53260 53246
12629	2	1	2	0	1	1	53259 53273 53274 53260
12630	2	1	2	0	1	1	53273 53287 53288 53274
12631	2	1	2	0	1	1	53287 53301 53302 53288
12632	2	1	2	0	1	1	53301 53076 53077 53302
12633	2	1	2	0	1	1	53106 53120 53121 53107
12634	2	1	2	0	1	1	53120 53134 53135 53121
12635	2	1	2	0	1	1	53134 53148 53149 53135
12636	2	1	2	0	1	1	53148 53162 53163 53149
12637	2	1	2	0	1	1	53162 53176 53177 53163
12638	2	1	2	0	1	1	53176 53190 53191 53177
12639	2	1	2	0	1	1	53190 53204 53205 53191

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12640	2	1	2	0	1	1	53204 53218 53219 53205
12641	2	1	2	0	1	1	53218 53232 53233 53219
12642	2	1	2	0	1	1	53232 53246 53247 53233
12643	2	1	2	0	1	1	53246 53260 53261 53247
12644	2	1	2	0	1	1	53260 53274 53275 53261
12645	2	1	2	0	1	1	53274 53288 53289 53275
12646	2	1	2	0	1	1	53288 53302 53303 53289
12647	2	1	2	0	1	1	53302 53077 53078 53303
12648	2	1	2	0	1	1	53107 53121 53122 53108
12649	2	1	2	0	1	1	53121 53135 53136 53122
12650	2	1	2	0	1	1	53135 53149 53150 53136
12651	2	1	2	0	1	1	53149 53163 53164 53150
12652	2	1	2	0	1	1	53163 53177 53178 53164
12653	2	1	2	0	1	1	53177 53191 53192 53178
12654	2	1	2	0	1	1	53191 53205 53206 53192
12655	2	1	2	0	1	1	53205 53219 53220 53206
12656	2	1	2	0	1	1	53219 53233 53234 53220
12657	2	1	2	0	1	1	53233 53247 53248 53234
12658	2	1	2	0	1	1	53247 53261 53262 53248
12659	2	1	2	0	1	1	53261 53275 53276 53262

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NOES
12660	2	1	2	0	1	1	53275 53289 53290 53276
12661	2	1	2	0	1	1	53289 53303 53304 53290
12662	2	1	2	0	1	1	53303 53078 53079 53304
12663	2	1	2	0	1	1	53108 53122 53123 53109
12664	2	1	2	0	1	1	53122 53136 53137 53123
12665	2	1	2	0	1	1	53136 53150 53151 53137
12666	2	1	2	0	1	1	53150 53164 53165 53151
12667	2	1	2	0	1	1	53164 53178 53179 53165
12668	2	1	2	0	1	1	53178 53192 53193 53179
12669	2	1	2	0	1	1	53192 53206 53207 53193
12670	2	1	2	0	1	1	53206 53220 53221 53207

T-CIA-00006, Rev. 0

12737	2	1	2	0	1	53388	53402	53403	53389
12738	2	1	2	0	1	53402	53416	53417	53403
12739	2	1	2	0	1	53416	53430	53431	53417

ELEM MAT TYP REL ESY SEC TSHA

NODES

12740	2	1	2	0	1	53430	53444	53445	53431
12741	2	1	2	0	1	53444	53458	53459	53445
12742	2	1	2	0	1	53458	53308	53309	53459
12743	2	1	2	0	1	53333	53347	53348	53334
12744	2	1	2	0	1	53347	53361	53362	53348
12745	2	1	2	0	1	53361	53375	53376	53362
12746	2	1	2	0	1	53375	53389	53390	53376
12747	2	1	2	0	1	53389	53403	53404	53390
12748	2	1	2	0	1	53403	53417	53418	53404
12749	2	1	2	0	1	53417	53431	53432	53431
12750	2	1	2	0	1	53431	53445	53446	53432
12751	2	1	2	0	1	53445	53459	53460	53446
12752	2	1	2	0	1	53459	53309	53310	53460
12753	2	1	2	0	1	53334	53348	53349	53335
12754	2	1	2	0	1	53348	53362	53363	53349
12755	2	1	2	0	1	53362	53376	53377	53363
12756	2	1	2	0	1	53376	53390	53391	53377
12757	2	1	2	0	1	53390	53404	53405	53391
12758	2	1	2	0	1	53404	53418	53419	53405
12759	2	1	2	0	1	53418	53432	53433	53419

ELEM MAT TYP REL ESY SEC TSHA

NODES

12760	2	1	2	0	1	53432	53446	53447	53433
12761	2	1	2	0	1	53446	53460	53461	53433
12762	2	1	2	0	1	53460	53310	53311	53461
12763	2	1	2	0	1	53335	53349	53350	53336
12764	2	1	2	0	1	53349	53363	53364	53350
12765	2	1	2	0	1	53363	53377	53378	53364
12766	2	1	2	0	1	53377	53391	53392	53378
12767	2	1	2	0	1	53391	53405	53406	53392
12768	2	1	2	0	1	53405	53419	53420	53406
12769	2	1	2	0	1	53419	53433	53434	53420
12770	2	1	2	0	1	53433	53447	53448	53434
12771	2	1	2	0	1	53447	53461	53462	53448
12772	2	1	2	0	1	53461	53311	53312	53462
12773	2	1	2	0	1	53336	53350	53351	53337
12774	2	1	2	0	1	53350	53364	53365	53351
12775	2	1	2	0	1	53364	53378	53379	53365
12776	2	1	2	0	1	53378	53392	53393	53379
12777	2	1	2	0	1	53392	53406	53407	53393
12778	2	1	2	0	1	53406	53420	53421	53407
12779	2	1	2	0	1	53420	53434	53435	53421

ELEM MAT TYP REL ESY SEC TSHA

NODES

12780	2	1	2	0	1	53434	53448	53449	53435
12781	2	1	2	0	1	53448	53462	53463	53449
12782	2	1	2	0	1	53462	53312	53313	53463
12783	2	1	2	0	1	53337	53351	53352	53338
12784	2	1	2	0	1	53351	53365	53366	53352
12785	2	1	2	0	1	53365	53379	53380	53366
12786	2	1	2	0	1	53379	53393	53394	53380
12787	2	1	2	0	1	53393	53407	53408	53394
12788	2	1	2	0	1	53407	53421	53422	53408
12789	2	1	2	0	1	53421	53435	53436	53422
12790	2	1	2	0	1	53435	53449	53450	53436
12791	2	1	2	0	1	53449	53463	53464	53450
12792	2	1	2	0	1	53463	53314	53314	53464
12793	2	1	2	0	1	53338	53352	53353	53339
12794	2	1	2	0	1	53352	53366	53367	53353
12795	2	1	2	0	1	53366	53380	53381	53367
12796	2	1	2	0	1	53380	53394	53395	53381
12797	2	1	2	0	1	53394	53408	53409	53395
12798	2	1	2	0	1	53408	53422	53423	53409
12799	2	1	2	0	1	53422	53436	53437	53423

ELEM MAT TYP REL ESY SEC TSHA

NODES

T-CIA-00006, Rev. 0

12671	2	1	2	0	1	53220	53234	53235	53221
12672	2	1	2	0	1	53234	53248	53249	53235
12673	2	1	2	0	1	53248	53262	53263	53249
12674	2	1	2	0	1	53262	53276	53277	53263
12675	2	1	2	0	1	53276	53290	53291	53277
12676	2	1	2	0	1	53290	53304	53305	53291
12677	2	1	2	0	1	53304	53079	53080	53305
12678	2	1	2	0	1	53309	53123	53124	53110
12679	2	1	2	0	1	53123	53137	53138	53124

ELEM MAT TYP REL ESY SEC TSHA

NODES

12680	2	1	2	0	1	53137	53151	53152	53138
12681	2	1	2	0	1	53151	53165	53166	53152
12682	2	1	2	0	1	53165	53179	53180	53166
12683	2	1	2	0	1	53179	53193	53194	53180
12684	2	1	2	0	1	53193	53207	53208	53194
12685	2	1	2	0	1	53207	53221	53222	53208
12686	2	1	2	0	1	53221	53235	53236	53222
12687	2	1	2	0	1	53235	53249	53250	53236
12688	2	1	2	0	1	53249	53263	53264	53250
12689	2	1	2	0	1	53263	53277	53278	53264
12690	2	1	2	0	1	53277	53291	53292	53278
12691	2	1	2	0	1	53291	53305	53306	53292
12692	2	1	2	0	1	53305	53080	53081	53306
12693	2	1	2	0	1	53110	53124	53125	53111
12694	2	1	2	0	1	53124	53138	53139	53125
12695	2	1	2	0	1	53138	53152	53153	53139
12696	2	1	2	0	1	53152	53166	53167	53153
12697	2	1	2	0	1	53166	53180	53181	53167
12698	2	1	2	0	1	53180	53194	53195	53181
12699	2	1	2	0	1	53194	53208	53209	53195

ELEM MAT TYP REL ESY SEC TSHA

NODES

12700	2	1	2	0	1	53208	53222	53223	53209
12701	2	1	2	0	1	53222	53236	53237	53223
12702	2	1	2	0	1	53236	53250	53251	53237
12703	2	1	2	0	1	53250	53264	53265	53251
12704	2	1	2	0	1	53264	53278	53279	53265
12705	2	1	2	0	1	53278	53292	53293	53279
12706	2	1	2	0	1	53292	53306	53307	53293
12707	2	1	2	0	1	53306	53081	53082	53307
12708	2	1	2	0	1	53111	53125	53126	53112
12709	2	1	2	0	1	53125	53139	53140	53126
12710	2	1	2	0	1	53139	53153	53154	53140
12711	2	1	2	0	1	53153	53167	53168	53141
12712	2	1	2	0	1	53167	53181	53182	53142
12713	2	1	2	0	1	53181	53195	53196	53143
12714	2	1	2	0	1	53195	53209	53210	53144
12715	2	1	2	0	1	53209	53223	53224	53145
12716	2	1	2	0	1	53223	53237	53238	53146
12717	2	1	2	0	1	53237	53251	53252	53147
12718	2	1	2	0	1	53251	53265	53266	53148
12719	2	1	2	0	1	53265	53279	53280	53149

ELEM MAT TYP REL ESY SEC TSHA

NODES

12720	2	1	2	0	1	53279	53293	53294	53280
12721	2	1	2	0	1	53293	53307	53308	53294
12722	2	1	2	0	1	53307	53321	53322	53308
12723	2	1	2	0	1	191	20615	53346	53322
12724	2	1	2	0	1	20615	20616	53360	53346
12725	2	1	2	0	1	20616	20617	53374	53360
12726	2	1	2	0	1	20617	20618	53388	53374
12727	2	1	2	0	1	20618	20619	53402	53388
12728	2	1	2	0	1	20619	20620	53416	53402
12729	2	1	2	0	1	20620	20621	53430	53416
12730	2	1	2	0	1	20621	20622	53444	53430
12731	2	1	2	0	1	20622	20623	53458	53444
12732	2	1	2	0	1	20623	20624	53508	53458
12733	2	1	2	0	1	53332	53346	53347	53333
12734	2	1	2	0	1	53346	53360	53361	53347
12735	2	1	2	0	1	53360	53374	53375	53361
12736	2	1	2	0	1	53374	53388	53389	53375

T-CAC-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12866	2	1	2	0	1		53387 53401 53326 53325
12867	2	1	2	0	1		53401 53415 53327 53326
12868	2	1	2	0	1		53415 53429 53328 53327
12869	2	1	2	0	1		53429 53443 53329 53328
12870	2	1	2	0	1		53443 53457 53330 53328
12871	2	1	2	0	1		53457 53471 53331 53330
12872	2	1	2	0	1		53471 53321 53083 53331
12873	2	1	2	0	1		51605 53473 53490 53097
12874	2	1	2	0	1		53473 53472 53488 53490
12875	2	1	2	0	1		53097 53490 53491 53096
12876	2	1	2	0	1		53490 53488 53487 53491
12877	2	1	2	0	1		53096 53491 53492 53095
12878	2	1	2	0	1		53491 53487 53486 53492
12879	2	1	2	0	1		53095 53492 53493 53094

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12880	2	1	2	0	1		53492 53486 53485 53493
12881	2	1	2	0	1		53094 53493 53494 53093
12882	2	1	2	0	1		53493 53485 53484 53494
12883	2	1	2	0	1		53093 53494 53495 53092
12884	2	1	2	0	1		53494 53484 53483 53495
12885	2	1	2	0	1		53092 53495 53496 53091
12886	2	1	2	0	1		53495 53483 53482 53496
12887	2	1	2	0	1		53091 53496 53497 53090
12888	2	1	2	0	1		53496 53482 53481 53497
12889	2	1	2	0	1		53090 53497 53498 53089
12890	2	1	2	0	1		53497 53481 53480 53498
12891	2	1	2	0	1		53089 53498 53499 53088
12892	2	1	2	0	1		53498 53480 53479 53499
12893	2	1	2	0	1		53088 53499 53500 53087
12894	2	1	2	0	1		53499 53479 53478 53500
12895	2	1	2	0	1		53087 53500 53501 53086
12896	2	1	2	0	1		53500 53478 53477 53501
12897	2	1	2	0	1		53086 53501 53502 53085
12898	2	1	2	0	1		53501 53477 53476 53502
12899	2	1	2	0	1		53085 53502 53503 53084

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12900	2	1	2	0	1		53502 53476 53475 53503
12901	2	1	2	0	1		53084 53503 53489 53083
12902	2	1	2	0	1		53503 53475 53474 53489
12903	2	1	2	0	1		53500 53505 53520 51619
12904	2	1	2	0	1		53505 53504 53519 53520
12905	2	1	2	0	1		51619 53520 53521 51618
12906	2	1	2	0	1		53520 53519 53518 53521
12907	2	1	2	0	1		51618 53521 53522 51617
12908	2	1	2	0	1		53521 53518 53517 53522
12909	2	1	2	0	1		51617 53522 53523 51616
12910	2	1	2	0	1		53522 53517 53516 53523
12911	2	1	2	0	1		51616 53523 53524 51615
12912	2	1	2	0	1		53523 53516 53515 53524
12913	2	1	2	0	1		51615 53524 53525 51614
12914	2	1	2	0	1		53524 53525 53526 51613
12915	2	1	2	0	1		51614 53525 53526 51613
12916	2	1	2	0	1		53525 53514 53513 53526
12917	2	1	2	0	1		51613 53526 53527 51612
12918	2	1	2	0	1		53526 53513 53512 53527
12919	2	1	2	0	1		51612 53527 53528 51611

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12920	2	1	2	0	1		53527 53512 53511 53528
12921	2	1	2	0	1		51611 53528 53529 51610
12922	2	1	2	0	1		53528 53511 53510 53529
12923	2	1	2	0	1		51610 53529 53530 51609
12924	2	1	2	0	1		53529 53510 53509 53530
12925	2	1	2	0	1		51609 53510 53511 51608
12926	2	1	2	0	1		53510 53509 53508 53531
12927	2	1	2	0	1		51608 53511 53512 51607
12928	2	1	2	0	1		53511 53508 53507 53532
12929	2	1	2	0	1		51607 53512 53513 51606
12930	2	1	2	0	1		53512 53507 53506 53533
12931	2	1	2	0	1		51606 53533 53473 51605

T-CAC-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12800	2	1	2	0	1		53436 53450 53451 53437
12801	2	1	2	0	1		53450 53464 53465 53451
12802	2	1	2	0	1		53464 53478 53479 53465
12803	2	1	2	0	1		53478 53492 53493 53466
12804	2	1	2	0	1		53492 53486 53487 53493
12805	2	1	2	0	1		53486 53481 53482 53487
12806	2	1	2	0	1		53481 53395 53396 53382
12807	2	1	2	0	1		53395 53409 53410 53396
12808	2	1	2	0	1		53409 53423 53424 53410
12809	2	1	2	0	1		53423 53437 53438 53424
12810	2	1	2	0	1		53437 53465 53466 53438
12811	2	1	2	0	1		53465 53451 53452 53466
12812	2	1	2	0	1		53451 53450 53451 53466
12813	2	1	2	0	1		53450 53354 53355 53341
12814	2	1	2	0	1		53354 53368 53369 53355
12815	2	1	2	0	1		53368 53382 53383 53369
12816	2	1	2	0	1		53382 53396 53397 53383
12817	2	1	2	0	1		53396 53410 53411 53397
12818	2	1	2	0	1		53410 53424 53425 53411
12819	2	1	2	0	1		53424 53438 53439 53425

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12820	2	1	2	0	1		53438 53452 53453 53439
12821	2	1	2	0	1		53452 53466 53467 53453
12822	2	1	2	0	1		53466 53316 53317 53467
12823	2	1	2	0	1		53316 53355 53356 53342
12824	2	1	2	0	1		53355 53369 53370 53356
12825	2	1	2	0	1		53369 53383 53384 53370
12826	2	1	2	0	1		53383 53397 53398 53384
12827	2	1	2	0	1		53397 53411 53412 53398
12828	2	1	2	0	1		53411 53425 53426 53412
12829	2	1	2	0	1		53425 53439 53440 53426
12830	2	1	2	0	1		53439 53453 53454 53440
12831	2	1	2	0	1		53453 53467 53468 53454
12832	2	1	2	0	1		53467 53317 53318 53468
12833	2	1	2	0	1		53317 53356 53357 53343
12834	2	1	2	0	1		53356 53370 53371 53357
12835	2	1	2	0	1		53370 53384 53385 53371
12836	2	1	2	0	1		53384 53398 53399 53385
12837	2	1	2	0	1		53398 53412 53413 53399
12838	2	1	2	0	1		53412 53426 53427 53413
12839	2	1	2	0	1		53426 53440 53441 53427

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12840	2	1	2	0	1		53440 53454 53455 53441
12841	2	1	2	0	1		53454 53468 53469 53455
12842	2	1	2	0	1		53468 53318 53319 53469
12843	2	1	2	0	1		53318 53357 53358 53344
12844	2	1	2	0	1		53357 53371 53372 53358
12845	2	1	2	0	1		53371 53385 53386 53372
12846	2	1	2	0	1		53385 53399 53400 53386
12847	2	1	2	0	1		53399 53413 53414 53400
12848	2	1	2	0	1		53413 53427 53428 53414
12849	2	1	2	0	1		53427 53441 53442 53428
12850	2	1	2	0	1		53441 53455 53456 53428
12851	2	1	2	0	1		53455 53469 53470 53456
12852	2	1	2	0	1		53469 53319 53320 53470
12853	2	1	2	0	1		53319 53358 53359 53345
12854	2	1	2	0	1		53358 53372 53373 53359
12855	2	1	2	0	1		53372 53386 53387 53373
12856	2	1	2	0	1		53386 53400 53401 53387
12857	2	1	2	0	1		53400 53414 53415 53401
12858	2	1	2	0	1		53414 53428 53429 53415
12859	2	1	2	0	1		53428 53442 53443 53429

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12860	2	1	2	0	1		53442 53456 53457 53443
12861	2	1	2	0	1		53456 53470 53471 53457
12862	2	1	2	0	1		53470 53320 53321 53471
12863	2	1	2	0	1		53320 53359 53360 53322
12864	2	1	2	0	1		53359 53373 53374 53322
12865	2	1	2	0	1		53373 53387 53388 53324

T-CAC-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12998	2	1	2	0	1	53560	53574 53575 53581
12999	2	1	2	0	1	53574	53588 53589 53575
13000	2	1	2	0	1	53588	53602 53603 53589
13001	2	1	2	0	1	53602	53616 53617 53617
13002	2	1	2	0	1	53616	53546 53547 53617
13003	2	1	2	0	1	53561	53575 51343 51341
13004	2	1	2	0	1	53575	53589 51344 51343
13005	2	1	2	0	1	53589	53603 51345 51344
13006	2	1	2	0	1	53603	53617 51346 51345
13007	2	1	2	0	1	53617	53547 51334 51346
13008	2	1	2	0	1	53083	53489 53629 53331
13009	2	1	2	0	1	53489	53474 53619 53609
13010	2	1	2	0	1	53331	53609 53630 53330
13011	2	1	2	0	1	53629	53619 53620 53620
13012	2	1	2	0	1	53330	53630 53631 53329
13013	2	1	2	0	1	53630	53620 53621 53631
13014	2	1	2	0	1	53329	53631 53632 53328
13015	2	1	2	0	1	53631	53621 53622 53632
13016	2	1	2	0	1	53328	53622 53633 53327
13017	2	1	2	0	1	53632	53622 53633 53633
13018	2	1	2	0	1	53327	53633 53634 53326
13019	2	1	2	0	1	53633	53623 53624 53634

