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TITLE:	Environmental Restoration Disposal Facility (ERDF) Cells 7-10 Detailed Design Package, Rev. 0

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WCH-195
Rev. 0

River Corridor
Closure Contract

Design Analysis Variance Report ERDF Cells 7-10

October 2007

Washington Closure Hanford

Prepared for the U.S. Department of Energy, Richland Operations Office
Office of Assistant Manager for River Corridor

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EXECUTIVE SUMMARY

This design analysis variance report (DAVR) for the Environmental Restoration Disposal Facility (ERDF) Cells 7 through 10 documents design revisions from the previous ERDF cell design.[1] The design revisions are based in large part on the lessons learned at ERDF that have occurred to date; these revisions are intended to serve as a reference point as the development of ERDF continues. Other revisions include the updating to current codes that would have been implemented since the last revision, as well as incorporating new design features that were requested by Washington Closure Hanford. Lastly, this DAVR documents verification of various design elements to confirm the existing ERDF infrastructure has the capacity to serve Cells 7 through 10.

Revisions based on a lessons learned represents the largest portion of this report. The largest segment of these revision types occurred in the trench section that comprises the ERDF cells themselves. Changes were made to multiple landfill components that did not adversely affect the engineering performance of ERDF. Examples of these changes included switching to a white geomembrane to reduce the effects of solar energy, creating redundancies in the sump riser pipes, welding the primary liner to the secondary liner in the anchor trench, reducing the types of drainage gravel to be used, and reducing liner system run out as well as the distance between the cell boundary and the cut slope.

A revision based on code updated included bringing the crest pad building current with the 2006 *International Building Code*.

Revisions that are new design features to ERDF include the vadose zone monitoring system.

Lastly, the DAVR contains sections that document that the existing ERDF design will meet the needs of Cells 7 through 10. These sections include verifying the existing capacity of the leachate storage tank, verifying the existing capacity of the leachate transmission system as well as verifying the power needs and capacity as well as signalization of the leachate transmission system.

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[1] BHI-00355, 1995, *Design Analysis: Construction of W-296 Environmental Disposal Facility*, Bechtel Hanford, Inc., Richland, Washington; and CCN 117640, *ERDF Cells 5 & 6 Design Analysis Variance Report*, dated November 16, 2004, Bechtel Hanford, Inc., Richland, Washington.

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ACRONYMS

ASTM	American Society for Testing and Materials
DAVR	design analysis variance report
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
FS	factor of safety
GC	geocomposite
GM	geomembrane
GRI	Geosynthetic Research Institute
HELP	Hydrologic Evaluation of Landfill Performance
HDPE	high-density polyethylene
IBC	*International Building Code*
IFC	*International Fire Code*
NFPA	National Fire Protection Association
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture

METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
If You Know	*Multiply By*	*To Get*	*If You Know*	*Multiply By*	*To Get*
Length			**Length**		
inches	25.4	millimeters	millimeters	0.039	inches
inches	2.54	centimeters	centimeters	0.394	inches
feet	0.305	meters	meters	3.281	feet
yards	0.914	meters	meters	1.094	yards
miles	1.609	kilometers	kilometers	0.621	miles
Area			**Area**		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
acres	0.405	hectares	hectares	2.47	acres
Mass (weight)			**Mass (weight)**		
ounces	28.35	grams	grams	0.035	ounces
pounds	0.454	kilograms	kilograms	2.205	pounds
ton	0.907	metric ton	metric ton	1.102	ton
Volume			**Volume**		
teaspoons	5	milliliters	milliliters	0.033	fluid ounces
tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.057	quarts
cups	0.24	liters	liters	0.264	gallons
pints	0.47	liters	cubic meters	35.315	cubic feet
quarts	0.95	liters	cubic meters	1.308	cubic yards
gallons	3.8	liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			**Temperature**		
Fahrenheit	subtract 32, then multiply by 5/9	Celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			**Radioactivity**		
picocuries	37	millibecquerel	millibecquerels	0.027	picocuries

1.0 TRENCH REVISIONS

1.1 LEACHATE PUMP DESIGN

Leachate generation calculations were performed to verify that the proposed leachate pumps are adequately sized to pump the expected leachate flows. Previous calculations (BHI 1995, 2004b) for sizing the leachate pumps in the Environmental Restoration Disposal Facility (ERDF) cells employed the assumption of removing the liquids from a 25-year, 24-hour storm event in 24 hours, even though the design analysis (BHI 1995) specifies design criteria: "For the design storm event, leachate will be removed so that the head on the primary liner system is below 1 foot within 72 hours." The leachate pumps in Cells 7 to 10 were sized to remove the collected leachate without exceeding the peak daily head requirement of 30 cm (12 in.).

Design Change Impact Statement

The U.S. Environmental Protection Agency's (EPA's) Hydrologic Evaluation of Landfill Performance (HELP) model (version 3.07) was used to evaluate the performance of the proposed design configuration. The HELP model is a quasi-two-dimensional model that is used to conduct water balance analyses for landfills and cover systems.

The HELP model was used to evaluate whether the calculated leachate head on the primary liner in the proposed configuration would exceed 30 cm (12 in.). In addition, model output was also used in the design of other ERDF system components, such as the leachate collection system piping.

In general, input data used in the HELP model include evapotranspiration data; meteorological data from the Hanford Meteorological Station (obtained from the Pacific Northwest National Laboratory); and soil and design data. Each of these input parameters is summarized in the following sections.

<u>Evapotranspiration Data</u>

The following data were manually input to simulate bare ground (i.e., no vegetation) since the simulation was performed for an open landfill during its operating life:

Station Latitude – The latitude of the Hanford Meteorological Station is 46.553 degrees north.

Maximum Leaf Area Index – A maximum leaf area index of zero was used to represent bare ground conditions.

Growing Season Dates – The starting and ending dates of the growing season at the Hanford site were input as April 14 (Julian day 103) and October 16 (Julian day 288), respectively.

Evaporative Zone Depth – An evaporative zone depth of 41 cm (16 in.) was used to represent bare ground conditions. This value is consistent with HELP model guidance and previous model simulations for the ERDF.

Average Annual Wind Speed – An average annual wind speed of 12.23 km/hr (7.60 mi/hr) was used.

Average Relative Humidity – The average relative humidity during the first, second, third, and fourth quarters of the year was input as 68.2%, 43.3%, 37.1%, and 70.1%, respectively.

Meteorological Data

Site-specific meteorological data from the Hanford Site was used. These data included daily values for precipitation, temperature, wind, humidity, and solar radiation. Climate data file was obtained from Ken Burk at the Hanford Weather Station. The HELP model was then run using the 31 years of data (1955-1959, 1980-1999, and 2001-2006).

Soil and Design Data (Open Sideslope)

The HELP model is not designed to model a compound slope, so separate simulations were performed for the sideslope and the floor. Since the sideslopes are designed with a 3:1 (33%) slope, liquid is expected to move through the drainage layers much faster than on the floor, which is designed with 1.5% and 3% slopes. The open sideslope simulation was performed for a 1.2 ha (3.0-acre) area, which represents the approximate sideslope area in each cell.

Layer 1 – The simulation was performed for open conditions (i.e., no waste), so the first (top) soil layer is the operations layer. A 0.9 m (3-ft) operations layer was assumed. The operations layer was assumed to be the HELP model default soil classification U.S. Department of Agriculture (USDA) soil type SL (sandy loam)/United Soil Classification System (USCS) soil type SM (silty sand); and the HELP model default hydraulic conductivity of 7.2×10^{-4} cm/sec was used.

Layer 2 – Below the operations layer, a geocomposite drainage layer will be installed on the sideslopes. The HELP model default parameters for a 0.6-cm drainage net were used, with a 33% slope and a maximum drainage length of 255 ft.

Layer 3 – A 60-mil HDPE geomembrane will be installed below the geocomposite described in Layer 2. The HELP model default parameters for a flexible membrane liner were used. A "good" geomembrane placement quality was assumed, along with one pinhole and four installation defects per acre.

Layer 4 – A second geocomposite will be installed below the primary liner described in Layer 3. The HELP model default parameters for a 0.6-cm drainage net were used, with a 33% slope and a maximum drainage length of 77.7 m (255 ft).

Layer 5 – A second 60-mil HDPE geomembrane will be installed below the geocomposite described in Layer 4. The HELP model default parameters for a flexible membrane liner were used. A "good" geomembrane placement quality was assumed, along with one pinhole and four installation defects per acre.

Layer 6 – The compacted admix layer will be constructed below the secondary geomembrane described in Layer 5. The admix layer will be a minimum of 0.9 m (3 ft) thick, with a minimum hydraulic conductivity of 1 x 10^{-7} cm/sec.

Soil and Design Data (Open Floor)

Since the HELP model is not designed to model a compound slope, separate open floor simulations were performed for the 1.5% and 3% slope areas. The 1.5% slope simulation was performed for a 1.11 ha (2.75-acre) area, and the 3% slope simulation was performed for a 1.06 ha (2.62-acre) area. These areas represent the total area of each slope configuration in each cell.

Layer 1 – The simulation was performed for open conditions (i.e., no waste), so the first (top) soil layer is the operations layer. A 0.9 m (3-ft) operations layer was assumed. The operations layer was assumed to be the HELP model default soil classification USDA soil type SL (sandy loam)/USCS soil type SM (sandy silt); and the HELP model default hydraulic conductivity of 7.2 x 10^{-4} cm/sec was used.

Layer 2 – Below the operations layer, a granular drainage layer will be installed on the floor. The maximum drainage length of 50 ft was used in the model, along with the proper drainage slope (1.5% or 3%). The hydraulic conductivity of the gravel drainage layer was assumed to be 5 x 10^{-2} cm/sec.

Layer 3 – A 60-mil HDPE geomembrane will be installed below the granular drainage layer described in Layer 2. The HELP model default parameters for a flexible membrane liner were used. A “good” geomembrane placement quality was assumed, along with one pinhole and four installation defects per acre.

Layer 4 – Below the primary geomembrane, a second granular drainage layer will be installed on the floor. Maximum drainage lengths of 122 m (400 ft) and 61 m (200 ft) were used for the 1.5% and 3% slopes, respectively, was used in the model, along with the proper drainage slope (1.5% or 3%). The hydraulic conductivity of the gravel drainage layer was assumed to be 5 x 10^{-2} cm/sec.

Layer 5 – A second 60-mil HDPE geomembrane will be installed below the drainage layer described in Layer 4. The HELP model default parameters for a flexible membrane liner were used. A “good” geomembrane placement quality was assumed, along with one pinhole and four installation defects per acre.

Layer 6 – The compacted admix layer will be constructed below the secondary geomembrane described in Layer 5. The admix layer will be a minimum of 0.9 m (3 ft) thick, with a minimum hydraulic conductivity of 1 x 10^{-7} cm/sec.

Soil and Design Data (Waste Simulations)

Simulations for the sideslopes and floor were similarly performed with 3 m (10 ft) and 11 m (35 ft) of waste in place, along with 30 cm (12 in.) of cover soil. The waste layer was modeled as HELP model default soil classification USDA soil type LFS (loamy fine sand)/USCS SM (sandy silt) with a hydraulic conductivity of 1 x 10^{-3} cm/sec. The soil classification was selected as it appears to generally represent the waste soil types (with some debris) received at ERDF with a hydraulic conductivity that is believed to be conservative for the waste that is to be disposed in the ERDF. The cover soil was assumed to be the same soil type as the operations layer (sandy loam, hydraulic conductivity of 7.2 x 10^{-4} cm/sec).

HELP Model Results

The results of the HELP model simulations are summarized in Tables 1 through 3. The tables show the average annual drainage and the peak daily drainage from the primary drainage layer in each of the three modeled scenarios. The peak precipitation calculated by the HELP model for the Hanford area was 4.06 cm (1.6 in.) This is approximately 25% greater than the 3.25 cm (1.28 in.) estimated for a 25-year, 24-hour storm. The total leachate generation is estimated by adding the results from the 1.5%, 3%, and sideslope scenarios.

The model analyses of open conditions (i.e., no waste in place) showed an average annual head on the primary geomembrane liner of less than one inch for all cases. The peak daily head was calculated to be approximately 11.7 cm (4.6 in.), for the 1.5% slope in open conditions. Therefore, the proposed design configuration satisfies the design criterion of less than 30 cm (12 in.) of head on the liner.

Subsequent analyses using 3 m (10 ft) and 11 m (35 ft) of waste were also performed, and these results are summarized in Tables 1 through 3. HELP model output for all of the referenced analyses is attached.

Table 1. Open Conditions (No Waste in Place).

Configuration	Average Primary Drainage (ft^3/yr)	Peak Primary Drainage (ft^3/day)	Average Primary Liner Head (in.)	Peak Primary Liner Head (in.)
1.5% Floor	9,517	3,438	0.031	4.55
3% Floor	9,794	4,741	0.017	4.12
3:1 Sideslope	14,301	7,626	0.000	0.006
TOTAL	**33,612**	**15,805**	**N/A**	**N/A**

Table 2. Operating Simulation (3 m [10 ft] Waste in Place).

Configuration	Average Primary Drainage (ft^3/yr)	Peak Primary Drainage (ft^3/day)	Average Primary Liner Head (in.)	Peak Primary Liner Head (in.)
1.5% Floor	7,667	285	0.025	0.578
3% Floor	8,154	294	0.014	0.342
3:1 Sideslope	20,282	433	0.000	0.000
TOTAL	**36,094**	**1,012**	**N/A**	**N/A**

Table 3. Operating Simulation (11 m [35 ft] Waste in Place).

Configuration	Average Primary Drainage (ft^3/yr)	Peak Primary Drainage (ft^3/day)	Average Primary Liner Head (in.)	Peak Primary Liner Head (in.)
1.5% Floor	4,299	59	0.014	0.131
3% Floor	4,608	62	0.008	0.075
3:1 Sideslope	14,330	204	0.000	0.093
TOTAL	**23,237**	**325**	**N/A**	**N/A**

When no waste is present in the cell, a minimum pump capacity of approximately 310 L/min (82 gal/min) is required. 530 L/min (140-gal/min) pumps were used in Cells 5 and 6 and will continue to be used in Cells 7-10. As shown on the above results, however, the peak leachate generation rates decrease significantly as additional waste is placed in the cell. The required peak pump capacity is reduced to 20.06 L/min (5.3 gal/min) and 6.4 L/min (1.7 gal/min) when 3 m (10 ft) and 11 m (35 ft) of waste, respectively, is in place. Calculations are provided in Appendix A.

1.2 LEACHATE STORAGE TANK CAPACITY EVALUATION

Calculations have been prepared demonstrating that the existing leachate storage tanks continue to provide sufficient capacity to meet the storage requirement criterion specified in the design analysis. The calculations were based on the leachate generation from one lined cell using the 25-year, 24-hour storm event.

Design Change Impact Statement

None. As shown in the attached calculations, the existing leachate storage tanks provide sufficient capacity to meet the calculated storage requirement. Calculations are provided in Appendix B.

1.3 WHITE GEOMEMBRANE DESIGN CHANGE

The specifications for the construction of Cells 7-10 have been revised to require the use of white geomembrane.

Design Change Impact Statement

White geomembrane is identical to black geomembrane, which was used on the previous cells, in synthetic properties except that it has a white light reflective surface on the upper side of the geomembrane. Advantages of white geomembrane include post-installation damage is more easily noted on white geomembrane, and heat buildup is reduced since the liner reflects solar energy. The lower liner temperature also leads to fewer wrinkles and less subgrade desiccation. No calculations are required for this change.

1.4 GEOSYNTHETIC RESEARCH INSTITUTE SPECIFICATIONS

The project specifications for the geomembrane and geotextile materials have been modified to be consistent with the most recent specification standards as published by the Geosynthetic Research Institute (GRI).

Design Change Impact Statement

The GRI specifications represent the state of the practice for geosynthetic design and provide a specification that all manufacturers can meet with standard products. The specifications were developed by the GRI membership to eliminate the variations in the industry with respect to quality control frequencies, variable test values that made certain specifications sole source, and also to provide the most recent and appropriate American Society for Testing and Materials (ASTM) standards. GRI has also eliminated some tests that have been determined to be irrelevant to the quality and performance of the finished material-such as low-temperature brittleness, soil burial, and dimensional stability.

The GRI membership consists of the engineers, landfill owners, geosynthetic manufacturers, resin suppliers, and regulators who all have a vested interest in the proper specification and use of geosynthetics. Members include EPA and the U.S. Army Corps of Engineers as well as numerous state agencies.

The GRI specifications clearly provide guidance on test methods and recommended values for each property. The use of minimum average roll values is recommended only for geotextile materials. All geomembrane materials require a minimum average or absolute minimum value. No calculations are required for this change.

1.5 REMOVAL OF WELD BEADS FROM INTERIOR OF SUMP RISER PIPES

All high-density polyethylene (HDPE) sideslope riser pipes shall have the internal fusion beads removed and extracted from the pipe. The pipe shall be visually inspected after the process is complete to verify that the interior of the riser pipes are smooth.

Design Change Impact Statement

Removing the fusion beads from the pipe interior will facilitate pump insertion and removal, and will minimize the number of locations for biofilm accumulation. No calculations are required for this change.

1.6 ANCHOR TRENCH DESIGN CHANGE

The anchor trench as been modified as shown on the design drawings. In the previous anchor trench design, the geosynthetic layers were separated by 15 cm (6 in.) of Type II fill. The new design calls for the primary and secondary liners to be welded together in the anchor trench, with no soil layers in between.

Design Change Impact Statement

The revised design will minimize water infiltration into the secondary liner system. No calculations are required for this change.

1.7 TRANSDUCER ACCESS PIPE DESIGN CHANGES

The transducer access pipe in the primary sump has been changed from a three-inch diameter HDPE pipe to a 15 cm (6-in.)-diameter HDPE pipe. In addition, the transducer access pipe in the secondary sump has been changed from a 7.6 cm (3-in.)-diameter HDPE pipe to a 30 cm (12-in.)-diameter HDPE pipe.

Design Change Impact Statement

The increased pipe sizes will allow for additional redundancies for pump and instrument access. As shown in the attached calculations, the designed HDPE pipes will withstand the overlying loads, including those imposed by the final cover system. Calculations are provided on Appendix C.

1.8 REDUCTION OF LINER SYSTEM RUN-OUT

The previous design called for a 13 m (43-ft) run-out beyond the cell limits. The run-out distance is used to facilitate tie-in during future cell construction projects. The liner system run-out past the cell limits has been reduced to 7 m (23 ft) as shown in the design drawings.

Design Change Impact Statement

Reducing the run-out will reduce in less wasted construction materials, as well as less area that may require repairs prior to tie-in. No calculations are required for this change.

1.9 REDUCTION OF SPACING BETWEEN THE CELL BOUNDARY AND THE EAST SIDE CUT SLOPE

The previous design called for approximate 69 m (228-ft) spacing between the cell boundary and the east side cut slope. The spacing has been reduced to 30 m (100 ft) as shown in the design drawings.

Design Change Impact Statement

Reducing the spacing will result in less excavation required during the construction of Cells 7 and 8 and 9 and 10. No calculations are required for this change.

1.10 SLOPE STABILITY CALCULATIONS

The interface friction angle values specified for the liner system were reviewed to ensure the materials specified provide the required stability. In addition, the higher 3.0 horizontal: 1.0 vertical excavation slope at the north wall of the cells was reviewed to verify compliance with the recommended factors of safety.

Design Change Impact Statement

<u>Internal Friction Angle</u>

Initially the ERDF design analysis (BHI 1995) required the interface friction angle to be determined by direct shear testing under fully saturated conditions (ASTM D5321) at nominal loads of 200, 400, and 600 psf. These load values are representative of the short term loading condition that exists before waste is placed against the slope (0.9 m [3 ft] of operations layer at a unit weight of 120 pcf). The required residual friction angle between the interfaces listed below were to have a minimum value of 29.5 degrees under a normal load of 400 psf and a displacement of 5 cm (2 in.):

- Geocomposite (GC) and operations layer material
- GC and textured HDPE geomembrane (GM)
- Soil bentonite admix and textured HDPE GM.

Testing performed by the construction quality assurance engineer during the construction of Cells 5 and 6 determined that the interface shear strength for the proposed GC and textured HDPE GM materials could not meet the minimum required 29.5 degree residual friction angle at these loads. We agree with this conclusion. At these relatively light loads, we were unable to locate any interface friction angles that would meet the original specification of 29.5 degrees.

To address this condition during the construction of Cells 5-6, CH2M HILL performed an interface shear strength and slope stability evaluation (BHI 2004a). Because the event being evaluated was a short term interim condition, CH2M HILL used a revised seismic coefficient (Cs) value (50% of peak ground acceleration for a 1,000–year design earthquake) along with a minimum factor of safety (FS) of 1.0 for seismic conditions. CH2M HILL also noted that these same input variables were used at the Hanford

Integrated Disposal Facility. In addition, CH2M HILL also assessed an alternate multi-layer system approach to evaluate peak and residual strengths for multi-layer geosynthetic lining systems. An important aspect of this approach is that the various layers of the lining system are viewed as a whole system and not individual interfaces. The approach reasons that the controlling residual strength of the multi-layer system is the interface with the lowest peak strength. The approach further theorizes that for an interface to achieve residual strength values, it first must reach its peak strength. CH2M HILL concluded that this approach has merit and was accepted for Cells 5 and 6.

Based on the above, we concur with CH2M HILL's findings. We therefore have revised the specification for Cells 7 through 10. Calculations are provided in Appendix D.

Interface Strength Specification

The residual friction angle between the geocomposite and operations layer material and admix and textured HDPE GM shall have a minimum value of 29.5 degrees under a normal load of 1,955 kg/m^2 (400 psf) and a displacement of 50 cm (2 in.) with a cohesion of zero (0). The residual friction angle between the textured HDPE GM and GC shall have a minimum value of 24.0 degrees under a normal load of 1,955 kg/m^2 (400 psf) and a displacement of 50 cm (2 in.) with cohesion of zero (0). The 24.0 degrees provides an FS of 1.1 as compared to the calculated angle of 21.9 degrees. Interface friction angles shall be determined by direct shear testing under fully saturated conditions (ASTM D5321) at nominal normal loads of 9.6, 19.2, and 28.8 kPa (200, 400, and 600 psf).

Global Stability

A slope stability analysis was performed considering static and seismic loading conditions. The stability analyses were performed using the computer program XSTABL, Version 5.02, developed by Interactive Software Designs, Inc. (1995). This program uses the conventional, two-dimensional, limit equilibrium methodology to analyze the stability of slopes and embankments. The XSTABL program uses a search routine by generating potential slip surfaces and subsequently calculates the factor of safety along the assumed surfaces. The two-dimensional method of limit equilibrium is widely used in the geotechnical engineering practice and is a generally accepted method to estimate the factor of safety for stability of a slope. The simplified Bishop method of slices was used to analyze for circular-type failure surfaces. For seismic loading conditions, a bedrock acceleration coefficient of 0.12g was used for dynamic analysis. Calculations are attached. Table 4 is a summary of the slope stability analysis results.

Table 4. Global Stability Analysis

S	Condition	Factor of Safety*
A-A'	Static	2.3
A-A'	Seismic	1.7

*Rounded to nearest 0.1.

In summary, the calculated FS's exceed regulatory requirements (static=1.5 and dynamic=1.2) and are considered adequate. Calculations are provided in Appendix E.

1.11 ACTION LEAKAGE RATE EVALUATION

The action leakage rate was evaluated for the proposed configuration.

Design Change Impact Statement

As shown in the attached sheets, an action leakage rate of 530 gal/acre/day was calculated using the procedures specified in the EPA's guidance documents. This value corresponds to a minimum pumping capacity of 12.1 L/min (3.2 gal/min) needed to maintain less than 0.3 m (1 ft) of head on the secondary liner. Calculations are provided in Appendix F.

2.0 CIVIL

2.1 ACCESS ROAD

A new access road may be constructed to provide access around the container queue area. The existing trail located along the north side of the container queue area may be upgraded into a two-lane, crowned, aggregate-surfaced site road with appropriate drainage and protection for buried utility crossings. This access road is not a required component of the cell construction and is only documented in the design analysis variance report because it may be included in the cell construction subcontract.

Design Change Impact Statement

The alignment of access road is presented on drawings 0600X-DD-C0301 and 0600X-DD-C0302 and details are presented on drawing 0600X-DD-C304. Design parameters were provided by Washington Closure Hanford.

2.2 VADOSE MONITORING SYSTEM DESIGN CHANGE

A vadose zone monitoring system, composed of buried stainless steel pipelines, was added under Cells 7 and 8. The buried stainless steel pipelines are not being added under Cells 9 and 10.

Design Change Impact Statement

The vadose zone monitoring system pipes will consist of three 10 cm (4-in.)-diameter nonperforated stainless steel pipes that will be installed in trenches below the admix liner. As shown on the drawings, the pipe will not be installed beneath the liner sumps. The pipes are designed such that a 0.6 m (2-ft)-long, 5 cm (2-in.)-diameter instrument can be pulled through using a cable system, and Victaulic® pipe couplings are used to maintain electrical conductivity along the entire pipe length.

The attached calculations show that Schedule 40 Grade 304 stainless steel pipes will withstand the overlying loads, including those imposed by the final cover system. Additional calculations demonstrating the adequacy of the proposed cable are also attached. The cable calculations contain a figure demonstrating that the proposed instrument can pass through the proposed bends between the floor and sideslope pipes. The gasket material for this application was a standard type "E" from Victaulic. This gasket was chosen based on the intent to keep debris and liquids out of the pipe. The likely substance the gasket may be subject to is groundwater, or dilute concentrations of organics. The type "E" gasket is compatible with this application.

Note that the attached pipe loading calculations are conservative, since they assume the earth loading to be calculated by a prism of soil over the pipe. In reality, the expected loads may be less than half of the calculated prism loads, due to soil arching over the pipe trench. Calculations are provided in Appendix G.

3.0 STRUCTURAL

3.1 2006 INTERNATIONAL BUILDING CODE DESIGN CHANGE

Update the structural calculations from the 1997 Universal Building Code to the 2006 *International Building Code* (IBC) (IBC 2006).

Design Change Impact Statement

The design changes made to the crest pad foundations calculations are due to acceptance of a new building code. The 2006 edition of the *International Building Code* is now to be used as amended by the State of Washington and local agencies. The loading conditions were analyzed and revised in accordance with the 2006 IBC (IBC 2006). Bearing capacity is, however, less than that assumed for the initial design. The initial design was checked and found to be within acceptable limits for the revised allowable bearing capacity. Calculations are provided in Appendix H.

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BUILDING CODE ANALYSIS

Project No.: 2186-351-11

Location: Hanford Site, Washington

Date: 02-14-2007 Analysis By: Mark Foster

Applicable Codes: *International Building Code*, 2006 edition (IBC 2006)
International Fire Code, 2006 edition (IFC 2006)

Project Description:

Two pre-engineered metal buildings that have the same floor plan will be constructed to monitor leachate liquid from the landfill. The buildings will consist of a meter room and an electrical room.

Classification: Section 306.3

Occupancy: F-2 Factory Industrial Low Hazard Occupancy

Construction Type: V Section 602.53

Occupancy Separation:

No Separation Requirement Table 508.3.3

Allowable Floor Area: Table 503

Basic allowable is 13,000 SFT

Actual Floor Area:

F-2 (Meter Room and Electrical Room): 540 SFT

Allowable Height: Table 503

40 ft max - Basic allowable is two stories

Actual Height:

F-2 (Single Story) Height = 15'-10"

Occupant Load Factor:

Accessory storage areas, mechanical equipment room — Table 1004.1.1

540/300=1.8 (say 2)

Number of Occupants:

Not normally occupied

Area Separation: — Section 508.3

N/A

Liquid Storage Room: — Section 3402 IFC / 2006
Section 307 IBC / 2006

Number of Exits Required: — Section 1015.1

Electrical Room and Mechanical Room only require one exit each

Maximum Travel Distance to Exits: — Table 1016.1

F-2 maximum of 300 ft

Dead End Corridor Limit: — Section 1017.3

N/A - No Corridors

Fire Resistive Requirements: — Table 601 & 602

N/A - No Corridors

Opening Protection: — Table 704.8

Both buildings are a distance greater than 30 ft from the property line or another building. Therefore, the openings do not need to be protected.

Roof Coverings: — Table 1505.1

Minimum Class C roofing required. Class B (metal sheets) will be provided.

Sprinkler System: — Section 903

Not required

Fire Alarm and Detection System: Section 907.2.4

Not required

Portable Fire Extinguishers: Section 906, NFPA 10

Required; one provided for each room placed by the exit.

Secondary Containment: Section 2704.2.2.1 IFC 2006

Containment of leachate water will be accomplished by providing a 6-in.-high concrete curb around the meter room with a floor drain directing any flow back into the 12-in. primary riser pipe.

Handicapped Accessibility:

N/A

Flammable and Combustible Materials: Table 803.3 IFC 2006

Class C interior room finish required

Hazardous Materials: Section 3700, IFC 2006

The leachate water that is pumped in and out of the buildings is composed of several constituents. The concentration levels of those constituents combined is of such a low level that the leachate is determined to be NON-HAZARDOUS.

In addition to the leachate water pumping through the buildings, barrels of resin modified emulsion will be stored in the Meter room. The resin is considered to be a health hazard1. The exempt amount stored in a building is not limited.

4.0 MECHANICAL

4.1 LEACHATE TRANSMISSION PIPELINE

The existing leachate transmission pipeline is a gravity-flow pipeline and future extensions were checked to verify gravity flow can be maintained. Two calculations were performed, and it was determined that the existing slope requirements and drain requirements provide the flow capacity required to handle leachate flows from Cells 7-10. The design reflects the required manhole pipe inlet elevations and the required crest pad elevations. Therefore, Cells 7-10 will not require design changes.

Design Change Impact Statement

None. Continuing the same pump operation configuration approved for Cells 5 and 6 (turning the high-capacity pumps from automatic to manual operation in cells containing waste), the existing design is adequate. Calculations are provided in Appendix I.

4.2 LEACHATE TRANSMISSION PIPELINE SLOPE

The design analysis (BHI 1995) used a transmission pipeline slope of 0.3% between the cells to convey leachate to the storage area. At 0.3% the 25 cm (10-in.) gravity line has a capacity of 1,893 L/min (500 gal/min). The pipeline segments for Cells 1 through 6 were constructed with a slope of greater than 0.3%. For Cells 7-10, the transmission pipeline slope was set to 0.3% in accordance with the design analysis (BHI 1995).

Design Change Impact Statement

None. The 0.3% transmission pipeline slope matches the slope used in the design analysis. Calculations are provided in Appendix J.

4.3 LEACHATE PUMP CAPACITY

The HELP model data in Section 1.1 estimate the expected volume of leachate to be removed. The minimum required volume is a reduction as compared to the volumes calculated for Cells 5 and 6. The new minimum flow rate was used to select the minimum required pump flow capacity to maintain the leachate depth less than 30 cm (12 in.) on the cell floor.

In addition, the availability of 316 Stainless Steel specified for previous pumps was verified. It is noted here that although 316 is available, 304 is also available and should be considered by the owner of the facility.

Design Change Impact Statement

To be consistent with previous cells and provide additional pump capacity factor of safety, the pump size was not revised to the minimum size needed. The high-capacity and low-capacity pumps specification were not revised and were left to match Cells 5 and 6 (530 L/min [140 gal/min] for high-capacity pump and 57 L/min [15 gal/min] for low-capacity pumps). Calculations are provided in Appendix K.

5.0 ELECTRICAL

5.1 CELLS 7-10 POWER CAPACITY DESIGN CHANGE

The power capacity in the existing duct banks for Cells 1 through 6 is at capacity. A new duct bank has been installed for the North Cells 7 and 9. The new duct bank consists of six 10 cm (4-in.)-diameter conduits encased in concrete (similar to the existing duct banks) and runs from a new transformer located along the north side of the container queue area, through the queue, and temporarily terminates in the north side of the perimeter berm north of Cell 5. Power for Cells 7 and 9 shall be from the new transformer and duct bank. Cells 8 and 10 (South) will be supplied power by utilizing existing conduits in the existing duct bank.