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
13020	2	1	2	0	1	53326	53634 53635 53325
13021	2	1	2	0	1	53634	53624 53625 53635
13022	2	1	2	0	1	53325	53635 53636 53324
13023	2	1	2	0	1	53635	53625 53626 53636
13024	2	1	2	0	1	53324	53636 53637 53323
13025	2	1	2	0	1	53636	53626 53627 53637
13026	2	1	2	0	1	53323	53637 53628 53322
13027	2	1	2	0	1	53637	53627 53628 53628
13028	2	1	2	0	1	52084	53639 53656 52112
13029	2	1	2	0	1	53639	53638 53654 53656
13030	2	1	2	0	1	52112	53656 53657 52111
13031	2	1	2	0	1	53656	53654 53653 53657
13032	2	1	2	0	1	52111	53657 53658 52110
13033	2	1	2	0	1	53657	53653 53652 53658
13034	2	1	2	0	1	52110	53658 53659 52109
13035	2	1	2	0	1	53658	53652 53651 53659
13036	2	1	2	0	1	52109	53659 53660 52108
13037	2	1	2	0	1	53659	53661 53660 53660
13038	2	1	2	0	1	52108	53660 53661 52107
13039	2	1	2	0	1	53660	53650 53649 53661

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
13040	2	1	2	0	1	52107	53661 53662 52106
13041	2	1	2	0	1	53661	53649 53648 53662
13042	2	1	2	0	1	52106	53662 53663 52105
13043	2	1	2	0	1	53662	53648 53647 53663
13044	2	1	2	0	1	52105	53663 53664 52104
13045	2	1	2	0	1	53663	53647 53646 53664
13046	2	1	2	0	1	52104	53664 53665 52103
13047	2	1	2	0	1	53664	53646 53645 53665
13048	2	1	2	0	1	52103	53665 53666 52102
13049	2	1	2	0	1	53665	53645 53644 53666
13050	2	1	2	0	1	52102	53666 53667 52101
13051	2	1	2	0	1	53666	53644 53643 53667
13052	2	1	2	0	1	52101	53667 53668 52100
13053	2	1	2	0	1	53667	53643 53642 53668
13054	2	1	2	0	1	52100	53668 53669 52099
13055	2	1	2	0	1	53668	53642 53641 53669
13056	2	1	2	0	1	52099	53669 53655 53694
13057	2	1	2	0	1	53669	53641 53640 53685
13058	2	1	2	0	1	52561	53671 53686 53589
13059	2	1	2	0	1	53671	53670 53685 53686
13060	2	1	2	0	1	52589	53686 53687 52588

T-CAC-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12932	2	1	2	0	1	53633	53506 53472 53473
12933	2	1	2	0	1	21061	21065 53562 53548
12934	2	1	2	0	1	21065	21064 53576 53562
12935	2	1	2	0	1	21064	21063 53590 53576
12936	2	1	2	0	1	21063	21062 53604 53590
12937	2	1	2	0	1	21062	212 53594 53604
12938	2	1	2	0	1	53548	53562 53563 53549
12939	2	1	2	0	1	53562	53576 53577 53563

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12940	2	1	2	0	1	53576	53590 53591 53577
12941	2	1	2	0	1	53590	53604 53605 53591
12942	2	1	2	0	1	53604	53534 53535 53505
12943	2	1	2	0	1	53549	53563 53564 53550
12944	2	1	2	0	1	53563	53577 53578 53564
12945	2	1	2	0	1	53577	53591 53592 53578
12946	2	1	2	0	1	53591	53605 53606 53592
12947	2	1	2	0	1	53605	53535 53536 53606
12948	2	1	2	0	1	53550	53564 53565 53551
12949	2	1	2	0	1	53564	53578 53579 53565
12950	2	1	2	0	1	53578	53592 53593 53579
12951	2	1	2	0	1	53592	53606 53607 53593
12952	2	1	2	0	1	53606	53536 53537 53607
12953	2	1	2	0	1	53551	53565 53566 53552
12954	2	1	2	0	1	53565	53579 53580 53566
12955	2	1	2	0	1	53579	53591 53594 53580
12956	2	1	2	0	1	53591	53607 53608 53594
12957	2	1	2	0	1	53607	53537 53538 53608
12958	2	1	2	0	1	53537	53566 53567 53553
12959	2	1	2	0	1	53566	53580 53581 53567

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12960	2	1	2	0	1	53580	53594 53595 53581
12961	2	1	2	0	1	53594	53608 53609 53595
12962	2	1	2	0	1	53608	53538 53539 53609
12963	2	1	2	0	1	53538	53567 53568 53554
12964	2	1	2	0	1	53567	53581 53582 53568
12965	2	1	2	0	1	53581	53595 53596 53582
12966	2	1	2	0	1	53595	53609 53610 53596
12967	2	1	2	0	1	53609	53539 53540 53610
12968	2	1	2	0	1	53539	53608 53609 53539
12969	2	1	2	0	1	53608	53582 53583 53585
12970	2	1	2	0	1	53582	53596 53597 53583
12971	2	1	2	0	1	53596	53610 53611 53597
12972	2	1	2	0	1	53610	53540 53541 53611
12973	2	1	2	0	1	53555	53569 53570 53556
12974	2	1	2	0	1	53569	53583 53584 53570
12975	2	1	2	0	1	53583	53597 53598 53584
12976	2	1	2	0	1	53597	53611 53612 53598
12977	2	1	2	0	1	53611	53541 53542 53612
12978	2	1	2	0	1	53556	53570 53571 53557
12979	2	1	2	0	1	53570	53584 53585 53571

T-CAC-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
12980	2	1	2	0	1	53584	53598 53599 53585
12981	2	1	2	0	1	53598	53612 53613 53599
12982	2	1	2	0	1	53612	53542 53543 53613
12983	2	1	2	0	1	53557	53571 53572 53558
12984	2	1	2	0	1	53571	53585 53586 53572
12985	2	1	2	0	1	53585	53599 53600 53586
12986	2	1	2	0	1	53599	53613 53614 53600
12987	2	1	2	0	1	53613	53543 53544 53614
12988	2	1	2	0	1	53558	53572 53573 53559
12989	2	1	2	0	1	53572	53586 53587 53573
12990	2	1	2	0	1	53586	53600 53601 53587
12991	2	1	2	0	1	53600	53614 53615 53601
12992	2	1	2	0	1	53614	53544 53545 53615
12993	2	1	2	0	1	53559	53573 53574 53565
12994	2	1	2	0	1	53573	53587 53588 53574
12995	2	1	2	0	1	53587	53601 53602 53588
12996	2	1	2	0	1	53601	53615 53616 53602
12997	2	1	2	0	1	53615	53545 53546 53616

T-CLC-00006, Rev. 0

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
7156	1	1	47	0	1	20691	20692 20724 20723
7157	1	1	47	0	1	20692	20693 20725 20724
7158	1	1	47	0	1	20693	20694 20726 20725
7159	1	1	47	0	1	20694	20695 20727 20726
7160	1	1	47	0	1	20695	20696 20728 20727
7161	1	1	47	0	1	20696	20682 20698 20728
7162	1	1	47	0	1	20714	20715 20713 20699
7163	1	1	47	0	1	20715	20716 20712 20713
7164	1	1	47	0	1	20716	20717 20711 20712
7165	1	1	47	0	1	20717	20718 20710 20711
7166	1	1	47	0	1	20718	20719 20709 20710
7167	1	1	47	0	1	20719	20720 20708 20709
7168	1	1	47	0	1	20720	20721 20707 20708

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
7169	1	1	47	0	1	20721	20722 20706 20707
7170	1	1	47	0	1	20722	20723 20705 20706
7171	1	1	47	0	1	20723	20724 20704 20705
7172	1	1	47	0	1	20724	20725 20703 20704
7173	1	1	47	0	1	20725	20726 20702 20703
7174	1	1	47	0	1	20726	20727 20701 20702
7175	1	1	47	0	1	20727	20728 20700 20701
7176	1	1	47	0	1	20728	20698 20697 20700
7177	1	1	47	0	1	215	20730 20740 217
7178	1	1	47	0	1	20730	20731 20741 20740
7179	1	1	47	0	1	20731	20732 20742 20741
7180	1	1	47	0	1	20732	20733 20743 20742
7181	1	1	47	0	1	20733	20729 20735 20743
7182	1	1	47	0	1	217	20740 20736 216
7183	1	1	47	0	1	20740	20741 20737 20736
7184	1	1	47	0	1	20741	20742 20738 20737
7185	1	1	47	0	1	20742	20743 20739 20738
7186	1	1	47	0	1	20743	20735 20734 20733
7187	1	1	47	0	1	20744	20746 20778 20777
7188	1	1	47	0	1	20746	20747 20779 20778

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
7189	1	1	47	0	1	20747	20748 20780 20779
7190	1	1	47	0	1	20748	20749 20781 20780
7191	1	1	47	0	1	20749	20750 20782 20781
7192	1	1	47	0	1	20750	20751 20783 20782
7193	1	1	47	0	1	20751	20752 20784 20783
7194	1	1	47	0	1	20752	20753 20785 20784
7195	1	1	47	0	1	20753	20754 20786 20785
7196	1	1	47	0	1	20754	20755 20787 20786
7197	1	1	47	0	1	20755	20756 20788 20787
7198	1	1	47	0	1	20756	20757 20789 20788
7199	1	1	47	0	1	20757	20758 20790 20789
7200	1	1	47	0	1	20758	20759 20791 20790
7201	1	1	47	0	1	20759	20745 20761 20791
7202	1	1	47	0	1	20777	20778 20776 20762
7203	1	1	47	0	1	20778	20779 20775 20776
7204	1	1	47	0	1	20779	20780 20774 20775
7205	1	1	47	0	1	20780	20781 20773 20774
7206	1	1	47	0	1	20781	20782 20772 20773
7207	1	1	47	0	1	20782	20783 20771 20772
7208	1	1	47	0	1	20783	20784 20770 20771

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
7209	1	1	47	0	1	20784	20785 20769 20770
7210	1	1	47	0	1	20785	20786 20768 20769
7211	1	1	47	0	1	20786	20787 20767 20768
7212	1	1	47	0	1	20787	20788 20766 20767
7213	1	1	47	0	1	20788	20789 20765 20766
7214	1	1	47	0	1	20789	20790 20764 20765
7215	1	1	47	0	1	20790	20791 20763 20764
7216	1	1	47	0	1	20791	20761 20760 20763
7217	1	1	47	0	1	20792	20794 20826 20825
7218	1	1	47	0	1	20794	20795 20827 20826
7219	1	1	47	0	1	20795	20796 20828 20827
7220	1	1	47	0	1	20796	20797 20829 20828
7221	1	1	47	0	1	20797	20798 20830 20829

T-CLC-00006, Rev. 0

7222	1	1	47	0	1	20798	20799 20831 20830
7223	1	1	47	0	1	20799	20800 20832 20831
7224	1	1	47	0	1	20800	20801 20833 20832
7225	1	1	47	0	1	20801	20802 20834 20833
7226	1	1	47	0	1	20802	20803 20835 20834
7227	1	1	47	0	1	20803	20804 20836 20835
7228	1	1	47	0	1	20804	20805 20837 20836

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
7229	1	1	47	0	1	20805	20806 20838 20837
7230	1	1	47	0	1	20806	20807 20839 20838
7231	1	1	47	0	1	20807	20793 20809 20839
7232	1	1	47	0	1	20805	20836 20824 20810
7233	1	1	47	0	1	20826	20827 20823 20824
7234	1	1	47	0	1	20827	20828 20822 20823
7235	1	1	47	0	1	20828	20829 20821 20822
7236	1	1	47	0	1	20829	20830 20820 20821
7237	1	1	47	0	1	20830	20831 20819 20820
7238	1	1	47	0	1	20831	20832 20818 20819
7239	1	1	47	0	1	20832	20833 20817 20818
7240	1	1	47	0	1	20833	20834 20816 20817
7241	1	1	47	0	1	20834	20835 20815 20816
7242	1	1	47	0	1	20835	20836 20814 20815
7243	1	1	47	0	1	20836	20837 20813 20814
7244	1	1	47	0	1	20837	20838 20812 20813
7245	1	1	47	0	1	20838	20839 20811 20812
7246	1	1	47	0	1	20839	20809 20808 20811
7247	1	1	47	0	1	20840	20841 20861 20860
7248	1	1	47	0	1	20841	20842 20862 20861

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
7249	1	1	47	0	1	20842	20843 20863 20862
7250	1	1	47	0	1	20843	20844 20864 20863
7251	1	1	47	0	1	20844	20845 20865 20864
7252	1	1	47	0	1	20845	20846 20866 20865
7253	1	1	47	0	1	20846	20847 20867 20866
7254	1	1	47	0	1	20847	20848 20868 20867
7255	1	1	47	0	1	20848	20849 20869 20868
7256	1	1	47	0	1	20849	214 219 20869
7257	1	1	47	0	1	20860	20861 20859 20850
7258	1	1	47	0	1	20861	20862 20858 20859
7259	1	1	47	0	1	20862	20863 20857 20858
7260	1	1	47	0	1	20863	20864 20856 20857
7261	1	1	47	0	1	20864	20865 20855 20856
7262	1	1	47	0	1	20865	20866 20854 20855
7263	1	1	47	0	1	20866	20867 20853 20854
7264	1	1	47	0	1	20867	20868 20852 20853
7265	1	1	47	0	1	20868	20869 20851 20852
7266	1	1	47	0	1	20869	219 218 20851
7267	1	1	47	0	1	20870	20872 20904 20903
7268	1	1	47	0	1	20872	20873 20905 20904

ELEM MAT TYP REL ESY SEC TSHA

ELEM	MAT	TYP	REL	ESY	SEC	TSHA	NODES
7269	1	1	47	0	1	20873	20874 20906 20905
7270	1	1	47	0	1	20874	20875 20907 20906
7271	1	1	47	0	1	20875	20876 20908 20907
7272	1	1	47	0	1	20876	20877 20909 20908
7273	1	1	47	0	1	20877	20878 20910 20909
7274	1	1	47	0	1	20878	20879 20911 20910
7275	1	1	47	0	1	20879	20880 20912 20911
7276	1	1	47	0	1	20880	20881 20913 20912
7277	1	1	47	0	1	20881	20882 20914 20913
7278	1	1	47	0	1	20882	20883 20915 20914
7279	1	1	47	0	1	20883	20884 20916 20915
7280	1	1	47	0	1	20884	20885 20917 20916
7281	1	1	47	0	1	20885	20886 20918 20887
7282	1	1	47	0	1	20903	20904 20902 20888
7283	1	1	47	0	1	20904	20905 20901 20902
7284	1	1	47	0	1	20905	20906 20900 20901
7285	1	1	47	0	1	20906	20907 20899 20900
7286	1	1	47	0	1	20907	20908 20898 20899
7287	1	1	47	0	1	20908	20909 20897 20898

T-CUC-00006, Rev. 0

LIST ALL SELECTED ELEMENTS. (LIST NODES)

ELEM MAT TYP REL ESY SEC TSHA	NODES
1 1 1 1 0 1	1 2 4 6
2 1 1 1 0 1	4 3 5
128 1 1 1 0 1	211 178 201 213
129 1 1 1 0 1	213 201 191 212
130 1 1 1 0 1	214 215 217 219
131 1 1 1 0 1	219 217 216 218
222 1 1 1 0 1	361 362 364 366
223 1 1 1 0 1	366 364 363 365
3822 1 1 4 7 0 1	365 363 10604 10619
3823 1 1 4 7 0 1	10619 10604 10605 10620
3824 1 1 4 7 0 1	10620 10605 10606 10621
3825 1 1 4 7 0 1	10621 10606 10607 10622
3826 1 1 4 7 0 1	10622 10607 10608 10623
3827 1 1 4 7 0 1	10623 10608 10609 10624
3828 1 1 4 7 0 1	10624 10609 10610 10625
3829 1 1 4 7 0 1	10625 10610 10611 10626
3830 1 1 4 7 0 1	10626 10611 10612 10627
3831 1 1 4 7 0 1	10627 10612 10613 10628
3832 1 1 4 7 0 1	10628 10613 10614 10629
3833 1 1 4 7 0 1	10629 10614 10615 10630

ELEM MAT TYP REL ESY SEC TSHA

NODES
10630 10615 10616 10631
10631 10616 10617 10632
10632 10617 10618 10633
10633 10618 10619 10634
10634 10619 10620 10635
10635 10620 10621 10636
10636 10621 10622 10637
10637 10622 10623 10638
10638 10623 10624 10639
10639 10624 10625 10640
10640 10625 10626 10641
10641 10626 10627 10642
10642 10627 10628 10643
10643 10628 10629 10644
10644 10629 10630 10645
10645 10630 10631 10646
10646 10631 10632 10647
10647 10632 10633 10648
10648 10633 10634 10649
10649 10634 10635 10650
10650 10635 10636 10651
10651 10636 10637 10652
10652 10637 10638 10653
10653 10638 10639 10654
10654 10639 10640 10655
10655 10640 10641 10656
10656 10641 10642 10657
10657 10642 10643 10658
10658 10643 10644 10659
10659 10644 10645 10660
10660 10645 10646 10661
10661 10646 10647 10662
10662 10647 10648 10663
10663 10648 10649 10664
10664 10649 10650 10665
10665 10650 10651 10666

ELEM MAT TYP REL ESY SEC TSHA

NODES
10680 10665 10666 10681
10681 10666 10667 10682
10682 10667 10668 10683
10683 10668 10669 10684
10684 10669 10670 10685
10685 10670 10671 10686
10686 10671 10672 10687
10687 10672 10673 10688
10688 10673 10674 10689
10689 10674 10675 10690
10690 10675 10676 10691
10691 10676 10677 10692
10692 10677 10678 10693
10693 10678 10679 10694
10694 10679 10680 10695
10695 10680 10681 10696
10696 10681 10682 10697
10697 10682 10683 10698
10698 10683 10684 10699
10699 10684 10685 10700
10700 10685 10686 10701
10701 10686 10687 10702
10702 10687 10688 10703
10703 10688 10689 10704
10704 10689 10690 10705
10705 10690 10691 10706
10706 10691 10692 10707
10707 10692 10693 10708
10708 10693 10694 10709
10709 10694 10695 10710
10710 10695 10696 10711
10711 10696 10697 10712
10712 10697 10698 10713
10713 10698 10699 10714
10714 10699 10700 10715

ELEM MAT TYP REL ESY SEC TSHA

NODES
10715 10700 10701 10716

T-CUC-00006, Rev. 0

10716 10701 10702 10717
10717 10702 10703 10718
10718 10703 10704 10719
10719 10704 10705 10720
10720 10705 10706 10721
10721 10706 10707 10722
10722 10707 10693 10708
178 20604 20624 201
20604 20605 20625 20634
20605 20606 20626 20635
20606 20607 20627 20636
20607 20608 20628 20637
20608 20609 20629 20638
20609 20610 20630 20639
20610 20611 20631 20640
20611 20612 20632 20631
20612 20603 20614 20632
201 20624 20615 191
20624 20625 20616 20615

ELEM MAT TYP REL ESY SEC TSHA

NODES
20625 20626 20617 20616
20626 20627 20618 20617
20627 20628 20619 20618
20628 20629 20620 20619
20629 20630 20621 20620
20630 20631 20622 20621
20631 20632 20623 20622
20632 20614 20613 20623
20633 20635 20657 20656
20635 20636 20658 20657
20637 20638 20670 20659
20638 20639 20671 20670
20639 20640 20672 20671
20640 20641 20673 20672
20641 20642 20674 20673
20642 20643 20675 20674
20643 20644 20676 20675
20644 20645 20677 20676
20645 20646 20678 20677

ELEM MAT TYP REL ESY SEC TSHA

NODES
20646 20647 20679 20678
20647 20648 20680 20679
20648 20634 20650 20680
20656 20667 20655 20651
20657 20668 20664 20665
20659 20670 20662 20663
20670 20671 20661 20662
20671 20672 20660 20661
20672 20673 20659 20660
20673 20674 20658 20659
20674 20675 20657 20658
20675 20676 20656 20657
20676 20677 20655 20656
20677 20678 20654 20655
20678 20679 20653 20654
20679 20680 20652 20653
20680 20650 20649 20652
20681 20683 20715 20714
20683 20684 20716 20715

ELEM MAT TYP REL ESY SEC TSHA

NODES
20684 20685 20717 20716
20685 20686 20718 20717
20686 20687 20719 20718
20687 20688 20720 20719
20688 20689 20721 20720
20689 20690 20722 20721
20690 20691 20723 20722

```
ANTYPE,0
TIME,1
NSUBST,4,10,2
/INPUT,'D1','txt','D:\Ansys Files\Run Files\Model 300\Diff Settlement',, 0
/STATUS,SOLU
SOLVE
!*
TIME,24
NSUBST,4,10,2
/INPUT,'D24','txt','D:\Ansys Files\Run Files\Model 300\Diff Settlement',, 0
/STATUS,SOLU
SOLVE
!*
TIME,100
NSUBST,10,100,5
/INPUT,'D100','txt','D:\Ansys Files\Run Files\Model 300\Diff Settlement',, 0
/STATUS,SOLU
SOLVE
!*
!TIME,1000
!NSUBST,4,100,2
!/INPUT,'D1000','txt','D:\Ansys Files\Run Files\Model 300\Diff Settlement',, 0
!/STATUS,SOLU
!SOLVE
!*
!TIME,5000
!NSUBST,10,100,2
!/INPUT,'D5000','txt','D:\Ansys Files\Run Files\Model 300\Diff Settlement',, 0
!/STATUS,SOLU
!SOLVE
!*
!TIME,10000
!/INPUT,'d10000','txt','D:\Ansys Files\Run Files\Model 300\Diff Settlement',, 0
!/STATUS,SOLU
!SOLVE
!FINISH
```

MODEL 300

Time step file for static displacements

49. D,30001,, -0.547,,, UY
D,30002,, -0.547,,, UY
D,51012,, -0.547,,, UY
D,51013,, -0.547,,, UY
D,51014,, -0.547,,, UY
D,51015,, -0.547,,, UY
D,51016,, -0.547,,, UY
D,51017,, -0.547,,, UY
D,51018,, -0.547,,, UY
D,51019,, -0.547,,, UY
D,51020,, -0.547,,, UY
D,51021,, -0.547,,, UY
D,51022,, -0.547,,, UY
D,51023,, -0.546,,, UY
D,51024,, -0.546,,, UY
D,51025,, -0.546,,, UY
D,50633,, -0.546,,, UY
D,51011,, -0.546,,, UY
D,50635,, -0.546,,, UY
D,50636,, -0.545,,, UY
D,50637,, -0.545,,, UY
D,50638,, -0.545,,, UY
D,50639,, -0.545,,, UY
D,50640,, -0.545,,, UY
D,50641,, -0.545,,, UY
D,50642,, -0.544,,, UY
D,50643,, -0.544,,, UY
D,50644,, -0.544,,, UY
D,50645,, -0.544,,, UY
D,50646,, -0.544,,, UY
D,50647,, -0.543,,, UY
D,50648,, -0.543,,, UY
D,50634,, -0.543,,, UY
D,50681,, -0.543,,, UY
D,50683,, -0.543,,, UY
D,50684,, -0.542,,, UY
D,50685,, -0.542,,, UY
D,50686,, -0.542,,, UY
D,50687,, -0.542,,, UY
D,50688,, -0.542,,, UY
D,50689,, -0.541,,, UY
D,50690,, -0.541,,, UY
D,50691,, -0.541,,, UY
D,50692,, -0.541,,, UY
D,50693,, -0.541,,, UY
D,50694,, -0.540,,, UY
D,50695,, -0.540,,, UY
D,50696,, -0.540,,, UY
D,50682,, -0.540,,, UY
D,51056,, -0.540,,, UY
D,51060,, -0.539,,, UY
D,51059,, -0.539,,, UY
D,51058,, -0.539,,, UY
D,51057,, -0.539,,, UY
D,30211,, -0.538,,, UY
D,30178,, -0.538,,, UY
D,50604,, -0.538,,, UY
D,50605,, -0.538,,, UY
D,50606,, -0.537,,, UY
D,50607,, -0.537,,, UY
D,50608,, -0.537,,, UY
D,50609,, -0.537,,, UY
D,50610,, -0.536,,, UY
D,50611,, -0.536,,, UY
D,50612,, -0.536,,, UY
D,50603,, -0.536,,, UY
D,50744,, -0.536,,, UY
D,50746,, -0.535,,, UY
D,50747,, -0.535,,, UY
D,50748,, -0.534,,, UY
D,50749,, -0.534,,, UY
D,50750,, -0.534,,, UY
D,50751,, -0.533,,, UY
D,50752,, -0.533,,, UY
D,50753,, -0.533,,, UY

Model 300

Typical static displacement file

D,50754,, -0.532,,, UY
D,50755,, -0.532,,, UY
D,50756,, -0.531,,, UY
D,50757,, -0.531,,, UY
D,50758,, -0.531,,, UY
D,50759,, -0.530,,, UY
D,50745,, -0.530,,, UY
D,50792,, -0.530,,, UY
D,50794,, -0.529,,, UY
D,50795,, -0.529,,, UY
D,50796,, -0.528,,, UY
D,50797,, -0.527,,, UY
D,50798,, -0.527,,, UY
D,50799,, -0.526,,, UY
D,50800,, -0.525,,, UY
D,50801,, -0.525,,, UY
D,50802,, -0.524,,, UY
D,50803,, -0.523,,, UY
D,50804,, -0.523,,, UY
D,50805,, -0.522,,, UY
D,50806,, -0.521,,, UY
D,50807,, -0.521,,, UY
D,50793,, -0.520,,, UY
D,50840,, -0.520,,, UY
D,50841,, -0.519,,, UY
D,50842,, -0.518,,, UY
D,50843,, -0.517,,, UY
D,50844,, -0.516,,, UY
D,50845,, -0.515,,, UY
D,50846,, -0.513,,, UY
D,50847,, -0.512,,, UY
D,50848,, -0.511,,, UY
D,50849,, -0.510,,, UY
D,30214,, -0.508,,, UY
D,30215,, -0.507,,, UY
D,50730,, -0.506,,, UY
D,50731,, -0.505,,, UY
D,50732,, -0.504,,, UY
D,50733,, -0.503,,, UY
D,50729,, -0.502,,, UY
D,50870,, -0.502,,, UY
D,50872,, -0.500,,, UY
D,50873,, -0.499,,, UY
D,50874,, -0.498,,, UY
D,50875,, -0.496,,, UY
D,50876,, -0.494,,, UY
D,50877,, -0.492,,, UY
D,50878,, -0.490,,, UY
D,50879,, -0.488,,, UY
D,50880,, -0.486,,, UY
D,50881,, -0.484,,, UY
D,50882,, -0.482,,, UY
D,50883,, -0.480,,, UY
D,50884,, -0.478,,, UY
D,50885,, -0.476,,, UY
D,50871,, -0.474,,, UY
D,50918,, -0.474,,, UY
D,50920,, -0.472,,, UY
D,50921,, -0.470,,, UY
D,50922,, -0.468,,, UY
D,50923,, -0.467,,, UY
D,50924,, -0.463,,, UY
D,50925,, -0.458,,, UY
D,50926,, -0.453,,, UY
D,50927,, -0.449,,, UY
D,50928,, -0.444,,, UY
D,50929,, -0.439,,, UY
D,50930,, -0.434,,, UY
D,50931,, -0.429,,, UY
D,50932,, -0.425,,, UY
D,50933,, -0.420,,, UY
D,50919,, -0.415,,, UY
D,50966,, -0.415,,, UY
D,50967,, -0.411,,, UY
D,50968,, -0.406,,, UY

D,50969,,,-0.401,,,,UY
D,50970,,,-0.397,,,,UY
D,50971,,,-0.392,,,,UY
D,50972,,,-0.387,,,,UY
D,50973,,,-0.382,,,,UY
D,50974,,,-0.376,,,,UY
D,50975,,,-0.371,,,,UY
D,50976,,,-0.365,,,,UY
D,50977,,,-0.360,,,,UY
D,50978,,,-0.354,,,,UY
D,50979,,,-0.349,,,,UY
D,50980,,,-0.343,,,,UY
D,30361,,,-0.338,,,,UY
D,30362,,,-0.334,,,,UY
D,10708,,,-0.000992,,,,UX
D,10722,,,-0.000931,,,,UX
D,10721,,,-0.000869,,,,UX
D,10720,,,-0.000808,,,,UX
D,10719,,,-0.000746,,,,UX
D,10718,,,-0.000684,,,,UX
D,10717,,,-0.000623,,,,UX
D,10716,,,-0.000561,,,,UX
D,10715,,,-0.000500,,,,UX
D,10714,,,-0.000438,,,,UX
D,10713,,,-0.000376,,,,UX
D,10712,,,-0.000315,,,,UX
D,10711,,,-0.000253,,,,UX
D,10710,,,-0.000192,,,,UX
D,10709,,,-0.000130,,,,UX
D,5,,,-0.000068,,,,UX
D,6,,,-0.000034,,,,UX
D,1,,0.000000,,,,UX

~~000~~D,30001,, -0.7141,, UY,.....
D,30002,, -0.7129,, UY,.....
D,51012,, -0.7077,, UY,.....
D,51013,, -0.6989,, UY,.....
D,51014,, -0.6870,, UY,.....
D,51015,, -0.6729,, UY,.....
D,51016,, -0.6575,, UY,.....
D,51017,, -0.6416,, UY,.....
D,51018,, -0.6259,, UY,.....
D,51019,, -0.6113,, UY,.....
D,51020,, -0.5980,, UY,.....
D,51021,, -0.5864,, UY,.....
D,51022,, -0.5766,, UY,.....
D,51023,, -0.5685,, UY,.....
D,51024,, -0.5621,, UY,.....
D,51025,, -0.5572,, UY,.....
D,50633,, -0.5535,, UY,.....
D,51011,, -0.5535,, UY,.....
D,50635,, -0.5507,, UY,.....
D,50636,, -0.5487,, UY,.....
D,50637,, -0.5473,, UY,.....
D,50638,, -0.5463,, UY,.....
D,50639,, -0.5456,, UY,.....
D,50640,, -0.5451,, UY,.....
D,50641,, -0.5448,, UY,.....
D,50642,, -0.5445,, UY,.....
D,50643,, -0.5442,, UY,.....
D,50644,, -0.5440,, UY,.....
D,50645,, -0.5438,, UY,.....
D,50646,, -0.5436,, UY,.....
D,50647,, -0.5434,, UY,.....
D,50648,, -0.5431,, UY,.....
D,50634,, -0.5429,, UY,.....
D,50681,, -0.5429,, UY,.....
D,50683,, -0.5427,, UY,.....
D,50684,, -0.5425,, UY,.....
D,50685,, -0.5423,, UY,.....
D,50686,, -0.5421,, UY,.....
D,50687,, -0.5419,, UY,.....
D,50688,, -0.5416,, UY,.....
D,50689,, -0.5414,, UY,.....
D,50690,, -0.5412,, UY,.....
D,50691,, -0.5410,, UY,.....
D,50692,, -0.5408,, UY,.....
D,50693,, -0.5406,, UY,.....
D,50694,, -0.5404,, UY,.....
D,50695,, -0.5401,, UY,.....
D,50696,, -0.5399,, UY,.....
D,50682,, -0.5396,, UY,.....
D,51056,, -0.5396,, UY,.....
D,51060,, -0.5394,, UY,.....
D,51059,, -0.5391,, UY,.....
D,51058,, -0.5389,, UY,.....
D,51057,, -0.5386,, UY,.....
D,30211,, -0.5384,, UY,.....
D,30178,, -0.5382,, UY,.....
D,50604,, -0.5380,, UY,.....
D,50605,, -0.5377,, UY,.....
D,50606,, -0.5375,, UY,.....
D,50607,, -0.5372,, UY,.....
D,50608,, -0.5370,, UY,.....
D,50609,, -0.5367,, UY,.....
D,50610,, -0.5365,, UY,.....
D,50611,, -0.5362,, UY,.....
D,50612,, -0.5360,, UY,.....
D,50603,, -0.5356,, UY,.....
D,50744,, -0.5356,, UY,.....
D,50746,, -0.5352,, UY,.....
D,50747,, -0.5348,, UY,.....
D,50748,, -0.5344,, UY,.....
D,50749,, -0.5341,, UY,.....
D,50750,, -0.5337,, UY,.....
D,50751,, -0.5333,, UY,.....
D,50752,, -0.5329,, UY,.....
D,50753,, -0.5325,, UY,.....

Model 300

Typical differential displacement
file

D,50754,, -0.5322,, ,UY,,,,
D,50755,, -0.5318,, ,UY,,,,
D,50756,, -0.5314,, ,UY,,,,
D,50757,, -0.5310,, ,UY,,,,
D,50758,, -0.5306,, ,UY,,,,
D,50759,, -0.5303,, ,UY,,,,
D,50745,, -0.5299,, ,UY,,,,
D,50792,, -0.5299,, ,UY,,,,
D,50794,, -0.5293,, ,UY,,,,
D,50795,, -0.5286,, ,UY,,,,
D,50796,, -0.5280,, ,UY,,,,
D,50797,, -0.5273,, ,UY,,,,
D,50798,, -0.5266,, ,UY,,,,
D,50799,, -0.5259,, ,UY,,,,
D,50800,, -0.5253,, ,UY,,,,
D,50801,, -0.5246,, ,UY,,,,
D,50802,, -0.5239,, ,UY,,,,
D,50803,, -0.5232,, ,UY,,,,
D,50804,, -0.5225,, ,UY,,,,
D,50805,, -0.5219,, ,UY,,,,
D,50806,, -0.5212,, ,UY,,,,
D,50807,, -0.5205,, ,UY,,,,
D,50793,, -0.5198,, ,UY,,,,
D,50840,, -0.5198,, ,UY,,,,
D,50841,, -0.5192,, ,UY,,,,
D,50842,, -0.5184,, ,UY,,,,
D,50843,, -0.5171,, ,UY,,,,
D,50844,, -0.5159,, ,UY,,,,
D,50845,, -0.5147,, ,UY,,,,
D,50846,, -0.5134,, ,UY,,,,
D,50847,, -0.5122,, ,UY,,,,
D,50848,, -0.5109,, ,UY,,,,
D,50849,, -0.5097,, ,UY,,,,
D,30214,, -0.5085,, ,UY,,,,
D,30215,, -0.5075,, ,UY,,,,
D,50730,, -0.5063,, ,UY,,,,
D,50731,, -0.5051,, ,UY,,,,
D,50732,, -0.5039,, ,UY,,,,
D,50733,, -0.5027,, ,UY,,,,
D,50729,, -0.5015,, ,UY,,,,
D,50870,, -0.5015,, ,UY,,,,
D,50872,, -0.5002,, ,UY,,,,
D,50873,, -0.4989,, ,UY,,,,
D,50874,, -0.4976,, ,UY,,,,
D,50875,, -0.4957,, ,UY,,,,
D,50876,, -0.4938,, ,UY,,,,
D,50877,, -0.4918,, ,UY,,,,
D,50878,, -0.4899,, ,UY,,,,
D,50879,, -0.4879,, ,UY,,,,
D,50880,, -0.4860,, ,UY,,,,
D,50881,, -0.4840,, ,UY,,,,
D,50882,, -0.4821,, ,UY,,,,
D,50883,, -0.4801,, ,UY,,,,
D,50884,, -0.4782,, ,UY,,,,
D,50885,, -0.4762,, ,UY,,,,
D,50871,, -0.4743,, ,UY,,,,
D,50918,, -0.4743,, ,UY,,,,
D,50920,, -0.4724,, ,UY,,,,
D,50921,, -0.4704,, ,UY,,,,
D,50922,, -0.4685,, ,UY,,,,
D,50923,, -0.4665,, ,UY,,,,
D,50924,, -0.4629,, ,UY,,,,
D,50925,, -0.4581,, ,UY,,,,
D,50926,, -0.4533,, ,UY,,,,
D,50927,, -0.4486,, ,UY,,,,
D,50928,, -0.4438,, ,UY,,,,
D,50929,, -0.4390,, ,UY,,,,
D,50930,, -0.4342,, ,UY,,,,
D,50931,, -0.4295,, ,UY,,,,
D,50932,, -0.4247,, ,UY,,,,
D,50933,, -0.4199,, ,UY,,,,
D,50919,, -0.4152,, ,UY,,,,
D,50966,, -0.4152,, ,UY,,,,
D,50967,, -0.4105,, ,UY,,,,
D,50968,, -0.4059,, ,UY,,,,

D,50969,, -0.4012,,, UY,,,,,
D,50970,, -0.3966,,, UY,,,,,
D,50971,, -0.3919,,, UY,,,,,
D,50972,, -0.3872,,, UY,,,,,
D,50973,, -0.3817,,, UY,,,,,
D,50974,, -0.3762,,, UY,,,,,
D,50975,, -0.3708,,, UY,,,,,
D,50976,, -0.3653,,, UY,,,,,
D,50977,, -0.3598,,, UY,,,,,
D,50978,, -0.3543,,, UY,,,,,
D,50979,, -0.3489,,, UY,,,,,
D,50980,, -0.3434,,, UY,,,,,
D,30361,, -0.3379,,, UY,,,,,
D,30362,, -0.3337,,, UY,,,,,

*SET,k,30
!*
R,44,0.975*k, , ,
!*
R,45,0.75*k, , ,
!*
R,46,1.725*k, , ,
!*
R,47,1.95*k, , ,
!*

Model 300

Script file for setting soil modulus.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 572	Rev. 0
----------------------------------	------------------	-----------

APPENDIX G

2-0/3-0 *est 7/11/03*

Preliminary Model Studies

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 573	Rev. 0
----------------------------------	------------------	-----------

This Appendix is intended to provide a summary of preliminary calculations that were performed to justify some of the assumptions and methods used for the final analysis.

G1. Bounding Case for Static Settlement Displacements.

A simple 2-D elastic model was used to determine which of the loading conditions resulted in the highest stress/strain state in the vault.

G1.1 Displacement Calculation.

The 2-D axisymmetric model was run with three loading conditions. A preliminary soil closure cap design was used to calculate the vertical pressure loads.

Load P1 – Loading from Vault 4 only.

Load P2 – Loads from all 15 proposed vaults.

Load P3 – Loads from all but 13, 14, 15. (The soil heave effect of these vaults tends to counteract the settlement under vault 4.)

The displacements from the axisymmetric model were interpolated for application to the plane strain elastic model.

G1.2 Plane Strain Model Results.

The model is shown on figures G1 through G3. The horizontal stress is shown on the contour plots in figures G4 through 8. The maximum tensile stress of 13.1 ksf occurs for case P3R. Case P3R is the right hand displacement pattern of loading condition P3. This bounding case is used for the remainder of the analysis in this calculation.

G2. Preliminary 2-D and 3-D Model Comparison.

To validate the use of a 2-D plane strain model, a preliminary analysis was performed with a non-linear 3-D model. Loads and displacements applied to the model were based on preliminary information. The model did not include the construction joints. For comparison, the 2-D model (Model 70) was modified to bond the construction joints and was run with the same loads and properties as the 3-D model.

The results are compared in figures G9 through G14. The results show slightly higher values for the 2-D model.

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 574	Rev. 0
----------------------------------	------------------	-----------

Table G1. 2-D and 3-D Model Comparison

Description	3-D Max. Value	2-D Max. Value	% Variation
Horizontal Stress	39.5 ksf	41.4 ksf	+4.8%
Horizontal Strain	7.69E-5	7.8E-5	+1.4%
Contact Pressure	18.4 ksf	20.9 ksf	+1.1%

The 2-D model and 3-D model give very similar results. In addition, the contours compare closely for both models.

G3. Conclusions.

1. The loading condition P3R chosen for the analysis represents a bounding case.
2. The use of a 2-D non-linear plane strain model is representative for the structural behavior of the vault.