Design Change Impact Statement

Cell 1-6 power supply has not been changed by this design. Cells 7 and 9 existing (new) substation power service is shown on Drawing No. 0600X-DD-E0101; continuation of a new duct bank is shown on Cell 7 electrical layout Drawing No. 0600X-DD-E-0111. The source circuit breaker at MDP #2 will need to be changed to a 100 ampere unit.

Cell 8 and 10 power supply will be provided by using existing 0.6 m (2-ft) conduits. Some minor wires will need to be relocated to adjacent conduits to provide two spare 0.6 m (2-ft) conduits from Substation #1 to Cell 8. Some larger conduits exist part way. The circuit will consist of parallel 250 kcmil conductors that are necessary to limit the voltage drop on this very long circuit. Calculations are provided in Appendix L.

5.2 CELLS 7-10 SIGNAL CABLE DESIGN CHANGE

The existing signal cable duct bank from the leachate pump station, located adjacent to the leachate storage tanks, to the Cells 5 and 6 crest pad building and associated motor-operated valves in the leachate transmission pipeline manholes outside of the crest pad building is at capacity.

Design Change Impact Statement

An options evaluation was made and where spare signal conduit is not available, it was decided to pull new I & C cable bundles in with existing cable bundles. Based on electrical conduit fill calculations (0600X-CA-E-001) the existing 0.6 m (2-ft) conduit can carry the additional bundles. Washington Closure Hanford has decided that the existing cable bundles will be pulled out and then back in with the new wires. Weather-proof enclosures will be provided to terminate wires where cut in pull boxes. Some sections of duct have spare conduits of varying sizes of 0.6 m to 10 cm (2 ft to 4 in.). See electrical layout

Drawing Nos. 0600X-DD-E0111 and 0600X-DD-E0112 and raceway and cable schedules 0600X-DD-E0109 and 0600X-DD-E0110.

5.3 LEACHATE SUMP LEVEL DATA LOGGER

The present design for Cells 5 and 6 does not have Sump Level Data Logger capability.

Design Change Impact Statement

At each crest pad building for Cells 7-10, a data logger will be added to the trench pump control panel. This data logger will digitally log its associated sump primary and secondary leachate level (reference Drawing No. 0600X-DD-E0118).

5.4 CREST PAD LEACHATE FLOW INTERLOCKS

The present design for Cells 5 and 6 does not have the ability to alarm or shut down the primary or secondary pumps when they are called on to run, but do not provide flow. Concerns about a broken pump shaft, plugged line, etc., make a design change desirable.

Design Change Impact Statement

Two additional outputs from the digital flow indicator, located in the trench control panel, will be utilized when any one of the three sump pumps should be running, but low flow is measured. One output will initiate a local pump failure alarm light and the second output will turn off the pump (reference Drawing Nos. 0600X-DD-E0118 and 0600X-DD-E0120).

6.0 REFERENCES

ASTM D5321, "Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method," ASTM International, West Conshohocken, Pennsylvania.

BHI, 1995, *Design Analysis: Construction of W-296 Environmental Restoration Disposal Facility*, BHI-00355, Vols. 1 and 2, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2004a, *ERDF Cells 5 & 6 Construction – Interface Shear Strength and Slope Stability Evaluation*, 0600X-CA-C0029, Rev. 0, Prepared by CH2M HILL for Bechtel Hanford, Inc., Richland, Washington.

BHI, 2004b, *ERDF Cells 5 & 6 Design Analysis Variance Report*, CCN 117640, dated November 16, 2004, Bechtel Hanford, Inc., Richland, Washington.

IBC, 2006, *International Building Code*, International Code Council, Washington, D.C.

IFC, 2006, *International Fire Code*, International Code Council, Washington, D.C.

NFPA 10, *Standard for Portable Fire Extinguishers*, National Fire Protection Association, Quincy, Massachusetts.

APPENDIX A

LEACHATE GENERATION AND HEAD LEVELS – 0060-SC-T-001

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-T-001
Discipline:	Civil		
Subject:	Leachate Generation and Head Levels		
Computer Program:	Hydrologic Evaluation of Landfill Peformance (HELP)		
Computer Program Version:	3.07		

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation **X** Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Output - 78 sheets Total = 79 sheets	Steve Niehoff	Mark Sieracke	Brian Horvath	John Briest	9/28/07 7/29/2007

Summary of Revisions	

Page 21 of 345

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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**            FOR USEPA RISK REDUCTION ENGINEERING LABORATORY               **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:      C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:        C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:    C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:      C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:    C:\HELP3\HANFORD\CN1\15-FLR.D10
OUTPUT DATA FILE:             C:\HELP3\HANFORD\CN1\15-FLR.OUT


TIME:  14:30     DATE:   9/28/2007


******************************************************************************

     TITLE:  HANFORD FLR: 1.5%,50',12" GRAV @ 0.05 CM/S, GOOD FML, 3'OPS

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                 LAYER  1
                                 --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                        MATERIAL TEXTURE NUMBER   6
          THICKNESS                  =     36.00   INCHES
          POROSITY                   =      0.4530 VOL/VOL
          FIELD CAPACITY             =      0.1900 VOL/VOL
          WILTING POINT              =      0.0850 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.2266 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.720000011000E-03 CM/SEC
```

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Sheet 2 of 8

```
                         LAYER  2
                         --------

             TYPE 2 - LATERAL DRAINAGE LAYER
               MATERIAL TEXTURE NUMBER   0
THICKNESS                     =      12.00    INCHES
POROSITY                      =       0.3970 VOL/VOL
FIELD CAPACITY                =       0.0320 VOL/VOL
WILTING POINT                 =       0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT    =       0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.500000007000E-01 CM/SEC
SLOPE                         =       1.50    PERCENT
DRAINAGE LENGTH               =      50.0     FEET


                         LAYER  3
                         --------

             TYPE 4 - FLEXIBLE MEMBRANE LINER
               MATERIAL TEXTURE NUMBER  35
THICKNESS                     =       0.06    INCHES
POROSITY                      =       0.0000 VOL/VOL
FIELD CAPACITY                =       0.0000 VOL/VOL
WILTING POINT                 =       0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT    =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY           =       1.00    HOLES/ACRE
FML INSTALLATION DEFECTS      =       4.00    HOLES/ACRE
FML PLACEMENT QUALITY         =  3 - GOOD


                         LAYER  4
                         --------

             TYPE 2 - LATERAL DRAINAGE LAYER
               MATERIAL TEXTURE NUMBER   0
THICKNESS                     =      12.00    INCHES
POROSITY                      =       0.3970 VOL/VOL
FIELD CAPACITY                =       0.0320 VOL/VOL
WILTING POINT                 =       0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT    =       0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.500000007000E-01 CM/SEC
SLOPE                         =       1.50    PERCENT
DRAINAGE LENGTH               =     400.0     FEET


                         LAYER  5
                         --------

             TYPE 4 - FLEXIBLE MEMBRANE LINER
```

Sheet 3 of 8

```
                MATERIAL TEXTURE NUMBER  35
THICKNESS                      =       0.06    INCHES
POROSITY                       =       0.0000 VOL/VOL
FIELD CAPACITY                 =       0.0000 VOL/VOL
WILTING POINT                  =       0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT     =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.      =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY            =       1.00    HOLES/ACRE
FML INSTALLATION DEFECTS       =       4.00    HOLES/ACRE
FML PLACEMENT QUALITY          =  3 - GOOD


                          LAYER  6
                          --------

                TYPE 3 - BARRIER SOIL LINER
                MATERIAL TEXTURE NUMBER  16
THICKNESS                      =      36.00    INCHES
POROSITY                       =       0.4270 VOL/VOL
FIELD CAPACITY                 =       0.4180 VOL/VOL
WILTING POINT                  =       0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT     =       0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.      =  0.100000001000E-06 CM/SEC


          GENERAL DESIGN AND EVAPORATIVE ZONE DATA
          ----------------------------------------

 NOTE:  SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER              =    89.50
FRACTION OF AREA ALLOWING RUNOFF     =     0.0     PERCENT
AREA PROJECTED ON HORIZONTAL PLANE   =     2.750   ACRES
EVAPORATIVE ZONE DEPTH               =    16.0     INCHES
INITIAL WATER IN EVAPORATIVE ZONE    =     4.359   INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE   =     7.248   INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE   =     1.360   INCHES
INITIAL SNOW WATER                   =     0.189   INCHES
INITIAL WATER IN LAYER MATERIALS     =    24.299   INCHES
TOTAL INITIAL WATER                  =    24.488   INCHES
TOTAL SUBSURFACE INFLOW              =     0.00    INCHES/YEAR


            EVAPOTRANSPIRATION AND WEATHER DATA
            -----------------------------------

 NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
          HANFORD                WASHINGTON

    STATION LATITUDE                         =  46.55 DEGREES
```

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```
MAXIMUM LEAF AREA INDEX                    =   0.00
START OF GROWING SEASON (JULIAN DATE)      =    103
END OF GROWING SEASON (JULIAN DATE)        =    288
EVAPORATIVE ZONE DEPTH                     =  16.0  INCHES
AVERAGE ANNUAL WIND SPEED                  =   7.60 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY      =  68.20 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY      =  43.30 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY      =  37.10 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY      =  70.10 %
```

NOTE: PRECIPITATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0.57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	0.476	0.622	1.227	0.714	0.467	0.492
	0.402	0.264	0.214	0.351	0.429	0.506
STD. DEVIATIONS	0.341	0.509	0.614	0.395	0.298	0.337
	0.351	0.188	0.100	0.397	0.324	0.243

```
LATERAL DRAINAGE COLLECTED FROM LAYER  2
---------------------------------------
 TOTALS                  0.0609   0.1378   0.3678   0.2224   0.1027   0.0398
                         0.0049   0.0005   0.0008   0.0012   0.0003   0.0143

 STD. DEVIATIONS         0.1821   0.2711   0.5817   0.2771   0.0950   0.0511
                         0.0118   0.0016   0.0019   0.0040   0.0009   0.0776

PERCOLATION/LEAKAGE THROUGH LAYER  3
------------------------------------
 TOTALS                  0.0128   0.0272   0.0640   0.0494   0.0288   0.0125
                         0.0019   0.0003   0.0005   0.0006   0.0002   0.0028

 STD. DEVIATIONS         0.0330   0.0466   0.0884   0.0532   0.0252   0.0153
                         0.0043   0.0009   0.0010   0.0018   0.0005   0.0144

LATERAL DRAINAGE COLLECTED FROM LAYER  4
---------------------------------------
 TOTALS                  0.0050   0.0131   0.0352   0.0490   0.0426   0.0282
                         0.0153   0.0066   0.0029   0.0016   0.0008   0.0008

 STD. DEVIATIONS         0.0162   0.0259   0.0548   0.0553   0.0406   0.0260
                         0.0147   0.0060   0.0022   0.0013   0.0009   0.0023

PERCOLATION/LEAKAGE THROUGH LAYER  6
------------------------------------
 TOTALS                  0.0000   0.0000   0.0000   0.0000   0.0000   0.0000
                         0.0000   0.0000   0.0000   0.0000   0.0000   0.0000

 STD. DEVIATIONS         0.0000   0.0000   0.0000   0.0000   0.0000   0.0000
                         0.0000   0.0000   0.0000   0.0000   0.0000   0.0000


-------------------------------------------------------------------------------
           AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)
-------------------------------------------------------------------------------


DAILY AVERAGE HEAD ON TOP OF LAYER  3
-------------------------------------
 AVERAGES                0.0231   0.0569   0.1393   0.0872   0.0390   0.0156
                         0.0018   0.0002   0.0003   0.0005   0.0001   0.0054

 STD. DEVIATIONS         0.0691   0.1108   0.2199   0.1086   0.0360   0.0200
                         0.0045   0.0006   0.0007   0.0015   0.0004   0.0295

DAILY AVERAGE HEAD ON TOP OF LAYER  5
-------------------------------------
 AVERAGES                0.0152   0.0438   0.1069   0.1536   0.1293   0.0884
                         0.0465   0.0199   0.0089   0.0047   0.0026   0.0026

 STD. DEVIATIONS         0.0492   0.0868   0.1663   0.1734   0.1232   0.0817
                         0.0445   0.0181   0.0071   0.0039   0.0029   0.0069

*******************************************************************************
```

Sheet 6 of 8

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006

	INCHES		CU. FEEI	PERCENI
PRECIPITATION	7.30	(2.032)	72869.0	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	6.165	(1.5248)	61538 23	84.450
LATERAL DRAINAGE COLLECTED FROM LAYER 2	0.95342	(1.10599)	9517.467	13.06106
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.20112	(0.19797)	2007.697	2.75521
AVERAGE HEAD ON IOP OF LAYER 3	0.031	(0.035)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.20106	(0.20134)	2007.043	2.75431
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00006	(0.00006)	0.631	0.00087
AVERAGE HEAD ON TOP OF LAYER 5	0.052	(0.052)		
CHANGE IN WATER SIORAGE	-0.019	(1.4871)	-194 33	-0.267

****

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PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU. FT.)
PRECIPITATION	1.60	15972.000
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 2	0.34444	3438.32593
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.036044	359.81049
AVERAGE HEAD ON TOP OF LAYER 3	3.752	
MAXIMUM HEAD ON TOP OF LAYER 3	4.549	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	21.9 FEET	
DRAINAGE COLLECTED FROM LAYER 4	0.00892	89.07829
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000002	0.02348
AVERAGE HEAD ON TOP OF LAYER 5	0.840	
MAXIMUM HEAD ON TOP OF LAYER 5	1.568	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	26.6 FEET	
SNOW WATER	1.96	19603.2383
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.4530
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0850

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	7.7444	0.2151
2	0.3840	0.0320
3	0.0000	0.0000
4	0.3841	0.0320
5	0.0000	0.0000
6	15.3720	0.4270
SNOW WATER	0.000	

****
****

Sheet 1 of 8

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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                   USAE WATERWAYS EXPERIMENT STATION                      **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORAIORY              **
**                                                                          **
**                                                                          **
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PRECIPITATION DATA FILE:     C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:       C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRAIION DATA:     C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\HANFORD\CN1\3-FLR.D10
OUIPUI DAIA FILE:            C:\HELP3\HANFORD\CN1\3-FLR.OUI


TIME:  14:29     DATE:   9/28/2007


******************************************************************************

     TITLE:  HANFORD FLR: 3%,50',12" GRAV @ 0.05 CM/S, GOOD FML, 3'OPS

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                   TYPE 1 - VERTICAL PERCOLATION LAYER
                       MATERIAL TEXIURE NUMBER   6
           THICKNESS                    =     36.00   INCHES
           POROSITY                     =      0.4530 VOL/VOL
           FIELD CAPACITY               =      0.1900 VOL/VOL
           WILTING POINT                =      0.0850 VOL/VOL
           INITIAL SOIL WATER CONTENT   =      0.2266 VOL/VOL
           EFFECTIVE SAT. HYD. COND.    =  0 720000011000E-03 CM/SEC
```

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Sheet 2 of 8

```
                         LAYER  2
                         --------

              TYPE 2 - LATERAL DRAINAGE LAYER
                MATERIAL TEXTURE NUMBER   0
THICKNESS                    =      12.00    INCHES
POROSITY                     =       0.3970  VOL/VOL
FIELD CAPACITY               =       0.0320  VOL/VOL
WILTING POINT                =       0.0130  VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0320  VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.500000007000E-01 CM/SEC
SLOPE                        =       3.00    PERCENT
DRAINAGE LENGTH              =      50.0     FEET


                         LAYER  3
                         --------

              TYPE 4 - FLEXIBLE MEMBRANE LINER
                MATERIAL TEXTURE NUMBER  35
THICKNESS                    =       0.06    INCHES
POROSITY                     =       0.0000  VOL/VOL
FIELD CAPACITY               =       0.0000  VOL/VOL
WILTING POINT                =       0.0000  VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0000  VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY          =       1.00    HOLES/ACRE
FML INSTALLATION DEFECTS     =       4.00    HOLES/ACRE
FML PLACEMENT QUALITY        =   3 - GOOD


                         LAYER  4
                         --------

              TYPE 2 - LATERAL DRAINAGE LAYER
                MATERIAL TEXTURE NUMBER   0
THICKNESS                    =      12.00    INCHES
POROSITY                     =       0.3970  VOL/VOL
FIELD CAPACITY               =       0.0320  VOL/VOL
WILTING POINT                =       0.0130  VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0320  VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.500000007000E-01 CM/SEC
SLOPE                        =       3.00    PERCENT
DRAINAGE LENGTH              =     200.0     FEET


                         LAYER  5
                         --------

              TYPE 4 - FLEXIBLE MEMBRANE LINER
```

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```
              MATERIAL TEXTURE NUMBER  35
THICKNESS                     =      0.06    INCHES
POROSITY                      =      0.0000 VOL/VOL
FIELD CAPACITY                =      0.0000 VOL/VOL
WILTING POINT                 =      0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT    =      0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY           =      1.00    HOLES/ACRE
FML INSTALLATION DEFECTS      =      4.00    HOLES/ACRE
FML PLACEMENT QUALITY         =  3 - GOOD


                         LAYER  6
                         --------

              TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER  16
THICKNESS                     =     36.00    INCHES
POROSITY                      =      0.4270 VOL/VOL
FIELD CAPACITY                =      0.4180 VOL/VOL
WILTING POINT                 =      0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT    =      0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.     =  0.100000001000E-06 CM/SEC


          GENERAL DESIGN AND EVAPORATIVE ZONE DATA
          ----------------------------------------

NOTE:  SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER             =     89.50
FRACTION OF AREA ALLOWING RUNOFF    =      0.0     PERCENT
AREA PROJECTED ON HORIZONTAL PLANE  =      2.620   ACRES
EVAPORATIVE ZONE DEPTH              =     16.0     INCHES
INITIAL WATER IN EVAPORATIVE ZONE   =      4.359   INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE  =      7.248   INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE  =      1.360   INCHES
INITIAL SNOW WATER                  =      0.189   INCHES
INITIAL WATER IN LAYER MATERIALS    =     24.299   INCHES
TOTAL INITIAL WATER                 =     24.488   INCHES
TOTAL SUBSURFACE INFLOW             =      0.00    INCHES/YEAR


           EVAPOTRANSPIRATION AND WEATHER DATA
           -----------------------------------

NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
         HANFORD                WASHINGTON

     STATION LATITUDE                   =  46.55 DEGREES
```

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```
MAXIMUM LEAF AREA INDEX                        =   0.00
START OF GROWING SEASON (JULIAN DATE)          =    103
END OF GROWING SEASON (JULIAN DATE)            =    288
EVAPORATIVE ZONE DEPTH                         =  16.0  INCHES
AVERAGE ANNUAL WIND SPEED                      =   7.60 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY          =  68.20 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY          =  43.30 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY          =  37.10 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY          =  70.10 %
```

NOTE: PRECIPITATION DATA FOR HANFORD WASHINGTON WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON WAS ENTERED FROM AN ASCII DATA FILE.

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0.57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	0.476	0.622	1.227	0.714	0.467	0.492
	0.402	0.264	0.214	0.351	0.429	0.506
STD. DEVIATIONS	0.341	0.509	0.614	0.395	0.298	0.337
	0.351	0.188	0.100	0.397	0.324	0.243

Sheet 5 of 8

LATERAL DRAINAGE COLLECTED FROM LAYER 2

TOTALS	0.0688	0.1646	0.3949	0.2257	0.1087	0.0414
	0.0047	0.0006	0.0010	0.0014	0.0003	0.0177
STD. DEVIATIONS	0.2042	0.3442	0.5994	0.2678	0.0998	0.0546
	0.0129	0.0020	0.0023	0.0047	0.0010	0.0960

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.0083	0.0180	0.0396	0.0296	0.0177	0.0075
	0.0010	0.0002	0.0003	0.0004	0.0001	0.0020
STD. DEVIATIONS	0.0209	0.0312	0.0526	0.0307	0.0155	0.0095
	0.0026	0.0006	0.0006	0.0012	0.0003	0.0100

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS	0.0063	0.0138	0.0348	0.0342	0.0209	0.0102
	0.0024	0.0003	0.0003	0.0004	0.0002	0.0010
STD. DEVIATIONS	0.0175	0.0246	0.0514	0.0387	0.0185	0.0110
	0.0036	0.0007	0.0006	0.0010	0.0004	0.0048

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	0.0131	0.0344	0.0750	0.0443	0.0206	0.0081
	0.0009	0.0001	0.0002	0.0003	0.0001	0.0034
STD. DEVIATIONS	0.0388	0.0723	0.1138	0.0525	0.0189	0.0107
	0.0024	0.0004	0.0004	0.0009	0.0002	0.0182

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0048	0.0115	0.0264	0.0268	0.0159	0.0080
	0.0018	0.0002	0.0002	0.0003	0.0001	0.0007
STD. DEVIATIONS	0.0133	0.0207	0.0391	0.0303	0.0140	0.0086
	0.0028	0.0005	0.0005	0.0008	0.0003	0.0036

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006

	INCHES		CU. FEET	PERCENT
PRECIPITATION	7.30	(2.032)	69424.3	100.00
RUNOFF	0.000	(0.0000)	0.00	0 000
EVAPOTRANSPIRATION	6.165	(1.5248)	58629.14	84.450
LATERAL DRAINAGE COLLECTED FROM LAYER 2	1.02978	(1.17751)	9793.829	14.10720
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.12476	(0.12118)	1186.508	1.70907
AVERAGE HEAD ON TOP OF LAYER 3	0.017	(0.019)		
LATERAL DRAINAGE COLLECIED FROM LAYER 4	0.12474	(0.12235)	1186.388	1.70889
PERCOLAIION/LEAKAGE IHROUGH LAYER 6	0.00001	(0.00001)	0.121	0.00017
AVERAGE HEAD ON TOP OF LAYER 5	0.008	(0.008)		
CHANGE IN WATER STORAGE	-0 019	(1.4662)	-185.17	-0.267

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PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU. FT.)
PRECIPITATION	1.60	15216.960
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 2	0.49851	4741.11719
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.029578	281.30200
AVERAGE HEAD ON TOP OF LAYER 3	2.934	
MAXIMUM HEAD ON TOP OF LAYER 3	4.121	
LOCATION OF MAXIMUM HEAD IN LAYER 2 (DISTANCE FROM DRAIN)	14.9 FEET	
DRAINAGE COLLECTED FROM LAYER 4	0.01159	110.25708
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000001	0.00809
AVERAGE HEAD ON TOP OF LAYER 5	0.273	
MAXIMUM HEAD ON TOP OF LAYER 5	0.530	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	5.7 FEET	
SNOW WATER	1.96	18676.5391

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4530
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0850

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	7.7444	0.2151
2	0.3840	0.0320
3	0.0000	0.0000
4	0.3840	0.0320
5	0.0000	0.0000
6	15.3720	0.4270
SNOW WATER	0.000	

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****

```
******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**               FOR USEPA RISK REDUCTION ENGINEERING LABORATORY            **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:       C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\HANFORD\CN1\ss-open.D10
OUTPUT DATA FILE:            C:\HELP3\HANFORD\CN1\SS-OPEN.OUT


TIME:  14:35      DATE:   9/28/2007


******************************************************************************

     TITLE:  HANFORD OPEN SIDESLOPE - 33%,255',GEOCOMP,3' OPS,GOOD FML

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                       TYPE 1 - VERTICAL PERCOLATION LAYER
                           MATERIAL TEXTURE NUMBER   6
           THICKNESS                  =      36.00   INCHES
           POROSITY                   =       0.4530 VOL/VOL
           FIELD CAPACITY             =       0.1900 VOL/VOL
           WILTING POINT              =       0.0850 VOL/VOL
           INITIAL SOIL WATER CONTENT =       0.2189 VOL/VOL
           EFFECTIVE SAT. HYD. COND.  =   0.720000011000E-03 CM/SEC
```

Sheet 2 of 8

0.6cm ≈ 0.25"

LAYER 2

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 34

THICKNESS	=	0.50	INCHES
POROSITY	=	0.8500	VOL/VOL
FIELD CAPACITY	=	0.0100	VOL/VOL
WILTING POINT	=	0.0050	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0101	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	33.0000000000	CM/SEC
SLOPE	=	33.00	PERCENT
DRAINAGE LENGTH	=	255.0	FEET

LAYER 3

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.199999996000E-12	CM/SEC
FML PINHOLE DENSITY	=	1.00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	4.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3 - GOOD	

0.6cm ≈ 0.25"

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 34

THICKNESS	=	0.50	INCHES
POROSITY	=	0.8500	VOL/VOL
FIELD CAPACITY	=	0.0100	VOL/VOL
WILTING POINT	=	0.0050	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0100	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	33.0000000000	CM/SEC
SLOPE	=	33.00	PERCENT
DRAINAGE LENGTH	=	255.0	FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER

```
              MATERIAL TEXTURE NUMBER  35
THICKNESS                    =       0.06    INCHES
POROSITY                     =       0.0000 VOL/VOL
FIELD CAPACITY               =       0.0000 VOL/VOL
WILTING POINT                =       0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY          =       1.00    HOLES/ACRE
FML INSTALLATION DEFECTS     =       4.00    HOLES/ACRE
FML PLACEMENT QUALITY        =  3 - GOOD


                        LAYER  6
                        --------

              TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER  16
THICKNESS                    =      36.00    INCHES
POROSITY                     =       0.4270 VOL/VOL
FIELD CAPACITY               =       0.4180 VOL/VOL
WILTING POINT                =       0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND     =  0.100000001000E-06 CM/SEC


           GENERAL DESIGN AND EVAPORATIVE ZONE DATA
           ----------------------------------------

NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
         SOIL DATA BASE USING SOIL TEXTURE # 6 WITH BARE
         GROUND CONDITIONS, A SURFACE SLOPE OF 33.% AND
         A SLOPE LENGTH OF   281. FEET.

SCS RUNOFF CURVE NUMBER            =      86.80
FRACTION OF AREA ALLOWING RUNOFF   =       0.0     PERCENT
AREA PROJECTED ON HORIZONTAL PLANE =       3.000   ACRES
EVAPORATIVE ZONE DEPTH             =      16.0     INCHES
INITIAL WATER IN EVAPORATIVE ZONE  =       4.014   INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE =       7.248   INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE =       1.360   INCHES
INITIAL SNOW WATER                 =       0.189   INCHES
INITIAL WATER IN LAYER MATERIALS   =      23.262   INCHES
TOTAL INITIAL WATER                =      23.451   INCHES
TOTAL SUBSURFACE INFLOW            =       0.00    INCHES/YEAR


           EVAPOTRANSPIRATION AND WEATHER DATA
           -----------------------------------

NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
```

Sheet 4 of 8

HANFORD WASHINGTON

STATION LATITUDE	=	46.55 DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00
START OF GROWING SEASON (JULIAN DATE)	=	103
END OF GROWING SEASON (JULIAN DATE)	=	288
EVAPORATIVE ZONE DEPTH	=	16.0 INCHES
AVERAGE ANNUAL WIND SPEED	=	7 60 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68 20 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	43.30 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	37.10 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	70.10 %

NOTE: PRECIPITATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

****

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0.57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0 000	0 000
EVAPOTRANSPIRATION						
TOTALS	0.486	0.629	1.204	0.692	0.450	0.446
	0.344	0.240	0.196	0.321	0.430	0.503

Sheet 5 of 8

STD. DEVIATIONS	0.338	0.492	0.608	0.385	0.308	0.272
	0.349	0.194	0.118	0.405	0.338	0.237

LATERAL DRAINAGE COLLECTED FROM LAYER 2

TOTALS	0.0860	0.1811	0.3734	0.2232	0.1229	0.0717
	0.0433	0.0305	0.0315	0.0369	0.0431	0.0697
STD. DEVIATIONS	0.1275	0.4189	0.5356	0.2602	0.0973	0.0594
	0.0432	0.0409	0.0339	0.0328	0.0382	0.1087

PERCOLATION/LEAKAGE THROUGH LAYER 3

TOTALS	0.0052	0.0061	0.0108	0.0104	0.0085	0.0060
	0.0040	0.0031	0.0032	0.0038	0.0042	0.0049
STD. DEVIATIONS	0.0053	0.0076	0.0111	0.0084	0.0054	0.0042
	0.0035	0.0033	0.0029	0.0029	0.0033	0.0045

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS	0.0052	0.0061	0.0108	0.0104	0.0085	0.0060
	0.0040	0.0031	0.0032	0.0038	0.0042	0.0049
STD. DEVIATIONS	0.0053	0.0076	0.0111	0.0084	0.0054	0.0042
	0.0035	0.0033	0.0029	0.0029	0.0033	0.0045

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 3

AVERAGES	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0001	0.0001	0.0001	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0000	0.0000	0.0001	0.0001	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Sheet 6 of 8

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****

AVERAGE ANNUAL TOTALS & (STD DEVIAIIONS) FOR YEARS 1955 THROUGH 2006

	INCHES		CU. FEET	PERCENT
PRECIPITATION	7.30	(2.032)	79493.5	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	5.939	(1.5185)	64674.70	81.358
LATERAL DRAINAGE COLLECTED FROM LAYER 2	1.31319	(1.20765)	14300.664	17.98973
PERCOLATION/LEAKAGE THROUGH LAYER 3	0.07019	(0.03864)	764.315	0 96148
AVERAGE HEAD ON TOP OF LAYER 3	0.000	(0.000)		
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.07018	(0.03864)	764.314	0.96148
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00000	(0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 5	0.000	(0.000)		
CHANGE IN WATER STORAGE	-0.023	(1.4326)	-246.20	-0 310

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Sheet 7 of 8

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             PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006
-------------------------------------------------------------------------------
                                                 (INCHES)      (CU. FT.)
                                                ----------   -------------
  PRECIPIIATION                                   1.60        17424.000

  RUNOFF                                          0.000           0.0000

  DRAINAGE COLLECTED FROM LAYER  2                0.70029      7626.13477

  PERCOLATION/LEAKAGE THROUGH LAYER  3            0.004489       48.88398

  AVERAGE HEAD ON TOP OF LAYER  3                 0.005

  MAXIMUM HEAD ON IOP OF LAYER  3                 0.006

  LOCATION OF MAXIMUM HEAD IN LAYER  2
        (DISTANCE FROM DRAIN)                     0.0 FEET

  DRAINAGE COLLECTED FROM LAYER  4                0.00449        48.88398

  PERCOLATION/LEAKAGE IHROUGH LAYER  6            0.000000        0.00000

  AVERAGE HEAD ON TOP OF LAYER  5                 0.001

  MAXIMUM HEAD ON TOP OF LAYER  5                 0.000

  LOCATION OF MAXIMUM HEAD IN LAYER  4
        (DISTANCE FROM DRAIN)                     0.0 FEET

  SNOW WATER                                      1.96        21385.3496


  MAXIMUM VEG. SOIL WATER (VOL/VOL)                      0.4530

  MINIMUM VEG. SOIL WATER (VOL/VOL)                      0.0850

   ***  Maximum heads are computed using McEnroe's equations.   ***

        Reference:  Maximum Saturated Depth over Landfill Liner
                    by Bruce M. McEnroe, University of Kansas
                    ASCE Journal of Environmental Engineering
                    Vol. 119, No. 2, March 1993, pp. 262-270.

*******************************************************************************
```

****

FINAL WATER STORAGE AI END OE YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	7.3686	0.2047
2	0.0050	0.0100
3	0.0000	0.0000
4	0.0050	0.0100
5	0.0000	0.0000
6	15 3720	0.4270
SNOW WAIER	0.000	

****
****

```
******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                   USAE WATERWAYS EXPERIMENT STATION                      **
**              FOR USEPA RISK REDUCTION ENGINEERING LABORATORY             **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:       C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\HANFORD\CN1\15FLR-10.D10
OUTPUT DATA FILE:            C:\HELP3\HANFORD\CN1\15FLR-10.OUT


TIME: 14:30    DATE:  9/28/2007


******************************************************************************

     TITLE:  HF FLR: 1.5%,50',12"GRAV@0.05 CM/S,GOOD FML,3'OPS,10'WASTE

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                       TYPE 1 - VERTICAL PERCOLATION LAYER
                           MATERIAL TEXTURE NUMBER   6
          THICKNESS                  =     12.00   INCHES
          POROSITY                   =      0.4530 VOL/VOL
          FIELD CAPACITY             =      0.1900 VOL/VOL
          WILTING POINT              =      0.0850 VOL/VOL
          INITIAL SOIL WATER CONTENT =      0.3361 VOL/VOL
          EFFECTIVE SAT. HYD. COND.  =  0.720000011000E-03 CM/SEC
```