Model 2 - 2D Plane Strain
Node Numbers

306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	
[Redacted]																															

337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366		
[Redacted]																															
305	244	183	122	617																											

Note: Bottom row has coincident nodes 1-61 and 367-427

Figure 61

Model 2 - 2D Plane Strain
Element Numbers

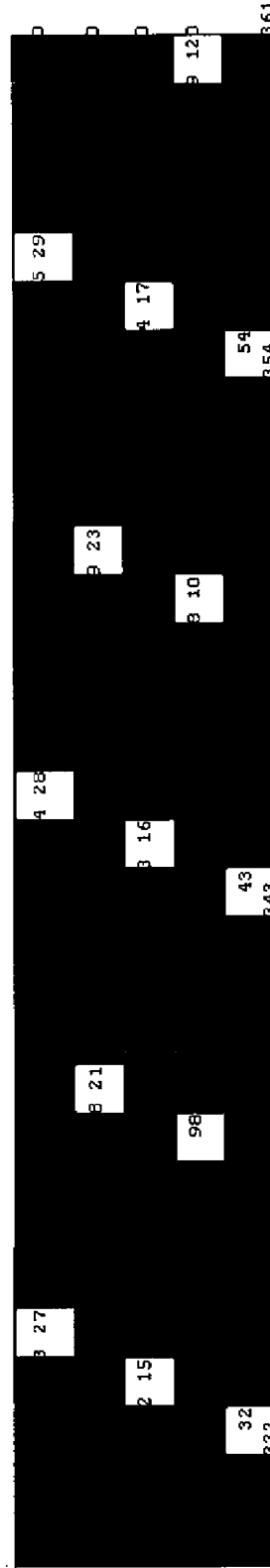
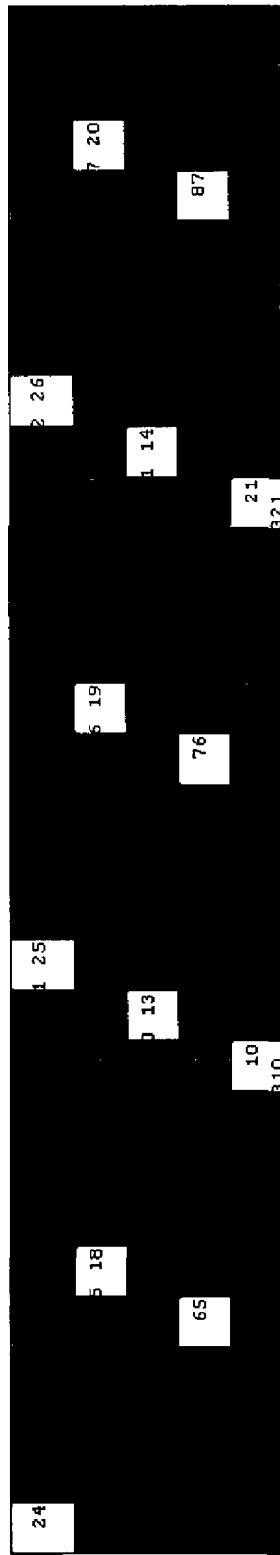


Figure 62

Model 2 - 2D Plane Strain

Boundary Conditions

X dir. - fixed left side

Y dir. - imposed displacements

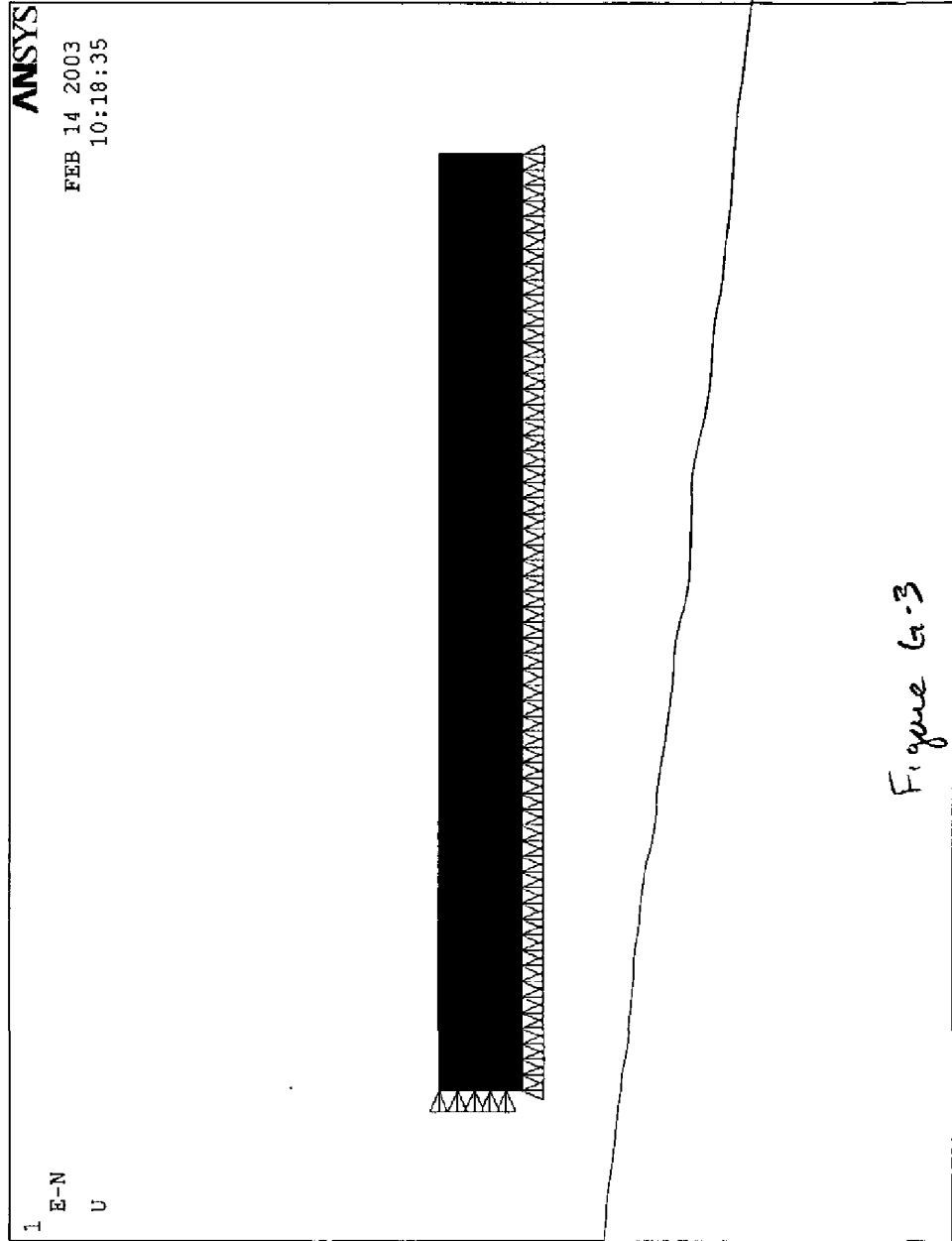
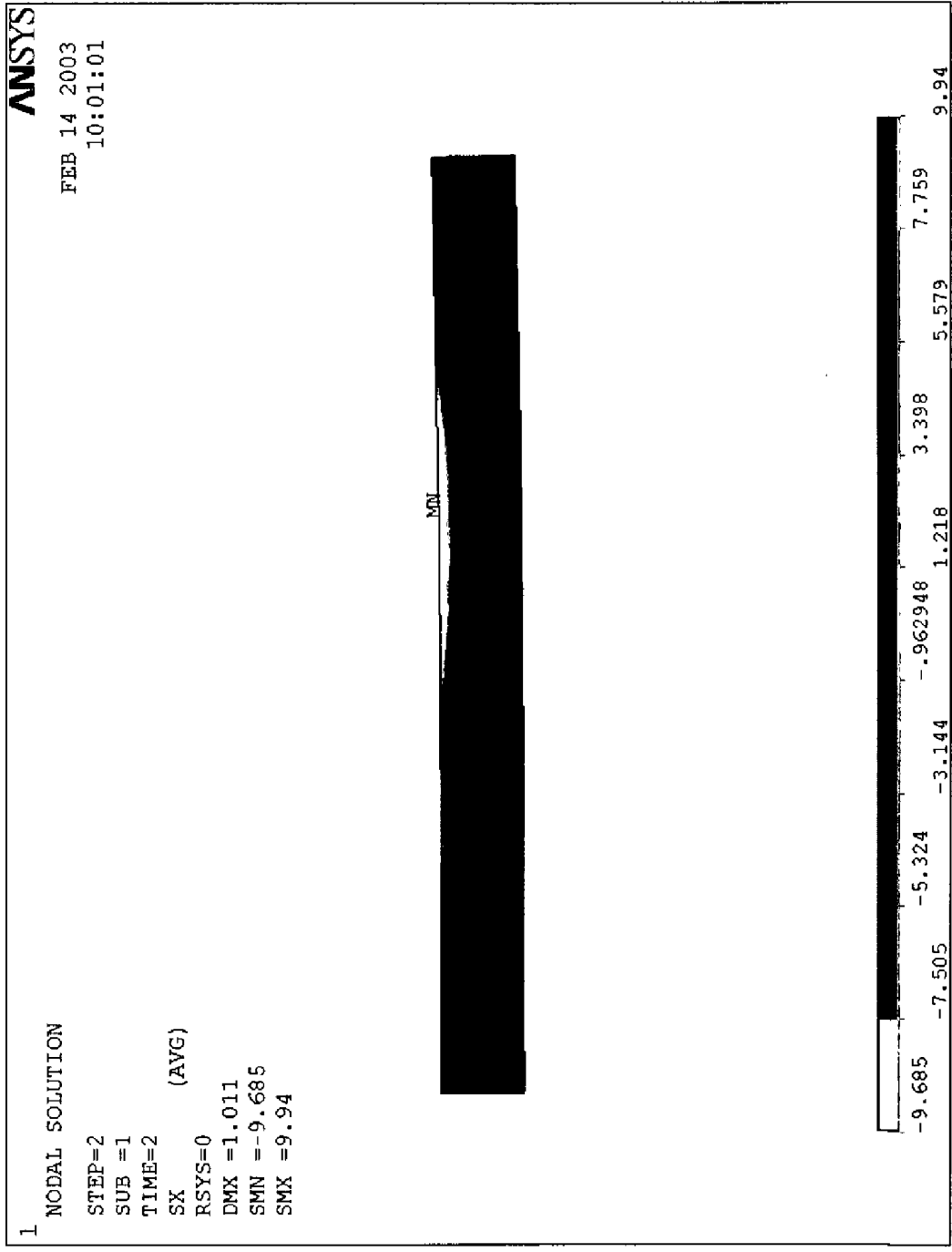


Figure G-3

Model 2 - 2D Plane Strain
 Case P1 - Vault 4 Only
 Horizontal Stress σ_x



T-ccc-2-00006, Rev. 0

Figure 6A

Model 2 - 2D Plane Strain
Case P2R - All Vaults
Horizontal Stress σ_x

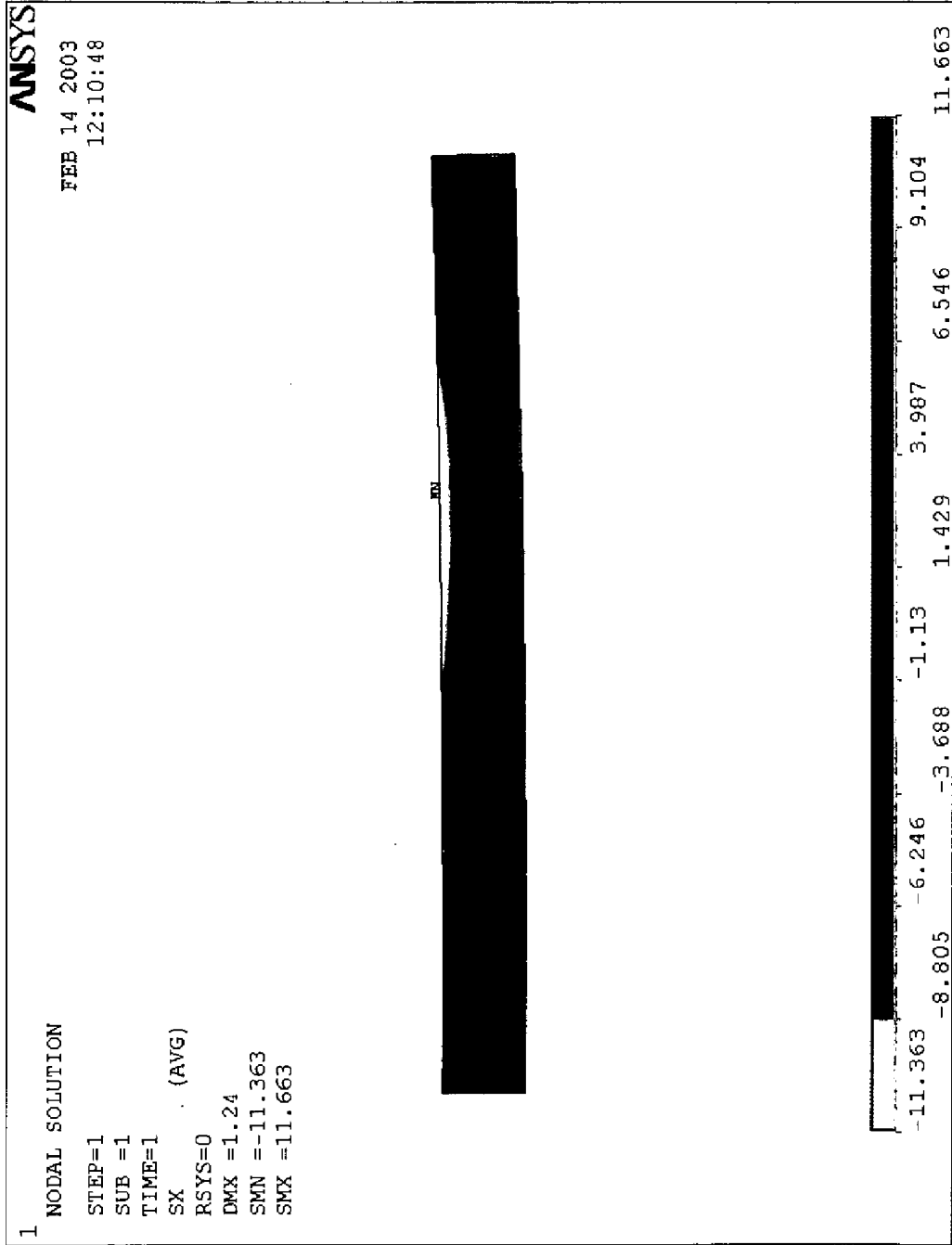


Figure 65

Model 2 - 2D Plane Strain
Case P2L - All Vaults
Horizontal Stress σ_x

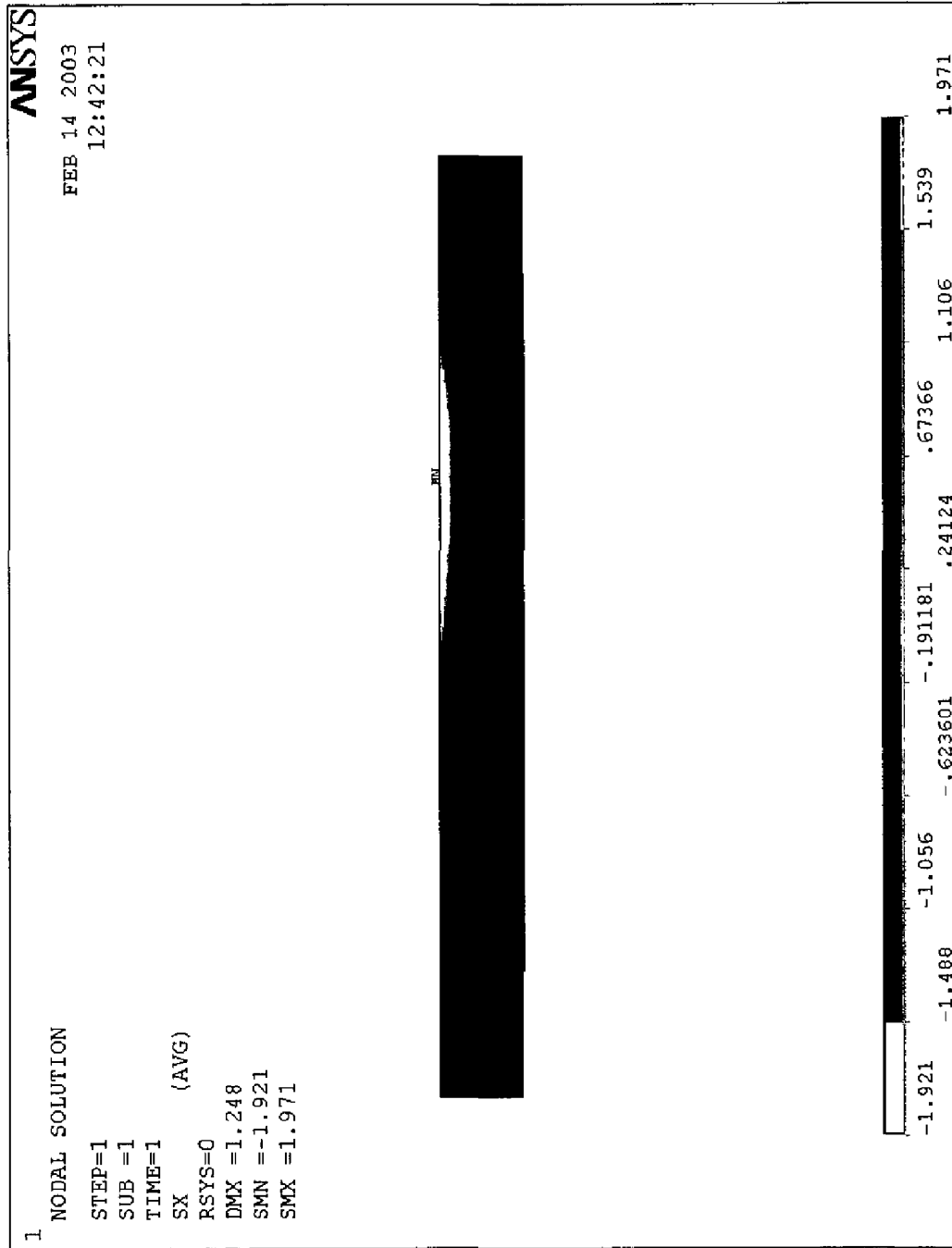


Figure 6b

Model 2 - 2D Plane Strain
Case P3R - All Vaults exc. 13,14,15
Horizontal Stress σ_x

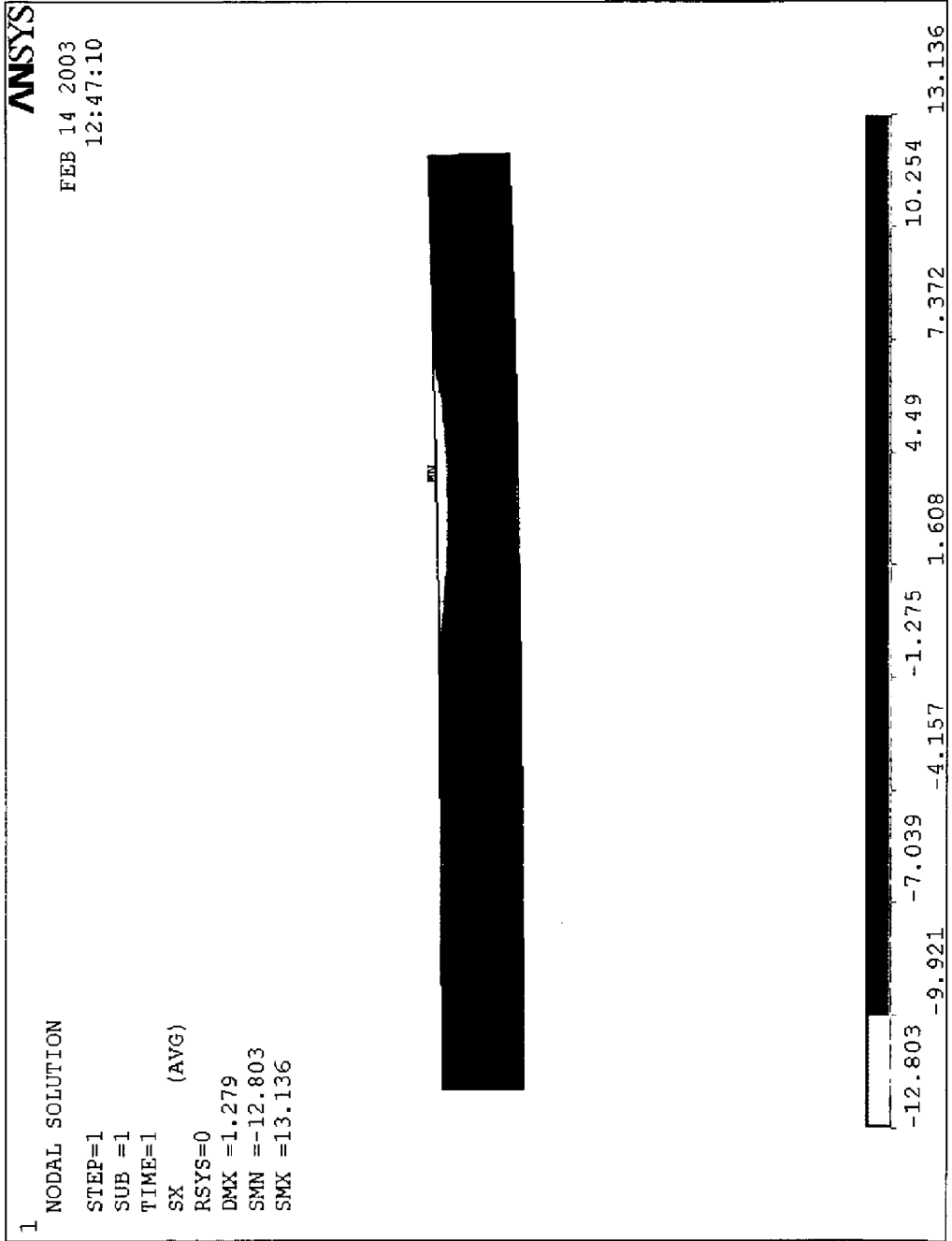


Figure 67

Model 2 - 2D Plane Strain
Case P3L - All Vaults exc. 13,14,15
Horizontal Stress σ_x

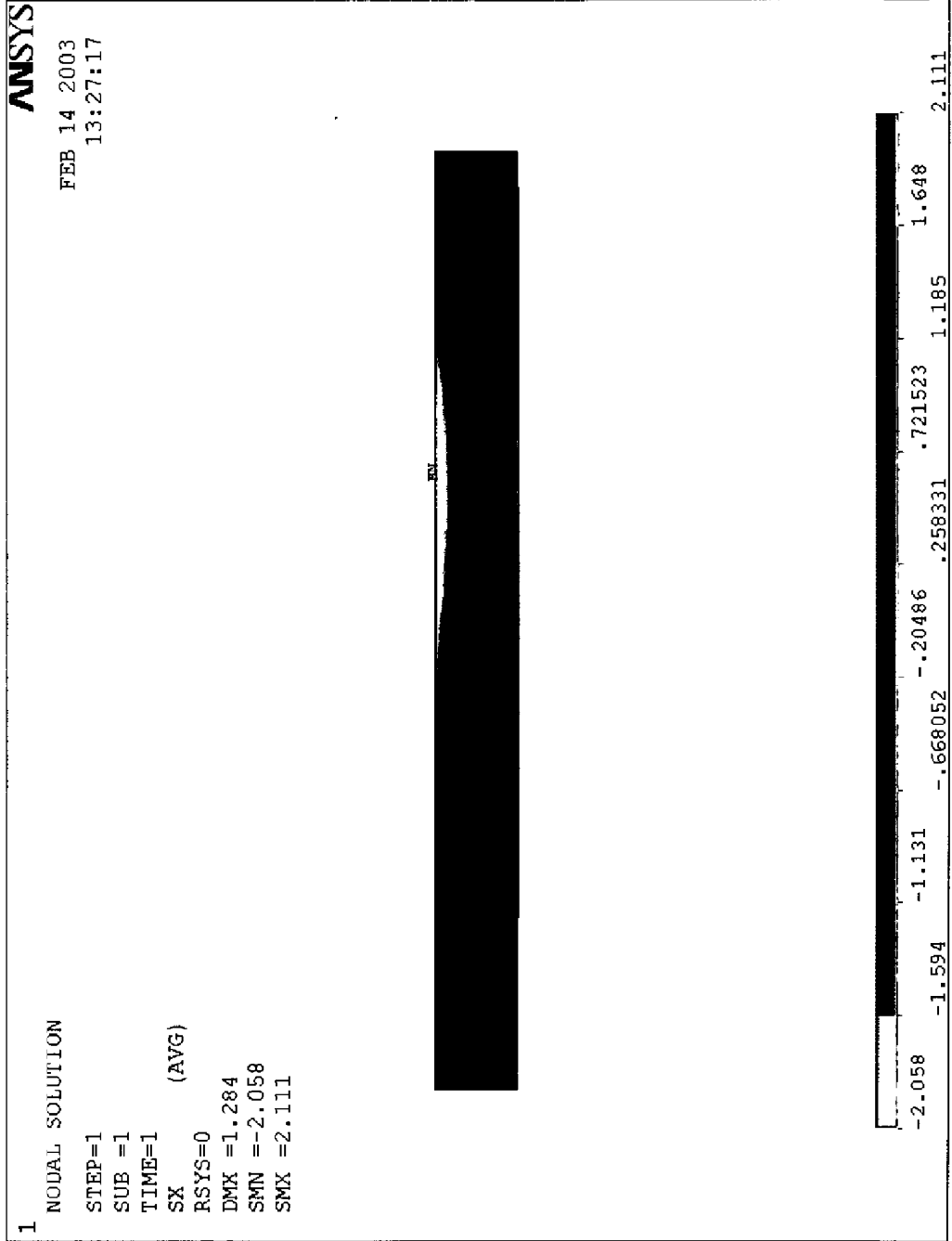


Figure 68

2-D Monolith Model σ_x Stress

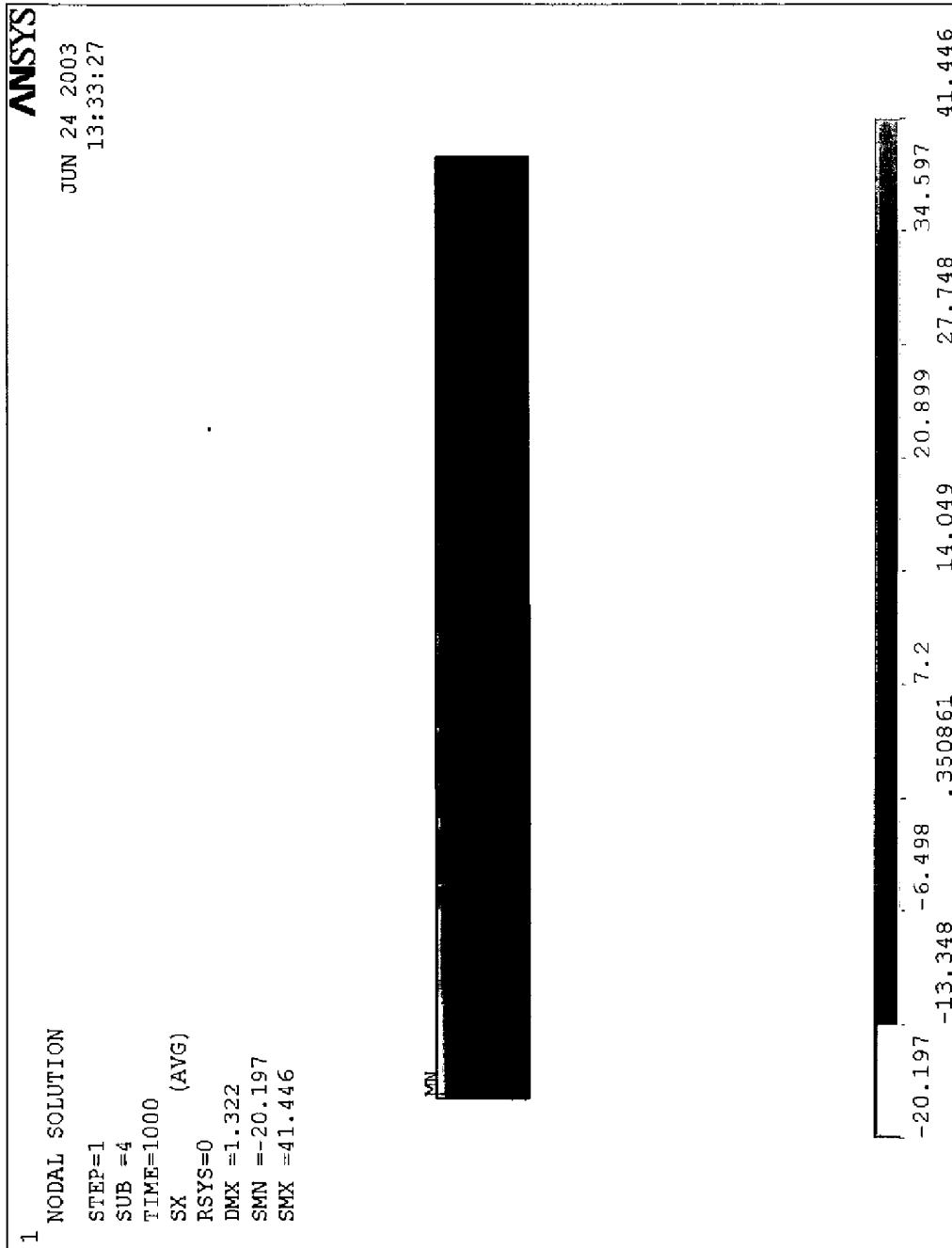


Figure 69

2-D Monolith Model ϵ_x Strain

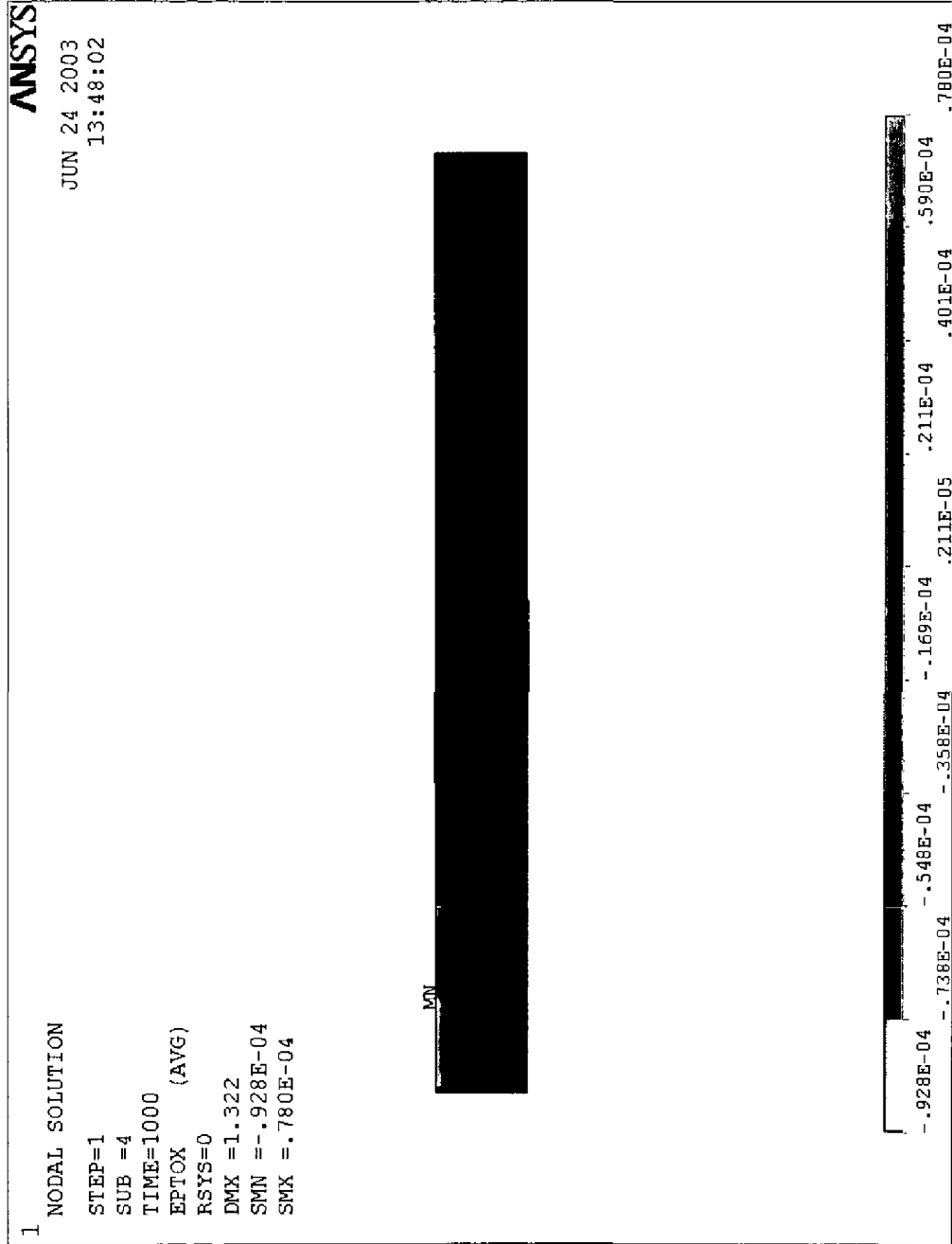
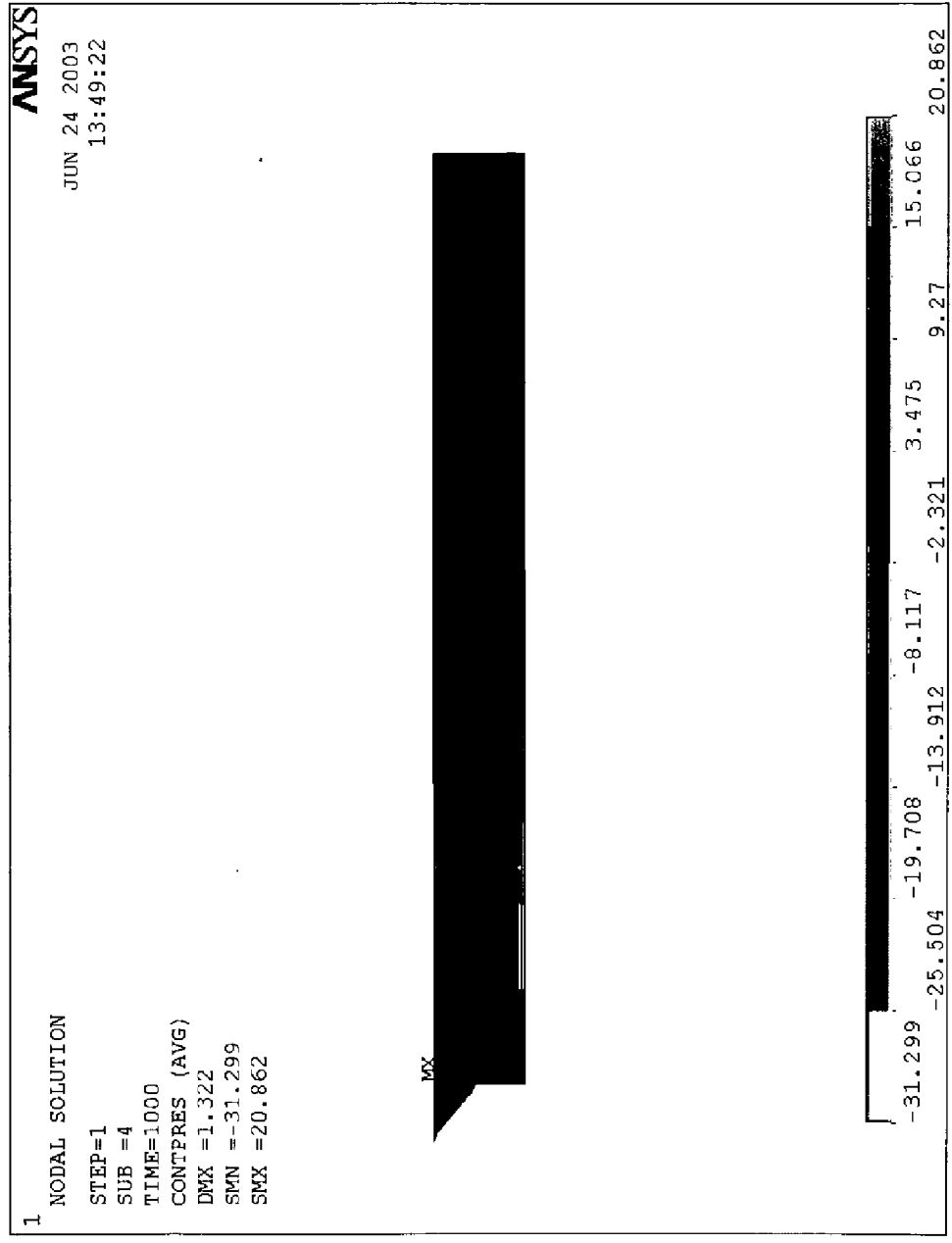


Figure 9-10

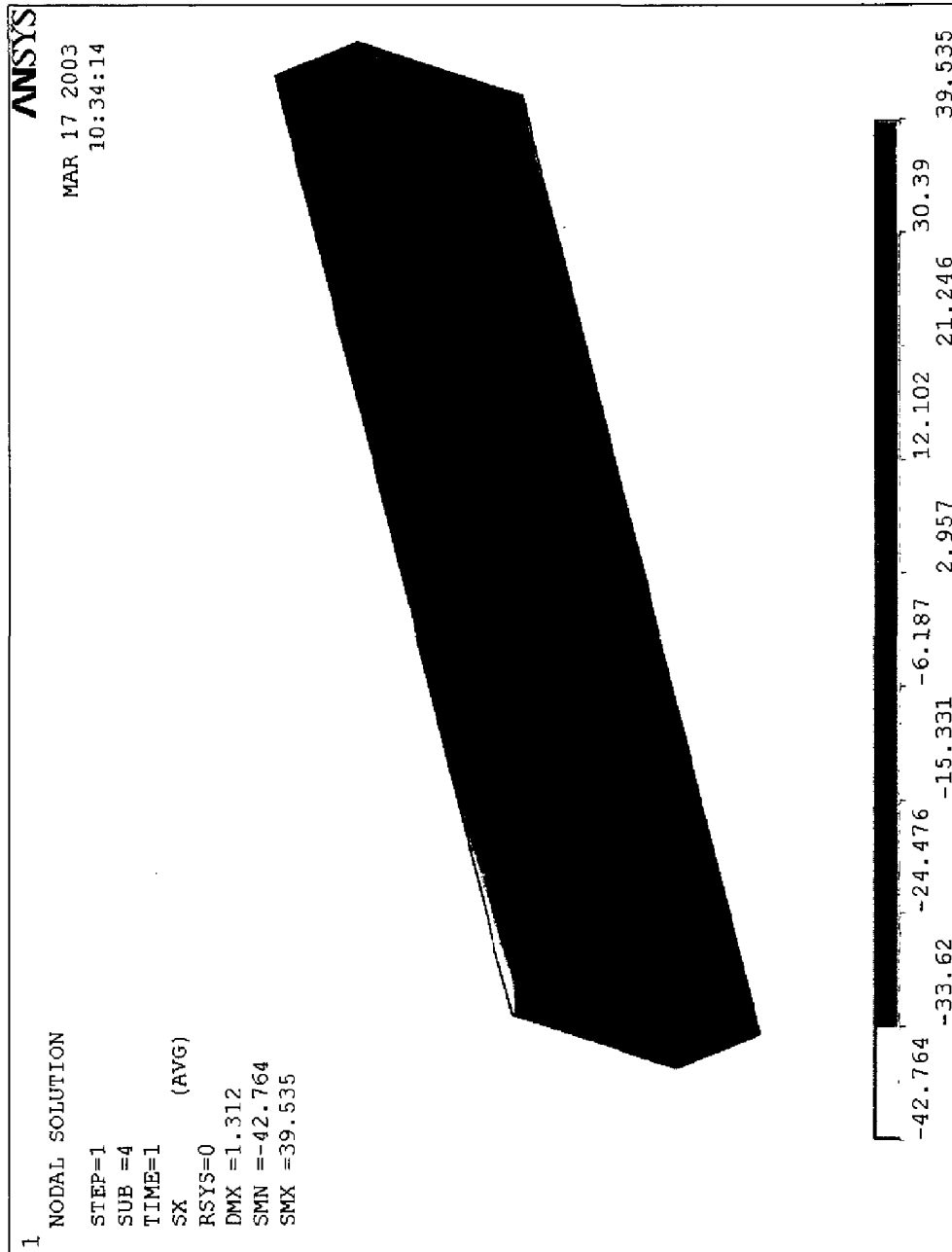
2-D Monolith Model Contact Pressure



Note: Negative pressure in base slab is due to contact elements being fixed.