Sheet 2 of 9

```
                    LAYER  2
                    --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
             MATERIAL TEXTURE NUMBER   5
THICKNESS                  =     120.00    INCHES
POROSITY                   =       0.4570 VOL/VOL
FIELD CAPACITY             =       0.1310 VOL/VOL
WILTING POINT              =       0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT =       0.1288 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =  0.100000005000E-02 CM/SEC


                    LAYER  3
                    --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
             MATERIAL TEXTURE NUMBER   6
THICKNESS                  =      36.00    INCHES
POROSITY                   =       0.4530 VOL/VOL
FIELD CAPACITY             =       0.1900 VOL/VOL
WILTING POINT              =       0.0850 VOL/VOL
INITIAL SOIL WATER CONTENT =       0.1900 VOL/VOL
EFFECTIVE SAT. HYD  COND.  =  0 720000011000E-03 CM/SEC


                    LAYER  4
                    --------

            TYPE 2 - LATERAL DRAINAGE LAYER
             MATERIAL TEXTURE NUMBER   0
THICKNESS                  =      12 00    INCHES
POROSITY                   =       0.3970 VOL/VOL
FIELD CAPACITY             =       0.0320 VOL/VOL
WILTING POINT              =       0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT =       0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =  0.500000007000E-01 CM/SEC
SLOPE                      =       1.50    PERCENT
DRAINAGE LENGTH            =      50.0     FEET


                    LAYER  5
                    --------

            TYPE 4 - FLEXIBLE MEMBRANE LINER
             MATERIAL TEXTURE NUMBER  35
THICKNESS                  =       0.06    INCHES
POROSITY                   =       0.0000 VOL/VOL
FIELD CAPACITY             =       0.0000 VOL/VOL
WILTING POINT              =       0.0000 VOL/VOL
```

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Sheet 3 of 9

```
INITIAL SOIL WATER CONTENT  =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =       1 00    HOLES/ACRE
FML INSTALLATION DEFECTS    =       4.00    HOLES/ACRE
FML PLACEMENT QUALITY       =  3 - GOOD


                         LAYER  6
                         --------

             TYPE 2 - LATERAL DRAINAGE LAYER
               MATERIAL TEXTURE NUMBER   0
THICKNESS                  =      12.00    INCHES
POROSITY                   =       0.3970 VOL/VOL
FIELD CAPACITY             =       0.0320 VOL/VOL
WILTING POINT              =       0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT =       0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND   =  0.500000007000E-01 CM/SEC
SLOPE                      =       1.50    PERCENT
DRAINAGE LENGTH            =     400.0     FEET


                         LAYER  7
                         --------

             TYPE 4 - FLEXIBLE MEMBRANE LINER
               MATERIAL TEXTURE NUMBER  35
THICKNESS                  =       0.06    INCHES
POROSITY                   =       0.0000 VOL/VOL
FIELD CAPACITY             =       0.0000 VOL/VOL
WILTING POINT              =       0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY        =       1.00    HOLES/ACRE
FML INSTALLATION DEFECTS   =       4.00    HOLES/ACRE
FML PLACEMENT QUALITY      =  3 - GOOD


                         LAYER  8
                         --------

               TYPE 3 - BARRIER SOIL LINER
               MATERIAL TEXTURE NUMBER  16
THICKNESS                  =      36.00    INCHES
POROSITY                   =       0.4270 VOL/VOL
FIELD CAPACITY             =       0.4180 VOL/VOL
WILTING POINT              =       0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT =       0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =  0.100000001000E-06 CM/SEC
```

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	89.50	
FRACTION OF AREA ALLOWING RUNOFF	=	0.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	2.750	ACRES
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	4.284	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	7.264	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.252	INCHES
INITIAL SNOW WATER	=	0.189	INCHES
INITIAL WATER IN LAYER MATERIALS	=	42.466	INCHES
TOTAL INITIAL WATER	=	42.655	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
HANFORD WASHINGTON

STATION LATITUDE	=	46.55	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	103	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.20	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	43.30	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	37.10	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	70.10	%

NOTE: PRECIPITATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

Sheet 5 of 9

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AVERAGE MONIHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0 55	0.53	0 53
	0.21	0.16	0.34	0.57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOIALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0 000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0 000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	0.484	0.603	1.210	0.684	0.463	0.539
	0.361	0.241	0.204	0.357	0.442	0.525
STD. DEVIATIONS	0.336	0.489	0.601	0 393	0.300	0.399
	0.299	0.186	0.101	0.397	0.328	0.238
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.0599	0.0575	0.0625	0.0584	0.0879	0.0827
	0.0662	0.0553	0.0544	0.0605	0.0599	0.0628
STD. DEVIATIONS	0.0521	0.0499	0.0453	0.0365	0.1357	0 1278
	0.1056	0.0870	0.0697	0.0650	0.0604	0.0586
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOIALS	0.0204	0.0194	0.0214	0.0202	0.0262	0.0246
	0.0205	0.0177	0.0181	0.0202	0.0200	0.0210
STD. DEVIATIONS	0.0138	0.0129	0.0122	0.0103	0.0265	0.0257
	0.0229	0.0202	0.0168	0.0160	0.0153	0.0151
LATERAL DRAINAGE COLLECTED FROM LAYER 6						
TOTALS	0.0198	0.0187	0.0209	0.0204	0.0227	0.0240
	0.0236	0.0205	0.0185	0.0194	0.0194	0.0205
STD. DEVIATIONS	0.0147	0.0128	0.0132	0.0113	0.0140	0.0209
	0.0227	0.0216	0.0189	0.0172	0.0154	0 0153

PERCOLAIION/LEAKAGE THROUGH LAYER 8

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TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0227	0.0240	0.0237	0.0229	0.0333	0.0324
	0.0251	0.0210	0.0213	0.0230	0.0235	0.0238
STD. DEVIATIONS	0.0198	0.0209	0.0172	0.0143	0.0515	0.0501
	0.0401	0.0330	0.0273	0.0247	0.0237	0.0222

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0602	0.0623	0.0635	0.0638	0.0689	0.0752
	0.0715	0.0622	0.0581	0.0589	0.0609	0.0623
STD. DEVIATIONS	0.0446	0.0430	0.0400	0.0355	0.0424	0.0655
	0.0689	0.0656	0.0591	0.0522	0.0482	0.0465

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006

	INCHES		CU. FEET	PERCENT
PRECIPITATION	7.30	(2.032)	72869.0	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	6.114	(1.5253)	61037.11	83.763
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.76808	(0.78868)	7667.361	10.52211
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.24967	(0.18143)	2492.360	3.42033
AVERAGE HEAD ON TOP OF LAYER 5	0.025	(0.025)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.24840	(0.17933)	2479.621	3.40285
PERCOLATION/LEAKAGE THROUGH	0.00008	(0.00005)	0.822	0.00113

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LAYER 8

AVERAGE HEAD ON TOP OF LAYER 7	0.064 (	0.046)		
CHANGE IN WATER STORAGE	0.169	(1.6624)	1684.12	2.311

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PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU. FT.)
PRECIPITATION	1.60	15972.000
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.02857	285.15463
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.005483	54.73595
AVERAGE HEAD ON TOP OF LAYER 5	0.336	
MAXIMUM HEAD ON TOP OF LAYER 5	0.578	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	7.0 FEET	
DRAINAGE COLLECTED FROM LAYER 6	0.00426	42.51468
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000001	0.01202
AVERAGE HEAD ON TOP OF LAYER 7	0.401	
MAXIMUM HEAD ON TOP OF LAYER 7	0.770	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	15.7 FEET	
SNOW WATER	1.96	19603.2383
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4540	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0783	

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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Sheet 9 of 9

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FINAL WAIER SIORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	3.2511	0.2709
2	20.9122	0.1743
3	7.5275	0.2091
4	0.4012	0.0334
5	0.0000	0.0000
6	0.4212	0.0351
7	0.0000	0.0000
8	15.3720	0.4270
SNOW WAIER	0.000	

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**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                 HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)               **
**                 DEVELOPED BY ENVIRONMENTAL LABORATORY                    **
**                   USAE WATERWAYS EXPERIMENT STATION                      **
**            FOR USEPA RISK REDUCTION ENGINEERING LABORATORY               **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:       C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\HANFORD\CN1\3FLR-10.D10
OUTPUT DATA FILE:            C:\HELP3\HANFORD\CN1\3FLR-10.OUT


TIME:  14:31     DATE:   9/28/2007


******************************************************************************

     TITLE:  HF FLR: 3%,50',12"GRAV@0.05 CM/S,GOOD FML,3'OPS,10' WASTE

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                      TYPE 1 - VERTICAL PERCOLATION LAYER
                          MATERIAL TEXTURE NUMBER   6
           THICKNESS                 =     12.00   INCHES
           POROSITY                  =      0.4530 VOL/VOL
           FIELD CAPACITY            =      0.1900 VOL/VOL
           WILTING POINT             =      0.0850 VOL/VOL
           INITIAL SOIL WATER CONTENT =     0.3361 VOL/VOL
           EFFECTIVE SAT. HYD. COND.  = 0.720000011000E-03 CM/SEC
```

```
                          LAYER  2
                          --------

              TYPE 1 - VERTICAL PERCOLATION LAYER
                  MATERIAL TEXTURE NUMBER   5
THICKNESS                    =     120.00    INCHES
POROSITY                     =       0.4570 VOL/VOL
FIELD CAPACITY               =       0.1310 VOL/VOL
WILTING POINT                =       0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.1288 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.100000005000E-02 CM/SEC


                          LAYER  3
                          --------

              TYPE 1 - VERTICAL PERCOLATION LAYER
                  MATERIAL TEXTURE NUMBER   6
THICKNESS                    =      36.00    INCHES
POROSITY                     =       0.4530 VOL/VOL
FIELD CAPACITY               =       0.1900 VOL/VOL
WILTING POINT                =       0.0850 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.1900 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.720000011000E-03 CM/SEC


                          LAYER  4
                          --------

                TYPE 2 - LATERAL DRAINAGE LAYER
                  MATERIAL TEXTURE NUMBER   0
THICKNESS                    =      12.00    INCHES
POROSITY                     =       0 3970 VOL/VOL
FIELD CAPACITY               =       0.0320 VOL/VOL
WILTING POINT                =       0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.500000007000E-01 CM/SEC
SLOPE                        =       3 00    PERCENT
DRAINAGE LENGTH              =      50.0     FEET


                          LAYER  5
                          --------

                TYPE 4 - FLEXIBLE MEMBRANE LINER
                  MATERIAL TEXTURE NUMBER  35
THICKNESS                    =       0.06    INCHES
POROSITY                     =       0.0000 VOL/VOL
FIELD CAPACITY               =       0.0000 VOL/VOL
WILTING POINT                =       0.0000 VOL/VOL
```

```
INITIAL SOIL WATER CONTENT  =       0.0000 VOL/VOL
EFFECIIVE SAT. HYD. COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =       1.00   HOLES/ACRE
FML INSTALLATION DEFECTS    =       4.00   HOLES/ACRE
FML PLACEMENT QUALIIY       =  3 - GOOD


                      LAYER  6
                      --------

             TYPE 2 - LATERAL DRAINAGE LAYER
              MAIERIAL TEXTURE NUMBER   0
THICKNESS                   =      12.00   INCHES
POROSITY                    =       0.3970 VOL/VOL
FIELD CAPACITY              =       0.0320 VOL/VOL
WILTING POINT               =       0.0130 VOL/VOL
INITIAL SOIL WATER CONIENT  =       0.0320 VOL/VOL
EFFECTIVE SAI. HYD. COND.   =  0.500000007000E-01 CM/SEC
SLOPE                       =       3.00   PERCENT
DRAINAGE LENGTH             =     200.0    FEEI


                      LAYER  7
                      --------

             TYPE 4 - FLEXIBLE MEMBRANE LINER
              MAIERIAL TEXTURE NUMBER  35
THICKNESS                   =       0.06   INCHES
POROSIIY                    =       0.0000 VOL/VOL
FIELD CAPACITY              =       0.0000 VOL/VOL
WILTING POINT               =       0.0000 VOL/VOL
INITIAL SOIL WAIER CONTENT  =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =       1.00   HOLES/ACRE
FML INSTALLATION DEFECTS    =       4.00   HOLES/ACRE
FML PLACEMENT QUALITY       =  3 - GOOD


                      LAYER  8
                      --------

               TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER  16
THICKNESS                   =      36.00   INCHES
POROSITY                    =       0.4270 VOL/VOL
FIELD CAPACIIY              =       0.4180 VOL/VOL
WILTING POINT               =       0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT  =       0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.100000001000E-06 CM/SEC
```

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	89.50	
FRACTION OF AREA ALLOWING RUNOFF	=	0.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	2.620	ACRES
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	4.284	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	7.264	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.252	INCHES
INITIAL SNOW WATER	=	0.189	INCHES
INITIAL WATER IN LAYER MATERIALS	=	42.466	INCHES
TOTAL INITIAL WATER	=	42.655	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
HANFORD WASHINGTON

STATION LATITUDE	=	46.55	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	103	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.20	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	43.30	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	37.10	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	70.10	%

NOTE: PRECIPITATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

****

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0 72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0.57	0.89	1.24
STD DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0 000
EVAPOTRANSPIRATION						
TOTALS	0.484	0.603	1.210	0.684	0.463	0 539
	0.361	0.241	0.204	0.357	0.442	0.525
STD. DEVIATIONS	0.336	0.489	0 601	0.393	0.300	0.399
	0 299	0.186	0.101	0.397	0.328	0.238
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.0673	0.0644	0.0703	0.0658	0.0987	0.0908
	0.0726	0.0614	0.0609	0.0679	0.0670	0.0702
STD. DEVIATIONS	0.0571	0.0544	0.0496	0.0401	0.1519	0 1355
	0.1129	0.0934	0 0753	0.0707	0.0659	0.0637
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOTALS	0.0132	0.0125	0.0138	0 0131	0.0169	0.0156
	0.0129	0.0113	0.0117	0.0131	0.0129	0.0136
STD. DEVIATIONS	0.0087	0.0081	0.0077	0.0065	0.0170	0.0159
	0.0143	0.0126	0.0105	0.0101	0.0097	0.0095
LATERAL DRAINAGE COLLECTED FROM LAYER 6						
TOTALS	0.0130	0.0124	0.0137	0.0131	0.0161	0.0160
	0.0139	0.0116	0.0115	0.0128	0.0128	0.0135
STD. DEVIATIONS	0.0088	0.0082	0.0079	0.0066	0 0134	0.0163
	0.0145	0.0131	0 0108	0.0102	0.0097	0.0097

PERCOLATION/LEAKAGE THROUGH LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0 0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0 0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0128	0.0134	0.0133	0.0129	0.0187	0 0178
	0.0138	0.0117	0.0120	0.0129	0.0131	0.0133
STD. DEVIATIONS	0.0108	0.0114	0.0094	0.0079	0.0288	0.0266
	0.0214	0.0177	0.0148	0.0134	0.0129	0.0121

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0099	0.0104	0.0104	0.0102	0.0122	0.0126
	0.0105	0.0088	0.0090	0.0098	0.0101	0.0103
STD. DEVIATIONS	0.0067	0.0069	0.0060	0.0052	0.0102	0.0128
	0.0110	0.0100	0.0085	0.0077	0.0076	0.0073

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006

	INCHES	CU. FEET	PERCENT
PRECIPITATION	7.30 (2.032)	69424.3	100 00
RUNOFF	0.000 (0.0000)	0.00	0.000
EVAPOTRANSPIRATION	6.114 (1.5253)	58151.72	83.763
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.85737 (0.85624)	8154.128	11 74535
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.16063 (0.11388)	1527.660	2.20047
AVERAGE HEAD ON TOP OF LAYER 5	0.014 (0.014)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.16039 (0.11372)	1525.449	2.19728
PERCOLATION/LEAKAGE THROUGH	0.00002 (0.00001)	0.168	0.00024

Sheet 7 of 9

```
   LAYER  8

 AVERAGE HEAD ON TOP             0.010 (     0 007)
   OF LAYER  7

 CHANGE IN WAIER STORAGE         0.167    (  1.6593)       1592.85       2.294

*******************************************************************************
```

Sheet 8 of 9

****

PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU. FT.)
PRECIPITAITION	1.60	15216 960
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.03090	293.87607
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.003428	32.60663
AVERAGE HEAD ON TOP OF LAYER 5	0.182	
MAXIMUM HEAD ON TOP OF LAYER 5	0.342	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	3.0 FEET	
DRAINAGE COLLECTED FROM LAYER 6	0.00327	31.07392
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000000	0.00257
AVERAGE HEAD ON TOP OF LAYER 7	0.077	
MAXIMUM HEAD ON TOP OF LAYER 7	0.152	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	2.2 FEET	
SNOW WATER	1 96	18676.5391
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4540	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0783	

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

****

****

FINAL WATER STORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	3.2511	0.2709
2	20 9122	0.1743
3	7.5275	0 2091
4	0.3936	0.0328
5	0.0000	0.0000
6	0.3907	0 0326
7	0.0000	0.0000
8	15.3720	0.4270
SNOW WATER	0.000	

****
****

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Sheet 1 of 9

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******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:       C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\HANFORD\CN1\SS-10.D10
OUTPUT DATA FILE:            C:\HELP3\HANFORD\CN1\SS-10.OUT


TIME:  14:32     DATE:   9/28/2007


******************************************************************************

     TITLE:  HANFORD SIDESLOPE-33%,255',GEOCOMP,3' OPS,GOOD FML,10'WASTE

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                 LAYER  1
                                 --------

                      TYPE 1 - VERTICAL PERCOLATION LAYER
                        MATERIAL TEXTURE NUMBER   6
           THICKNESS                   =     12.00   INCHES
           POROSITY                    =      0.4530 VOL/VOL
           FIELD CAPACITY              =      0.1900 VOL/VOL
           WILTING POINT               =      0.0850 VOL/VOL
           INITIAL SOIL WATER CONTENT  =      0.3160 VOL/VOL
           EFFECTIVE SAT. HYD. COND    =  0.720000011000E-03 CM/SEC
```

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```
                          LAYER  2
                          --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
              MATERIAL TEXTURE NUMBER   5
THICKNESS                    =     120.00    INCHES
POROSITY                     =       0.4570 VOL/VOL
FIELD CAPACITY               =       0.1310 VOL/VOL
WILTING POINT                =       0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.1350 VOL/VOL
EFFECTIVE SAT. HYD  COND     =   0.100000005000E-02 CM/SEC


                          LAYER  3
                          --------

          TYPE 1 - VERTICAL PERCOLATION LAYER
              MATERIAL TEXTURE NUMBER   6
THICKNESS                    =      36.00    INCHES
POROSITY                     =       0.4530 VOL/VOL
FIELD CAPACITY               =       0.1900 VOL/VOL
WILTING POINT                =       0.0850 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.1900 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.720000011000E-03 CM/SEC


                          LAYER  4
                          --------

            TYPE 2 - LATERAL DRAINAGE LAYER
              MATERIAL TEXTURE NUMBER  34
THICKNESS                    =       0.50    INCHES
POROSITY                     =       0.8500 VOL/VOL
FIELD CAPACITY               =       0.0100 VOL/VOL
WILTING POINT                =       0.0050 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0100 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =    33.0000000000       CM/SEC
SLOPE                        =      33.00    PERCENT
DRAINAGE LENGTH              =     255.0     FEET


                          LAYER  5
                          --------

            TYPE 4 - FLEXIBLE MEMBRANE LINER
              MATERIAL TEXTURE NUMBER  35
THICKNESS                    =       0.06    INCHES
POROSITY                     =       0.0000 VOL/VOL
FIELD CAPACITY               =       0.0000 VOL/VOL
WILTING POINT                =       0.0000 VOL/VOL
```

.6cm ≈ 0.25"

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```
INITIAL SOIL WATER CONTENT   =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY          =       1.00   HOLES/ACRE
FML INSTALLATION DEFECTS     =       4.00   HOLES/ACRE
FML PLACEMENT QUALITY        =   3 - GOOD


                         LAYER  6
                         --------

              TYPE 2 - LATERAL DRAINAGE LAYER
                MATERIAL TEXTURE NUMBER  34
THICKNESS                    =       0.50   INCHES
POROSITY                     =       0.8500 VOL/VOL
FIELD CAPACITY               =       0.0100 VOL/VOL
WILTING POINT                =       0.0050 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0100 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =    33.0000000000     CM/SEC
SLOPE                        =     33.00    PERCENT
DRAINAGE LENGTH              =     255.0    FEET


                         LAYER  7
                         --------

              TYPE 4 - FLEXIBLE MEMBRANE LINER
                MATERIAL TEXTURE NUMBER  35
THICKNESS                    =       0.06   INCHES
POROSITY                     =       0.0000 VOL/VOL
FIELD CAPACITY               =       0.0000 VOL/VOL
WILTING POINT                =       0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY          =       1.00   HOLES/ACRE
FML INSTALLATION DEFECTS     =       4.00   HOLES/ACRE
FML PLACEMENT QUALITY        =   3 - GOOD


                         LAYER  8
                         --------

              TYPE 3 - BARRIER SOIL LINER
                MATERIAL TEXTURE NUMBER  16
THICKNESS                    =      36.00   INCHES
POROSITY                     =       0.4270 VOL/VOL
FIELD CAPACITY               =       0.4180 VOL/VOL
WILTING POINT                =       0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT   =       0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =   0.100000001000E-06 CM/SEC
```

0.6 cm ≈ 0.25"

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GENERAL DESIGN AND EVAPORAIIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DAIA BASE USING SOIL TEXIURE # 6 WITH BARE GROUND CONDITIONS, A SURFACE SLOPE OF 33.% AND A SLOPE LENGTH OF 281. FEET

SCS RUNOFF CURVE NUMBER	=	86.80	
FRACTION OF AREA ALLOWING RUNOFF	=	0.0	PERCENT
AREA PROJECTED ON HORIZONIAL PLANE	=	3.000	ACRES
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
INIIIAL WATER IN EVAPORATIVE ZONE	=	4.042	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	7.264	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.252	INCHES
INITIAL SNOW WATER	=	0.189	INCHES
INITIAL WATER IN LAYER MATERIALS	=	42.213	INCHES
TOTAL INITIAL WATER	=	42 402	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOIE: EVAPOTRANSPIRATION DAIA WAS OBTAINED FROM HANFORD WASHINGTON

STATION LATITUDE	=	46.55	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	103	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORAIIVE ZONE DEPTH	=	16.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.20	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	43.30	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	37.10	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	70.10	%

NOTE: PRECIPIIAIION DATA FOR HANFORD WASHINGTON WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON WAS ENTERED FROM AN ASCII DATA FILE.

NOIE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON WAS ENTERED FROM AN ASCII DATA FILE.

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0.57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	0.450	0.528	1.110	0.631	0.349	0.341
	0.238	0.175	0.163	0.314	0.395	0.442
STD. DEVIATIONS	0.246	0.358	0.556	0.435	0.251	0.302
	0.213	0.109	0.069	0.351	0.218	0.158
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.1577	0.1456	0.1372	0.1380	0.1532	0.1281
	0.1458	0.1654	0.1657	0.1775	0.1737	0.1747
STD DEVIATIONS	0.0879	0.0699	0.0590	0.1022	0.1882	0.1407
	0.1298	0.1208	0.1106	0.1095	0.0959	0.0928
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOTALS	0.0106	0.0099	0.0099	0.0096	0.0100	0.0088
	0.0098	0.0107	0.0107	0.0114	0.0112	0.0114
STD. DEVIATIONS	0.0043	0.0035	0.0033	0.0036	0.0052	0.0048
	0.0052	0.0051	0.0047	0.0046	0.0039	0.0042
LATERAL DRAINAGE COLLECTED FROM LAYER 6						
TOTALS	0.0106	0.0099	0.0099	0.0096	0.0100	0.0088
	0.0098	0.0107	0.0107	0.0114	0.0112	0.0114
STD. DEVIATIONS	0.0043	0.0035	0.0033	0.0036	0.0052	0.0048
	0.0052	0.0051	0.0047	0.0046	0.0039	0.0042

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PERCOLATION/LEAKAGE THROUGH LAYER  8
-------------------------------------
  TOTALS               0.0000   0.0000   0.0000   0.0000   0.0000   0.0000
                       0.0000   0.0000   0.0000   0.0000   0 0000   0.0000

  STD. DEVIATIONS      0.0000   0.0000   0.0000   0.0000   0.0000   0.0000
                       0 0000   0.0000   0.0000   0.0000   0.0000   0.0000

-------------------------------------------------------------------------------
               AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)
-------------------------------------------------------------------------------

DAILY AVERAGE HEAD ON TOP OF LAYER  5
-------------------------------------
  AVERAGES             0.0000   0.0000   0.0000   0.0000   0.0000   0.0000
                       0.0000   0.0000   0.0000   0.0000   0.0000   0.0000

  STD. DEVIATIONS      0.0000   0.0000   0.0000   0.0000   0.0000   0.0000
                       0.0000   0.0000   0.0000   0.0000   0.0000   0.0000

DAILY AVERAGE HEAD ON TOP OF LAYER  7
-------------------------------------
  AVERAGES             0.0001   0.0001   0.0000   0.0000   0.0000   0.0000
                       0.0000   0.0001   0.0001   0.0001   0.0001   0.0001

  STD. DEVIATIONS      0.0000   0.0000   0.0000   0.0000   0.0000   0.0000
                       0.0000   0.0000   0.0000   0.0000   0.0000   0.0000

*******************************************************************************


*******************************************************************************

     AVERAGE ANNUAL TOIALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006
-------------------------------------------------------------------------------
                                      INCHES            CU. FEET      PERCENI
                                ------------------    ------------   ---------
PRECIPITATION                     7.30   (  2 032)     79493.5      100.00

RUNOFF                            0.000  ( 0.0000)        0.00        0.000

EVAPOTRANSPIRATION                5.135  ( 1.1901)     55923.12      70.349

LATERAL DRAINAGE COLLECTED        1.86250 ( 1.04344)   20282 602     25.51479
  FROM LAYER  4

PERCOLATION/LEAKAGE THROUGH       0.12415 ( 0.04155)    1351.973      1.70073
  LAYER  5

AVERAGE HEAD ON TOP               0.000 (    0.000)
  OF LAYER  5

LATERAL DRAINAGE COLLECTED        0 12415 ( 0.04155)    1351.973      1.70073
```

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  FROM LAYER  6

PERCOLATION/LEAKAGE THROUGH     0.00000 (  0.00000)        0.000     0.00000
  LAYER  8

AVERAGE HEAD ON TOP             0.000 (    0.000)
  OF LAYER  7

CHANGE IN WAIER SIORAGE         0.178    ( 1.4978)      1935.80      2 435

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Sheet 8 of 9

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PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU. FT.)
PRECIPITATION	1.60	17424.000
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.03978	433.16138
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.001070	11 64817
AVERAGE HEAD ON TOP OF LAYER 5	0.000	
MAXIMUM HEAD ON TOP OF LAYER 5	0.000	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	0.0 FEET	
DRAINAGE COLLECTED FROM LAYER 6	0.00107	11.64817
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	
MAXIMUM HEAD ON TOP OF LAYER 7	0.142	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	1.96	21385.3496

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4325
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0782

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	2.8896	0 2408
2	21.8867	0.1824
3	7.7545	0.2154
4	0.0051	0.0102
5	0.0000	0.0000
6	0.0050	0.0100
7	0.0000	0.0000
8	15.3720	0.4270
SNOW WATER	0 000	

****
****

Sheet 1 of 9

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**************************************************************************
**************************************************************************
**                                                                      **
**                                                                      **
**          HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**             HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)               **
**              DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                USAE WATERWAYS EXPERIMENT STATION                     **
**          FOR USEPA RISK REDUCTION ENGINEERING LABORATORY             **
**                                                                      **
**                                                                      **
**************************************************************************
**************************************************************************


PRECIPITATION DATA FILE:      C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:        C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:    C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:      C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:    C:\HELP3\HANFORD\CN1\15FLR-35.D10
OUTPUT DATA FILE:             C:\HELP3\HANFORD\CN1\15FLR-35.OUT


TIME:  14:31      DATE:   9/28/2007


**************************************************************************

     TITLE:  HF FLR: 1.5%,50',12"GRAV@0.05 CM/S,GOOD FML,3'OPS,35'WASTE

**************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                      TYPE 1 - VERTICAL PERCOLATION LAYER
                          MATERIAL TEXTURE NUMBER   6
           THICKNESS                  =     12.00   INCHES
           POROSITY                   =      0.4530 VOL/VOL
           FIELD CAPACITY             =      0.1900 VOL/VOL
           WILTING POINT              =      0.0850 VOL/VOL
           INITIAL SOIL WATER CONTENT =      0.3361 VOL/VOL
           EFFECTIVE SAT. HYD. COND.  =  0.720000011000E-03 CM/SEC
```

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Sheet 2 of 9

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 5

THICKNESS	=	420.00 INCHES
POROSITY	=	0.4570 VOL/VOL
FIELD CAPACITY	=	0.1310 VOL/VOL
WILTING POINT	=	0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1304 VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000005000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 6

THICKNESS	=	36.00 INCHES
POROSITY	=	0.4530 VOL/VOL
FIELD CAPACITY	=	0.1900 VOL/VOL
WILTING POINT	=	0.0850 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1900 VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.720000011000E-03 CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00 INCHES
POROSITY	=	0.3970 VOL/VOL
FIELD CAPACITY	=	0.0320 VOL/VOL
WILTING POINT	=	0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.500000007000E-01 CM/SEC
SLOPE	=	1.50 PERCENT
DRAINAGE LENGTH	=	50.0 FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER
MATERIAL TEXTURE NUMBER 35

THICKNESS	=	0.06 INCHES
POROSITY	=	0.0000 VOL/VOL
FIELD CAPACITY	=	0.0000 VOL/VOL
WILTING POINT	=	0.0000 VOL/VOL

Sheet 3 of 9

```
INITIAL SOIL WATER CONTENT  =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD  COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =       1.00    HOLES/ACRE
FML INSTALLATION DEFECTS    =       4.00    HOLES/ACRE
FML PLACEMENT QUALITY       =  3 - GOOD


                        LAYER  6
                        --------

              TYPE 2 - LATERAL DRAINAGE LAYER
               MATERIAL TEXTURE NUMBER   0
THICKNESS                   =      12.00    INCHES
POROSITY                    =       0.3970 VOL/VOL
FIELD CAPACITY              =       0 0320 VOL/VOL
WILTING POINT               =       0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT  =       0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.500000007000E-01 CM/SEC
SLOPE                       =       1.50    PERCENT
DRAINAGE LENGTH             =     400.0     FEET


                        LAYER  7
                        --------

              TYPE 4 - FLEXIBLE MEMBRANE LINER
               MATERIAL TEXTURE NUMBER  35
THICKNESS                   =       0.06    INCHES
POROSITY                    =       0.0000 VOL/VOL
FIELD CAPACITY              =       0 0000 VOL/VOL
WILTING POINT               =       0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT  =       0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =       1.00    HOLES/ACRE
FML INSTALLATION DEFECTS    =       4 00    HOLES/ACRE
FML PLACEMENT QUALITY       =  3 - GOOD


                        LAYER  8
                        --------

               TYPE 3 - BARRIER SOIL LINER
               MATERIAL TEXTURE NUMBER  16
THICKNESS                   =      36.00    INCHES
POROSITY                    =       0 4270 VOL/VOL
FIELD CAPACITY              =       0 4180 VOL/VOL
WILTING POINT               =       0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT  =       0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.100000001000E-06 CM/SEC
```

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GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	89.50	
FRACTION OF AREA ALLOWING RUNOFF	=	0.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	2.750	ACRES
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	4.284	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	7.264	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.252	INCHES
INITIAL SNOW WATER	=	0.189	INCHES
INITIAL WATER IN LAYER MATERIALS	=	81.766	INCHES
TOTAL INITIAL WATER	=	81.955	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
HANFORD WASHINGTON

STATION LATITUDE	=	46.55	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DATE)	=	103	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	68.20	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	43.30	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	37.10	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	70.10	%