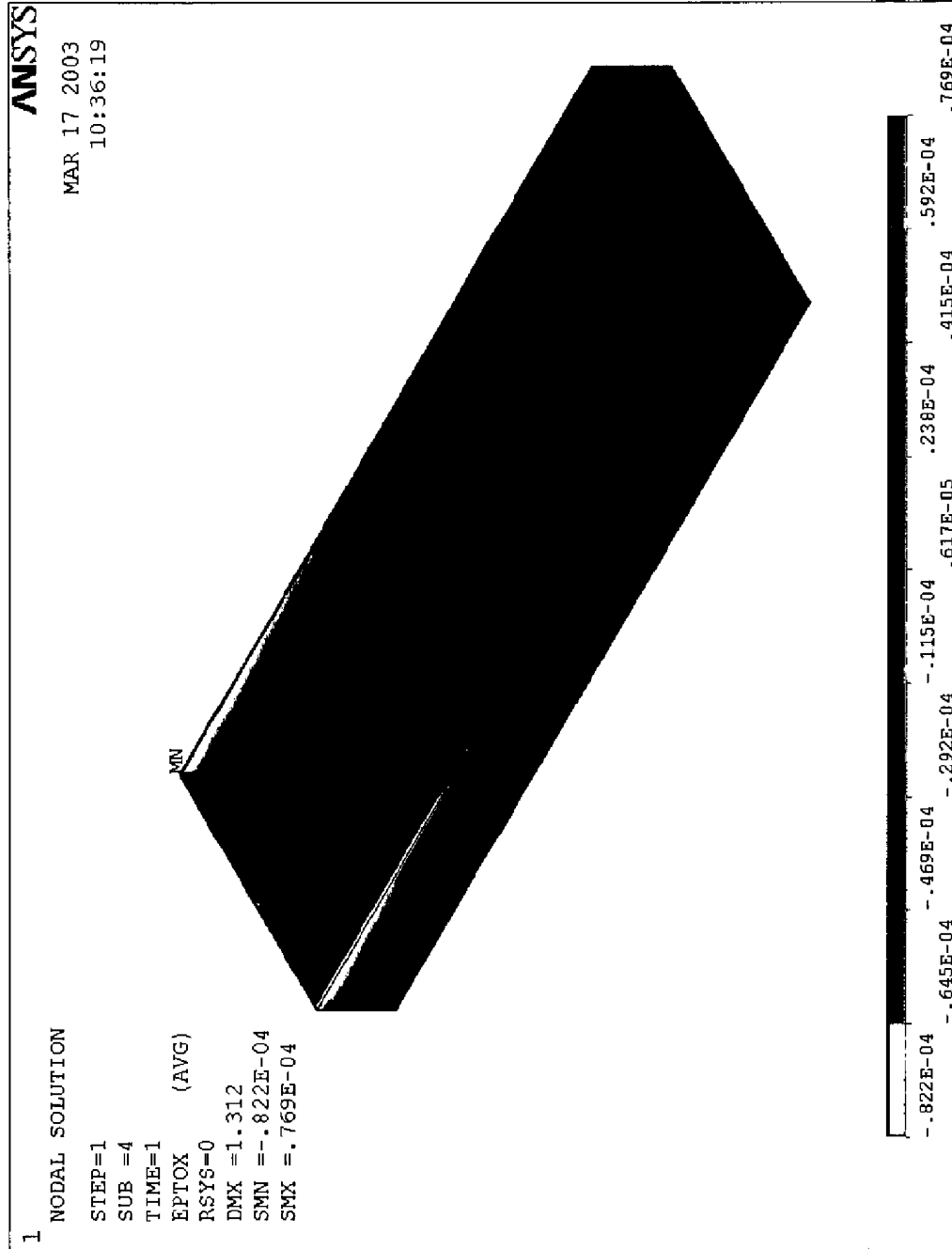
Figure G-11

Model 3 – Concrete Structure
Case 3 – Static Deformation after 1000 years
 σ_x – Horizontal Stress



612

Model 3 - Concrete Structure
Case 3 - Static Deformation after 1000 years
 ϵ_x - Horizontal Strain

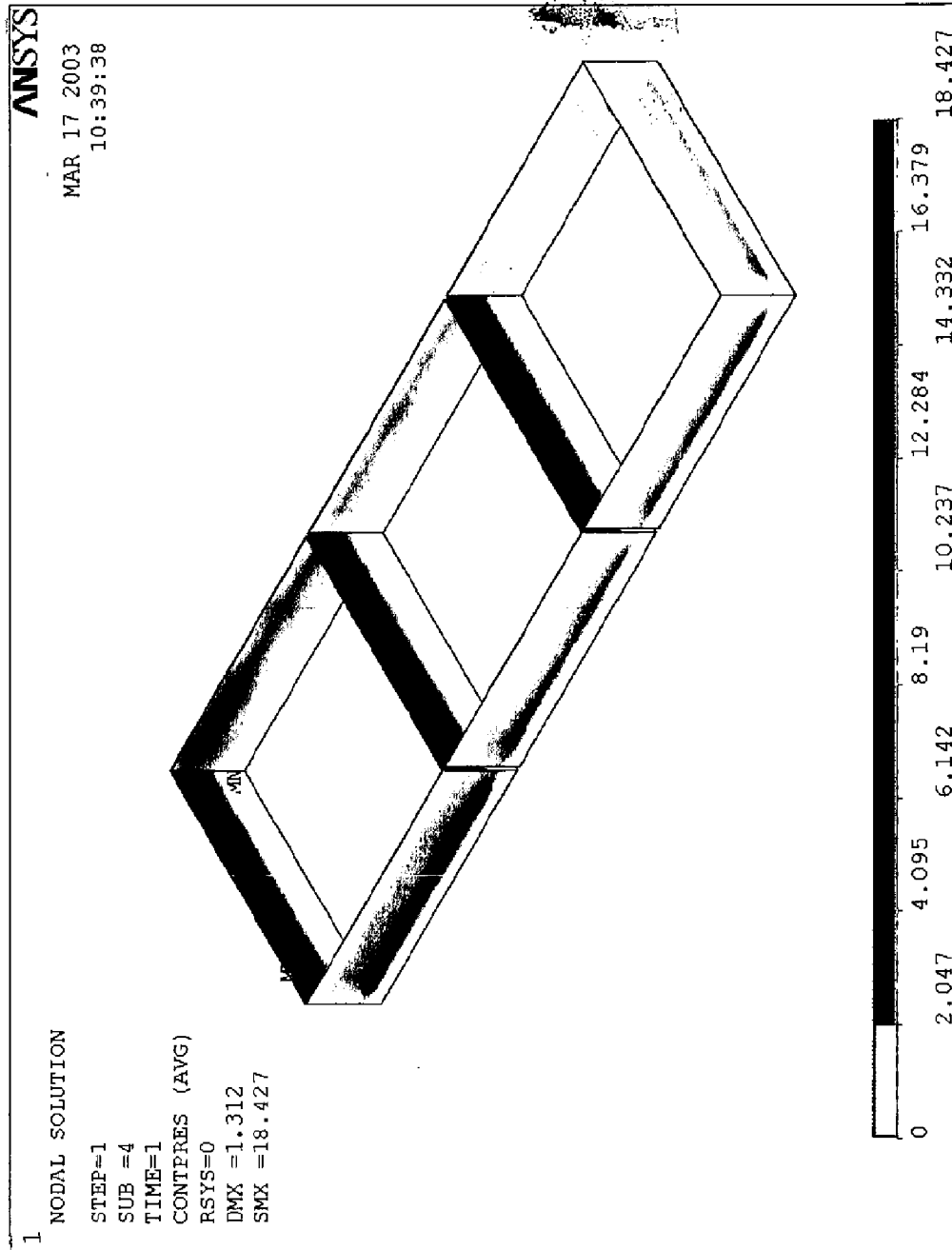


613

Model 3 – Concrete Structure
Case 3 – Static Deformation after 1000 years
Contact Pressure

T-CLC-# 00006, Rev. 0

588



619

Calculation Continuation Sheet

Calculation No. T-CLC-Z-00006	Sheet No. 589	Rev. 0
----------------------------------	------------------	-----------

APPENDIX H

Independent Verification of Statistical Approach

Appendix H - Independent Verification of Statistical Approach

Contents

H.1 Purpose

H.2 Conclusion

H.3 Discussion

H.3.1 Technical Approach

H.3.2 Seismic Settlement

H.3.2.1 Seismic Settlement Model #1

H.3.2.2 Seismic Settlement Model #2

H.3.2.3 Comparison of Seismic Settlement Models

H.3.3 Median Settlement Estimate

H.3.3.1 Crack Area Relationships

H.3.3.2 Median Crack Area

H.3.4 Variability of Mean Settlement Estimate

H.3.4.1 Variability of Random Variables

H.3.4.2 Bottom Crack Areas

H.3.4.3 Top Crack Areas

Initialize *Mathematica* packages used in this appendix.

```
<< Graphics`Graphics`
<< Statistics`DataManipulation`
<< Statistics`NormalDistribution`
<< Statistics`ContinuousDistributions`
<< Statistics`DescriptiveStatistics`
```

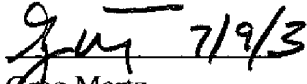
Define the function Stats which calculates the mean and coefficient of variation, cov, of raw data

```
Stats[x_List, print_:=True] := Module[{},
  n = Length[x];
  If[n <= 0, Print["Invalid number of data, X=", x]; Return[0]];
  ave = Plus@@x/n; std = Sqrt[Plus@@(x - ave)^2/n]; If[ave > 0, cov = std/ave, cov = {}];
  If[print, Print["N=", n, "\nAverage=", ave,
    "\nStandard Deviation=", std, "\nCoefficient of Variation=", cov]];
  {n, ave, std, cov}];
```

Note that Plus@@x sums all of the elements in the array x.

■ H.1 Purpose

The mean settlement, along with the settlement variability, are estimated in this appendix using simplified methods to validate the statistical results of this calculation. These results are based on the Finite Element results contained in Section 8.2 of this calculation. This appendix is independently prepared by one of the calculation verifiers.


Greg Mertz

■ H.2 Conclusion

This appendix independently calculates the crack area using the FEM results developed in Section 8.2. Despite using different seismic hazard models, different probability distributions and different fits to the FEM results, the crack areas calculated in this appendix have similar magnitudes and trends compared to the values developed in the body of this calculation. Note that the differences in results are much less than the inherent variability of the data. It is the verifier's judgement that this match is sufficient verification of the probabilistic results in the body of the calculation.

■ H.3 Discussion

■ H.3.1 Technical Approach

Background and Assumptions

The purpose of this calculation is to forecast cracking of Saltstone Vault #4 over the 1000 year period of the Performance Assessment. Additionally, the cracking is forecasted over a 10,000 year study period. Cracking is an input parameter to environmental studies, by others, to predict contaminate transport.

This calculation focuses on mechanical mechanisms which initiate and propagate cracks through the concrete vault and grout monolith. Non-mechanical mechanisms, such as weathering or chemical degradation are addressed elsewhere.

Cracks were initiated by hydrostatic operating loads in the walls of some cells of Vault #4. A key assumption in this analysis is that these cracks will be repaired prior to closure. Thus, these cracks are not considered in this calculation.

Since Vault #4 will be buried as part of the closure process then, external loads such as wind and tornado missiles will not impact the vault and need not be considered.

Differential settlement of the underlying soil has the largest potential to initiate cracking in Vault #4. Differential settlement due to 1) primary consolidation; 2) secondary consolidation; and 3) post-seismic differential settlement; are considered in this calculation. Post-seismic differential settlement consist of dynamic settlement as identified in Appendix D.

Cracking is quantified in this calculation by a parameter, CA, which represents the summation of projected crack areas on one 300' long vault wall. Cracking is determined by numerous finite element analyses, described in Section 8.2 of this calculation, for various combinations of random variables.

Random Variables

The following sources of variability are considered in this analysis:

- 1) Grout modulus, X_g ,
- 2) Grout cracking strain, X_ϵ ,
- 3) Soil modulus for primary consolidation, X_k ,
- 4) Static settlement rate for secondary consolidation, X_r ,
- 5) Size of the seismic differential settlement region, X_s ,
- 6) Magnitude of seismic event, X_m , and
- 7) Location of the differential settlement region.

The first five random variables, X_g , X_ϵ , X_k , X_r , and X_s are assumed to be normally distributed (truncated) in the calculation and log-normally distributed in this appendix.

Magnitude of Seismic Event

The magnitude of the seismic event, X_m , is a function of the seismic hazard curve and the amount of settlement for a given size earthquake. The differential settlement (mean and variability) for various time periods is determined by Monte-Carlo simulation. The magnitude of the seismic event can be approximated with a lognormal variable as shown below.

The actual magnitude of differential settlement is only known for seismic events with an annual probability of occurrence of 4×10^{-4} and 10^{-4} . Different assumptions are investigated to determine a continuous probability distribution for these two data points.

Additionally, a conservative bias is introduced in the seismic settlement because each event is assumed to be independent and the resulting settlements are additive.

Location of Differential Settlement Region.

The location of the differential settlement region under the vault is assumed to be a uniformly distributed variable. Structural analyses indicate that multiple differential settlement regions, on the average, are not as severe as a single differential settlement region. A conservative bias is introduced by only postulating one single differential settlement region per seismic event.

The vault is divided into 7 zones and the seismic differential settlement for a given earthquake is randomly assigned to one zone. The choice of 7 zones is based on the vault geometry and corresponds to a settlement zone in the center of each 100' cell and on the boundary of each 100' cell. The zones are centered 50' apart, which is roughly the size of the differential settlement region. The resulting total crack area can be shown to be independent of the number of differential settlement zones that the vault is divided into, provided that a minimum number of zones is used. The use of 7 zones is judged to be more than adequate for this purpose.

Probabilistic Model

The total crack area is represented by the product of lognormal variables in this appendix

$$CA = X_m \times X_g \times X_\epsilon \times X_k \times X_r \times X_s.$$

where X_m is $\sum_{i=1}^7 CA_i$, which is the CA due to a seismic event,

CA_i is the total crack area due to Δ_i ,

Δ_i is the differential settlement at location i , $\Delta_i = \frac{\Delta_s}{7}$,

Δ_s is the total differential settlement,

X_g is a CA factor to account for changes in grout modulus,

X_ϵ is a CA factor to account for changes in grout cracking strain,

X_k is a CA factor to account for changes in soil subgrade modulus,

X_r is a CA factor to account for changes in secondary consolidation rate,

X_s is a CA factor to account for changes in settlement magnitude.

Since CA is the product of random variables, then its median is the product of the median of the random variables

$$\overline{CA} = \overline{X_m} \times \overline{X_g} \times \overline{X_\epsilon} \times \overline{X_k} \times \overline{X_r} \times \overline{X_s}$$

and the total lognormal standard deviation is

$$\sigma_{\ln Total} = \sqrt{\sigma_{\ln X_m}^2 + \sigma_{\ln X_g}^2 + \sigma_{\ln X_\epsilon}^2 + \sigma_{\ln X_k}^2 + \sigma_{\ln X_r}^2 + \sigma_{\ln X_s}^2}$$

where \overline{X} is the median (50%) value of the random variable and

σ_{\ln} is the lognormal standard deviation.

Since X_g , X_ϵ , X_k , X_r , X_s are factors to account for variation in input parameters then their median value will be defined as 1.

■ H.3.2 Seismic Settlement

Predicted dynamic settlement data from Geotechnical studies for PC-3 and PC-4 events, Appendix D.

```

ΔPC3 = { .5, .25, .5, .25, .5, 1 };
{nPC3, μPC3, σPC3, covPC3} = Stats[%];

```

```

N=6
Average=0.5
Standard Deviation=0.25
Coefficient of Variation=0.5

```

```

ΔPC4 = { 3, 1.5, 2.25, 1.5, 2, 4 };
{nPC4, μPC4, σPC4, covPC4} = Stats[%];

```

```

N=6
Average=2.375
Standard Deviation=0.886825
Coefficient of Variation=0.3734

```

Conservative estimates of the PC-3 and PC-4 differential settlement, 0.75" and 2.75", are used in the body of the calculation. This bias is removed in this appendix.

■ H.3.2.1 Seismic Differential Settlement Model #1

Seismic Hazard Curve

Define the seismic differential settlement as a function of a uniform random variable $X[0,1]$. Geotechnical data is available corresponding to PC3 (2,500 year return period) and PC4 (10,000 year return period) events.

```

SeismicΔData = {{4 × 10-4, μPC3}, {10-4, μPC4}}
{{ $\frac{1}{2500}$ , 0.5}, { $\frac{1}{10000}$ , 2.375}}

```

Assume that the seismic hazard curve is linear through these points. Fit a curve to the data and truncate to avoid negative settlements.

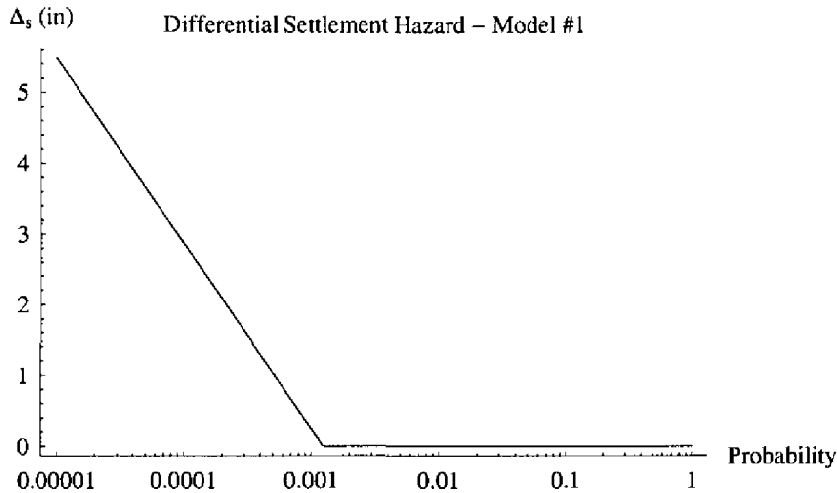
```

Clear[p]
SeismicΔ = fit = Max[Fit[SeismicΔData, {1, Log[10, p]}, p], 0]
Max[0, -10.0822 - 1.35253 Log[p]]

```

Plot the resulting seismic differential settlement hazard curve

```
LogLinearPlot[SeismicΔ, {p, 10-5, 1}, PlotRange → All, AxesLabel → {"Probability", "Δs (in)"},
  PlotLabel → "Differential Settlement Hazard - Model #1"];
```



Note that probability is expressed as an exceedance probability. For example, the probability that the seismic differential settlement will exceed 4" in a single year is approximately 4×10^{-5} .

Total Seismic Differential Settlement for One Observation

The total seismic differential settlement for a single 10,000 year period is calculated in this section. The resulting settlements from many similar periods are examined in the next section to determine the mean and standard deviation of the differential settlement.

Generate an exceedance probability for each individual year over a 10,000 year period. Recall that low probability events lead to differential settlement.

```
PSeismic = RandomArray[UniformDistribution[], 10000];
Shallow[PSeismic]
{0.942818, 0.12615, 0.441279, 0.622717, 0.936228,
 0.532282, 0.799757, 0.0444464, 0.89475, 0.711487, <<9990>>}
```

Only the first few probabilities are shown above to demonstrate that most years will not have seismic events leading to differential settlement. This observation is consistent with experience.

Assign a differential settlement to each year based on the probability and the differential settlement hazard curve developed above. Omit years with zero seismic settlement

```

 $\Delta s = \{\};$  listing = {};  $\Delta sTotal = 0;$ 
Do[
  p = PSeismic[[i]];
  x = Seismic $\Delta$ ;
  If[x > 0,
     $\Delta s = Append[\Delta s, x];$   $\Delta sTotal = \Delta sTotal + x;$  listing = Append[listing, {i, p, x}]];
  , {i, Length[PSeismic]}}]
TableForm[listing, TableHeadings  $\rightarrow$  {None, {"Year", "Annual Probability", " $\Delta s$  (in)}}]
Print["Summation of seismic differential settlement = ",  $\Delta sTotal$  " (in)"];

```

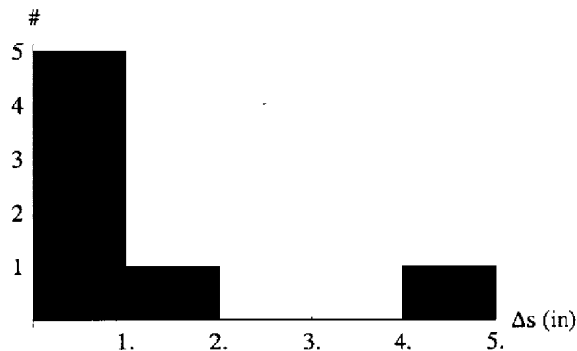
Year	Annual Probability	Δs (in)
1096	0.000440239	0.370354
1118	0.000195707	1.46685
3697	0.000399883	0.500397
5969	0.000570669	0.0193866
6088	0.000513084	0.163254
6946	0.0000228231	4.37322
7275	0.000336729	0.732887

Summation of seismic differential settlement = 7.62635 (in)

```

Histogram[ $\Delta s$ , HistogramCategories  $\rightarrow$  {0.001, 1, 2, 3, 4, 5, 6, 7, 8},
  AxesLabel  $\rightarrow$  {" $\Delta s$  (in)", "#"}, HistogramScale  $\rightarrow$  Automatic];

```



This data represents one observation, numerous observations are averaged below to determine the mean seismic settlement.

Mean Seismic Settlement for Model #1

Determine the cumulative seismic settlement for a Period T with n observations.

```

Clear[Modell];
Modell[n_, T_] := Module[{},
   $\Delta = \{\};$ 
  Do[  $\Delta s = 0;$ 
    Do[ p = Random[];
       $\Delta s = \Delta s + Seismic\Delta;$ 
      , {T}];
     $\Delta = Append[\Delta, \Delta s];$ 
    , {n}];
  Stats[ $\Delta$ ];
   $\Delta$ ]

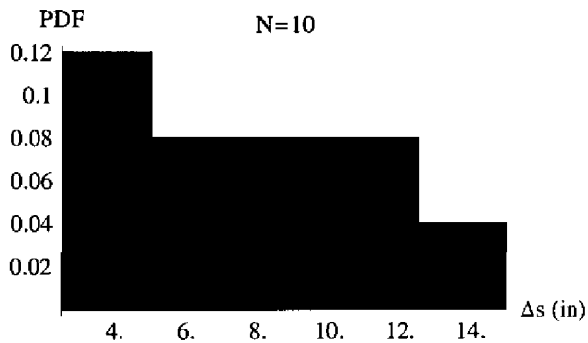
```


Convergence

Calculate the cumulative seismic settlement for a period of 10,000 years using 10, 100 and 1000 observations.

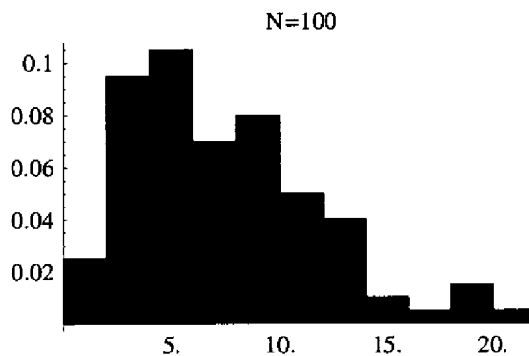
```
 $\Delta$  = Modell[10, 10000];  
 $\Delta$ 1a =  $\Delta$ ;  
SetOptions[Histogram, HistogramScale  $\rightarrow$  1];  
Histogram[ $\Delta$ , AxesLabel  $\rightarrow$  {" $\Delta$ s (in)", "PDF"}, PlotLabel  $\rightarrow$  "N=10"];
```

```
N=10  
Average=8.06529  
Standard Deviation=3.52661  
Coefficient of Variation=0.437203
```



```
 $\Delta$  = Modell[100, 10000];  
 $\Delta$ 1b =  $\Delta$ ; Histogram[ $\Delta$ 1b, PlotLabel  $\rightarrow$  "N=100"];
```

```
N=100  
Average=7.46417  
Standard Deviation=4.41177  
Coefficient of Variation=0.59106
```



```

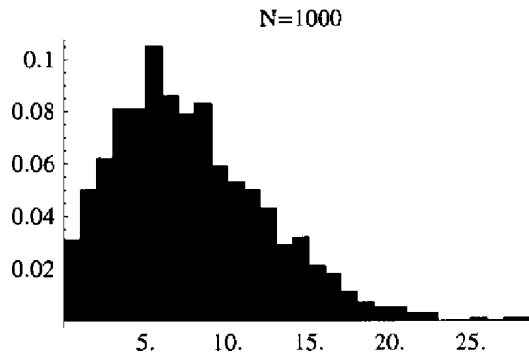
Δ = Modell[1000, 10000];
Δlc = Δ; Histogram[Δlc, PlotLabel → "N=1000"];

```

```

N=1000
Average=7.76792
Standard Deviation=4.6
Coefficient of Variation=0.592179

```



Compare solutions for 10, 100 and 1000 observations.

```

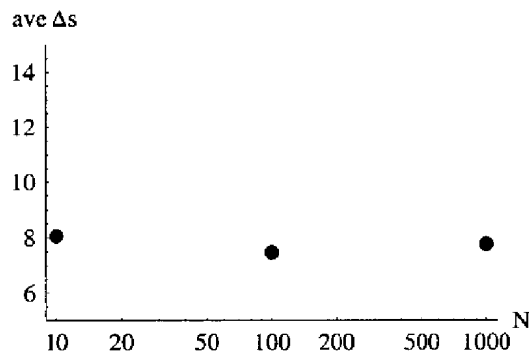
{n, ave, std, cov} =
soln1 = Transpose[{{Stats[Δ1a, False], Stats[Δ1b, False], Stats[Δ1c, False]}}];

```

```

ave1 = LogLinearListPlot[Transpose[{n, ave}],
Prolog → AbsolutePointSize[7], PlotRange → {5, 15}, AxesLabel → {"N", "ave Δs"}];

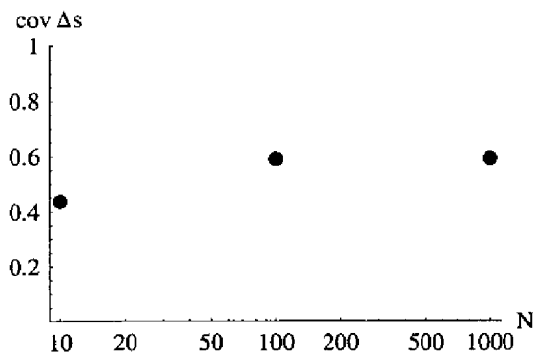
```



```

ave2 = LogLinearListPlot[Transpose[{n, cov}],
Prolog → AbsolutePointSize[7], PlotRange → {0, 1}, AxesLabel → {"N", "cov Δs"}];

```



Solutions are roughly stable at $N \geq 100$. Note that large numbers of observations are required to define the shape of the distribution while smaller numbers of observations are required to define the mean and cov.

Lognormal Distribution

Demonstrate that the distribution of Δs can be represented by a lognormal distribution by comparing the histogram and probability density function (PDF). Use $N=1000$ observations

Statistics for 1000 observations

```
{n, μ, σ, cov} = Stats[Δlc];
```

```
N=1000
```

```
Average=7.76792
```

```
Standard Deviation=4.6
```

```
Coefficient of Variation=0.592179
```

Median Δs

$$\text{Med} = \frac{\mu}{\sqrt{1 + \text{cov}^2}}$$

```
6.68389
```

Lognormal standard deviation

$$\sigma_{\ln} = \sqrt{\text{Log}[1 + \text{cov}^2]}$$

```
0.548275
```

Lognormal probability density function

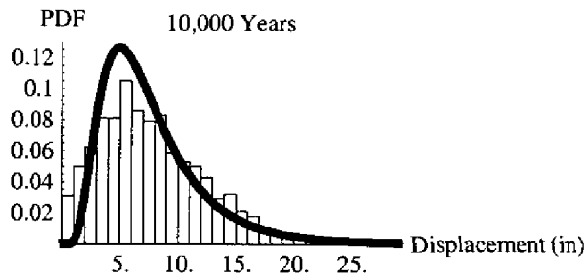
```
Clear[x];
```

$$\text{dist} = \frac{1}{x \sigma_{\ln} \sqrt{2\pi}} e^{-\frac{1}{2} \left(\frac{\text{Log}[x] - \text{Log}[\text{Med}]}{\sigma_{\ln}} \right)^2}$$

$$\frac{0.727632 e^{-1.66331 (-1.8997 + \text{Log}[x])^2}}{x}$$

Compare unit histogram and lognormal probability density function

```
pdf = Plot[dist, {x, .1, 35}, PlotRange -> All,
  PlotStyle -> {AbsoluteThickness[4]}, DisplayFunction -> Identity];
bar = Histogram[Δlc, HistogramScale -> 1, BarStyle -> {GrayLevel[1]},
  DisplayFunction -> Identity];
Show[bar, pdf, DisplayFunction -> $DisplayFunction,
  AxesLabel -> {"Displacement (in)", "PDF"}, PlotLabel -> "10,000 Years"];
```



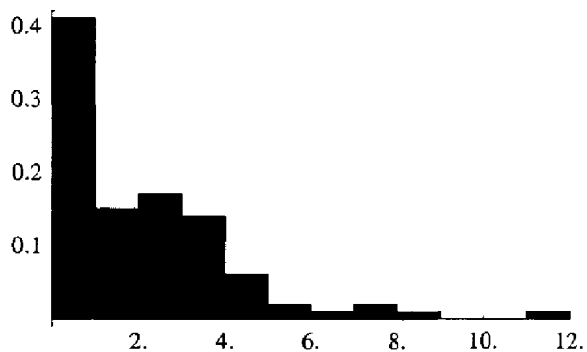
Conclusion: The distribution of seismic displacements can be approximated by a lognormal distribution

Additional Time Periods

Calculate the cumulative seismic settlement for a periods of 2,500, 1,000 and 500 years.

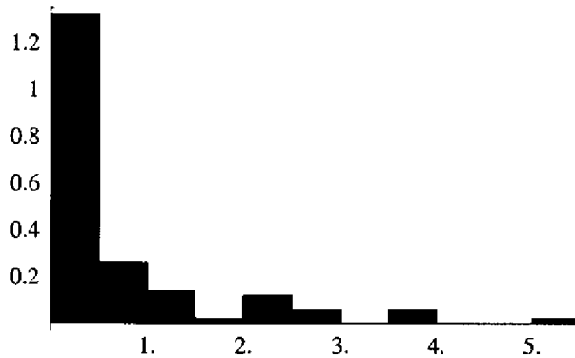
```
T1d = 2500; Δ = Model1[100, T1d];
Δ1d = Δ; Histogram[Δ];
```

```
N=100
Average=1.99837
Standard Deviation=2.09268
Coefficient of Variation=1.0472
```



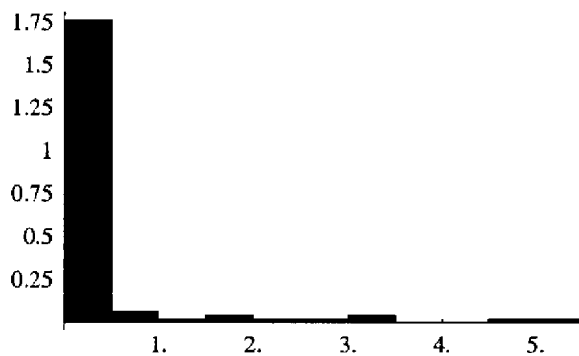
```
T1e = 1000; Δ = Modell1[100, T1e];
Δ1e = Δ; Histogram[Δ];
```

```
N=100
Average=0.61383
Standard Deviation=1.03886
Coefficient of Variation=1.69242
```



```
T1f = 500; Δ = Modell1[100, T1f];
Δ1f = Δ; Histogram[Δ];
```

```
N=100
Average=0.287912
Standard Deviation=0.903938
Coefficient of Variation=3.13963
```

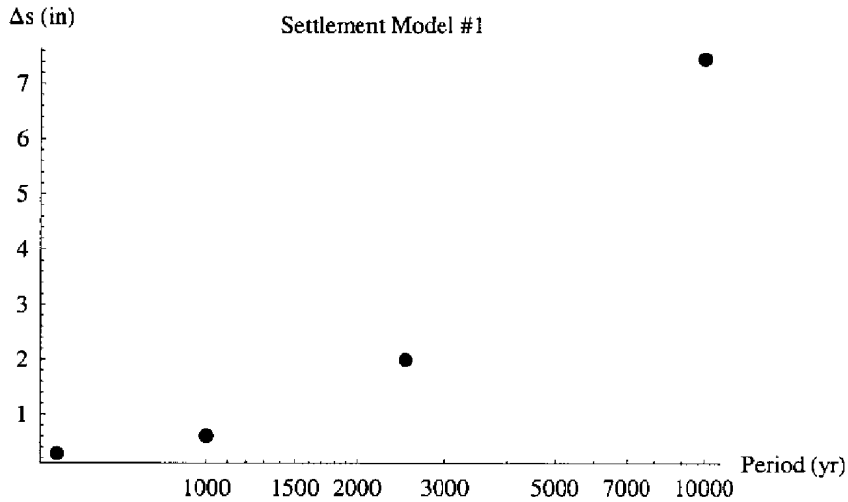


Compare solutions for different periods

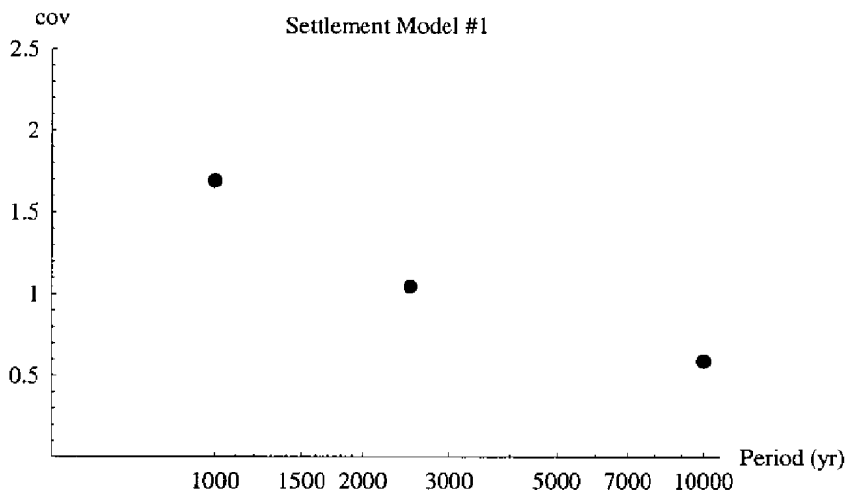
```
{n, ave, std, cov} = solns =
  Transpose[{Stats[Δ1b, False], Stats[Δ1d, False], Stats[Δ1e, False], Stats[Δ1f, False]}]
T = {10000, 2500, 1000, 500};

{{100, 100, 100, 100}, {7.46417, 1.99837, 0.61383, 0.287912},
 {4.41177, 2.09268, 1.03886, 0.903938}, {0.59106, 1.0472, 1.69242, 3.13963}}
```

```
LogLinearListPlot[Transpose[{T, ave}], Prolog -> AbsolutePointSize[7], PlotRange -> All,
  AxesLabel -> {"Period (yr)", "Δs (in)"}, PlotLabel -> "Settlement Model #1"];
```



```
LogLinearListPlot[Transpose[{T, cov}], Prolog -> AbsolutePointSize[7], PlotRange -> {0, 2.5},
  AxesLabel -> {"Period (yr)", "cov"}, PlotLabel -> "Settlement Model #1"];
```



■ H.3.2.2 Seismic Differential Settlement Model #2

The body of this calculation assumes that the seismic differential displacement of 4" at a 100,000 year return period. Model #1 is revised to incorporate this data and the results are compared.

Additional settlement data for low probability events

```
SeismicData2 = {{10^-4, μPC4}, {10^-5, 4}}
{{1/10000, 2.375}, {1/100000, 4}}
```

Fit a curve to the data

```

Clear[p]
fit2 = Fit[SeismicDeltaData2, {1, Log[10, p]}, p]
-4.125 - 0.705729 Log[p]

```

Set up a function that uses fit for higher probability events and fit2 for low probability events

```

SeismicDelta2[p_] := If[p > 10-4, fit, fit2]

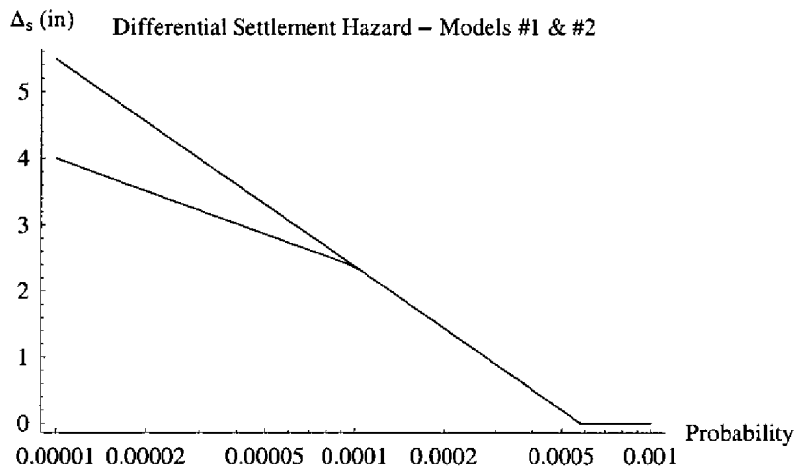
```

Plot both Models #1 and #2. Model #2 predicts less settlement for very low probability events.

```

LogLinearPlot[{SeismicDelta, SeismicDelta2[p]}, {p, 10-5, .001},
  PlotRange -> All, AxesLabel -> {"Probability", "Δs (in)"},
  PlotLabel -> "Differential Settlement Hazard - Models #1 & #2"];

```



Mean Seismic Settlement for Model #2

Define a function to determine the cumulative seismic settlement for Period T and n observations.

```

Clear[Model2];
Model2[n_, T_] := Module[{},
  Δ = {};
  Do[Δs = 0;
    Do[p = Random[];
      Δs = Δs + SeismicDelta2[p];
      , {T}];
    Δ = Append[Δ, Δs];
    , {n}];
  Stats[Δ];
  Δ]

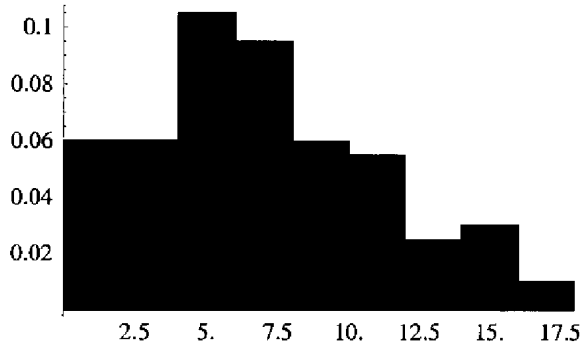
```

Calculate the accumulated seismic displacements for a 10,000 year period using n=100

```

Δ = Model2[100, 10000];
Δ2b = Δ; Histogram[Δ];

N=100
Average=7.02508
Standard Deviation=4.09338
Coefficient of Variation=0.58268
    
```

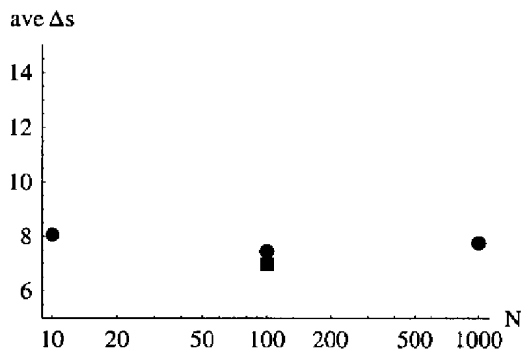


■ H.3.2.3 Comparison of Seismic Settlement Models

Compare Model #1 (●) and Model #2 (■)

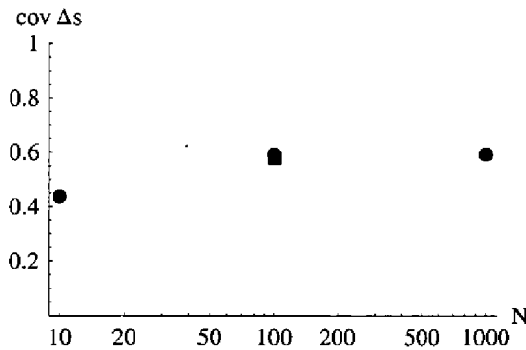
```

{n, ave, std, cov} = Stats[Δ2b, False];
Show[ave1, Graphics[Text["■", {Log[10, 100], ave}]]];
    
```



```

Show[ave2, Graphics[Text["■", {Log[10, 100], cov}]]];
    
```



The difference between Model #1 and Model #2 is less than the variability within each model.

■ H.3.3 Median Crack Area Estimate

■ H.3.3.1 Crack Area Relationships

The crack area corresponding to seismic settlement events at locations 1 through 7 from the FEM analyses is summarized below. Each crack area corresponds to best estimate soil, grout data and settlement size at a time of 1000 years.

```
loc = {"Loc 1-bot", "Loc 2-bot", "Loc 3-bot", "Loc 4-bot",
      "Loc 5-bot", "Loc 6-bot", "Loc 7-bot", "Loc 1-top", "Loc 2-top",
      "Loc 3-top", "Loc 4-top", "Loc 5-top", "Loc 6-top", "Loc 7-top"};

loc = {"Loc 1", "Loc 2", "Loc 3", "Loc 4", "Loc 5", "Loc 6", "Loc 7"};
PC3 = {0, 0, 25.5, 49.92, 71.76, 0, 0, 0, 0, 0, 0, 0, 0, 0};
PC4 =
  {29.48, 73.32, 110.16, 155.52, 157.14, 176.58, 0, 0, 37.26, 55.08, 59.94, 19.44, 43.74, 0};
TableForm[Transpose[{Take[PC3, 7], Take[PC4, 7], Take[PC3, -7], Take[PC4, -7]}],
  TableHeadings -> {loc, {"PC-3 Bot", "PC-4 Bot", "PC-3 Top", "PC-4 Top"}}]

```

	PC-3 Bot	PC-4 Bot	PC-3 Top	PC-4 Top
Loc 1	0	29.48	0	0
Loc 2	0	73.32	0	37.26
Loc 3	25.5	110.16	0	55.08
Loc 4	49.92	155.52	0	59.94
Loc 5	71.76	157.14	0	19.44
Loc 6	0	176.58	0	43.74
Loc 7	0	0	0	0

Fit a line through each pair of data as a function of differential settlement. Ensure that the crack area is always positive. Note that the FEM analyses are based on (1) PC-3 events with 0.75" of differential settlement; and () PC-4 events with 2.75" of differential settlement.

```

Clear[Δ];
ΔPC34 = {0.75, 2.75};
CA = {};
Do[
  z = {{ΔPC34[[1]], PC3[[i]], {ΔPC34[[2]], PC4[[i]]}};
  CA = Append[CA, Max[0, Fit[z, {1, Δ}, Δ]]];
  , {i, 1, Length[PC3]}]
CAb = Take[CA, 7];
CAt = Take[CA, -7];
TableForm[Transpose[{CAb, CAt}],
  TableHeadings → {loc, {"Bot Crack Area", "Top Crack Area"}}]

```

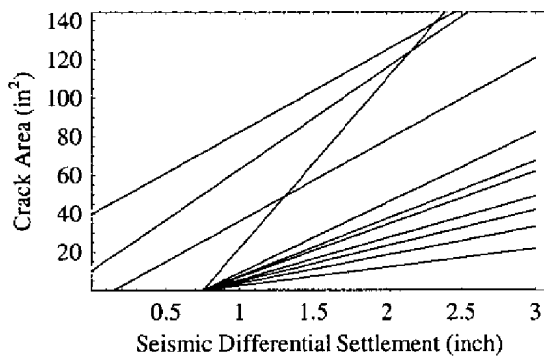
	Bot Crack Area	Top Crack Area
Loc 1	Max[0, -11.055 + 14.74 Δ]	Max[0, 0. + 0. Δ]
Loc 2	Max[0, -27.495 + 36.66 Δ]	Max[0, -13.9725 + 18.63 Δ]
Loc 3	Max[0, -6.2475 + 42.33 Δ]	Max[0, -20.655 + 27.54 Δ]
Loc 4	Max[0, 10.32 + 52.8 Δ]	Max[0, -22.4775 + 29.97 Δ]
Loc 5	Max[0, 39.7425 + 42.69 Δ]	Max[0, -7.29 + 9.72 Δ]
Loc 6	Max[0, -66.2175 + 88.29 Δ]	Max[0, -16.4025 + 21.87 Δ]
Loc 7	Max[0, 0. + 0. Δ]	Max[0, 0. + 0. Δ]