NOTE: PRECIPITATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0.57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	0.484	0.603	1.210	0.684	0.463	0.539
	0.361	0.241	0.204	0.357	0.442	0.525
STD. DEVIATIONS	0.336	0.489	0.601	0.393	0.300	0.399
	0.299	0.186	0.101	0.397	0.328	0.238
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.0362	0.0315	0.0371	0.0388	0.0442	0.0447
	0.0397	0.0326	0.0280	0.0304	0.0319	0.0355
STD. DEVIATIONS	0.0446	0.0391	0.0430	0.0417	0.0464	0.0449
	0.0433	0.0413	0.0392	0.0387	0.0380	0.0419
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOTALS	0.0128	0.0113	0.0133	0.0138	0.0154	0.0154
	0.0138	0.0116	0.0101	0.0111	0.0116	0.0128
STD. DEVIATIONS	0.0133	0.0116	0.0128	0.0124	0.0138	0.0136
	0.0134	0.0127	0.0121	0.0120	0.0119	0.0127
LATERAL DRAINAGE COLLECTED FROM LAYER 6						
TOTALS	0.0123	0.0113	0.0127	0.0130	0.0143	0.0147
	0.0149	0.0135	0.0114	0.0112	0.0111	0.0120
STD. DEVIATIONS	0.0126	0.0116	0.0127	0.0123	0.0129	0.0130
	0.0132	0.0127	0.0120	0.0122	0.0115	0.0121

PERCOLATION/LEAKAGE THROUGH LAYER 8

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TOTALS	0.0000	0.0000	0 0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0 0000	0.0000
	0.0000	0.0000	0 0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0137	0.0132	0.0141	0.0152	0 0168	0.0175
	0.0151	0.0124	0.0110	0.0115	0.0125	0.0135
STD. DEVIATIONS	0 0169	0.0164	0.0163	0.0163	0.0176	0.0176
	0.0164	0 0157	0.0153	0.0147	0.0149	0.0159

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0372	0.0379	0.0385	0.0407	0.0433	0.0461
	0.0454	0.0411	0.0359	0.0340	0.0347	0.0365
STD. DEVIATIONS	0.0383	0.0390	0.0386	0.0387	0 0392	0 0408
	0 0400	0.0386	0.0375	0.0370	0.0362	0 0367

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006

	INCHES		CU. FEET	PERCENT
PRECIPITATION	7.30	(2.032)	72869.0	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	6.114	(1.5253)	61037.11	83 763
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.43062	(0.47101)	4298.646	5.89914
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.15281	(0.14344)	1525.446	2.09341
AVERAGE HEAD ON TOP OF LAYER 5	0.014	(0.015)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0.15238	(0.14399)	1521.145	2 08750
PERCOLATION/LEAKAGE THROUGH	0.00005	(0.00004)	0.525	0.00072

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```
  LAYER  8

AVERAGE HEAD ON TOP               0.039 (     0.037)
  OF LAYER  7

CHANGE IN WATER STORAGE           0 602    (  1.4559)        6011.60       8.250

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PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU. FT.)
PRECIPITATION	1.60	15972.000
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.00587	58.60678
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.001638	16.35556
AVERAGE HEAD ON TOP OF LAYER 5	0.069	
MAXIMUM HEAD ON TOP OF LAYER 5	0.131	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	2.5 FEET	
DRAINAGE COLLECTED FROM LAYER 6	0.00159	15.87103
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000000	0.00493
AVERAGE HEAD ON TOP OF LAYER 7	0.150	
MAXIMUM HEAD ON TOP OF LAYER 7	0.294	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	7.5 FEET	
SNOW WATER	1.96	19603.2383
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4540	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0783	

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	3 2511	0.2709
2	74.0310	0 1763
3	7.1858	0.1996
4	0.3881	0.0323
5	0.0000	0.0000
6	0.3959	0.0330
7	0.0000	0.0000
8	15 3720	0.4270
SNOW WATER	0.000	

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******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:       C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\HANFORD\CN1\HANFORD2.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\HANFORD\CN1\3FLR-35.D10
OUTPUT DATA FILE:            C:\HELP3\HANFORD\CN1\3FLR-35.OUT


TIME:  14:32      DATE:   9/28/2007


******************************************************************************

     TITLE:  HF FLR: 3%,50',12"GRAV@0.05 CM/S,GOOD FML,3'OPS,35' WASTE

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                      TYPE 1 - VERTICAL PERCOLATION LAYER
                          MATERIAL TEXTURE NUMBER   6
          THICKNESS                    =       12.00    INCHES
          POROSITY                     =        0.4530 VOL/VOL
          FIELD CAPACITY               =        0.1900 VOL/VOL
          WILTING POINT                =        0.0850 VOL/VOL
          INITIAL SOIL WATER CONTENT   =        0.3361 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.720000011000E-03 CM/SEC
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                         LAYER  2
                         --------

              TYPE 1 - VERTICAL PERCOLATION LAYER
                  MATERIAL TEXTURE NUMBER   5
THICKNESS                    =    420.00   INCHES
POROSITY                     =      0.4570 VOL/VOL
FIELD CAPACITY               =      0.1310 VOL/VOL
WILTING POINT                =      0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.1304 VOL/VOL
EFFECTIVE SAT. HYD  COND.    =  0.100000005000E-02 CM/SEC


                         LAYER  3
                         --------

              TYPE 1 - VERTICAL PERCOLATION LAYER
                  MATERIAL TEXTURE NUMBER   6
THICKNESS                    =     36.00   INCHES
POROSITY                     =      0.4530 VOL/VOL
FIELD CAPACITY               =      0.1900 VOL/VOL
WILTING POINT                =      0.0850 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.1900 VOL/VOL
EFFECTIVE SAT. HYD. COND     =  0.720000011000E-03 CM/SEC


                         LAYER  4
                         --------

                TYPE 2 - LATERAL DRAINAGE LAYER
                  MATERIAL TEXTURE NUMBER   0
THICKNESS                    =     12.00   INCHES
POROSITY                     =      0.3970 VOL/VOL
FIELD CAPACITY               =      0.0320 VOL/VOL
WILTING POINT                =      0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT   =      0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.    =  0.500000007000E-01 CM/SEC
SLOPE                        =      3.00   PERCENT
DRAINAGE LENGTH              =     50.0    FEET


                         LAYER  5
                         --------

                TYPE 4 - FLEXIBLE MEMBRANE LINER
                  MATERIAL TEXTURE NUMBER  35
THICKNESS                    =      0.06   INCHES
POROSITY                     =      0.0000 VOL/VOL
FIELD CAPACITY               =      0.0000 VOL/VOL
WILTING POINT                =      0.0000 VOL/VOL
```

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```
INITIAL SOIL WATER CONTENT  =      0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0 199999996000E-12 CM/SEC
FML PINHOLE DENSIIY         =      1.00   HOLES/ACRE
FML INSTALLATION DEFECIS    =      4.00   HOLES/ACRE
FML PLACEMENI QUALITY       =  3 - GOOD


                      LAYER  6
                      --------

            TYPE 2 - LATERAL DRAINAGE LAYER
              MATERIAL TEXTURE NUMBER   0
THICKNESS                   =     12.00   INCHES
POROSITY                    =      0 3970 VOL/VOL
FIELD CAPACITY              =      0.0320 VOL/VOL
WILTING POINI               =      0.0130 VOL/VOL
INITIAL SOIL WATER CONTENT  =      0.0320 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.500000007000E-01 CM/SEC
SLOPE                       =      3.00   PERCENT
DRAINAGE LENGTH             =    200 0    FEET


                      LAYER  7
                      --------

            IYPE 4 - FLEXIBLE MEMBRANE LINER
              MATERIAL TEXTURE NUMBER  35
THICKNESS                   =      0.06   INCHES
POROSITY                    =      0.0000 VOL/VOL
FIELD CAPACIIY              =      0.0000 VOL/VOL
WILTING POINI               =      0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT  =      0.0000 VOL/VOL
EFFECTIVE SAT. HYD  COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =      1.00   HOLES/ACRE
FML INSTALLATION DEFECIS    =      4.00   HOLES/ACRE
FML PLACEMENT QUALIIY       =  3 - GOOD


                      LAYER  8
                      --------

              TYPE 3 - BARRIER SOIL LINER
              MATERIAL TEXTURE NUMBER  16
THICKNESS                   =     36.00   INCHES
POROSITY                    =      0 4270 VOL/VOL
FIELD CAPACITY              =      0.4180 VOL/VOL
WILTING POINT               =      0.3670 VOL/VOL
INITIAL SOIL WATER CONIENI  =      0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.100000001000E-06 CM/SEC
```

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GENERAL DESIGN AND EVAPORAIIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS USER-SPECIFIED.

SCS RUNOFF CURVE NUMBER	=	89.50	
FRACTION OF AREA ALLOWING RUNOFF	=	0.0	PERCENI
AREA PROJECIED ON HORIZONTAL PLANE	=	2.620	ACRES
EVAPORATIVE ZONE DEPTH	=	16.0	INCHES
INITIAL WATER IN EVAPORAIIVE ZONE	=	4.284	INCHES
UPPER LIMIT OF EVAPORATIVE S1ORAGE	=	7.264	INCHES
LOWER LIMIT OF EVAPORAIIVE STORAGE	=	1.252	INCHES
INITIAL SNOW WAIER	=	0.189	INCHES
INITIAL WATER IN LAYER MATERIALS	=	81.766	INCHES
TOTAL INITIAL WATER	=	81.955	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOIRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OD1AINED FROM
HANFORD WASHINGTON

STATION LATITUDE	=	46.55	DEGREES
MAXIMUM LEAF AREA INDEX	=	0.00	
START OF GROWING SEASON (JULIAN DAIE)	=	103	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORAIIVE ZONE DEPTH	=	16.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	7.60	MPH
AVERAGE 1ST QUARTER RELAIIVE HUMIDITY	=	68.20	%
AVERAGE 2ND QUAR1ER RELATIVE HUMIDI1Y	=	43.30	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	37.10	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	70.10	%

NOTE: PRECIPITATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR HANFORD WASHINGTON
WAS ENTERED FROM AN ASCII DATA FILE

Sheet 5 of 9

****

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0 57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0 45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0 000	0.000	0 000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	0.484	0.603	1.210	0.684	0.463	0.539
	0.361	0.241	0.204	0 357	0.442	0.525
STD. DEVIATIONS	0.336	0.489	0.601	0.393	0 300	0.399
	0.299	0.186	0.101	0.397	0.328	0.238
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.0407	0.0354	0.0420	0.0438	0.0499	0.0500
	0.0442	0.0363	0.0316	0.0343	0.0361	0.0402
STD. DEVIATIONS	0.0495	0.0432	0.0477	0.0462	0.0515	0.0497
	0.0481	0.0457	0.0434	0.0429	0.0424	0.0466
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOTALS	0.0083	0.0073	0.0086	0.0090	0.0100	0.0099
	0.0088	0.0074	0.0066	0.0072	0.0075	0.0083
STD DEVIATIONS	0.0085	0.0074	0.0082	0.0079	0.0088	0.0086
	0.0086	0.0081	0.0078	0.0077	0.0076	0.0081
LATERAL DRAINAGE COLLECTED FROM LAYER 6						
TOTALS	0.0083	0.0074	0.0084	0.0088	0.0098	0.0099
	0.0092	0.0078	0.0066	0.0071	0.0074	0.0082
STD. DEVIATIONS	0 0084	0.0075	0.0081	0.0079	0.0086	0.0086
	0.0085	0 0083	0.0078	0.0078	0.0075	0.0081

PERCOLATION/LEAKAGE THROUGH LAYER 8

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TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0 0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0 0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0077	0.0074	0.0080	0.0086	0.0095	0.0098
	0.0084	0.0069	0.0062	0.0065	0.0071	0.0076
STD. DEVIATIONS	0.0094	0.0091	0.0090	0.0091	0.0098	0.0097
	0.0091	0 0087	0.0085	0.0081	0.0083	0.0088

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0063	0.0062	0.0064	0.0069	0.0074	0.0078
	0.0070	0 0060	0.0052	0.0054	0.0058	0.0062
STD DEVIATIONS	0.0064	0.0063	0.0062	0.0062	0.0065	0.0068
	0.0065	0.0063	0.0061	0.0059	0.0059	0.0061

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006

	INCHES		CU. FEET	PERCENT
PRECIPITATION	7.30	(2.032)	69424.3	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	6.114	(1.5253)	58151.72	83.763
LATERAL DRAINAGE COLLECTED FROM LAYER 4	0.48456	(0.52209)	4608.444	6.63808
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.09893	(0.09166)	940.855	1.35522
AVERAGE HEAD ON TOP OF LAYER 5	0.008	(0.008)		
LATERAL DRAINAGE COLLECTED FROM LAYER 6	0 09885	(0.09189)	940.084	1.35411
PERCOLATION/LEAKAGE THROUGH	0.00001	(0.00001)	0.114	0.00016

Sheet 7 of 9

LAYER 8				
AVERAGE HEAD ON TOP OF LAYER 7	0.006 (	0 006)		
CHANGE IN WATER STORAGE	0.602	(1.4563)	5723.95	8.245

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PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU FT.)
PRECIPITATION	1.60	15216.960
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.00650	61.79332
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.001045	9.93560
AVERAGE HEAD ON TOP OF LAYER 5	0.038	
MAXIMUM HEAD ON TOP OF LAYER 5	0.075	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	0.9 FEET	
DRAINAGE COLLECTED FROM LAYER 6	0.00103	9.83923
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000000	0.00095
AVERAGE HEAD ON TOP OF LAYER 7	0.024	
MAXIMUM HEAD ON TOP OF LAYER 7	0.048	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	3.7 FEET	
SNOW WATER	1.96	18676.5391
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4540	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0783	

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No 2, March 1993, pp. 262-270.

****

****

FINAL WATER STORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	3.2511	0.2709
2	74 0310	0.1763
3	7.1858	0.1996
4	0.3864	0.0322
5	0.0000	0.0000
6	0.3862	0.0322
7	0.0000	0.0000
8	15.3720	0.4270
SNOW WATER	0 000	

****
****

Sheet 1 of 9

```
****************************************************************************
****************************************************************************
**                                                                        **
**                                                                        **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE             **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)              **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                 **
**                    USAE WATERWAYS EXPERIMENT STATION                   **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY            **
**                                                                        **
**                                                                        **
****************************************************************************
****************************************************************************


PRECIPITATION DATA FILE:      C:\HELP3\HANFORD\CN1\PREC31.D4
TEMPERATURE DATA FILE:        C:\HELP3\HANFORD\CN1\TEMP31.D7
SOLAR RADIATION DATA FILE:    C:\HELP3\HANFORD\CN1\RAD31.D13
EVAPOTRANSPIRATION DATA:      C:\HELP3\HANFORD\CN1\HANFORD2 D11
SOIL AND DESIGN DATA FILE:    C:\HELP3\HANFORD\CN1\SS-35.D10
OUTPUT DATA FILE:             C:\HELP3\HANFORD\CN1\SS-35.OUT


TIME:  14:33      DATE:   9/28/2007


****************************************************************************

     TITLE:  HANFORD SIDESLOPE-33%,255',GEOCOMP,3' OPS,GOOD FML,35'WASTE

****************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                      TYPE 1 - VERTICAL PERCOLATION LAYER
                          MATERIAL TEXTURE NUMBER   6
          THICKNESS                  =      12.00   INCHES
          POROSITY                   =       0.4530 VOL/VOL
          FIELD CAPACITY             =       0.1900 VOL/VOL
          WILTING POINT              =       0.0850 VOL/VOL
          INITIAL SOIL WATER CONTENT =       0.3160 VOL/VOL
          EFFECTIVE SAT. HYD. COND   =  0.720000011000E-03 CM/SEC
```

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```
                         LAYER  2
                         --------

             TYPE 1 - VERTICAL PERCOLATION LAYER
                 MATERIAL TEXTURE NUMBER    5
THICKNESS                  =     420.00    INCHES
POROSITY                   =        0.4570 VOL/VOL
FIELD CAPACITY             =        0.1310 VOL/VOL
WILTING POINT              =        0.0580 VOL/VOL
INITIAL SOIL WATER CONTENT =        0.1321 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =  0 100000005000E-02 CM/SEC


                         LAYER  3
                         --------

             TYPE 1 - VERTICAL PERCOLATION LAYER
                 MATERIAL TEXTURE NUMBER    6
THICKNESS                  =       36.00    INCHES
POROSITY                   =        0.4530 VOL/VOL
FIELD CAPACITY             =        0.1900 VOL/VOL
WILTING POINT              =        0.0850 VOL/VOL
INITIAL SOIL WATER CONTENT =        0.1900 VOL/VOL
EFFECTIVE SAT. HYD  COND.  =  0.720000011000E-03 CM/SEC


                         LAYER  4
                         --------

               TYPE 2 - LATERAL DRAINAGE LAYER
                 MATERIAL TEXTURE NUMBER  34
THICKNESS                  =        0.50    INCHES
POROSITY                   =        0.8500 VOL/VOL
FIELD CAPACITY             =        0.0100 VOL/VOL
WILTING POINT              =        0.0050 VOL/VOL
INITIAL SOIL WATER CONTENT =        0.0100 VOL/VOL
EFFECTIVE SAT. HYD. COND.  =   33.0000000000       CM/SEC
SLOPE                      =       33.00    PERCENT
DRAINAGE LENGTH            =     255.0      FEET


                         LAYER  5
                         --------

               TYPE 4 - FLEXIBLE MEMBRANE LINER
                 MATERIAL TEXTURE NUMBER  35
THICKNESS                  =        0.06    INCHES
POROSITY                   =        0.0000 VOL/VOL
FIELD CAPACITY             =        0.0000 VOL/VOL
WILTING POINT              =        0.0000 VOL/VOL
```

```
INITIAL SOIL WATER CONTENT  =        0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =        1.00   HOLES/ACRE
FML INSTALLATION DEFECTS    =        4.00   HOLES/ACRE
FML PLACEMENT QUALITY       =  3 - GOOD


                          LAYER  6
                          --------

              TYPE 2 - LATERAL DRAINAGE LAYER
                MATERIAL TEXTURE NUMBER  34
THICKNESS                   =        0.50   INCHES
POROSITY                    =        0.8500 VOL/VOL
FIELD CAPACITY              =        0.0100 VOL/VOL
WILTING POINT               =        0.0050 VOL/VOL
INITIAL SOIL WATER CONTENT  =        0.0100 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =   33.0000000000       CM/SEC
SLOPE                       =       33.00   PERCENT
DRAINAGE LENGTH             =      255.0    FEET


                          LAYER  7
                          --------

              TYPE 4 - FLEXIBLE MEMBRANE LINER
                MATERIAL TEXTURE NUMBER  35
THICKNESS                   =        0.06   INCHES
POROSITY                    =        0.0000 VOL/VOL
FIELD CAPACITY              =        0.0000 VOL/VOL
WILTING POINT               =        0.0000 VOL/VOL
INITIAL SOIL WATER CONTENT  =        0.0000 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.199999996000E-12 CM/SEC
FML PINHOLE DENSITY         =        1.00   HOLES/ACRE
FML INSTALLATION DEFECTS    =        4.00   HOLES/ACRE
FML PLACEMENT QUALITY       =  3 - GOOD


                          LAYER  8
                          --------

                TYPE 3 - BARRIER SOIL LINER
                MATERIAL TEXTURE NUMBER  16
THICKNESS                   =       36.00   INCHES
POROSITY                    =        0.4270 VOL/VOL
FIELD CAPACITY              =        0.4180 VOL/VOL
WILTING POINT               =        0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT  =        0.4270 VOL/VOL
EFFECTIVE SAT. HYD. COND.   =  0.100000001000E-06 CM/SEC
```

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Sheet 4 of 9

```
              GENERAL DESIGN AND EVAPORATIVE ZONE DATA
              ----------------------------------------

     NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
              SOIL DATA BASE USING SOIL TEXTURE # 6 WITH BARE
              GROUND CONDITIONS, A SURFACE SLOPE OF 33.% AND
              A SLOPE LENGTH OF  281. FEET.

    SCS RUNOFF CURVE NUMBER              =       86.80
    FRACTION OF AREA ALLOWING RUNOFF     =        0.0    PERCENT
    AREA PROJECTED ON HORIZONTAL PLANE   =        3.000  ACRES
    EVAPORATIVE ZONE DEPTH               =       16.0    INCHES
    INITIAL WATER IN EVAPORATIVE ZONE    =        4.042  INCHES
    UPPER LIMIT OF EVAPORATIVE STORAGE   =        7.264  INCHES
    LOWER LIMIT OF EVAPORATIVE STORAGE   =        1.252  INCHES
    INITIAL SNOW WATER                   =        0.189  INCHES
    INITIAL WATER IN LAYER MATERIALS     =       81.514  INCHES
    TOTAL INITIAL WATER                  =       81.703  INCHES
    TOTAL SUBSURFACE INFLOW              =        0.00   INCHES/YEAR


               EVAPOTRANSPIRATION AND WEATHER DATA
               -----------------------------------

     NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
              HANFORD              WASHINGTON

         STATION LATITUDE                          =  46.55 DEGREES
         MAXIMUM LEAF AREA INDEX                   =   0.00
         START OF GROWING SEASON (JULIAN DATE)     =    103
         END OF GROWING SEASON (JULIAN DATE)       =    288
         EVAPORATIVE ZONE DEPTH                    =  16.0  INCHES
         AVERAGE ANNUAL WIND SPEED                 =   7.60 MPH
         AVERAGE 1ST QUARTER RELATIVE HUMIDITY     =  68.20 %
         AVERAGE 2ND QUARTER RELATIVE HUMIDITY     =  43.30 %
         AVERAGE 3RD QUARTER RELATIVE HUMIDITY     =  37.10 %
         AVERAGE 4TH QUARTER RELATIVE HUMIDITY     =  70.10 %


     NOTE:  PRECIPITATION DATA FOR     HANFORD             WASHINGTON
              WAS ENTERED FROM AN ASCII DATA FILE.


     NOTE:  TEMPERATURE DATA FOR     HANFORD             WASHINGTON
              WAS ENTERED FROM AN ASCII DATA FILE.