Plot the individual crack area curves

```

Plot[Evaluate[CA], {Δ, 0, 3}, Frame → True,
  FrameLabel → {"Seismic Differential Settlement (inch)", "Crack Area (in2)"},
  PlotRange → {{0, Automatic}, {0, Automatic}}];

```



■ H.3.3.2 Median Crack Area

Determine the median crack area for a Period T with n observations. The approach taken is similar to calculation of Δ_s in Model1. However, once a non-zero seismic displacement is calculated, then the displacement is randomly assigned to one of the 7 locations and the corresponding crack area is calculated. All of the crack areas are summed together.

```

Clear[CrackArea, p];
CrackArea[n_, T_] := Module[{},
  ca = {};
  Do[
    cab = cat = 0;
    Do[ p = Random[];
      Δs = SeismicΔ;
      If[Δs > 0,
        locn = Random[Integer, {1, 7}];
        cat = cat + CAT[[locn]] /. Δ → Δs;
        cab = cab + CAB[[locn]] /. Δ → Δs;
      ];
    , {T}];
  ca = Append[ca, {cab, cat}];
  , {n}];
{cab, cat} = Transpose[ca];
Print["Total Bottom Crack Area (in2)"]; Stats[cab];
Print["Total Top Crack Area (in2)"]; Stats[cat];
{cab, cat}];

```

Crack Areas for Various Periods

```

T1 = T = 10000;
{cab1, cat1} = CrackArea[100, T];

```

Total Bottom Crack Area (in²)

```

N=100
Average=299.154
Standard Deviation=211.722
Coefficient of Variation=0.707738

```

Total Top Crack Area (in²)

```

N=100
Average=77.7886
Standard Deviation=75.2141
Coefficient of Variation=0.966904

```

```

T2 = T = 2500;
{cab2, cat2} = CrackArea[100, T];

```

Total Bottom Crack Area (in²)

```

N=100
Average=72.8814
Standard Deviation=91.3856
Coefficient of Variation=1.2539

```

Total Top Crack Area (in²)

```

N=100
Average=18.2076
Standard Deviation=30.1546
Coefficient of Variation=1.65615

```

```
T3 = T = 1000;
{cab3, cat3} = CrackArea[100, T];
```

Total Bottom Crack Area (in²)

```
N=100
Average=36.2603
Standard Deviation=97.4137
Coefficient of Variation=2.68651
```

Total Top Crack Area (in²)

```
N=100
Average=7.32096
Standard Deviation=25.272
Coefficient of Variation=3.45201
```

```
T4 = T = 500;
{cab4, cat4} = CrackArea[100, T];
```

Total Bottom Crack Area (in²)

```
N=100
Average=15.5225
Standard Deviation=43.8927
Coefficient of Variation=2.82769
```

Total Top Crack Area (in²)

```
N=100
Average=3.51003
Standard Deviation=12.0225
Coefficient of Variation=3.42519
```

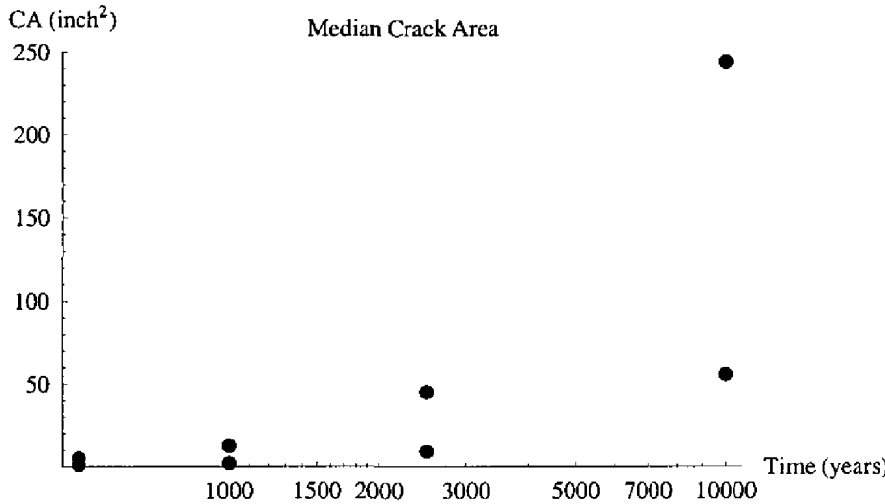
Determine the median crack area for bottom and top cracks

```
{n, meanB, stdevB, covB} = Transpose[
  {Stats[cab1, False], Stats[cab2, False], Stats[cab3, False], Stats[cab4, False]};
medianB =  $\frac{\text{meanB}}{\sqrt{1 + \text{covB}^2}}$ 
{244.185, 45.4423, 12.6493, 5.17536}
```

```
{n, meanT, stdevT, covT} = Transpose[
  {Stats[cat1, False], Stats[cat2, False], Stats[cat3, False], Stats[cat4, False]};
medianT =  $\frac{\text{meanT}}{\sqrt{1 + \text{covT}^2}}$ 
{55.9225, 9.41136, 2.03703, 0.983701}
```

Plot data for the bottom and top crack areas

```
T = {T1, T2, T3, T4};
LogLinearListPlot[Transpose[{Join[T, T], Join[medianB, medianT]}],
  Prolog -> AbsolutePointSize[7], PlotRange -> {0, Automatic},
  AxesLabel -> {"Time (years)", "CA (inch2)"}, PlotLabel -> "Median Crack Area";
```



```
Print["Crack Area (in2) Due to Xm"]
TableForm[Transpose[{T, meanB, meanT, medianB, medianT}],
  TableHeadings -> {None, {"Time (yr)", "Bot Mean", "Top Mean", "Bot Median", "Top Median"}}]
```

Crack Area (in²) Due to Xm

Time (yr)	Bot Mean	Top Mean	Bot Median	Top Median
10000	299.154	77.7886	244.185	55.9225
2500	72.8814	18.2076	45.4423	9.41136
1000	36.2603	7.32096	12.6493	2.03703
500	15.5225	3.51003	5.17536	0.983701

■ H.3.4 Variability of Mean Crack Area Estimate

■ H.3.4.1 Variability of Random Variables

Recall the PC4 crack area data from the FEM analyses which corresponds to mean value random parameters. The data contains bottom and top crack areas for each of 7 settlement locations.

PC4

{29.48, 73.32, 110.16, 155.52, 157.14, 176.58, 0, 0, 37.26, 55.08, 59.94, 19.44, 43.74, 0}

Extract the crack area's for the seven differential settlement locations for a PC-4 event using LB and UB data from each of the random variables. Note that only one random variable is varied at a time and all of the remaining variables are set to their mean or best estimate values.

LB corresponds to lower bound value and is assumed to be the mean less one standard deviation.

UB corresponds to lower bound value and is assumed to be the mean plus one standard deviation.

```

XgLB =
  {27, 81.49, 110.16, 157.14, 168.48, 183.06, 0, 0, 46.98, 54.27, 62.69, 25.27, 48.44, 0};
XgUB = {30, 76.14, 110.16, 153.9, 173.34, 32.76, 0, 0, 40.5, 54.59, 58.32, 24.62, 0, 0};

XeLB =
  {28.5, 76.14, 110.16, 155.52, 166.83, 176.58, 0, 0, 34.54, 55.08, 59.94, 24.95, 42.93, 0};
XeUB = {27.3, 75.65, 110.81, 155.36, 167.67, 176.26,
  0, 0, 35.8, 54.59, 60.43, 25.11, 42.61, 0};

XkLB = {28.5, 46.8, 97.2, 124.74, 149.04, 0, 0, 0, 0, 42.12, 22.68, 10.5, 0, 0};
XkUB =
  {29.4, 129.6, 119.88, 186.3, 178.2, 225.18, 0, 0, 105.3, 61.58, 100.44, 25.92, 76.14, 0};

XsUB = {73.32, 118.26, 178.2, 212.22,
  239.76, 215.46, 0, 48.6, 68.4, 108.54, 93.96, 64.8, 74.52, 0};

```

Varying the static settlement rate for secondary consolidation, X_r , effected the time at which cracking due to gravity loads occurred by did not have a significant influence on the crack area when combined with a PC-4 event. Assign X_r a minimum cov of 0.10 based on judgment.

```
covXr = 0.1;
```

Determine the total crack area for bottom cracks by taking the cov of the sum of the first 7 areas. Similarly, determine the total crack area for the top cracks by summing the last 7 areas. Fit a line for each data set through the points $(-1\sigma, \frac{LB}{BE})$, $(0\sigma, \frac{BE}{BE})$ and $(1\sigma, \frac{UB}{BE})$. Force the line to have a value of 1 at 0σ . This line represents the random variable as a function of σ . The cov is the absolute value of the slope of the line.

```
Clear[x]
```

Variable Xg

```
XLB = XgLB;
```

```
XUB = XgUB;
```

```
data = {{-1,  $\frac{\text{Plus}@@\text{Take}[XLB, 7]}{\text{Plus}@@\text{Take}[PC4, 7]}$ }, {0, 1}, {1,  $\frac{\text{Plus}@@\text{Take}[XUB, 7]}{\text{Plus}@@\text{Take}[PC4, 7]}$ }}}
```

```
{{-1, 1.03579}, {0, 1}, {1, 0.820706}}
```

```
factorBot = Fit[data, {x}, x]
```

```
-0.107541 x
```

```
data = {{-1,  $\frac{\text{Plus}@@\text{Take}[XLB, -7]}{\text{Plus}@@\text{Take}[PC4, -7]}$ }, {0, 1}, {1,  $\frac{\text{Plus}@@\text{Take}[XUB, -7]}{\text{Plus}@@\text{Take}[PC4, -7]}$ }}}
```

```
{{-1, 1.10299}, {0, 1}, {1, 0.826279}}
```

```
factorTop = Fit[data, {x}, x]
```

```
-0.138355 x
```

```
covXg = Abs[{factorBot, factorTop} /. x -> 1]
{0.107541, 0.138355}
```

Variable Xe

```
XLB = XeLB;
XUB = XeUB;
data = {{-1,  $\frac{\text{Plus @@ Take}[XLB, 7]}{\text{Plus @@ Take}[PC4, 7]}$ }, {0, 1}, {1,  $\frac{\text{Plus @@ Take}[XUB, 7]}{\text{Plus @@ Take}[PC4, 7]}$ }}
{{-1, 1.01642}, {0, 1}, {1, 1.01545}}

factorBot = Fit[data, {x}, x]
-0.000484193 x

data = {{-1,  $\frac{\text{Plus @@ Take}[XLB, -7]}{\text{Plus @@ Take}[PC4, -7]}$ }, {0, 1}, {1,  $\frac{\text{Plus @@ Take}[XUB, -7]}{\text{Plus @@ Take}[PC4, -7]}$ }}
{{-1, 1.00919}, {0, 1}, {1, 1.01429}}

factorTop = Fit[data, {x}, x]
0.00255268 x
```

```
covXe = Abs[{factorBot, factorTop} /. x -> 1]
{0.000484193, 0.00255268}
```

Variable Xk

```
XLB = XkLB;
XUB = XkUB;
data = {{-1,  $\frac{\text{Plus @@ Take}[XLB, 7]}{\text{Plus @@ Take}[PC4, 7]}$ }, {0, 1}, {1,  $\frac{\text{Plus @@ Take}[XUB, 7]}{\text{Plus @@ Take}[PC4, 7]}$ }}
{{-1, 0.635545}, {0, 1}, {1, 1.23691}}

factorBot = Fit[data, {x}, x]
0.300684 x

data = {{-1,  $\frac{\text{Plus @@ Take}[XLB, -7]}{\text{Plus @@ Take}[PC4, -7]}$ }, {0, 1}, {1,  $\frac{\text{Plus @@ Take}[XUB, -7]}{\text{Plus @@ Take}[PC4, -7]}$ }}
{{-1, 0.349485}, {0, 1}, {1, 1.71438}}

factorTop = Fit[data, {x}, x]
0.682447 x
```

```
covXk = Abs[{factorBot, factorTop} /. x -> 1]
{0.300684, 0.682447}
```

Variable Xs

```

XUB = XsUB;
data = {{0, 1}, {1,  $\frac{\text{Plus @@ Take[XUB, 7]}}{\text{Plus @@ Take[PC4, 7]}}$ }}
{{0, 1}, {1, 1.4771}}
factorBot = Fit[data, {x}, x]
1.4771 x
data = {{0, 1}, {1,  $\frac{\text{Plus @@ Take[XUB, -7]}}{\text{Plus @@ Take[PC4, -7]}}$ }}
{{0, 1}, {1, 2.12949}}
factorTop = Fit[data, {x}, x]
2.12949 x
covXs = Abs[{factorBot, factorTop} /. x -> 1]
{1.4771, 2.12949}

```

■ H.3.4.2 Bottom Crack Areas

The cov of the bottom crack areas, except Xm, is

```

covBot = {covXg[[1], covXe[[1], covXk[[1], covXr, covXs[[1]]}
{0.107541, 0.000484193, 0.300684, 0.1, 1.4771}

```

Logarithmic standard deviation for each variable, except Xm

```

σln =  $\sqrt{\text{Log}[1 + \text{covBot}^2]}$ 
{0.107232, 0.000484193, 0.294201, 0.0997513, 1.07585}

```

Logarithmic standard deviation of Xm for various periods, T

```

σlnXm =  $\sqrt{\text{Log}[1 + \text{covB}^2]}$ 
{0.637228, 0.971999, 1.45129, 1.48215}

```

Total logarithmic standard deviation for various periods, T

```

σlnBot = Table[ $\sqrt{\text{Plus @@ } \sigma_{\ln}^2 + \sigma_{\ln X_m}[i]^2}$ , {i, Length[covB]}]
{1.29287, 1.48669, 1.83622, 1.8607}

```

The bottom crack coefficient of variation for various periods, T

```

covBot =  $\sqrt{e^{\sigma_{\ln Bot}^2} - 1}$ 
{2.07852, 2.8492, 5.3036, 5.55767}

```


Median crack area for various periods, T

```
medianB
{244.185, 45.4423, 12.6493, 5.17536}
```

Mean crack area for various periods, T

```
meanB = medianB * sqrt(1 + covBot^2)
{563.229, 137.217, 68.2688, 29.2248}
```

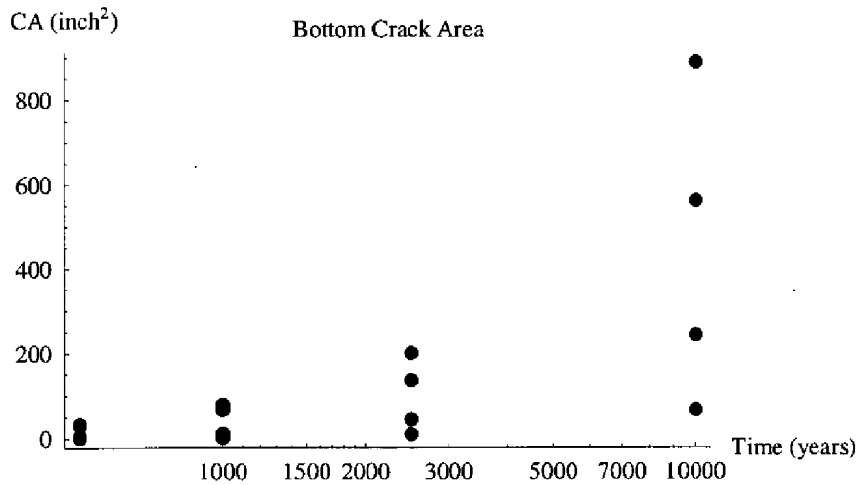
mean - 1 σ crack area for various periods, T

```
calbLB = medianB * e^(-1 * sigmaBot)
{67.0243, 10.2754, 2.01653, 0.805095}
```

mean + 1 σ crack area for various periods, T

```
calbUB = medianB * e^(1 * sigmaBot)
{889.625, 200.965, 79.3462, 33.2686}
```

```
LogLinearListPlot[Transpose[{Join[T, T, T, T], Join[meanB, medianB, calbUB, calbLB]}],
  Prolog -> AbsolutePointSize[7], PlotRange -> All,
  AxesLabel -> {"Time (years)", "CA (inch^2)"}, PlotLabel -> "Bottom Crack Area"];
```



```
Print["Bottom Crack Area"];
TableForm[Transpose[{T, meanB, medianB, calbUB, calbLB, covBot}],
  TableHeadings -> {None, {"Time", "Mean", "Median", "Mean+1σ", "Mean-1σ", "cov"}}]
```

Bottom Crack Area

Time	Mean	Median	Mean+1σ	Mean-1σ	cov
10000	563.229	244.185	889.625	67.0243	2.07852
2500	137.217	45.4423	200.965	10.2754	2.8492
1000	68.2688	12.6493	79.3462	2.01653	5.3036
500	29.2248	5.17536	33.2686	0.805095	5.55767

■ H.3.4.3 Top Crack Areas

The cov of the top crack areas, except X_m , is

```
covTop = {covXg[[2]], covXe[[2]], covXk[[2]], covXr, covXs[[2]]}
{0.138355, 0.00255268, 0.682447, 0.1, 2.12949}
```

Logarithmic standard deviation for each variable, except X_m

```
σln = √Log[1 + covTop²]
{0.1377, 0.00255267, 0.618349, 0.0997513, 1.30807}
```

Logarithmic standard deviation of X_m for various periods, T

```
σlnXm = √Log[1 + covT²]
{0.812439, 1.14885, 1.59953, 1.59503}
```

Total logarithmic standard deviation for various periods, T

```
σlnTop = Table[√Plus@@σln² + σlnXm[[i]]², {i, Length[covT]}]
{1.66804, 1.85531, 2.16352, 2.16019}
```

The bottom crack coefficient of variation for various periods, T

```
covTop = √eσlnTop² - 1
{3.89324, 5.50041, 10.3372, 10.2624}
```

Median crack area for various periods, T

```
medianT
{55.9225, 9.41136, 2.03703, 0.983701}
```

Mean crack area for various periods, T

```
meanT = medianT  $\sqrt{1 + covTop^2}$ 
{224.787, 52.6149, 21.1555, 10.143}
```

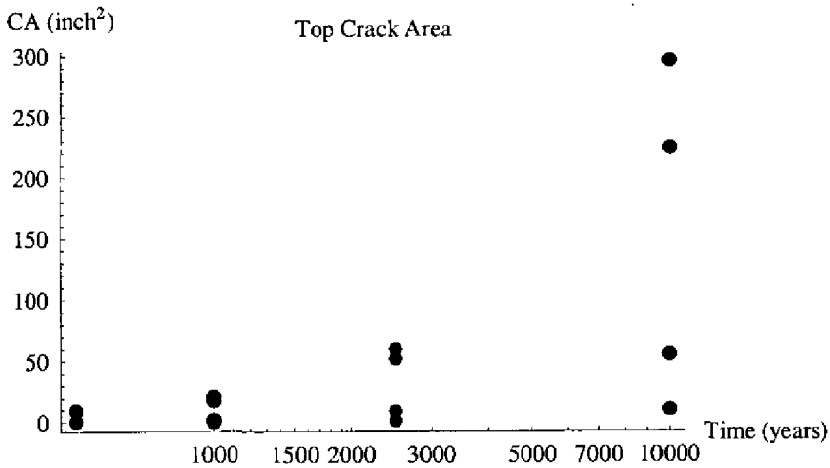
mean - 1 σ crack area for various periods, T

```
caltLB = medianT  $e^{-1.0lnTop}$ 
{10.5478, 1.47198, 0.234096, 0.113424}
```

mean+1 σ crack area for various periods, T

```
caltUB = medianT  $e^{+1.0lnTop}$ 
{296.489, 60.173, 17.7256, 8.53145}
```

```
LogLinearListPlot[Transpose[{Join[T, T, T, T], Join[meanT, medianT, caltUB, caltLB]}],
  Prolog -> AbsolutePointSize[7], PlotRange -> All,
  AxesLabel -> {"Time (years)", "CA (inch2)"}, PlotLabel -> "Top Crack Area"];
```



```
Print["Top Crack Area"];
TableForm[Transpose[{T, meanT, medianT, caltUB, caltLB, covTop}],
  TableHeadings -> {None, {"Time", "Mean", "Median", "Mean+1σ", "Mean-1σ", "cov"}}]
```

Top Crack Area

Time	Mean	Median	Mean+1σ	Mean-1σ	cov
10000	224.787	55.9225	296.489	10.5478	3.89324
2500	52.6149	9.41136	60.173	1.47198	5.50041
1000	21.1555	2.03703	17.7256	0.234096	10.3372
500	10.143	0.983701	8.53145	0.113424	10.2624

See H.2 For Conclusion.