     NOTE:  SOLAR RADIATION DATA FOR     HANFORD             WASHINGTON
              WAS ENTERED FROM AN ASCII DATA FILE.
```

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Sheet 5 of 9

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1955 THROUGH 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	1.01	0.72	0.56	0.55	0.53	0.53
	0.21	0.16	0.34	0.57	0.89	1.24
STD. DEVIATIONS	0.63	0.48	0.45	0.50	0.34	0.42
	0.32	0.24	0.33	0.52	0.63	0.86
RUNOFF						
TOTALS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
STD. DEVIATIONS	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION						
TOTALS	0.450	0.528	1.110	0.631	0.349	0.341
	0.238	0.175	0.163	0.314	0.395	0.442
STD. DEVIATIONS	0.246	0.358	0.556	0.435	0.251	0.302
	0.213	0.109	0.069	0.351	0.218	0.158
LATERAL DRAINAGE COLLECTED FROM LAYER 4						
TOTALS	0.1193	0.1167	0.1263	0.1108	0.1155	0.1038
	0.1071	0.0985	0.0907	0.0967	0.1097	0.1209
STD. DEVIATIONS	0.1048	0.0890	0.0885	0.0832	0.0868	0.0825
	0.0847	0.0936	0.0980	0.0984	0.0969	0.1087
PERCOLATION/LEAKAGE THROUGH LAYER 5						
TOTALS	0.0083	0.0081	0.0090	0.0083	0.0085	0.0078
	0.0081	0.0077	0.0068	0.0074	0.0080	0.0085
STD. DEVIATIONS	0.0055	0.0050	0.0052	0.0047	0.0050	0.0049
	0.0049	0.0049	0.0053	0.0050	0.0050	0.0054
LATERAL DRAINAGE COLLECTED FROM LAYER 6						
TOTALS	0.0083	0.0081	0.0090	0.0083	0.0085	0.0078
	0.0081	0.0077	0.0068	0.0074	0.0080	0.0085
STD. DEVIATIONS	0.0055	0.0050	0.0052	0.0047	0.0050	0.0049
	0.0049	0.0049	0.0053	0.0050	0.0050	0.0054

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PERCOLAIION/LEAKAGE THROUGH LAYER 8

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0 0000	0.0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONIHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0 0000	0.0000	0.0000	0.0000	0.0000
STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0 0000	0.0000	0.0000	0.0000	0.0000	0.0000

DAILY AVERAGE HEAD ON TOP OF LAYER 7

AVERAGES	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0 0000	0 0000	0.0000
STD DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

****

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1955 THROUGH 2006

	INCHES		CU. FEET	PERCENT
PRECIPITATION	7.30	(2.032)	79493 5	100.00
RUNOFF	0.000	(0.0000)	0.00	0.000
EVAPOTRANSPIRATION	5.135	(1.1901)	55923.12	70.349
LATERAL DRAINAGE COLLECTED FROM LAYER 4	1.31594	(0.99454)	14330.568	18.02735
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.09641	(0.05608)	1049 882	1.32071
AVERAGE HEAD ON TOP OF LAYER 5	0.000	(0.000)		
LATERAL DRAINAGE COLLECTED	0.09641	(0.05608)	1049.881	1.32071

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FROM LAYER 6			
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.00000 (0.00000)	0.000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000 (0.000)		
CHANGE IN WATER STORAGE	0.752 (1.8036)	8189.92	10.303

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PEAK DAILY VALUES FOR YEARS 1955 THROUGH 2006

	(INCHES)	(CU. FT.)
PRECIPITATION	1.60	17424.000
RUNOFF	0.000	0.0000
DRAINAGE COLLECTED FROM LAYER 4	0.01871	203.77544
PERCOLATION/LEAKAGE THROUGH LAYER 5	0.000790	8.59934
AVERAGE HEAD ON TOP OF LAYER 5	0.000	
MAXIMUM HEAD ON TOP OF LAYER 5	0.093	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	0.0 FEET	
DRAINAGE COLLECTED FROM LAYER 6	0.00079	8.59934
PERCOLATION/LEAKAGE THROUGH LAYER 8	0.000000	0.00000
AVERAGE HEAD ON TOP OF LAYER 7	0.000	
MAXIMUM HEAD ON TOP OF LAYER 7	0.122	
LOCATION OF MAXIMUM HEAD IN LAYER 6 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	1.96	21385.3496

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.4325

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0782

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 2006

LAYER	(INCHES)	(VOL/VOL)
1	2 8896	0.2408
2	78.9820	0.1881
3	7 7631	0.2156
4	0 0051	0.0101
5	0.0000	0.0000
6	0.0050	0.0100
7	0 0000	0.0000
8	15.3720	0.4270
SNOW WATER	0.000	

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APPENDIX B

LEACHATE TANK CAPACITY CALCULATION – 0060-SC-T-002

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-T-002
Discipline:	Civil		
Subject:	Leachate Tank Capacity Calculations		
Computer Program:			
Computer Program Version:			

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation X Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 1 sheet Att. 1 - 2 sheets Total = 4 sheets	Steve Niehoff	Mark Sieracke	Brian Horvath	John Briest	7/28/07 7/29/2007

Summary of Revisions	

Page 100 of 345

Sheet 1 of 1
File No. 2186-351-11
Calculation No. 0060-SC-T-002

Weaver Boos Consultants, LLC

Made By	SN	Date	07/09/07	Subject	Leachate Storage Tank Calculation
Chkd By	JB	Date	07/09/07		Hanford ERDF

Objective: To verify that the existing storage tanks continue to provide the storage capacity required to meet the storage requirement criteria specified in the design analysis.

Methods: The required leachate storage tank capacity will be based on the 25-year, 24-hour storm event for a one lined, open cell. References are shown below:

ERDF Cells 5 & 6 Design Analysis Variance Report (CCN 117640)
Constuction Subcontract Drawings prepared for Delhur Industries, Inc. - Subcontract No.: 0600X-SC-G0002. Section 13205 - Lined Bolted Steel Liquid Storage Tanks
Design Analysis (BHI-00355, Rev. 0)

Given: The following parameters are used to perform the storage tank calculations:

Area of one lined cell =	8.36 acres (Cells 7-10)	(8.3551 rounded to 8.36 acres)
25-year, 24-hour storm event =	1.28 inches (from ERDF Cells 5 & 6 DAVR)	
Height of existing storage tank =	8.12 feet	
Diameter of existing storage tank =	81 feet	

Assume tanks are completely empty for calculating factors of safety.

Calculations: The required leachate storage volume is calculated by assuming that all of the precipitation from the 25-year, 24-hour storm is captured in a single lined cell. This volume is calculated as shown below:

25-year, 24-hour storm event =	1.28 inches	=	0.11 ft	
Area of one lined, open cell =	8.36 acres	=	363948 ft^2	(uses 8.3551 acres)
Volume of leachate from one open cell =	38,821 ft^3			

The available storage volume in the each of the existing leachate storage tanks is then calculated as shown

Diameter of storage tank =	81 feet
Cross-sectional area =	5,153 square feet
Maximum leachate height in tank	6 feet (assume 2' freeboard in tank)
Volume of each storage tank =	30,918 ft^3
Number of storage tanks =	2
Total available storage volume =	61,836 ft^3

The factor of safety is calculated by dividing the available volume in the leachate storage tanks by the calculated volume of leachate storage needed:

FS = 1.59

The available leachate storage tank is adequate to contain the calculated volume.

The factor of safety including the open cell plus leachate pumped from the cells: (This information was provided WCH on 9/25/07)

Volume of leachate from one open cell=	38,821 ft^3	
Volume of leachate pumped from cells=	6,016 ft^3	As provided by WCH: 9 cells at 5,000 gal/week/cell
	44,837 ft^3	
Total Available Storage=	61,836 ft^3	

FS= 1.38

C:\Documents and Settings\khudnut.WEAVERBOOS\Local Settings\Temporary Internet Files\OLK1\tank volume

U. S. DEPARTMENT OF ENERGY - HANFORD SITE
BECHTEL HANFORD, INC. - ENVIRONMENTAL REMEDIATION PROGRAM
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)
PROJECT NO. W-296
CONSTRUCTION SUBCONTRACT DRAWINGS PREPARED FOR:
DELHUR INDUSTRIES, INC. - SUBCONTRACT NO.: 0600X-SC-G0002
SECTION 13205 - LINED BOLTED STEEL LIQUID STORAGE TANKS

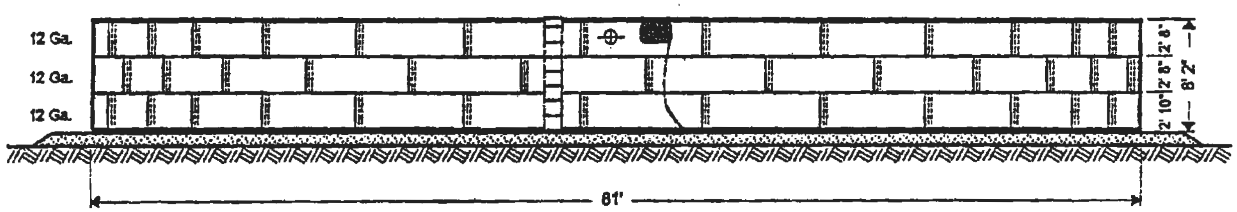
INDEX TO SUBMITTAL DRAWINGS

SK NO.	REVISION	DESCRIPTION
950518-S0	-	INDEX TO SUBMITTAL DRAWINGS
950518-S1	-	81' DIAMETER TANK ELEVATIONS
950518-S2	-	30' DIAMETER TANK ELEVATION
950518-S3	-	LEACHATE TANK NO. 1 PLAN - LINER AND PIPING DETAILS
950518-S4	-	LEACHATE TANK NO. 2 PLAN - LINER AND PIPING DETAILS
950518-S5	-	WASHWATER TANK PLAN - LINER AND PIPING DETAILS
950518-S6	-	LEACHATE TANK NO. 1 - FLOATING COVER PLAN
950518-S7	-	LEACHATE TANK NO. 2 - FLOATING COVER PLAN
950518-S8	-	LEACHATE TANK SECTION
950518-S9	-	DUAL CONTAINMENT PIPE CONNECTION DETAILS
950518-S10	-	DUCTILE IRON PIPE CONNECTION DETAILS
950518-S11	-	WIND ANCHOR DETAIL
950518-S12	-	SITE PREPARATION RECOMMENDATIONS

Attachment 1 (1 of 2)

ENVIRONETICS, INC.
1201 Commerce Street
Lockport, Illinois 60441
Tel.: (815) 838-8331
Fax: (815) 838-8336

SK# 950518-S0
Date: 5/18/95
Drawn By: WSJ
Scale: NTS



PORTA TANK™ ELEVATION
(2) UNITS REQUIRED

Design Specifications:

Shell Design:
AWWA D-103-87
Specific Gravity:
1.00
Wind Load:
70 MPH
Bearing Load:
1165 psf
Seismic Design:
Zone 2 Per AWWA D-103-87

Material Specifications:

Wall Panel Steel:
ASTM A446 Grade "D", Minimum Yield Strength 50,000 psi
Factory Coating:
ENV-0516-01 (5 Mil Polyester Powdercoat Finish)
Structural Fasteners:
SAE J429 Grade 8, Zinc Electroplated
Primary Liner:
ENV-3004-12 (30 Mil Seaman Corp. XR-5®)
Geotextile:
ENV-0813-62 (8 oz. Nonwoven Polypropylene)

U.S. Patent No. 4,860,916

PORTA TANK™ - LEACHATE STORAGE TANK
GENERAL DESIGN PREPARED FOR:
U. S. D. O. E. HANFORD SITE
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY

ENVIRONETICS, INC.
1201 Commerce Street
Lockport, Illinois 60441
Tel.: (815) 838-8331
Fax: (815) 838-8336

SK# 950518-S1
Date: 5/18/95
Drawn By: WSJ
Scale: 1" = 10'

Attachment 1 (2 of 2)

APPENDIX C

HDPE PIPE STRENGTH CALCULATIONS – 0060-SC-T-003

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-T-003
Discipline:	Civil		
Subject:	HDPE Pipe Strength Calculations		
Computer Program:			
Computer Program Version:			

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation X Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 10 sheets Figures - 2 sheets Att. 1 - 12 sheets Total = 25 sheets	Steve Niehoff	Mark Sieracke	Brian Horvath	John Briest	9/28/07 7/29/2007

Summary of Revisions	

Weaver Boos Consultants, LLC

Made By SN	Date 6/20/07	Subject HDPE 6" Transducer Access Pipe Calculations
Chkd By JB	Date 8/01/07	Hanford ERDF Bottom Liner Design

Objective: To calculate the static loads on the HDPE transducer access pipes that will be used in the bottom liner system beneath Cells 7-10. These loads are then compared to the allowable stresses on the selected pipe.

Methods: For pipes placed in an embankment above the water table, the earth loading applied to the pipe is calculated as a prism of soil with a width equal to the pipe diameter, and a height equal to the depth of fill over the pipe. This loading is used to calculate the stresses on the pipe due to compression, buckling, and ring bending strain. References are listed below:

Chevron Phillips Chemical Company LP (2003). "Performance Pipe Engineering Manual". Bulletin PP 900, September 2003.

U.S. Environmental Protection Agency (2002). "Assessment and Recommendations for Improving the Performance of Waste Containment Systems." U.S. EPA, EPA/600/R-02/099.

Given: The transducer access pipes will consist of six-inch diameter high-density polyethylene (HDPE) pipes. The pipes will be perforated to allow liquid to enter, and installed in the gravel drainage layer. The piping must be designed to withstand the overlying loads, including those imposed by the final cover system. The unit weights and thicknesses of the various earth loading layers are summarized below and in the attached figures:

Overburden Layer	Thickness (ft)	Unit Wt. (pcf)	Applied Load (psf)	
Final Cover	18	120	2,160	
Waste	91	140	12,740	
Operations Layer	3	130	390	
Drainage Layer	6.5	130	845	*Thickness calculated to top of pipe.
TOTAL			**16,135**	

The pipes are assumed to be constructed of high-density polyethylene Typical pipe properties are shown below:

Pipe design ratio (DR) =	11
Nominal pipe diameter =	6 inches
Wall thickness (t) =	0.602 inches
Pipe outer diameter (D_o) =	6.625 inches
Avg. inner diameter (D_i) =	5.373 inches
Design compressive stress (σ_c) =	800 psi (from Ref. 1)
Long-term elastic modulus (E) =	29,900 psi (from Ref. 1, assuming 60° F)
Ring buckling strain limits =	4.2% of diameter (conservative, from Ref. 1)
Perforation frequency =	2 holes per foot
Perforation diameter =	0.500 inches

Weaver Boos Consultants, LLC

Made By SN	Date 6/20/07	Subject HDPE 6" Transducer Access Pipe Calculations
Chkd By JB	Date 8/01/07	Hanford ERDF Bottom Liner Design

Calculations: *Adjustment for Perforations*

The prism load applied to the top of the pipe must be adjusted to account for the perforations in the pipe. The adjusted load applied to the pipe is calculated by the following equation:

$$P_C = P\frac{12}{12 - ND_P}$$

where

P_C = Corrected pipe loading, psf
P = Vertical load applied to pipe = 16,135 psf
N = Perforation frequency = 2 holes per foot
D_P = Performation diameter = 0.500 inches

P_C = 17,602 psf

Pipe Wall Compressive Stress

When a non-pressurized pipe is confined in a dense embedment, the compressive stress in the pipe wall is calculated by the following equation:

$$\sigma_{wall} = \frac{P_C D_o}{288t} \qquad \text{(Chevron, 2003)}$$

where

σ_{wall} = Pipe wall compressive stress, psi
P_C = Corrected pipe loading = 17,602 psf
D_o = Pipe outer diameter = 6.625 inches
t = Pipe wall thickness = 0.602 inches

σ_{wall} = 672.6 psi

The factor of safety against wall crushing is calculated as shown below:

$$FS = \frac{\sigma_c}{\sigma_{wall}}$$

where

FS = Factor of safety against wall crushing
σ_c = Long-term compressive stress design value 800 psi

FS = 1.19

Weaver Boos Consultants, LLC

Made By	SN	Date	6/20/07	Subject	HDPE 6" Transducer Access Pipe Calculations
Chkd By	JB	Date	8/01/07		Hanford ERDF Bottom Liner Design

Pipe Wall Buckling

Buckling resistance increases when flexible pipe is embedded in soil, since the soil and pipe work together to resist the buckling forces. The allowable buckling pressure on the pipe is calculated by the following equation:

$$P_{WC} = 5.65\sqrt{RB'E'\frac{E}{12(DR-1)^3}}$$ (Chevron, 2003)

where
P_{WC} = Allowable constrained buckling pressure, psi
R = Buoyancy reduction factor = 1 (pipe is not below water table)
B' = Elastic support factor (see equation below)
E' = Modulus of soil reaction = 3,000 psi (for well-compacted coarse bedding)
E = Pipe elastic modulus = 29,900 psi
DR = Pipe design ratio = 11

The elastic support factor B' is calculated using the following equation:

$$B' = \frac{1}{1+4e^{(-0.065H)}}$$ (Chevron, 2003)

where H = Soil cover depth above pipe = 118.5 feet

B' = 0.998

The allowable constrained buckling pressure can then be calculated:

P_{WC} = 488 psi = 70,279 psf

The factor of safety against wall buckling is calculated as shown below:

$$FS = \frac{P_{WC}}{P_C}$$

where
FS = Factor of safety against wall buckling
P_C = Corrected pipe loading = 17,602 psf

FS = 3.99

Ring Bending Strain

Some deflection in flexible pipe is desirable to promote arching and mobilize the passive soil resistance forces that support the pipe. The estimate deflection is calculated using Spangler's Modified Iowa Formula:

$$\frac{\Delta X}{D_I} = \frac{P_C}{144}\left(\frac{KL}{\frac{2E}{3}\left(\frac{1}{DR-1}\right)^3 + 0.061E'}\right) \qquad \text{(Chevron, 2003)}$$

where

ΔX = Horizontal deflection, inches		
D_I = Pipe inner diameter =	5.373	inches
P_c = Corrected pipe loading =	17,602	psf
K = Bedding factor =	0.1	(typical)
L = Deflection lag factor =	1.0	(recommended in Ref. 2)
E = Pipe elastic modulus =	29,900	psi
DR = Pipe design ratio =	11	
E' = Modulus of soil reaction =	3,000	psi (for well-compacted coarse bedding)

ΔX = 0.32 inches

As the pipe deflects, bending strain occurs in the pipe wall. For an elliptically deformed pipe, the pipe wall ring bending strain can be calculated using the deflection in the equation below:

$$\varepsilon = f_D \frac{\Delta X}{D_M}\frac{2C}{D_M} \qquad \text{(Chevron, 2003)}$$

where

ε = Pipe wall strain		
f_D = Deformation shape factor =	6.00	(conservative for non-elliptical shape)
ΔX = Pipe deflection =	0.32	inches
D_M = Pipe mean diameter =	5.999	inches
C = Distance from outer fiber to wall centroid (see equation below)		

The distance from the outer fiber to the pipe wall centroid is calculated using the following equation:

$$C = 0.5(1.06t) \qquad \text{(Chevron, 2003)}$$

where t = Pipe wall thickness = 0.602 inches

C = 0.32

The pipe wall strain can then be calculated:

ε = 3.4%

The factor of safety for the wall strain is calculated as shown below:

$$FS = \frac{\varepsilon_{allow}}{\varepsilon}$$

where FS = Factor of safety for pipe wall strain
ε_{allow} = Allowable ring strain = 4.2% (conservative, from Ref. 1)

$FS =$ **1.22**

Conclusions: The selected pipes are suitable for the proposed application. Note that the above calculations are conservative, particularly with respect to wall crushing and ring bending. Reference 1 recommends using 800 psi as a "long-term compressive strength design value". Other publications list a compressive strength of over 1,500 ps for polyethylene pipe, so presumably a factor of safety is already included in the "design value" from Reference 1. In addition, Reference 1 notes that 4.2% is a conservative value for non-pressure pipe, and that "high performance polyethylene material at an 8% strain level has a life expectancy of at least 50 years."

Weaver Boos Consultants, LLC

Made By SN Date 6/20/07 Subject HDPE 12" Transducer Access Pipe Calculations
Chkd By JB Date 8/01/07 Hanford ERDF Bottom Liner Design

Objective: To calculate the static loads on the HDPE transducer access pipes that will be used in the bottom liner system beneath Cells 7-10. These loads are then compared to the allowable stresses on the selected pipe.

Methods: For pipes placed in an embankment above the water table, the earth loading applied to the pipe is calculated as a prism of soil with a width equal to the pipe diameter, and a height equal to the depth of fill over the pipe. This loading is used to calculate the stresses on the pipe due to compression, buckling, and ring bending strain. References are listed below:

Chevron Phillips Chemical Company LP (2003). "Performance Pipe Engineering Manual". Bulletin PP 900, September 2003.

U.S. Environmental Protection Agency (2002). "Assessment and Recommendations for Improving the Performance of Waste Containment Systems." U.S. EPA, EPA/600/R-02/099.

Given: The transducer access pipes will consist of 12-inch diameter high-density polyethylene (HDPE) pipes. The pipes will be perforated to allow liquid to enter, and installed in the gravel drainage layer. The piping must be designed to withstand the overlying loads, including those imposed by the final cover system. The unit weights and thicknesses of the various earth loading layers are summarized below and in the attached figures:

Overburden Layer	Thickness (ft)	Unit Wt. (pcf)	Applied Load (psf)	
Final Cover	18	120	2,160	
Waste	91	140	12,740	
Operations Layer	3	130	390	
Drainage Layer	7	130	910	
Secondary Sump Gravel	0.5	130	65	*Thickness calculated to
TOTAL			**16,200**	top of pipe.

The pipes are assumed to be constructed of high-density polyethylene Typical pipe properties are shown below:

Pipe design ratio (DR) =	11
Nominal pipe diameter =	12 inches
Wall thickness (t) =	1.159 inches
Pipe outer diameter (D_o) =	12.75 inches
Avg. inner diameter (D_i) =	10.339 inches
Design compressive stress (σ_c) =	800 psi (from Ref. 1)
Long-term elastic modulus (E) =	29,900 psi (from Ref. 1, assuming 60° F)
Ring buckling strain limits =	4.2% of diameter (conservative, from Ref. 1)
Perforation frequency =	2 holes per foot
Perforation diameter =	0.500 inches

Weaver Boos Consultants, LLC

Made By SN	Date 6/20/07	Subject HDPE 12" Transducer Access Pipe Calculations
Chkd By JB	Date 8/01/07	Hanford ERDF Bottom Liner Design

Calculations: *Adjustment for Perforations*

The prism load applied to the top of the pipe must be adjusted to account for the perforations in the pipe. The adjusted load applied to the pipe is calculated by the following equation:

$$P_C = P\frac{12}{12 - ND_P}$$

where
- P_C = Corrected pipe loading, psf
- P = Vertical load applied to pipe = 16,200 psf
- N = Perforation frequency = 2 holes per foot
- D_P = Performation diameter = 0.500 inches

P_C = 17,673 psf

Pipe Wall Compressive Stress

When a non-pressurized pipe is confined in a dense embedment, the compressive stress in the pipe wall is calculated by the following equation:

$$\sigma_{wall} = \frac{P_C D_o}{288t} \qquad \text{(Chevron, 2003)}$$

where
- σ_{wall} = Pipe wall compressive stress, psi
- P_C = Corrected pipe loading = 17,673 psf
- D_o = Pipe outer diameter = 12.750 inches
- t = Pipe wall thickness = 1.159 inches

σ_{wall} = 675.1 psi

The factor of safety against wall crushing is calculated as shown below:

$$FS = \frac{\sigma_c}{\sigma_{wall}}$$

where
- FS = Factor of safety against wall crushing
- σ_c = Long-term compressive stress design value = 800 psi

FS = 1.19

Weaver Boos Consultants, LLC

Made By	SN	Date	6/20/07	Subject	HDPE 12" Transducer Access Pipe Calculations
Chkd By	JB	Date	8/01/07		Hanford ERDF Bottom Liner Design

Pipe Wall Buckling

Buckling resistance increases when flexible pipe is embedded in soil, since the soil and pipe work together to resist the buckling forces. The allowable buckling pressure on the pipe is calculated by the following equation:

$$P_{WC} = 5.65\sqrt{RB'E'\frac{E}{12(DR-1)^3}}$$ (Chevron, 2003)

where P_{WC} = Allowable constrained buckling pressure, psi
R = Buoyancy reduction factor = 1 (pipe is not below water table)
B' = Elastic support factor (see equation below)
E' = Modulus of soil reaction = 3,000 psi (well-compacted coarse bedding)
E = Pipe elastic modulus = 29,900 psi
DR = Pipe design ratio = 11

The elastic support factor B' is calculated using the following equation:

$$B' = \frac{1}{1+4e^{(-0.065H)}}$$ (Chevron, 2003)

where H = Soil cover depth above pipe = 119.0 feet

B' = 0.998

The allowable constrained buckling pressure can then be calculated:

P_{WC} = 488 psi = 70,281 psf

The factor of safety against wall buckling is calculated as shown below:

$$FS = \frac{P_{WC}}{P_C}$$

where FS = Factor of safety against wall buckling
P_C = Corrected pipe loading = 17,673 psf

FS = 3.98

Weaver Boos Consultants, LLC

Made By SN	Date 6/20/07	Subject HDPE 12" Transducer Access Pipe Calculations
Chkd By JB	Date 8/01/07	Hanford ERDF Bottom Liner Design

Ring Bending Strain

Some deflection in flexible pipe is desirable to promote arching and mobilize the passive soil resistance forces that support the pipe. The estimate deflection is calculated using Spangler's Modified Iowa Formula:

$$\frac{\Delta X}{D_i} = \frac{P_C}{144}\left(\frac{KL}{\frac{2E}{3}\left(\frac{1}{DR-1}\right)^3 + 0.061E'}\right) \qquad \text{(Chevron, 2003)}$$

where
- ΔX = Horizontal deflection, inches
- D_i = Pipe inner diameter = 10.339 inches
- P_c = Corrected pipe loading = 17,673 psf
- K = Bedding factor = 0.1 (typical)
- L = Deflection lag factor = 1.0 (recommended in Ref. 2)
- E = Pipe elastic modulus = 29,900 psi
- DR = Pipe design ratio = 11
- E' = Modulus of soil reaction = 3,000 psi (well-compacted coarse bedding)

ΔX = 0.63 inches

As the pipe deflects, bending strain occurs in the pipe wall. For an elliptically deformed pipe, the pipe wall ring bending strain can be calculated using the deflection in the equation below:

$$\varepsilon = f_D \frac{\Delta X}{D_M}\frac{2C}{D_M} \qquad \text{(Chevron, 2003)}$$

where
- ε = Pipe wall strain
- f_D = Deformation shape factor = 6.00 (conservative for non-elliptical shape)
- ΔX = Pipe deflection = 0.63 inches
- D_M = Pipe mean diameter = 11.545 inches
- C = Distance from outer fiber to wall centroid (see equation below)

The distance from the outer fiber to the pipe wall centroid is calculated using the following equation:

$$C = 0.5(1.06t) \qquad \text{(Chevron, 2003)}$$

where t = Pipe wall thickness = 1.159 inches

C = 0.61

The pipe wall strain can then be calculated:

ε = 3.5%

Weaver Boos Consultants, LLC

Made By SN	Date 6/20/07	Subject HDPE 12" Transducer Access Pipe Calculations
Chkd By JB	Date 8/01/07	Hanford ERDF Bottom Liner Design

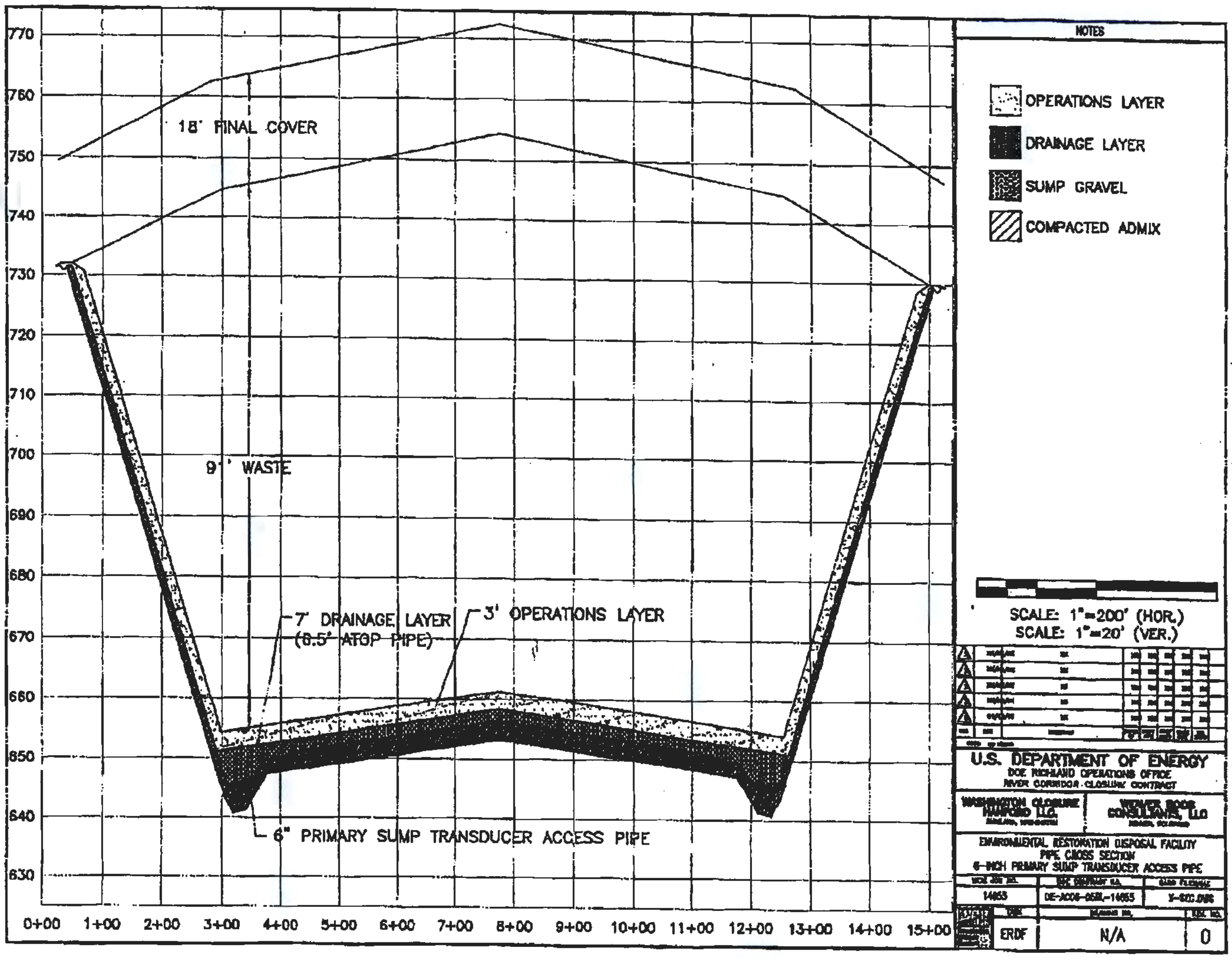
The factor of safety for the wall strain is calculated as shown below:

$$FS := \frac{\varepsilon_{allow}}{\varepsilon}$$

where FS = Factor of safety for pipe wall strain
ε_{allow} = Allowable ring strain = 4.2% (conservative, from Ref. 1)

FS = **1.21**

Conclusions: The selected pipes are suitable for the proposed application. Note that the above calculations are conservative, particularly with respect to wall crushing and ring bending. Reference 1 recommends using 800 psi as a "long-term compressive strength design value". Other publications list a compressive strength of over 1,500 ps for polyethylene pipe, so presumably a factor of safety is already included in the "design value" from Reference 1. In addition, Reference 1 notes that 4.2% is a conservative value for non-pressure pipe, and that "high performance polyethylene material at an 8% strain level has a life expectancy of at least 50 years."


770
760
750
740
730
720
710
700
690
680
670
660
650
640
630
18' FINAL COVER
9' WASTE
7' DRAINAGE LAYER
(6.5' ATOP PIPE)
3' OPERATIONS LAYER
6" PRIMARY SUMP TRANSDUCER ACCESS PIPE
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
NOTES
OPERATIONS LAYER
DRAINAGE LAYER
SUMP GRAVEL
COMPACTED ADMIX
SCALE: 1"=200' (HOR.)
SCALE: 1"=20' (VER.)
U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
PIPE CROSS SECTION
6-INCH PRIMARY SUMP TRANSDUCER ACCESS PIPE
ERDF
N/A
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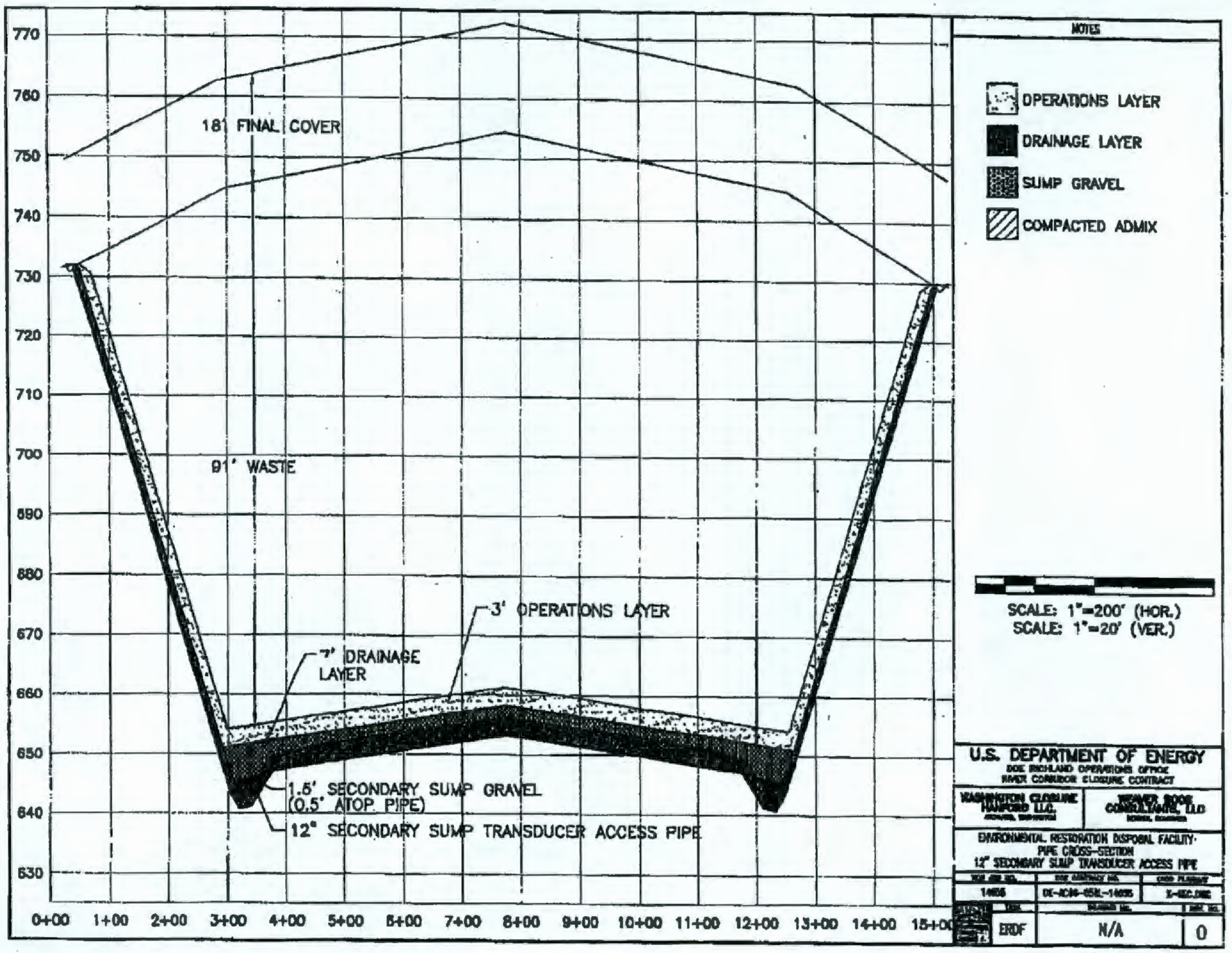
NOTES
OPERATIONS LAYER
DRAINAGE LAYER
SUMP GRAVEL
COMPACTED ADMIX
18' FINAL COVER
91' WASTE
3' OPERATIONS LAYER
7' DRAINAGE LAYER
1.5' SECONDARY SUMP GRAVEL (0.5' ATOP PIPE)
12" SECONDARY SUMP TRANSDUCER ACCESS PIPE
770
760
750
740
730
720
710
700
690
680
670
660
650
640
630
0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00
SCALE: 1"=200' (HOR.)
SCALE: 1"=20' (VER.)
U.S. DEPARTMENT OF ENERGY
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
PIPE CROSS-SECTION
12" SECONDARY SUMP TRANSDUCER ACCESS PIPE
ERDF
N/A
0

CPChem
PERFORMANCE PIPE
a division of Chevron Phillips Chemical Company LP

PERFORMANCE PIPE Municipal & Industrial Series/IPS Pipe Data

Pipe weights are calculated in accordance with PPI TR-7. Average inside diameter calculated using nominal OD and minimum wall plus 6% for use in estimating fluid flows. Actual ID will vary. When designing components to fit the pipe ID, refer to pipe dimensions and tolerances in applicable pipe specifications.

Pressure Ratings are for water at 73.4 °F. For other fluid and service temperature, ratings may differ. Refer to Engineering Manual for Chemical and Environmental Considerations.

Pressure Rating		255 psi DR 7.3			200 psi DR 9.0			160 psi DR 11.0			130 psi DR 13.5			
IPS Pipe Size	Nominal OD (in)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	IPS Pipe Size
1 1/4	1.660	[illegible]	1.179	0.44	[illegible]	1.270	0.37	[illegible]	1.340	0.31	0.123	1.399	0.26	1 1/4
1 1/2	1.900	0.260	1.349	0.58	0.211	1.453	0.49	[illegible]	1.533	0.41	0.141	1.601	0.34	1 1/2
2	2.375	0.325	1.686	0.91	0.264	1.815	0.76	0.216	1.917	0.64	0.176	2.002	0.53	2
3	3.500	0.479	2.485	1.98	0.389	2.675	1.66	0.318	2.826	1.39	0.259	2.951	1.15	3
4	4.500	0.616	3.194	3.27	0.500	3.440	2.74	0.409	3.633	2.29	[illegible]	3.794	1.90	4
5 3/8	5.375	0.736	3.815	4.66	[illegible]	4.109	3.90	0.489	4.338	3.27	0.398	4.531	2.72	5 3/8
5	5.563	0.762	3.948	5.00	[illegible]	4.253	4.18	0.506	4.490	3.51	0.412	4.690	2.91	5
6	6.625	0.908	4.700	7.09	0.736	5.065	5.93	0.602	5.349	4.97	0.491	5.584	4.13	6
7 1/8	7.125	0.976	5.056	8.20	0.792	5.446	6.86	0.648	5.751	5.75	0.528	6.006	4.78	7 1/8
8	8.625	1.182	6.119	12.01	0.958	6.594	10.05	0.784	6.963	8.42	0.639	7.270	7.00	8
10	10.750	1.473	7.627	18.66	1.194	8.219	15.61	0.977	8.679	13.09	0.796	9.062	10.87	10
12	12.750	1.747	9.046	26.25	[illegible]	9.746	21.97	1.159	10.293	18.41	0.944	10.749	15.29	12
13 3/8	13.375	1.832	9.491	28.88	1.486	10.225	24.18	1.216	10.797	20.26	0.991	11.274	16.84	13 3/8
14	14.000	1.918	9.934	31.64	1.556	10.701	26.50	1.273	11.301	22.20	1.037	11.802	18.44	14
16	16.000	2.192	11.353	41.33	1.778	12.231	34.60	1.455	12.915	29.00	1.185	13.488	24.09	16
18	18.000	2.466	12.772	52.31	2.000	13.760	43.79	1.636	14.532	36.69	1.333	15.174	30.48	18
20	20.000	2.740	14.191	64.58	2.222	15.289	54.05	1.818	16.146	45.30	1.481	16.860	37.63	20
22	22.000	3.014	15.610	78.14	2.444	16.819	65.40	2.000	17.760	54.82	1.630	18.544	45.56	22
24	24.000	3.288	17.029	93.00	2.667	18.346	77.85	2.182	19.374	65.24	1.778	20.231	54.21	24
26	26.000	[illegible]			2.889	19.875	91.36	2.364	20.988	76.57	1.926	21.917	63.62	26
28	28.000	[illegible]			[illegible]	21.405	105.95	2.545	22.605	88.78	2.074	23.603	73.78	28
30	30.000	[illegible]			[illegible]	22.934	121.62	2.727	24.219	101.92	2.222	25.289	84.69	30
32	32.000	[illegible]			[illegible]			2.909	25.833	115.97	2.370	26.976	96.35	32
34	34.000	[illegible]			[illegible]			3.091	27.447	130.93	2.519	28.660	108.81	34
36	36.000	[illegible]			[illegible]			3.273	29.061	146.80	2.667	30.346	121.98	36
42	42.000	[illegible]			[illegible]			[illegible]			3.111	35.405	166.00	42
48	48.000	[illegible]			[illegible]			[illegible]			[illegible]			48
54	54.000	[illegible]			[illegible]			[illegible]			[illegible]			54

Attachment 1 (1 of 12)

ATTACHMENT 1 (2 of 12)

PERFORMANCE PIPE

A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP

The Performance Pipe Engineering Manual

First Edition

NOTICE. This publication is for informational purposes and is intended for use as a reference guide. It should not be used in place of the advice of a professional engineer. This publication does not contain or confer any warranty or guarantee of any kind. Performance Pipe has made every reasonable effort towards the accuracy of the information contained in this publication, but it may not provide all necessary information, particularly with respect to special or unusual applications. This publication may be changed from time to time without notice. Contact Performance Pipe to ensure that you have the most current edition.

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Plano, TX 75026-9006

Phone: 800-527-0662
Fax: 972-599-7348

DRISCOPLEX

ATTACHMENT 1 (3 OF 12)

Table 5-1 Typical Elastic Modulus for DriscoPlex® PE 3408

Load Duration	*Elastic Modulus†, 1000 psi (MPa), at Temperature, °F (°C)*							
	-20 (-29)	*0 (-18)*	*40 (4)*	*60 (16)*	*73 (23)*	*100 (38)*	*120 (49)*	*140 (60)*
Short-Term	300.0 (2069)	260.0 (1793)	170 0 (1172)	130.0 (896)	110.0 (758)	100.0 (690)	65 0 (448)	50 0 (345)
10 h	140.8 (971)	122.0 (841)	79 8 (550)	61.0 (421)	57 5 (396)	46 9 (323)	30 5 (210)	23.5 (162)
100 h	125.4 (865)	108.7 (749)	71 0 (490)	54 3 (374)	51.2 (353)	41 8 (288)	27 2 (188)	20 9 (144)
1000 h	107.0 (738)	92 8 (640)	60.7 (419)	46.4 (320)	43.7 (301)	35 7 (246)	23 2 (160)	17 8 (123)
1 y	93 0 (641)	80 6 (556)	52 7 (363)	40.3 (278)	38.0 (262)	31 0 (214)	20 2 (139)	15.5 (107)
10 y	77.4 (534)	67.1 (463)	43.9 (303)	33.5 (231)	31 6 (218)	25 8 (178)	16.8 (116)	12.9 (89)
50 y	69.1 (476)	59.9 (413)	39.1 (270)	29.9 (206)	28.2 (194)	23 0 (159)	15.0 (103)	11.5 (79)
† Typical values based on ASTM D 638 testing of molded plaque material specimens.								

Controlling Expansion and Contraction

Black polyethylene pipe on the surface or above grade and exposed to the sun can absorb solar energy. The resulting pipe temperatures can be greater than the air temperature. To help reduce temperature changes resulting solar heating of a piping system, the pipo may be shaded or placed in a location that receives less direct sunlight.

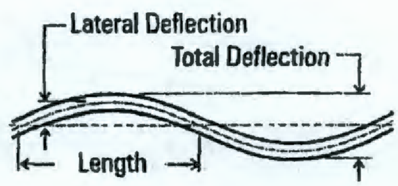
The effects of thermal expansion and contraction on a piping system can be controlled in several ways, including

- Lateral deflection expansion loops (snaking the pipe)
- Anchor and guide the pipe
- Conventional Expansion loops
- Expansion joints (non-pressures systems only)
- Burying pipes

Lateral Deflection Expansion Loops

The simplest installation involves stringing pipe between end point anchor structures. If the pipe is simply laid in a straight line between the end anchors the pipeline anchoring structures must be capable of handling potentially high thermal contraction thrust loads during temperature decrease, and during temperature increase, the maximum compressive thrust is the force required to cause lateral deflection at which time the compressive stress and end thrust will then

Figure 5-1 Lateral Deflection



ATTACHMENT 1 (4 OF 12)

Constrained Pipe Wall Compressive Stress

When a non-pressurized pipe that is confined in a dense embedment is subjected to a radially directed soil pressure, a circumferential, compressive thrust occurs in its wall. This is similar to the thrust force that occurs within the wall of a ring when it is squeezed. This thrust creates a ring (or hoop) compressive stress within the pipe wall. This is similar to a hoop tensile stress from internal pressure, but compressive stress acts in the opposite direction.

As is often the case, the radial soil pressure that causes compressive stress is not uniform. However, for convenience in calculating wall compressive stress, radial soil pressure is assumed to be uniform and equal to the vertical soil pressure at the crown of the pipe.

With buried pressure pipe, internal pressure may be greater than the radial external pressure applied by the soil This results in a tensile stress rather than a compressive stress in the pipe wall. Thus for pressure pipe, compressive wall stresses are normally not considered This can be verified by comparing internal pressure hoop stress to wall compressive stress.

When subjected to a uniform radial soil pressure, the compressive stress in the pipe wall is:

DriscoPlex™ OD controlled pipe:

$$S = \frac{P_T D_O}{288 t} \qquad \textbf{(7-23)}$$

DriscoPlex™ 2000 SPIROLITE® pipe:

$$S = \frac{P_T D_O}{288 A} \qquad \textbf{(7-24)}$$

Where

P_T	=	vertical load applied to pipe, lb/ft^2
S	=	pipe wall compressive stress, lb/in^2
D_O	=	pipe outside diameter, in
t	=	pipe wall thickness, in
A	=	pipe wall profile average cross-sectional area, in^2/in

Because arching commonly occurs for entrenched pipe, the modified arching load rather than the prism load is used to determine the vertical soil pressure at the pipe crown

The pipe wall compressive stress should be compared to an allowable material stress value that should be determined by testing The recommended, long-term compressive strength design value for DriscoPlex™ polyethylene pipe is 800 lb/in^2.

Example 7-9

Find the pipe wall compressive ring (or hoop) stress in a DriscoPlex™ 2000 SPIROLITE® 36" Class 100 pipe buried under 18 ft of cover The ground water level is at the surface, the saturated weight of the insitu silty-clay soil is 120 lbs/ft^3 and the trench width equals the pipe diameter plus 3 ft.

Solution: Determine the modified arching load using Formula 7-5. The arching coefficient from Formula 7-7 or from Figure 7-3 is

$$F = 0.83$$

ATTACHMENT 1 (5 of 12)

For a constant water table above the pipe, Table 5-1 indicates a 50-year, 73° F modulus of 28,200 lb/in², thus Formula 7-28 yields

$$P_{CR} = \frac{(24)(28{,}200)(0.124)}{(1-0.45^2)(25^3)} = 6.79\ lb/in^2$$

Assuming 5% ovality and a 2 to 1 safety factor, f_O from Figure 7-14 is 0.64. Formula 7-30 yields

$$P = \frac{(0.64)(6.79)}{2} = 2.17\ lb/in^2 = 5.0\ ft\ H_2O$$

Flooding conditions are occasional happenings, usually lasting a few days to a week or so. From Table 5-1, 1000 hours (41.6 days) is about twice the expected flood duration, so a value of 43,700 lb/in² provides about a 2 to 1 safety margin. Solving as above,

$$P_{CR} = \frac{(24)(43{,}700)(0.124)}{(1-0.45^2)(25^3)} = 10.44\ lb/in^2$$

$$P = (0.64)(10.44) = 6.68\ lb/in^2 = 15.4\ ft\ H_2O$$

Constrained Pipe Wall Buckling

Buckling resistance is increased when flexible pipe is embedded in soil. The soil and pipe couple together to resist buckling forces. A vertically applied thrust force causes the pipe to widen horizontally, but horizontal pipe deflection is restrained by the embedment soil, thus the pipes critical buckling pressure increases. A pipe/soil interaction occurs when the depth of cover is sufficient to mobilize soil support. A publication by the American Water Works Association, AWWA C-950, indicates that at least four feet of cover is needed to mobilize soil support.

AWWA C-950 provides a design equation for buckling of a buried plastic pipe. The following constrained pipe buckling equation is applicable to DriscoPlex™ OD controlled and DriscoPlex™ 2000 SPIROLITE® pipe.

For OD Controlled Pipe

$$P_{WC} = \frac{5.65}{N}\sqrt{R\,B'\,E'\frac{E}{12(DR-1)^3}} \qquad \textbf{(7-32)}$$

For DriscoPlex™ 2000 SPIROLITE® Pipe

$$P_{WC} = \frac{5.65}{N}\sqrt{R\,B'\,E'\frac{EI}{D_M{}^3}} \qquad \textbf{(7-33)}$$

Where terms are previously defined and

P_{WC} = allowable constrained buckling pressure, lb/in²
N = safety factor
R = buoyancy reduction factor

$$R = 1 - 0.33\frac{H'}{H} \qquad \textbf{(7-34)}$$

H' = groundwater height above pipe, ft
H = cover above pipe, ft

ATTACHMENT 1 (6 OF 12)

B' = elastic support factor

$$B' = \frac{1}{1+4e^{(-0.065H)}} \qquad \textbf{(7-35)}$$

E' = soil reaction modulus, lb/in² (Table 7-7)

The designer should apply a safety factor appropriate to the application A safety factor of 2 0 has been used for thermoplastic pipe.

The allowable constrained buckling pressure should be compared to the total vertical stress acting on the pipe crown from the combined load of soil and groundwater or floodwater It is prudent to check buckling resistance against a groundwater level for a 100-year-flood. In this calculation the total vertical stress is typically taken as the prism load pressure for saturated soil, plus the fluid pressure of any floodwater above the ground surface.

Example 7-11

Find the allowable buckling pressure for a DriscoPlex™ 2000 SPIROLITE® 36" Class 100 36" pipe, installed in compacted soil embedment having an E' of 2000 lb/in² Determine if Class 100 pipe is sufficient for an applied load from 18 feet of cover and ground water to the surface.

Solution: Solve Formula 7-33 using Formulas 7-26, 7-35, 7-34 and Table 5-1 DriscoPlex™ 2000 SPIROLITE® pipe dimensions and properties are published in Bulletin PP-401. For DriscoPlex™ 2000 SPIROLITE® 36" Class 100 pipe, I is 0.171 in⁴/in, and Z is 0 58 in. Solve for terms D_M, B', and R

$$D_M = 36 + 2(0.58) = 37.16\,in$$

$$B' = \frac{1}{1+4e^{(-0.065(18))}} = 0\ 446$$

$$R = 1 - 0\ 33\frac{18}{18} = 0\ 67$$

Under a 100-year-flood condition, soil cover, H, and floodwater height, H', are both 18 feet.

From Table 5-1, E is 28,200 lb/in² for 50 years at 73° F. A common practice is a safety factor of 2. Solving Formula 7-32,

$$P_{WC} = \frac{5.65}{2}\sqrt{\frac{(0.67)(0.446)(2000)(28,800)(0.171)}{(37\ 16)^3}}$$

$$P_{WC} = 21\ 17\,lb/in^2 = 3051\,lb/ft^2$$

The load applied to the pipe is found using the prism load, Formula 7-1.

(In this example, the specified soil reaction modulus, E', is an empirical value that was developed using prism load rather than arching load methods. Therefore, the prism soil load must be used. If a soil reaction modulus value is developed using arching or modified arching methods, then soil loads should be calculated using the appropriate method See discussions on Soil Reaction Modulus and Vertical Soil Pressure)

$$P_E = (120)(18) = 2160\,lb/ft^2$$

Attachment 1 (7 of 12)

The allowable buckling stress, P_{WC}, is greater than the applied load pressure, P_E, therefore, Class 100 pipe is satisfactory for this installation.

Ring Deflection

Some vertical pipe deflection is desirable to promote arching and to mobilize the passive soil resistance forces that support the pipe However, deflection may affect other pipe or system performance areas, such as pipe material long-term strain capability, pipeline hydraulic capacity and compatibility with cleaning equipment. In DriscoPlex™ 2000 SPIROLITE® pipe, bell-and-spigot joint sealing capability may be affected by excessive deflection

The two components of buried pipe deflection are construction deflection and service load deflection. Construction deflection occurs during shipping and handling and placing embedment around the pipe up to the pipe crown. Construction deflection incorporates all forces acting on the pipe up to the point where backfill is placed above the pipe. Service load deflection occurs from backfill placement above the pipe and from applied surcharge loads. The deflection observed in a buried pipe after the completing an installation is the sum of construction deflection and service load deflection.

Several methods are available for determining flexible pipe deflection from earth loads and surcharge loads. Historically, Spangler's Modified Iowa formula has been used to find the deflection of plastic pipes. Other methods include closed form solutions, and numerical methods such as finite element solutions. Alternatives to Spangler's formula may give more accurate values, but they usually require more precise information on soil and pipe properties. Therefore, these methods are not as commonly used as Spangler's Modified Iowa formula.

Spangler's Modified Iowa Formula can be written for DriscoPlex™ 2000 SPIROLITE® pipe as:

$$\frac{\Delta X}{D_I} = \frac{P_T}{144}\left(\frac{KL}{\frac{1.24(RSC)}{D_I} + 0.061E'}\right) \tag{7-36}$$

And for DriscoPlex™ OD controlled pipe as:

$$\frac{\Delta X}{D_I} = \frac{P_T}{144}\left(\frac{KL}{\frac{2E}{3}\left(\frac{1}{DR-1}\right)^3 + 0.061E'}\right) \tag{7-37}$$

Where

ΔX	=	horizontal deflection, in
D_I	=	inside diameter, in
P_T	=	pipe crown vertical pressure, lb/ft^2
K	=	bedding factor, typically 0 1
L	=	deflection lag factor
E'	=	soil reaction modulus lb/in^2
E	=	elastic modulus, lb/in^2 (Table 5-1)

ATTACHMENT 1 (8 OF 12)

$$\% \, Deflection = \frac{\Delta X}{D_I}(100) = \frac{\Delta X}{D_M}(100) \quad \textbf{(7-38)}$$

D_M = mean diameter, in (Formula 7-26 or 7-27)

Soil Reaction Modulus, E′

The soil reaction modulus, E', is an interactive modulus representing the support or stiffness of the embedment soil in reaction to lateral pipe deflection under load. It is dependent on both soil and pipe properties, so there are no convenient laboratory tests to determine the soil reaction modulus for a given soil.

For the most part the modulus must be determined empirically, that is, it must be found by measuring the deflection of a buried pipe, then substituting that value into Spangler's formula and back-calculating

Table 7-7 presents soil reaction modulus values from an extensive field study for the Bureau of Reclamation performed by A. Howard. These values for soil reaction modulus are commonly used in flexible pipe design.

Howard noted deflection variability along the length of a typical pipeline. To determine maximum deflection, variability should be accommodated by reducing the Table 7-7 E′ value by 25%, or by adding the deflection percentage given in Table 7-7.

As cover depth increases, so does the earth pressure on the embedment material. Both horizontal and vertical pressures exist in a soil mass, but unlike water, these pressures are not normally equal to each other As the enveloping or confining pressure is increased on a granular material, soil grains are held together more tightly, and the entire system stiffens. J. Hartley and J. Duncan published a study of soil reaction modulus variation with depth Their recommended soil reaction modulus values are presented in Table 7-8, and should be considered when cover depth is less than 20 feet.

The vertical soil pressure exerted on a buried flexible pipe is typically equal to the Marston load. However, Howard's Bureau of Reclamation E′ values assumed that the pipe was subjected to a prism load, which means that soil arching is incorporated in Howard's E′ values When using Table 7-7 or Table 7-8, the prism load should be used.

The soil reaction modulus represents the stiffness of the soil surrounding the pipe In Tables 7-7 and 7-8, E′ values are given for the embedment material. However, when the insitu trench soil is highly compressible (marsh clay, peat, saturated organic soils, etc.) compared to the embedment around the pipe, the embedment soil may not develop the E′ values presented in the tables, resulting in pipe deflection greater than the design prediction. Increasing trench width, thereby increasing the width of embedment soil around the pipe, can minimize the effect of highly plastic insitu trench soil

Janson recommends the use of the short-term pipe elastic modulus value in Spangler's equation. The concept is that soil settlement around the buried pipe occurs in discrete events as soil grains shift or fracture. Once movement occurs, soil arching redistributes the load, and no further deflection occurs for that event. Since these load increments are felt like impulse loads, the pipe resists them with its short-term elastic modulus.

ATTACHMENT 1 (9 OF 12)

Table 7-7 Bureau of Reclamation Average E' Values for Iowa Formula (Initial Deflection)

Soil type – pipe bedding material (Unified Classification)†	*E' for Degree of Bedding Compaction, lb/in²*			
	Dumped	*Slight (<85% Proctor <40% relative density)*	*Moderate (48%-95% Proctor 40%-70% relative density)*	*High (>95% Proctor >70% relative density)*
Fine-grained soils (LL>50)‡ Soils with medium to high plasticity CH, MH, CH-MH	No data available; consult a competent soils engineer; otherwise, use E' = 0			
Fine-grained soils (LL<50) Soils with medium to no plasticity CL, ML, CL-ML, with <25% coarse grained particles	50	200	400	1000
Fine-grained soils (LL<50) Soils with medium to no plasticity CL, ML, CL-ML, with >25% coarse grained particles Coarse-grained soils with fines GM, GC, SM, SC◊ contains >12% fines	100	400	1000	2000
Coarse-grained soils with little or no fines GW, GP, SW, SP◊ contains <12% fines	200	1000	2000	3000
Crushed rock	1000	3000	3000	3000
Accuracy in terms of percentage deflection▼	±2%	±2%	±1%	±0.5%

† ASTM D 2487; USBR Designation E-3. ‡ LL = Liquid limit. ◊ Or any borderline soil beginning with one of these symbols, i.e , GM-GC, GC-SC ▼For ±1% accuracy and predicted deflection of 3%, actual deflection would be between 2% and 4%.

Note – Values applicable only for fills less than 50 ft (15 m) No safety factor included in table values. For use in predicting initial deflections only; appropriate Deflection Lag Factor must be applied for long-term deflections. If bedding falls on the borderline between two compaction categories, select the lower E' value or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using 12,500 ft-lb/ft³ (598,000 J/m³) (ASTM D 698, AASHTO T-99, USBR Designation E-11). 1 lb/in² = 6.895 kPa.

Table 7-8 Duncan-Hartley Soil Reaction Modulus

Type of Soil	Depth of Cover, ft	E' for Standard AASHTO Relative Compaction, lb.in²			
		85%	90%	95%	100%
Fine-grained soils with <25% sand content (CL, ML, CL-ML)	0-5	500	700	1000	1500
	5-10	600	1000	1400	2000
	10-15	700	1200	1600	2300
	15-20	800	1300	1800	2600
Coarse-grained soils with fines (SM, SC)	0-5	600	1000	1200	1900
	5-10	900	1400	1800	2700
	10-15	1000	1500	2100	3200
	15-20	1100	1600	1400	3700
Coarse-grained soils with little or no fines (SP, SW, GP, GW)	0-5	700	1000	1600	2500
	5-10	1000	1500	2200	3300
	10-15	1050	1600	2400	3600
	15-20	1100	1700	2500	3800

ATTACHMENT 1 (10 of 12)

DriscoPlex™ 2000 SPIROLITE® pipe is manufactured to ASTM F 894, which states that profile pipe designed for 7.5% deflection will perform satisfactorily when installed in accordance with ASTM D 2321. Deflection is measured at least 30 days after installation.

Manufacturing processes for DriscoPlex™ 2000 SPIROLITE® and DriscoPlex™ OD controlled pipe differ Deflection limitations for OD controlled pipe are controlled by long-term material strain.

Ring Bending Strain

As pipe deflects, bending strains occur in the pipe wall. For an elliptically deformed pipe, the pipe wall ring bending strain, ε, can be related to deflection:

$$\varepsilon = f_D \frac{\Delta X}{D_M} \frac{2C}{D_M} \qquad \textbf{(7-39)}$$

Where

ε	=	wall strain
f_D	=	deformation shape factor
ΔX	=	deflection, in
D_M	=	mean diameter, in
C	=	distance from outer fiber to wall centroid, in

For DriscoPlex™ 2000 SPIROLITE® pipe

$$C = h - z \qquad \textbf{(7-40)}$$

For DriscoPlex™ OD Controlled pipe

$$C = 0\,5(1\,06t) \qquad \textbf{(7-41)}$$

Where

h	=	pipe wall height, in
z	=	pipe wall centroid, in
t	=	pipe minimum wall thickness, in

For elliptical deformation, f_D = 4.28. However, buried pipe rarely has a perfectly elliptical shape Irregular deformation can occur from installation forces such as compaction variation alongside the pipe. To account for the non-elliptical shape many designers use f_D = 6.0.

Lytton and Chua report that for high performance polyethylene materials such as those used by Performance Pipe, 4.2% ring bending strain is a conservative value for non-pressure pipe. Jansen reports that high performance polyethylene material at an 8% strain level has a life expectancy of at least 50 years

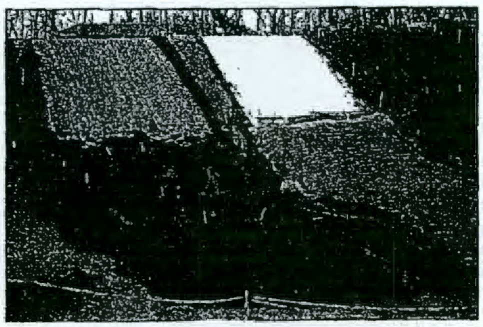
When designing non-pressure heavy wall OD controlled pipe (DR less than 17), and high RSC (above 200) DriscoPlex™ 2000 SPIROLITE® pipe, the ring bending strain at the predicted deflection should be calculated and compared to the allowable strain.

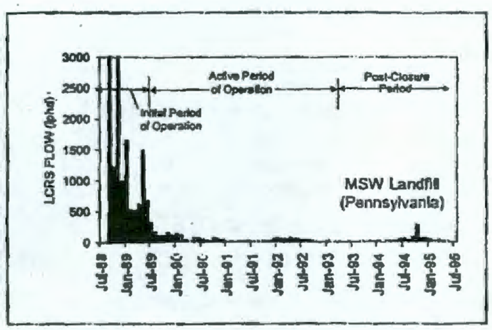
In pressure pipe, the combined stress from deflection and internal pressure should not exceed the material's long-term design stress rating Combined stresses are incorporated into Table 7-9 values, which presumes deflected pipe at full pressure At reduced pressure, greater deflection is allowable.

Attachment 1 (11 of 12)

EPA/600/R-02/099
December 2002

Assessment and Recommendations for Improving the Performance of Waste Containment Systems





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performed under

EPA Cooperative Agreement Number
CR-821448-01-0

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perforations for corrugated pipes. The pattern of perforations consists of two or more rows of holes of diameters ranging between 10 to 15 mm and spaced at distances between 100 and 300 mm. The rows of holes are located symmetrically though offset from each other in the lower 180 degrees or less of the pipe circumference. With perforated pipes, the slots are located at the valleys of the corrugations.

Various methods are used for joining of pipes. They can be grouped into three categories: butt fusion or seaming, overlap connections, and special couplings.

In general, butt fusion or seaming is used for thick-walled HDPE pipe (either solid or perforated). The ends of the pipe are brought together with a heated plate placed between them. A small force brings the ends of each pipe against opposite sides of the plate. When adequate thermal energy is realized and the pipe ends become viscous, the heat plate is removed and the pipe ends are quickly brought together. Adequate force is applied to the opposing pipes to extrude a slight amount of the molten material out of the seam area. After cooling, the force is released and the seam is completed. PVC pipe, on the other hand, is usually chemically seamed using a solvent on the pipe ends before the pipe ends are drawn together.

The overlap type of connections can only be made if the pipe thickness is adequate to machine the pipe ends so as to accept one another. To make a tight connection, gaskets are sometimes used which reside in slotted seats of the thicker section of the connection. Extrusion seaming can be used from the outside of small diameter pipes or from the inside of large diameter pipes to make a leak-free connection.

Special couplings are used to connect the ends of profile-wall (i.e., corrugated) pipes. Each of these couplings must be mated to the type of pipe for which they were designed. It is not acceptable practice to use couplings made for one style of profiled pipe on a different style. Electro-fusion couplings are also used with smooth HDPE pipe.

It should be noted that the influence of holes (perforations or slots) and connections (of all types) are not routinely accounted for as part of the design process. Design engineers sometimes attempt to account for holes by assuming that the normal force on the pipe is applied over an area reduced by the size of the holes (i.e., an increased normal stress is considered). The design method to follow is based on the pipe itself, not holes or connections, which represent an area of future research activity.

2.3.3 Design by the Iowa State Formula

Design of plastic pipes (i.e., the calculation of pipe deflection) in most applications is based on the modified Iowa State formula, which was originally developed in 1941, see Spangler (1971). It was later modified by Watkins and Spangler (1958). Variations to the Iowa State formula as well as other analytical approaches have been proposed for

predicting pipe deflection. However, such methods have not been generally accepted in practice and hence only the Iowa State formula is presented herein. The formula takes one of the following two forms:

$$\Delta = \frac{D_L K W}{\frac{EI}{R^3} + 0.061\,E'} \qquad \text{(Eq. 2-5)}$$

or

$$\frac{\Delta}{D} = \frac{D_L K W_s}{\frac{EI}{R^3} + 0.061\,E'} \qquad \text{(Eq. 2-6)}$$

where:

- Δ = change in pipe diameter, m (Δ is used interchangeably in design for the horizontal and vertical deflections, Δx and Δy respectively as per ASTM D2412; in the derivation of the formula, Δ is the horizontal deflection and the deflected pipe is assumed to take an elliptic shape);
- D_L = deflection lag factor (dimensionless);
- K = bedding constant (dimensionless);
- W = load per unit length of pipe (kN/m);
- W_s = load per unit area (kPa);
- R = mean radius of pipe (m);
- D = mean diameter of pipe (m);
- Δ/D = deflection ratio (dimensionless);
- E = modulus of elasticity of pipe material (kPa);
- I = moment of inertia of pipe wall per unit length (m^4/m); and
- E' = modulus of soil reaction (kPa).

The deflection lag factor "D_L" is a result of soil compression at the sides of the pipe whereby additional load may be exerted on the pipe with time. A value of 1.5 for the deflection lag factor was originally proposed. However, due to the inherent conservatism in the formula, it has more recently been suggested that a value of 1.0 be used (Moser, 1990). Note that in design, the load W is taken as the full prism load over the pipe which, in the case of no variation of unit weight with height above the pipe, will be equal to unit weight times the pipe diameter times the full height above pipe. Accordingly, the load per unit area "W_s", will be equal to the overburden pressure above the pipe. Thus, in using this approach, the effect of arching in relieving pipe stress is not addressed, nor considered. It has been pointed out by Moser (1990) that the long term load will never exceed the prism load.

The bedding constant "K" varies with the bedding angle. However, a value of 0.1 is often assumed in calculations since other parameters are much more significant.

ATTACHMENT 1 (12 of 12)

APPENDIX D

EXCAVATION SLOPE STABILITY – 0060-SC-T-004

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-T-004
Discipline:	Civil		
Subject:	Excavation Slope Stability		
Computer Program:	XSTABL		
Computer Program Version:	5.02		

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation **X** Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 19 sheets Total = 20 sheets	Chris Bosy	Mark Sieracke	Brian Horvath	John Briest	9/28/07 7/29/2007

Summary of Revisions	

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By CJ Date 6-25-07 Subject ERDF-CELLS 7→10 Sheet 1 of 19
Ckd By SD Date 8/1/07 EXCAVATION SLOPE STABILITY File No. 2186351-11-1

PROBLEM STATEMENT: ASSESS THE STABILITY OF THE EXCAVATED SLOPES @ CELLS 7-10.

SOLUTION: THE TALLEST SLOPE WILL BE ALONG THE NORTH EXCAVATION WALL & WILL EXTEND FROM EL 650'± TO 730'±. THE DESIGN SLOPE IS 3.0 HORIZONTAL : 1.0 VERTICAL. VARIOUS INPUT PARAMETERS ARE DESCRIBED IN MORE DETAIL IN THE FOLLOWING SECTIONS. SEE 3/19 & 4/19 FOR THE PLAN & PROFILE, RESP.

SOILS

BASED ON REVIEW OF PREVIOUS STABILITY CALCULATIONS (SEE 7/19 → 8/19) AND A BOREHOLE LOG 699-35-68B (SEE 3/19 FOR LOCATION & 9/19 FOR LOG OF BORING), A FRICTION ANGLE OF 38° & MOIST DENSITY OF 125 PCF REMAIN APPROPRIATE

GROUNDWATER LEVEL

BASED ON 6/19, THE GROUNDWATER LEVEL WILL BE PLACED @ EL 455

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By: CJ Date: 6-25-07 Subject: ERDF - CELLS 7-10 Sheet 2 of 19
Ckd By: SB Date: 8/1/07 EXCAVATION SLOPE STABILITY File No. 2196351-11-1

EARTHQUAKE LOADS

BASED ON (6/19), A HORIZONTAL ACCELERATION OF 0.12 g WILL BE USED.

ANALYSIS

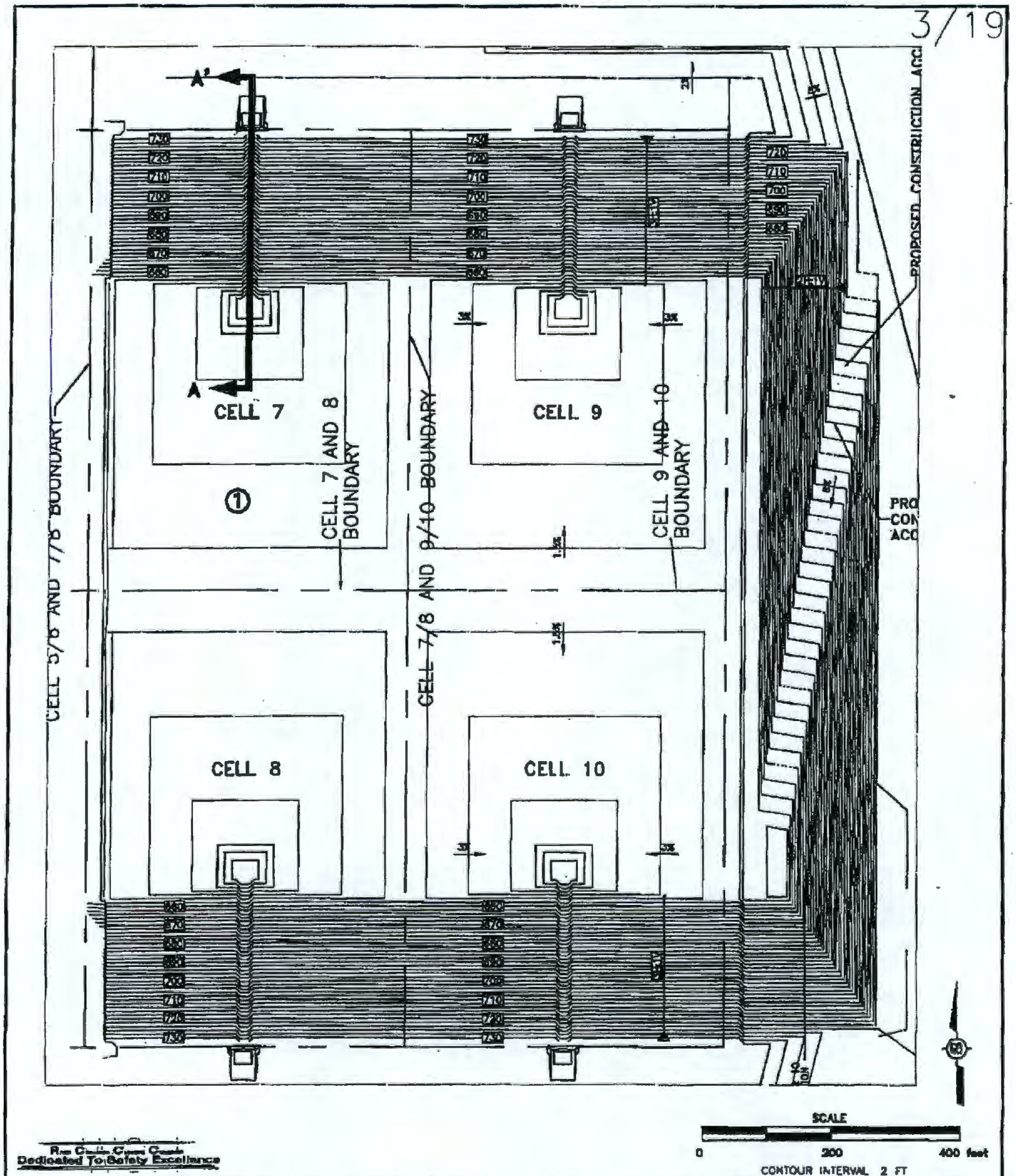
THE ANALYSIS RESULTS USING XSTABL ARE:

SECTION	CONDITION	FACTOR OF SAFETY *
A-A'	STATIC	2.3 (SEE (10/19) & (13/19))
A-A'	SEISMIC	1.7 (SEE (14/19) & (19/19))

* ROUNDED TO NEAREST 0.1

SUMMARY

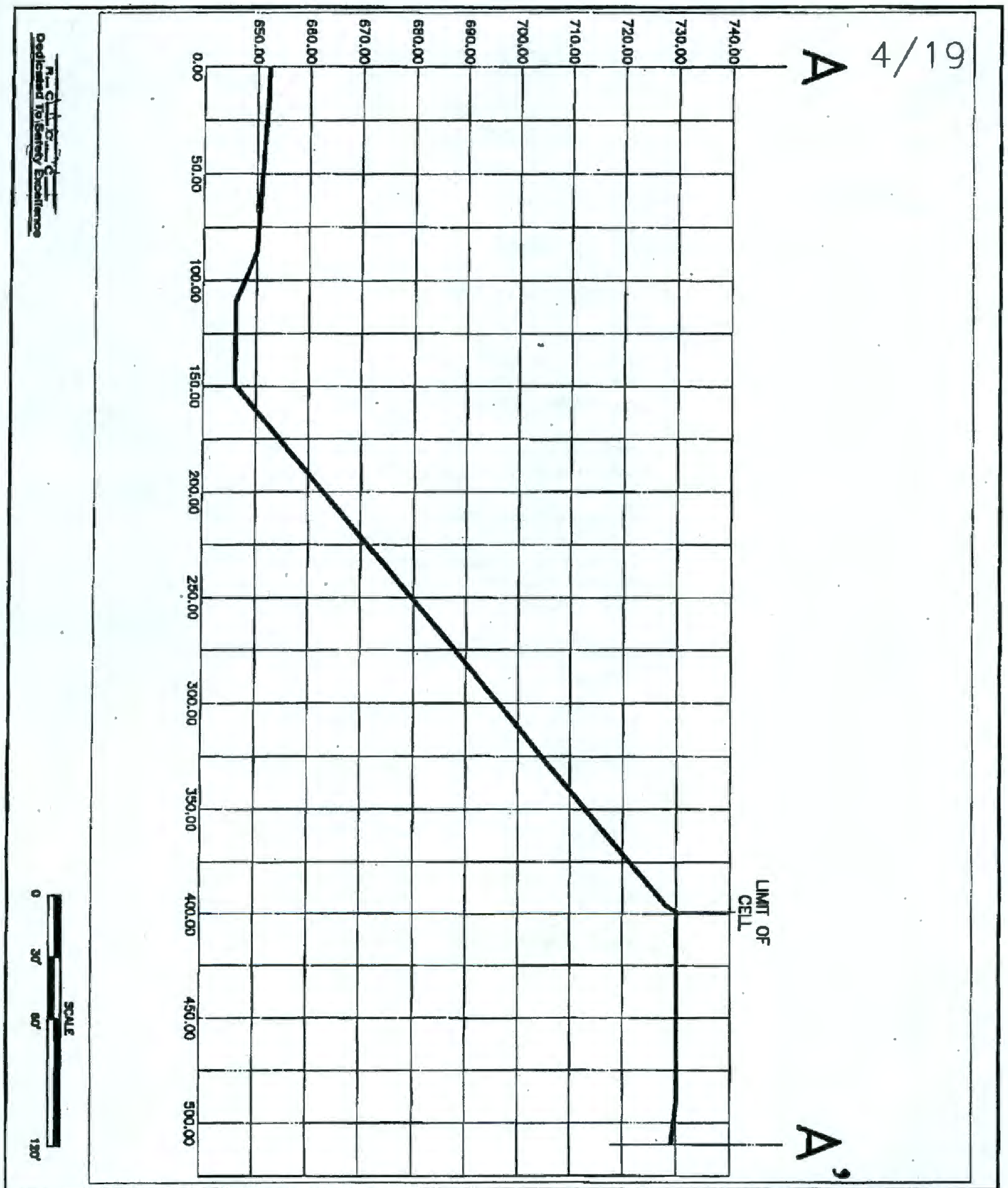
THE CALCULATED FS'S EXCEED REGULATORY REQUIREMENTS (STATIC = 1.5 & DYNAMIC = 1.2) & ARE CONSIDERED ADEQUATE.



Dedicated To Safety Excellence

PREPARED FOR WASHINGTON CLOSURE HANFORD LLC RICHLAND WASHINGTON	ENVIRONMENTAL RESTORATION DISPOSAL FACILITY CELLS 7 – 10 A–A' CROSS SECTION PLAN VIEW	WEAVER BOOS CONSULTANTS 1813 N MILL STREET, SUITE A NAPERVILLE, ILLINOIS 60563 (630) 717-4848 (MAIN) (630) 717-4850 (FAX)		
		NAPERVILLE IL CHICAGO IL GRIFFITH, IN	SPRINGFIELD, IL COLUMBUS, OH DENVER, CO	SOUTH BEND IN FORT WORTH, TX
		DRAWN BY: CJB	DATE: 8/20/07	FILE: 2188-351
		REVIEWED BY: SMN	CAD: BEARING.DWG	FIGURE 1

Page 132 of 345



PREPARED FOR WASHINGTON CLOSURE HANFORD LLC RICHLAND WASHINGTON	ENVIRONMENTAL RESTORATION DISPOSAL FACILITY CELLS 7 – 10 A–A' CROSS SECTION PROFILE VIEW	WEAVER BOOS CONSULTANTS 1813 N MILL STREET, SUITE A NAPERVILLE, ILLINOIS 60563 (630) 717-4848 (MAIN) (630) 717-4850 (FAX)	
		NAPERVILLE IL CHICAGO IL GRIFFITH, IN	SPRINGFIELD, IL COLUMBUS, OH DENVER, CO
		SOUTH BEND IN FORT WORTH TX	
		DRAWN BY: CJB	DATE: 6/21/07
		FILE: 2188-351	
		REVIEWED BY: SMN	CAD: BEARING.DWG
		FIGURE 2	

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BHI-00355
Rev 00, Vol. 1

5/19

Golder Associates	Subject: Stability Analysis of Excavated Slopes		
	Job No.: 943-1215	Made by: SGH	Date: 1/31/95
	Ref:	Checked: QDJ	Sheet: 2 of 42
		Reviewed:	

CALCULATIONS: **- Determine the Input Parameters**

- Soil Characteristics and Properties

There are three soil types to consider in the analysis:

Soil Type 1: Structural Fill

Use a moist density of 125 pcf.
Use a cohesion of 0 psf.
Use a friction angle of 38 degrees.

Friction angle based on laboratory tests of similar material for the Non-Drag-Off facility (see reference 2).

Also, see Fill Specifications: Fill shall be compacted to 95% of Modified Proctor, dry unit weight =115-120 pcf. Using Figure 3.7 from reference 5, and using a minimum relative density of 75%, a friction angle of 38 degrees is reasonable for this material.

Soil Type 2: Loose to medium dense upper Eolian Deposit (SAND), little gravel

Use a moist density of 125 pcf
Use a cohesion of 0 psf.
Use a friction angle of 38 degrees

Friction angle based on laboratory tests of similar material for the Non-Drag-Off facility (see reference 2).

Also, see boring logs for wells 699-35-68B and 699-35-69B for soils information. All material has N values greater than 50. From chart, reference 6, take a minimum relative density of 90%, and from Figure 3.7 from reference 5, a friction angle of 38 degrees is reasonable for this material.

REFERENCE NO.

T222 Reference: BHI, (1995), "Design Analysis - Construction of W-296 Environmental Restoration Disposal Facility", prepared by Golder Associates for BHI, BHI-00355, Rev.00, Vol 1, June 1995

BHI-00355
Rev.00, Vol 1

6/19

Golder Associates	Subject: Stability Analysis of Excavated Slopes		
	Job No.: 943-1215	Made by: SGH	Date: 1/31/95
	Ref:	Checked: QBY	Sheet: 3 of 42
		Reviewed:	

CALCULATIONS: (cont.) **- Determine the Input Parameters (cont.)**

Soil Type 3: Dense to very dense fine to coarse SAND.
Use a moist density of 125 pcf
Use a cohesion of 0 psf
Use a friction angle of 38 degrees.

Friction angle based on laboratory tests of similar material for the Non-Drag-Off facility (see reference 2)

Also, see boring logs for wells 699-35-68B and 699-35-69B for soils information. All material has N values greater than 50 From chart, reference 6, take a minimum relative density of 90%, and from Figure 3.7 from reference 5, a friction angle of 38 degrees is reasonable for this material.

- Seismic Accelerations

For dynamic analysis, use 0.12g as the horizontal acceleration. (see "Sideslope Liner Seismic Stability" analysis, part of this package)

- Groundwater (see reference 7)

The uppermost aquifer in the proposed ERDF area has a maximum elevation of approximately 455 ft MSL. The maximum depth of ERDF excavation is approximately 648 ft MSL Therefore, groundwater is almost 200 ft below the ERDF and will not adversely effect the slope stability at the ERDF.

- Run the analysis

The analysis was performed using XSTABL. The output files and graphical representations of the critical failure surface and factor of safety are provided in this calculation. In summary:

Section A Minimum Factor of Safety:	Static =	2 2
	Dynamic =	1.6
Section B Minimum Factor of Safety:	Static =	1 2
	Dynamic =	0.9

IBID.

T223

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Rev 00, Vol 1

Sheet 20 of 42

7/19

XSTABL File: SECTASTA 1-21-95 10:09

```
*********************************************
*                 X S T A B L               *
*                                           *
*         Slope Stability Analysis          *
*               using the                   *
*            Method of Slices               *
*                                           *
*        Copyright (C) 1992 & 94            *
*   Interactive Software Designs, Inc.      *
*       Moscow, ID 83843, U.S.A.            *
*                                           *
*          All Rights Reserved              *
*                                           *
*  Ver. 5.007a                  94 & 1319   *
*********************************************
```

Problem Description : ERDF - DEFINITIVE DESIGN

SEGMENT BOUNDARY COORDINATES

6 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	656.4	118.8	660.0	3
2	118.8	660.0	226.8	696.0	3
3	226.8	696.0	262.8	706.0	2
4	262.8	706.0	334.4	731.9	1
5	334.4	731.9	363.1	729.3	1
6	363.1	729.3	486.9	726.8	1

2 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	262.8	706.0	486.9	706.0	2
2	226.8	696.0	486.9	696.0	3

ISOTROPIC Soil Parameters

3 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.

T240

IBHP

BHI-00535
Rev.00, Vol. 1

Sheet 21 of 42

1	125.0	125.0	.0	38.00	.000	.0	0
2	125.0	125.0	.0	38.00	.000	.0	0
3	125.0	125.0	.0	38.00	.000	.0	0

8/19

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

2000 trial surfaces will be generated and analyzed.

2 Surfaces initiate from each of1000 points equally spaced along the ground surface between x = 117.0 ft
and x = 300.0 ft

Each surface terminates between x = 335.0 ft
and x = 435.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = 600.0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *

7.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 15 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	245.78	701.27
2	252.68	702.46
3	259.54	703.81

IBID

T241

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9/19

PROJECT: ERDF

BOREHOLE LOG

BORING NO. 699-35-68B
SHEET 1 **OF** 1

BORING LOCATION NORTH 35399
EAST −67498

GROUND ELEVATION: 713.9 FEET

BORING DATE: 4/26/94

DRILLING METHOD AND EQUIPMENT: HOLLOW STEM AUGER, B-57 DRILL
DRILLING CONTRACTOR:
DRILLER: D. ROSSMAN

LOGGED: E.A. JOHNSON
CHECKED: EDWARD C. RAFUSE
DATE: 4/27/94

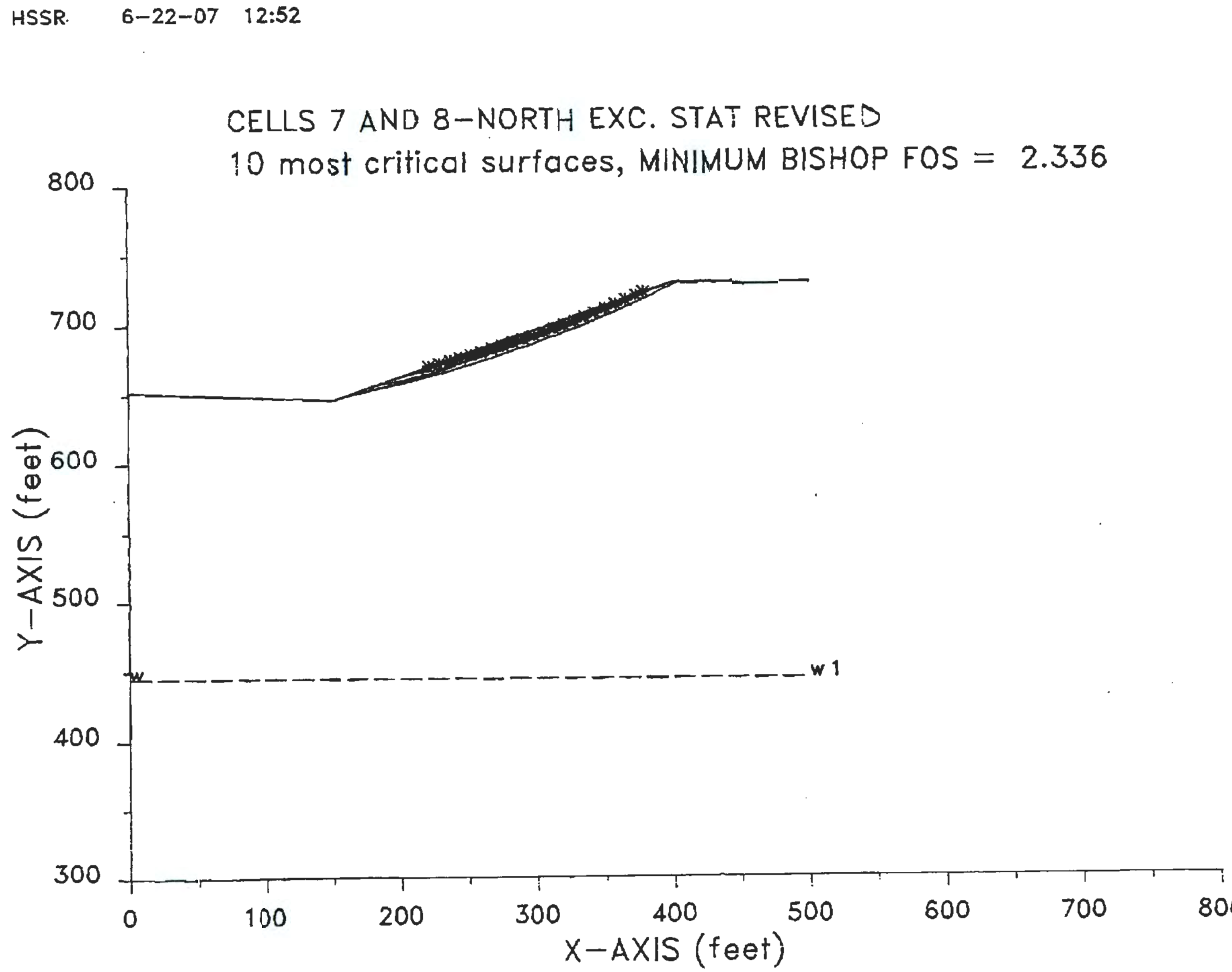
SOIL PROFILE			SAMPLES					PENETRATION RESISTANCE BLOWS/FT. ■ (0 10 20 30 40 50) / WATER CONTENT, PERCENT	PIEZOMETER GRAPHIC / WATER LEVEL
DEPTH (FT)	DESCRIPTION	GRAPHIC LOG	NUMBER	TYPE	BLOWS 140 Pound Hammer 30 In. Drop	N	RECOVERY		
0–10	Yellowish Brown, Slightly Moist Fine to Medium SAND with Some Coarse Sand								
10–20	Compact, Dark Olive Gray, Moist, Medium to Coarse SAND, Trace Silt			SS SS	53/0" 50/12"		0% 200%	53	
20–30	Dense to Very Dense, Light Yellowish Brown, Fine to Medium SAND			SS SS	40/12" 55/12"		100%	55	
30–40	Very Dense, Light Brownish Gray, Dry, Medium to Coarse SAND			SS SS	57/12" 87/13"		50%	57 80	
40–48	Very Dense, Pale Brown, Dry, Fine to Medium SAND, Trace Silt			SS	91/10"		100%	109	
48–52.4	Very Dense, Pale Yellow, Medium to Coarse SAND			SS SS SS SS	26/6" 30/6" 55/6" 70/6"		55%	56 125	
	BOTTOM OF BOREHOLE AT 52.4 FEET								

Depth scale (FT): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70

$\overline{N} > 50$

REFERENCE NO.

Page 138 of 345


HSSR 6-22-07 12:52
CELLS 7 AND 8-NORTH EXC. STAT REVISED
10 most critical surfaces, MINIMUM BISHOP FOS = 2.336
800
700
600
500
400
300
Y-AXIS (feet)
w1
0
100
200
300
400
500
600
700
800
X-AXIS (feet)

10/19

11/19

XSTABL File: HSSR 6-22-07 12:52

```
*******************************************
*              X S T A B L                *
*                                         *
*        Slope Stability Analysis         *
*               using the                 *
*           Method of Slices              *
*                                         *
*        Copyright (C) 1992 - 2006        *
*   Interactive Software Designs, Inc.    *
*        Moscow, ID 83843, U.S.A.         *
*                                         *
*          All Rights Reserved            *
*                                         *
*  Ver. 5.208                 96 - 1477   *
*******************************************
```

Problem Description : CELLS 7 AND 8-NORTH EXC. STAT REVISED

SEGMENT BOUNDARY COORDINATES

---

3 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	652.0	150.0	646.0	1
2	150.0	646.0	400.0	730.0	1
3	400.0	730.0	500.0	730.0	1

ISOTROPIC Soil Parameters

---

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	125.0	.0	38.00	.000	.0	0

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 2 coordinate points

12/19

```
***********************************
        PHREATIC SURFACE,
***********************************

  Point       x-water      y-water
   No.         (ft)          (ft)

   1            .00         444.00
   2          500.00        444.00

-- WARNING ------------------------------------------------
     Water surface number 1 has been defined but is not
     used by any soil unit.  The analysis will IGNORE
     water surface # 1.  Please make sure that this
     assumption is consistent with your subsurface model.
----------------------------------------------------------


A critical failure surface searching method, using a random
technique for generating CIRCULAR surfaces has been specified.


 2000 trial surfaces will be generated and analyzed.


   2 Surfaces initiate from each of1000 points equally spaced
along the ground surface between  x =         .0 ft
                             and  x =      275.0 ft


Each surface terminates between   x =      275.0 ft
                            and   x =      500.0 ft


Unless further limitations were imposed, the minimum elevation
at which a surface extends is  y =         .0 ft


* * * * *  DEFAULT SEGMENT LENGTH SELECTED BY XSTABL  * * * * *

    8.0 ft line segments define each trial failure surface.


---------------------
ANGULAR RESTRICTIONS
---------------------

  The first segment of each failure surface will be inclined
  within the angular range defined by :

          Lower angular limit :=   -45.0 degrees
          Upper angular limit :=  (slope angle - 5.0) degrees
```

Factors of safety have been calculated by the :

13/19

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 22 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	221.32	669.96
2	229.11	671.78
3	236.88	673.68
4	244.64	675.65
5	252.37	677.69
6	260.08	679.81
7	267.78	682.00
8	275.45	684.27
9	283.10	686.60
10	290.73	689.02
11	298.33	691.50
12	305.91	694.06
13	313.47	696.69
14	321.00	699.39
15	328.50	702.17
16	335.98	705.01
17	343.43	707.93
18	350.85	710.92
19	358.24	713.98
20	365.60	717.11
21	372.93	720.31
22	378.23	722.68

**** Simplified BISHOP FOS = 2.336 ****

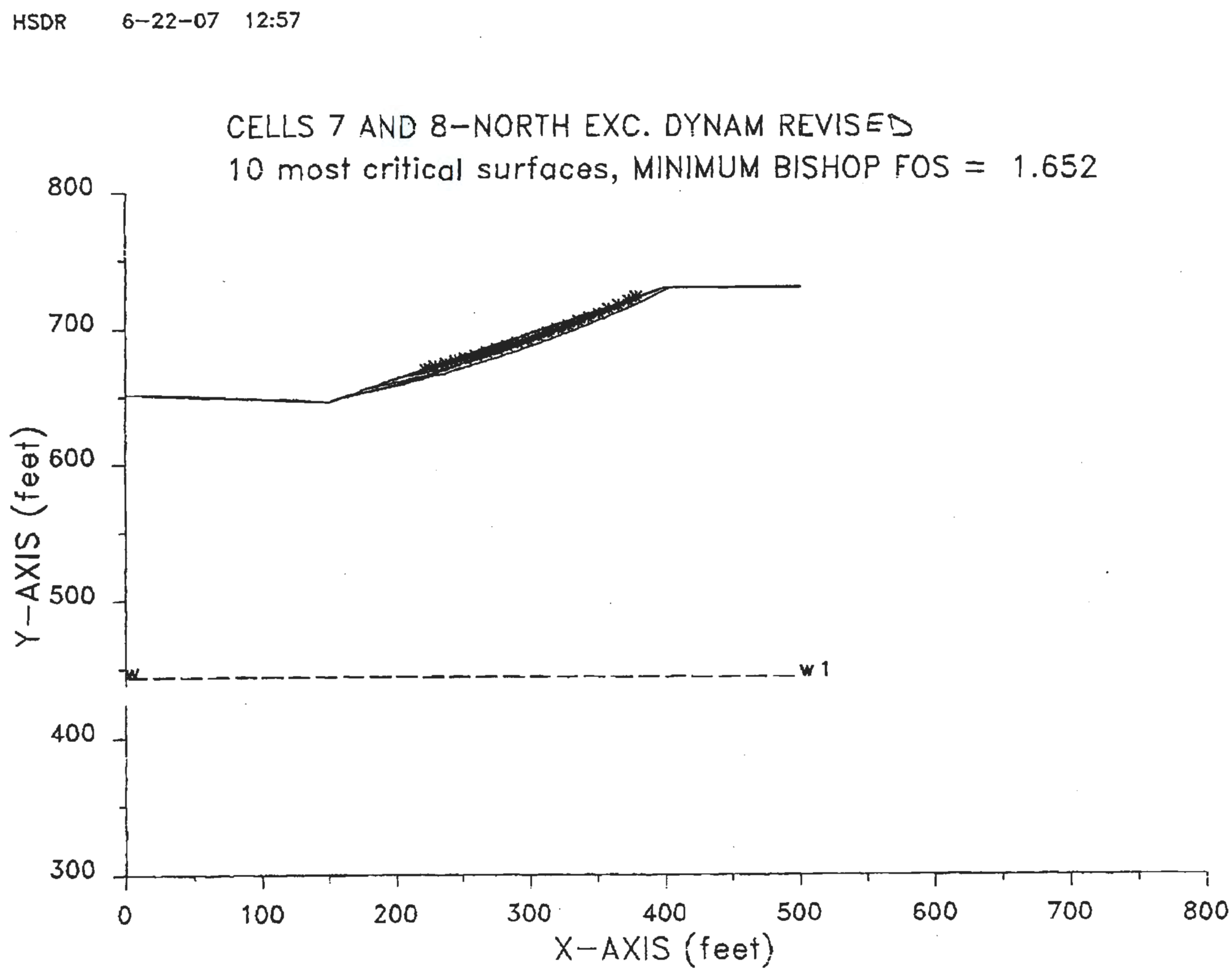
The following is a summary of the TEN most critical surfaces

Problem Description : CELLS 7 AND 8-NORTH EXC. STAT REVISE

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	2.336	35.47	1482.95	833.96	221.32	378.23	3.509E+07
2.	2.340	113.95	1155.66	498.18	214.99	327.97	1.310E+07
3.	2.341	17.18	1345.57	710.83	159.11	324.58	4.126E+07
4.	2.341	142.32	988.30	329.44	207.83	284.95	4.161E+06
5.	2.343	180.64	914.51	246.89	227.93	289.18	2.075E+06
6.	2.343	51.70	1301.74	658.65	177.28	341.93	4.072E+07
7.	2.345	206.84	849.05	176.00	239.76	284.97	8.214E+05
8.	2.351	112.42	1185.23	529.61	200.67	357.34	3.517E+07
9.	2.351	-12.13	1580.63	947.01	160.21	404.07	1.462E+08
10.	2.352	88.86	1087.60	443.85	160.76	295.98	2.260E+07

(14/19)

* * * END OF FILE * * *


HSDR 6-22-07 12:57
CELLS 7 AND 8-NORTH EXC. DYNAM REVISED
10 most critical surfaces, MINIMUM BISHOP FOS = 1.652
Y-AXIS (feet)
800
700
600
500
400
300
w
w 1
0
100
200
300
400
500
600
700
800
X-AXIS (feet)

15/19

(16/19)

XSTABL File: HSDR 6-22-07 12:57

```
*******************************************
*              X S T A B L                *
*                                         *
*       Slope Stability Analysis          *
*              using the                  *
*           Method of Slices              *
*                                         *
*       Copyright (C) 1992 - 2006         *
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*       Moscow, ID 83843, U.S.A.          *
*                                         *
*          All Rights Reserved            *
*                                         *
*  Ver. 5.208                 96 - 1477   *
*******************************************
```

Problem Description : CELLS 7 AND 8-NORTH EXC. DYNAM REVISED

SEGMENT BOUNDARY COORDINATES

3 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	652.0	150.0	646.0	1
2	150.0	646.0	400.0	730.0	1
3	400.0	730.0	500.0	730.0	1

ISOTROPIC Soil Parameters

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	125.0	125.0	.0	38.00	.000	.0	0

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 2 coordinate points

```
**********************************
        PHREATIC SURFACE,
**********************************

  Point       x-water      y-water
   No.         (ft)         (ft)

    1            .00        444.00
    2         500.00        444.00

-- WARNING ---------------------------------------------------
     Water surface number 1 has been defined but is not
     used by any soil unit.  The analysis will IGNORE
     water surface # 1.  Please make sure that this
     assumption is consistent with your subsurface model.
-------------------------------------------------------------


A horizontal earthquake loading coefficient
of    .120 has been assigned

A vertical earthquake loading coefficient
of    .000 has been assigned


A critical failure surface searching method, using a random
technique for generating CIRCULAR surfaces has been specified.


 2000 trial surfaces will be generated and analyzed.


   2 Surfaces initiate from each of1000 points equally spaced
along the ground surface between   x =       .0 ft
                             and   x =    275.0 ft


Each surface terminates between    x =    275.0 ft
                            and    x =    500.0 ft


Unless further limitations were imposed, the minimum elevation
at which a surface extends is  y =       .0 ft
```

17/19

18/19

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 22 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	221.32	669.96
2	229.11	671.78
3	236.88	673.68
4	244.64	675.65
5	252.37	677.69
6	260.08	679.81
7	267.78	682.00
8	275.45	684.27
9	283.10	686.60
10	290.73	689.02
11	298.33	691.50
12	305.91	694.06
13	313.47	696.69
14	321.00	699.39
15	328.50	702.17
16	335.98	705.01
17	343.43	707.93
18	350.85	710.92
19	358.24	713.98
20	365.60	717.11
21	372.93	720.31
22	378.23	722.68

**** Simplified BISHOP FOS = 1.652 ****

The following is a summary of the TEN most critical surfaces

Problem Description : CELLS 7 AND 8-NORTH EXC. DYNAM REVIS

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.652	35.47	1482.95	833.96	221.32	378.23	3.368E+07
2.	1.656	113.95	1155.66	498.18	214.99	327.97	1.257E+07

19/19

3.	1.656	17.18	1345.57	710.83	159.11	324.58	3.961E+07
4.	1.656	142.32	988.30	329.44	207.83	284.95	3.995E+06
5.	1.658	180.64	914.51	246.89	227.93	289.18	1.992E+06
6.	1.658	51.70	1301.74	658.65	177.28	341.93	3.910E+07
7.	1.659	206.84	849.05	176.00	239.76	284.97	7.887E+05
8.	1.663	-12.13	1580.63	947.01	160.21	404.07	1.404E+08
9.	1.664	112.42	1185.23	529.61	200.67	357.34	3.378E+07
10.	1.665	88.86	1087.60	443.85	160.76	295.98	2.171E+07

* * * END OF FILE * * *

APPENDIX E

VENEER SLOPE STABILITY – 0060-SC-T-005

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-T-005
Discipline:	Civil		
Subject:	Veneer Slope Stability		
Computer Program:			
Computer Program Version:			

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation X Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 3 sheets Total = 4 sheets	Chris Bosy	Mark Sieracke	Brian Horvath	John Briest	9/28/07 7/29/2007

Summary of Revisions	

07/09/2007 18:27 FAX 6307174850 WEAVER BOOS CONSULTANTS ☑003/005
07/09/2007 16:56 FAX 312 922 0201 Weaver Boos Consultants → NAPERVILLE ☑002

1/3

WEAVER BOOS CONSULTANTS

- ☐ 70 West Madison, Suite 4250 • Chicago, IL 60602 • (312) 922-1030
- ☐ 1335 Dublin Rd., Suite 105C • Columbus, OH 43215 • (614) 487-8347
- ☐ 6420 Southwest Blvd, Suite 206 • Fort Worth TX 76109 • (817) 735-9770
- ☐ 1944 N Griffith Blvd, Unit A • Griffith, IN 46319 • (219) 923-9609
- ☐ 1813 N. Mill St, Suite A • Naperville, IL 60563 • (630) 717-4848
- ☐ 630 East Bronson St, Suite 1 • South Bend, IN 46601 • (574) 232-4826
- ☐ 2021 Timberbrook Lane • Springfield, IL 62702 • (217) 787-0290
- ☐ 801 North Second St Suite 202 • St Louis, MO 63102 • (314) 621-8140

By CJS Date 7-9-7 Subject HANFORD - VENEER Sheet 1 of 3
Ckd By MS Date 7-9-7 STABILITY File No 2186-351-11-0

PROBLEM STATEMENT: FIND THE INTERFACE FRICTION ANGLE FOR A $F = 1.0$ & $C_s = 0.06$

ALSO GIVEN ARE $\bar{c} = 0$, $\alpha = 18.4°$

$r_u = 0$

SOLN: FROM (3/3),

$$F = \frac{\cancel{\bar{c}/\gamma d \sec\alpha} + [(1 - r_u)\cos\alpha - C_s \sin\alpha]\tan\bar{\phi}}{\sin\alpha + C_s \cos\alpha}$$

$$\frac{F(\sin\alpha + C_s \cos\alpha)}{\cos\alpha - C_s \sin\alpha} = \tan\bar{\phi}$$

$$\frac{\sin 18.4 + 0.06 \cos 18.4}{\cos 18.4 - 0.06 \sin 18.4} = \tan\bar{\phi}$$

$$\frac{0.316 + 0.057}{0.949 - 0.019} = \tan\bar{\phi}$$

$$\frac{0.373}{0.93} ✓ = \tan\bar{\phi}$$

$$\bar{\phi} = 21.9° ✓$$

07/08/2007 18:27 FAX 6307174850 WEAVER BOOS CONSULTANTS 004/005
07/08/2007 16:57 FAX 312 922 0201 Weaver Boos Consultants → NAPERVILLE 003

2/3

STABILITY ANALYSIS OF EARTH SLOPES

Yang H. Huang
University of Kentucky

VNR VAN NOSTRAND REINHOLD COMPANY
NEW YORK CINCINNATI TORONTO LONDON MELBOURNE

normal to the failure plane and thus on the shear resistance is considered In all the derivations which follow, only the effective stress analysis will be presented The equations can also be applied to a total stress analysis by simply replacing the effective strength parameters by the total strength parameters

The factor of safety is defined as a ratio of the resisting force due to the shear strength of soil along the failure surface to the driving force due to the weight of the sliding mass The resisting force is composed of two parts: one due to cohesion and equal to $\bar{c}a \sec \alpha$ and the other due to friction and equal to $\bar{N} \tan \bar{\phi}$, where $\bar{N}$ is the effective force normal to the failure plane With a pore pressure ratio, r_u

$$\bar{N} = W\,[(1 - r_u) \cos \alpha - C_s \sin \alpha] \qquad (6\ 1)$$

The driving force is always equal to the component of weight and seismic force parallel to the failure surface, or $W \sin \alpha + C_s W \cos \alpha$, regardless of whether seepage exists or not Therefore, the factor of safety, F, can be written as

$$F = \frac{\bar{c}a \sec \alpha + W\,[(1 - r_u) \cos \alpha - C_s \sin \alpha] \tan \bar{\phi}}{W(\sin \alpha + C_s \cos \alpha)} \qquad (6\ 2)$$

Replacing W by γad, where γ is the unit weight of the sliding mass

sec = 1/cos

$$F = \frac{(\bar{c}/\gamma d) \sec \alpha + [(1 - r_u) \cos \alpha - C_s \sin \alpha] \tan \bar{\phi}}{\sin \alpha + C_s \cos \alpha} \qquad (6\ 3)$$

Equation 6 3 is applicable to an infinite slope possessing both cohesion and angle of internal friction The factor of safety decreases with the increase in d, so the most critical plane is along the rock surface

If there is no cohesion ($\bar{c} = 0$), from Eq 6 3

$$F = \frac{[(1 - r_u) \cos \alpha - C_s \sin \alpha] \tan \bar{\phi}}{\sin \alpha + C_s \cos \alpha} \qquad (6\ 4)$$

Equation 6.4 shows that the factor of safety for a cohesionless material is independent of d. Therefore, every plane parallel to the slope is a critical plane and has the same factor of safety The failure will start from the slope surface where the soil particles will roll down the slope If there is no seismic force, Eq 6 4 can be simplified to

$$F = (1 - r_u) \frac{\tan \bar{\phi}}{\tan \alpha} \qquad (6\ 5)$$

APPENDIX F

ACTION LEAKAGE RATE – 0060-SC-T-006

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-T-006
Discipline:	Civil		
Subject:	Action Leakage Rate		
Computer Program:			
Computer Program Version:			

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation X   Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 2 sheets Att. 1 - 4 sheets Total = 7 sheets	Steve Niehoff	Mark Sieracke	Brian Horvath	John Briest	9/28/07 7/29/2007

Summary of Revisions	

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Sheet 1 of 2
File No. 2186-351-11
Calculation No. 0060-SC-T-005

Weaver Boos Consultants, LLC

Made By	SN	Date	06/07/07	Subject	Action Leakage Rate (ALR) Calculations
Chkd By	JB	Date	8/01/07		Hanford ERDF Liner Design

Objective: To calculate the Action Leakage Rate (ALR) for the secondary leachate collection system / leak detection system between the geomembrane liners at the Hanford ERDF.

Methods: The USEPA defines the ALR as "[T]he maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot." (40 CFR 264.302, 1992). The ALR must consider uncertainties in the systerm design, construction, and operation; as well as decreases in the flow capacity of the system over time. USEPA published a guidance document in 1992 that addresses the calculation of site-specific ALRs for hazardous waste landfills. In addition, the long-term design flow capacity of the proposed geosynthetic drainage layer was also calculated. References are shown below:

U.S. Environmental Protection Agency (1992). "Action Leakage Rates for Leak Detection Systems." Supplemental Background Document for the Final Double Liners and Leak Detection Systems Rule for Hazardous Waste Landfills, Waste Piles, and Surface Impoundments. U.S. EPA, EPA 530-R-92-004.

Given: In 40 CFR 264.301, the following minimum standards for a leak detection system are presented:

Minimum bottom slope =	1%	
Minimum drainage layer conductivity =	1.0E-02	cm/sec (for granular drainage layers)
Minimum drainage layer thickness =	12	inches (for granular drainage layers)
Minimum drainage layer transmissivity =	3.0E-05	m^2/sec (for geosynthetic drainage layers)

Calculations: In the 1992 guidance document, USEPA proposed the following equation to calculate the flow in the leak detection system:

$$Q = k \cdot h \cdot \tan\alpha \cdot B_{avg} \qquad \text{(USEPA, 1992)}$$

where:

Q = Flow rate in the leak detection system (drainage layer)
k = Hydraulic conductivity of the drainage medium
h = Head on the bottom liner
α = Slope of the leak detection system
B_{avg} = Average width of flow in the leak detection system

$$B_{avg} = \frac{D}{\sin\alpha} \qquad \text{(USEPA, 1992)}$$

where: D = Drainage layer thickness

For the proposed ERDF liner configuration, the following values are used:

k =	5.00E-02 cm/sec =	1.42E+02 ft/day (assumed based on previous values at the site)
h =	12 inches =	1.0 foot (assume worst-case value)
α =	1.5%	
$\tan\alpha$ =	0.0150 (based on slope of the bottom liner)	
$\sin\alpha$ =	0.0150 (based on slope of the bottom liner)	
D =	12 inches =	1.0 foot (from proposed design)
B_{avg} =	66.67 feet (from equation above)	

V:\PROJECTS\2186\351\Change Notice 1\Calculations\100\action leakage rate

Weaver Boos Consultants, LLC

Made By	SN	Date	06/07/07	Subject	Action Leakage Rate (ALR) Calculations
Chkd By	JB	Date	8/01/07		Hanford ERDF Liner Design

Incorporating the parameters into the equations above, the flow rate in the leak detection system (Q) is calculated as follows:

$Q =$ 1.42E+02 cubic feet per day
$Q =$ 1.06E+03 gallons per day

In accordance with the USEPA Supplemental Background Document, a factor of safety is incorporated. In order to provide a more conservative ALR, the calculated flow is divided by the safety factor:

$FS =$ 2.0 (recommended by USEPA)
$Q =$ 530 gallons per day

For purposes of calculating leakage rates through geomembranes, the USEPA Supplemental Background Document estimates a geomembrane defect (i.e., hole) frequency of one to two per acre. Assuming a defect frequency of one per acre, the flowrate calculated above may be converted directly from gallons/day to gallons/acre/day:

$Q =$ 530 gallons per acre per day (gpad)

The required pumping capacity for the secondary sump can then be calculated by multiplying the ALR by the area draining to each sump in Cells 7-10:

$A =$ 8.63 acres (area of each lined cell)
$Q_{req} =$ 4,576 gallons per day
$Q_{req} =$ 3.2 gallons per minute (gpm)

The pumping factor of safety is then calculated by dividing the leachate extraction pump capacity by the required pumping capacity that was calculated above:

$Q_{pump} =$ 15 gpm
$FS =$ 4.7

ATTACHMENT 1 (1 of 4)
EPA 530-R-92-004
NTIS #PB 92-128 214

ACTION LEAKAGE RATES FOR LEAK DETECTION SYSTEMS

(Supplemental Background Document for
the Final Double Liners and Leak Detection Systems Rule for
Hazardous Waste Landfills, Waste Piles, and Surface Impoundments)

U. S. ENVIRONMENTAL PROTECTION AGENCY
Office of Solid Waste
January 1992

ATTACHMENT 1 (2 of 4)

This data in conjunction with the previous EPA data show that over the past 10 years, and especially in more recent years, facility owners and operators have been building and operating liner systems that work better and better to minimize flow through the top liner. The major contributions to this improvement have been better installation practices and better CQA.

3. ACTION LEAKAGE RATE

In the final rule, as in the May 29, 1987 proposal, the owner or operator of units subject to the leak detection system requirements must propose and the Regional Administrator (or State Director in authorized States) must approve an action leakage rate. "Action leakage rate" is defined in the final rule as "the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.)." In short, the "action leakage rate" is the maximum design flow rate, with a safety factor, that the leak detection system can remove without the head on the bottom liner exceeding one foot (called rapid and extremely large leak in the May 29, 1987 proposal). The objective is to minimize the head or pressure on the bottom liner and thereby decrease the potential for migration of hazardous constituents out of the unit should a leak in the bottom liner, as well as the top liner, occur. The proposal background document [Ref. 4] presented a number of mathematical models for making such a determination. All of these models are based on Darcy's Law for non-turbulent flow through saturated media.

3.1 Determining an Action Leakage Rate

The proposal background document gives the following formula for flow originating through a hole in the liner, the most likely leak scenario for a geomembrane liner (pages 2.6-12 and 2.10-10, Ref. 4):

$$Q = k \cdot h \cdot \tan \alpha \cdot B_{avg} \qquad \text{[Equation 1]}$$

where Q = flow rate in the leak detection system (drainage layer),
h = head on the bottom liner,
k = hydraulic conductivity of the drainage medium,
α = slope of the leak detection system,

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ATTACHMENT 1 (3 of 4)

B_{avg} = average width of the flow in the leak detection system, perpendicular to the flow.

Assumming that the gradient of flow through the hole, at the hole, is sin α and depth of flow at the hole for concentrated flow = the thickness of the drainage layer:

$$B_{avg} = D/\sin \alpha$$

where D = leak detection system thickness.

Then, with D = 1 ft and sin α = 0.01, B_{avg} = 100 ft
0.02, B_{avg} = 50 ft
0.03, B_{avg} = 33 ft.

Using these values for B_{avg} and Equation 1 with h $\approx$ D = 1 ft (h $\approx$ D for small values of α), Q in gpad =

k (cm/sec)	sin α	B_{avg} (ft)		
		33	50	100
1	.01 .02 .03	---- ---- 21,000	---- 21,000 ----	21,000 ---- ----
.1	.01 .02 .03	---- ---- 2,100	---- 2,100 ----	2,100 ---- ----
.01	.01 .02 .03	---- ---- 210	---- 210 ----	210 ---- ----

Thus, using the minimum specifications in today's rule: 1% slope, 12 in thick drainage layer, and 1 X 10^{-1} cm/sec hydraulic conductivity for surface impoundments and 1 X 10^{-2} cm/sec hydraulic conductivity for landfills and waste piles, and assuming that the head is 1 ft and the average width of flow (B_{avg}) is as given above, the results show maximum flow rates of 2,100 gpad for surface impoundments and 210 gpad for landfills and waste piles. Using a safety factor of two, as suggested in the example given in the proposed rule preamble, yields about 1,000 gpad for surface impoundments and 100 gpad for landfills and waste piles as the Agency recommended action leakage rates, for units that are designed to the minimum specifications in today's rule. As listed in the rule and above, the safety factor helps account for uncertainties in the design, construction, operation, and location of the drainage layer and potential decreases in flow over time as a result of overburden compressive forces and clogging caused by fines and biological and chemical actions in any leachate that seeps through. Of course, all of the above mechanisms that could result in potential decreases in flow over time should also be considered when selecting the design, especially the hydraulic conductivity of the drainage layer, and in construction. Because this calculation used the

ATTACHMENT 1 (4 of 4)

minimum technical requirements and other design assumptions to maximize potential head on the bottom liner, and uses a safety factor, EPA believes that the units meeting the minimum technical requirements would not require action leakage rates below 100 gpad for landfills and waste piles and 1,000 gpad for surface impoundments.

Assuming the wetted area in the drainage layer beneath a small hole leak has approximately the shape of a cone from side view and a parabola from top view, the width of the parabola (B) is:

$$B = \frac{2\sqrt{Q/k}}{\sin\alpha}\sqrt{1 + \frac{2x\sin\alpha}{\sqrt{Q/k}}}$$

where x = plan distance downslope from hole (i.e., B is a function of the distance x from the hole; most of B is at the hole with only slight increases downslope).

Assuming x = 0 (i.e., looking at B under the hole, $B = \frac{2\sqrt{Q/k}}{\sin\alpha}$) and substituting this value for B into Equation 1 modified for a triangular cross-section of flow (i.e., $Q = 1/2\ k \cdot h \cdot \tan\alpha \cdot B$) and solving for Q yields:

$$Q = k \cdot h^2 \qquad \text{[Equation 2]}$$

where h = head on the bottom liner and h < thickness of drainage layer.

This equation becomes the following if the condition is changed from "h < thickness of the drainage layer (D)" to "h ≥ D" (which is important for geonet calculations):

$$Q = k \cdot D\ (2h - D) \qquad \text{[Equation 3].}$$

Solving Equation 3 using the minimum design specifications in the final rule, Q =

for .1 cm/sec: 2100 gpad
.01 cm/sec: 210 gpad
geonet: 6800 gpad.

These numbers are the same as the results given above for Equation 1.

Results Using a 3-D Model

Tables 1-4 and Figures 1-10 in Appendix B were developed from a 3-D model to show the relative effects of various design parameters and assumptions on flow capacity, and to show the shapes of the flow in the drainage layer for various designs and assumptions, including hole size and head. Appendix C gives background information on the 3-D model. The tables show that slope, length of run, and hole size have some effect on flow rate (e.g., 4% increase in flow rate when slope is increased from 1% to 2% [Tables 1, 3-5]; 1% increase in flow rate at 1% slope when

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APPENDIX G

VADOSE ZONE PIPE CALCULATIONS – 0060-SC-C-001

CABLE TENSION CALCULATION – 0060-SC-C-002

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-C-001
Discipline:	Civil		
Subject:	Vadose Zone Pipe Calculations		
Computer Program:			
Computer Program Version:			

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation X Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 3 sheets Figures - 1 sheet Att. 1 - 8 sheets Total = 13 sheets	Steve Niehoff	Mark Sieracke	Brian Horvath	John Briest	9/28/07 7/29/2007

Summary of Revisions	

Weaver Boos Consultants, LLC

Made By SN	Date 06/25/07	Subject	Stainless Steel Pipe Static Load Calculations
Chkd By JB	Date 8/01/07		Hanford ERDF Vadose Zone Monitoring

Objective: To calculate the static loads on the stainless steel piping that will be used in the vadose zone monitoring system beneath Cells 7 and 8. These loads are then compared to the allowable stresses on the selected

Methods: For earth loads on a buried steel pipe, the steel pipe is considered flexible and the design procedures for flexible pipe apply. For pipes placed in a trench above the water table, the earth loading applied to the pipe is calculated as a prism of soil with a width equal to the pipe diameter, and a height equal to th depth of fill over the pipe. References are listed below:

American Lifelines Alliance. (2001). "Guidelines for the Design of Buried Steel Pipe."

Given: The vadose zone monitoring system will consist of three (3) four-inch diameter non-perforated stainless steel pipelines trenched into the cell subgrade just beneath the admix liner. The piping must be designed to withstand the overlying loads, including those imposed by the final cover system. The unit weights and thicknesses of the various earth loading layers are summarized below and in the attached figure:

Overburden Layer	Thickness (ft)	Unit Wt. (pcf)	Applied Load (psf)
Final Cover	18	120	2,160
Waste	93	140	13,020
Operations Layer	3	130	390
Drainage Layer(s)	2	130	260
Admix Liner	3	140	420
Pipe Trench Backfill	2	130	260
TOTAL			**16,510**

The pipes are assumed to be Schedule 40, and constructed of Grade 304 stainless steel. Typical pipe properties are shown below:

Minimum yield strength (σ_y) =	29,500 psi
Modulus of Elasticity =	29,000 ksi
Ring buckling strain limits =	5.0% of diameter
Nominal pipe diameter =	4 inches
Wall thickness (t) =	0.237 inches
Pipe outer diameter =	4.5 inches

Weaver Boos Consultants, LLC

Made By	SN	Date	06/25/07	Subject	Stainless Steel Pipe Static Load Calculations
Chkd By	JB	Date	8/01/07		Hanford ERDF Vadose Zone Monitoring

Calculations: *Wall Crushing*

The factor of safety against wall crushing can be calculated by the following equation:

$$FS = \frac{\sigma_y}{\sigma_{applied}}$$ (American Lifelines Alliance, 2001)

where
FS = Factor of safety against wall crushing
σ_y = Minimum yield strength of pipe materials 29,500 psi
$\sigma_{applied}$ = Applied load = 16,510 psf = 115 psi

FS = 257

Through-Wall Bending

Buried steel pipe will tend to ovalize under the effects of loading. The modified Iowa deflection formula is used to estimate the pipe ovality under the applied loads:

$$\frac{\Delta y}{D} = \frac{LKP}{\frac{EI}{R^3} + 0.061E'}$$ (American Lifelines Alliance, 2001)

where
Δy = Vertical deflection of pipe, inches
D = Outer diameter of pipe = 4.5 inches
L = Deflection lag factor = 1.5 (assumed)
K = Bedding constant = 0.1 (assumed)
P = Applied pipe load = 115 psi (calculated above)
E = Pipe modulus of elasticity = 2.90E+07 psi
I = Pipe wall moment of inertia = 1.109E-03 in.^{4}/in. ($I = t^3/12$)
R = Pipe radius = 2 inches
E' = Modulus of soil reaction = 3,000 psi (assume well-compacted coarse bedding)

Δy = 0.018 inches

The through-wall bending stress is then calculated using the following equation:

$$\sigma_{bw} = 4E\left(\frac{\Delta y}{D}\right)\left(\frac{t}{D}\right)$$ (American Lifelines Alliance, 2001)

where σ_{bw} = Through-wall bending stress, psi

σ_{bw} = 24,990 psi

$$FS = \frac{\sigma_y}{\sigma_{bw}}$$

FS = 1.2

Weaver Boos Consultants, LLC

Ring Buckling

If loads are excessive, the pipe may buckle. The critical buckling pressure is calculated using the following equation:

$$P_c = \sqrt{32 R_w B' E'\left(\frac{EI}{D^3}\right)}$$ (American Lifelines Alliance, 2001)

where P_c = Critical buckling pressure, psi

R_W = Water buoyancy factor = 1 (assumed when pipe is above water table)

B' = Empirical coefficient of elastic support

$$B' = \frac{1}{1+4e^{\left(-0.065\frac{C}{D}\right)}}$$ (American Lifelines Alliance, 2001)

where C = Depth of soil cover above pipe = 121 ft = 1,452 inches

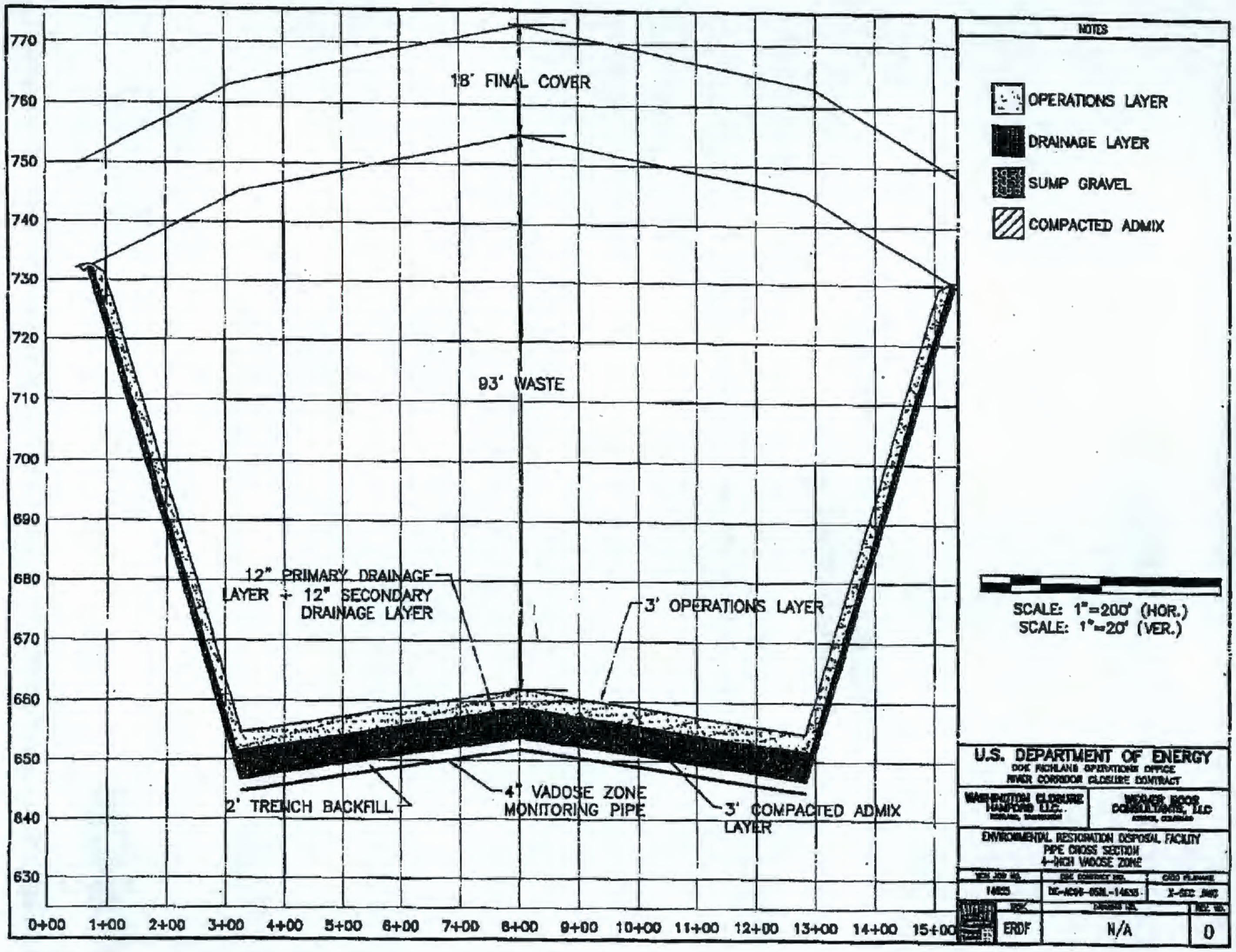
B' = 1.000

P_c = 5,822 psi

$$FS = \frac{P_c}{\sigma_{applied}}$$

FS = **50.8**

Conclusions: The selected pipes are suitable for the proposed application. Note that the above calculations are conservative, since a prism load was used. Since the vadose zone monitoring pipes are to be installed in a trench, soil arching is expected to occur, thus lessening the earth loads on the buried pipe. The use of the modified arching load, which is a composite of the prism load and the Marston load, results in a calculated soil pressure that is less than half of the prism load.


18' FINAL COVER
93' WASTE
12" PRIMARY DRAINAGE LAYER + 12" SECONDARY DRAINAGE LAYER
3' OPERATIONS LAYER
2' TRENCH BACKFILL
4" VADOSE ZONE MONITORING PIPE
3' COMPACTED ADMIX LAYER
770
760
750
740
730
720
710
700
690
680
670
660
650
640
630
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
NOTES
OPERATIONS LAYER
DRAINAGE LAYER
SUMP GRAVEL
COMPACTED ADMIX
SCALE: 1"=200' (HOR.)
SCALE: 1"=20' (VER.)
U.S. DEPARTMENT OF ENERGY
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
PIPE CROSS SECTION
4-INCH VADOSE ZONE
ERDF
N/A
0

Attachment 1 (1 of 8)

AmericanLifelinesAlliance

A public-private partnership to reduce risk to utility and transportation systems from natural hazards

Guidelines for the Design of Buried Steel Pipe

July 2001

(with addenda through February 2005)

ASCE

American Society of Civil Engineers

ATTACHMENT 1 (2 OF 8)

4.2 Ovality and Stress

4.2.1 Ovality

A buried pipe tends to ovalize under the effects of earth and live loads, as illustrated in Figure 4.2-1 The modified Iowa deflection formula may be used to calculate the pipe ovality under earth and live loads:

$$\frac{\Delta y}{D} = \frac{D_l KP}{\left(\frac{(EI)_{eq}}{R^3} + 0.061E'\right)} \tag{4-2}$$

where:

- D = pipe outside diameter, inches
- Δy = vertical deflection of pipe, inches
- D_l = deflection lag factor (~1.0-1.5)
- K = bedding constant (~0.1)
- P = pressure on pipe due to soil load P_V plus live load P_P, psi
- R = pipe radius, inches
- $(EI)_{eq}$ = equivalent pipe wall stiffness per inch of pipe length, in./lb
- E' = modulus of soil reaction, psi

The pipe wall stiffness, $(EI)_{eq}$, is the sum of the stiffness of the bare pipe, lining (subscript L) and coating (subscript C).

$$(EI)_{eq} = EI + E_L I_L + E_C I_C \tag{4-3}$$

where:

- I = $\frac{t^3}{12}$
- t = wall thickness of pipe, lining, or coating

The modulus of soil reaction E' is a measure of the stiffness of the embedment material surrounding the pipe. E' is actually a hybrid modulus, being the product of the modulus of the passive resistance of the soil and the radius of the pipe. Values of E' vary from close to zero for dumped, loose, fine-grained soil to 3000 psi for highly compacted, coarse-grained soil. Recent studies show that the confined compression modulus can be used in place of E'

4.2.2 Through-Wall Bending

Under the effect of earth and surface loads, the through-wall bending stress in the buried pipe, distributed as shown in Figure 4.2-2, is estimated according to (4-4):

$$\sigma_{bw} = 4E\left(\frac{\Delta y}{D}\right)\left(\frac{t}{D}\right) \qquad (4\text{-}4)$$

where:

- σ_{bw} = through-wall bending stress
- $\Delta y/D$ = pipe ovality
- D = outside diameter of pipe
- t = pipe wall thickness
- E = modulus of elasticity of pipe

4.2.3 Crushing of Side Walls

The burial depth should be sufficient that the pressure P on the pipe due to the earth and surface load is less than that causing the crushing of the side wall (see Figure 4.2-3)

For buried pressure-steel piping and pipelines, with D/t typically smaller than 100, and a yield stress larger than 30,000 psi, crushing of the sidewall is quite unlikely.

4.2.4 Ring Buckling

If the soil and surface loads are excessive, the pipe cross-section could buckle as shown in Figure 4.2-4.

Appendix A evaluates ring buckling, which depends on limiting the total vertical pressure load on pipe to:

$$\frac{1}{FS}\sqrt{32 R_W B' E' \frac{(EI)_{eq}}{D^3}}$$

where:

- FS = factor of safety
  - = 2.5 for $(C/D) \geq 2$
  - = 3.0 for $(C/D) < 2$
- C = depth of soil cover above pipe
- D = diameter of pipe
- Rw = water buoyancy factor = 1 - 0.33(hw/C), 0<hw<C
- hw = height of water surface above top of pipe
- B' = empirical coefficient of elastic support (dimensionless)

B' as given AWWA Manual 11, *Steel Pipe—A Guide for Design and Installation*:

$$B' = \frac{1}{1+4e^{(-0.065\frac{C}{D})}} \tag{4-6}$$

In steel pipelines, buckling typically occurs when the ovality reaches about 20%. Other construction and code requirements typically limit the amount of permissible cross section ovality for new steel pipelines to much smaller values (e.g., 3% in API RP-1102).

4.2.5 Fatigue

Where buried pipe is subject to large cyclic surface loads, as in the case of pipe crossing under railroad tracks or highways, Federal, state or local regulations usually specify a minimum burial depth. These typically vary from 1 to 6 feet, depending on the type of crossing, the type of excavation (rock or normal excavation), the pipe diameter, and the consequence of failure [ASME B31.4, ASME B31.8, 49 CFR Part 192 and Part 195, API RP-1102]. For example, API RP-1102 Steel Pipeline Crossing Railroads and Highways, Sixth edition, April 1993, specifies a minimum depth of cover of 6 feet under railroad tracks and 4 feet under highway surfaces.

If the pipe is buried with less than two feet of cover, the continual flexing of the pipe may cause a breakup of the road surface. If the pipe is mortar line or coated, the deflection limit due to the cyclic live load should be limited to an amplitude of 1%.

4.3 Example

A standard, 24-inch diameter carbon steel pipe with flexible lining and coating and wall thickness $t = 0.375$-inch (moment of inertia $I = 1943$ in^4), crosses beneath a road. The maximum design surface load is $P_s = 10{,}000$ pounds. The pipe is buried 3 feet (36 inches) underground, above the water table, in soil with a total unit weight of 100 lb/ft^3 with a modulus of soil reaction E' of 500 psi. Determine the stresses in the pipe for the case of zero internal pressure.

The soil pressure on the pipe is:

$$P_v = 100\frac{\text{lb}}{\text{ft}^3} 3\text{ ft}\left(\frac{1\text{ psi}}{144\text{ psf}}\right) = 2.1\text{ psi}$$

The pressure on the pipe due to a 10,000 pound surface load directly over the pipe (d = 0) is:

$$P_p = \frac{3(10000\text{ lb})}{2\pi(36\text{ in})^2\left[1+\left(\frac{0}{36\text{ in}}\right)^2\right]^{2.5}} = 3.7\text{ psi}$$

With an impact factor of 1.15, the total live load is $1.15(3.7) = 4.3$ psi.

Therefore, the total applied pressure on the pipe is:

$$P = 2.1\text{ psi} + 4.3\text{ psi} = 6.4\text{ psi}$$

The moment of inertia of the pipe wall per inch of circumference is the moment of inertia of a strip 3/8-inch wide and 1 inch long.

ATTACHMENT 1 (5 of 8)

H. CROSS COMPANY

COMPANY HISTORY NEWS PURCHASING POLICY CATALOG CONTACT US

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TESTING CAPABILITIES
CUSTOMER MATERIALS

Stainless Steel

Table of Contents

STANDARD DIMENSIONS and TOLERANCES

Introduction

There are various forms of stainless steels and we will briefly discuss the most common alloys produced by H Cross Company. If the specific alloy you require is not listed contact us as we will fabricate your material or if the required quantity is large enough we can purchase and fabricate the material for you

Type 302 Stainless Steel

Chemistry % by Weight

C	0.15% Max	Mn	2% Max	P	0 45%
Cr	17-19%	N	0 1% Max	S	0 03%
Fe	Balance	Ni	8-10%	Si	0 75% Max

Typical Mechanical Properties

Ultimate Tensile Strength	74,000 PSI Minimum
Yield Strength	29,500 PSI Minimum
Elongation @ Break	40%
Modulus of Elasticity	29,000 KSI

Typical Physical Properties

Density	0.285 lbs/cu in
Melting Point	1420 °C
Electrical Resistivity @ RT	72 Microhm-cm
Thermal Conductivity @ 100°C	16 3 w/m-k

This alloy is the most frequently used in the stainless steel family. It is best used in applications that require resistance to corrosion, product contamination and oxidation. It is easily fabricated, has excellent formability, is easily cleaned, has high strength with low weight and is available in many product forms. The various forms H Cross Company can supply are listed below. Typical applications for the material include the food and beverage industry, cryogenics, and pressure containing. Type 302 is preferred to type 304 for as rolled product since its higher carbon content allows for meeting yield and tensile requirements while holding a higher level of ductility

Back to Top

Type 304 Stainless Steel

Chemistry % by Weight

C	0.08% Max	Mn	2% Max	P	0 045%
Cr	18-20%	N	0 1% Max	S	0 03%
Fe	Balance	Ni	8-10 5%	Si	0 75% Max

Typical Mechanical Properties

Ultimate Tensile Strength	74,500 PSI Minimum
Yield Strength	29,500 PSI Minimum

ATTACHMENT 1 (6 OF 8)

Elongation @ Break	40%
Modulus of Elasticity	29,000 KSI

Typical Physical Properties

Density	0.285 lbs/cu in
Melting Point	1421° C
Electrical Resistivity @ RT	72 Microhm-cm
Thermal Conductivity @ 100° C	16 3 W/m-K

Type 304 stainless steel is probably the second most used and familiar of the stainless steel family It is used in many of the same applications that the type 302 stainless steel is used and in fact many past users of type 302 stainless steel are now using type 304 since technology has made lower carbon levels more easily attainable and economical

Back to Top

Type 316L Stainless Steel

Chemistry % by Weight

C	0.03%	Mo	2-3%	P	0 045%
Cr	16-18%	N	0.1%	S	0 03%
Fe	Balance	Ni	10-14%	Si	0 75%
Mn	2%				

Typical Mechanical Properties

Ultimate Tensile Strength	70,000 PSI Minimum
Yield Strength	24,500 PSI Minimum
Elongation @ Break	40% Minimum (Annealed Temper)
Modulus of Elasticity	29,000 KSI

Typical Physical Properties

Density	0.29 lbs/cu in
Melting Point	1440°C
Electrical Resistivity @ RT	74 Microhm-cm
Thermal Conductivity @ RT	14.6 W/m-K
Maximum Service Temp (Air)	900° C

Back to Top

Type 316L stainless steel in a molybdenum bearing austenitic that is more resistant to general corrosion and pitting than conventional nickel chromium stainless steels such as 302-304. This alloy also has a higher creep resistance, rupture strength and tensile strength at elevated temperatures In addition to the excellent corrosion resistance and tensile strength properties it still has excellent formability

In addition to these alloys H Cross Company can also supply material in type 347 and type 420 (Martensitic) Stainless steels

Forms

H Cross Company can provide all stainless steels in wire, ribbon, strip, sheet and foil sizes to suit your particular needs. Please refer to our Standard Dimensions and Tolerances page for general size ranges of products. If you do not see your required size list contact us via email or phone for further information or assistance

Back to Top

Info@HCrossCompany.com

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Fax: 201-863-9297

363 Park Avenue
Weehawken, NJ 07086 USA

Custom Metal Fabrication Shops Services • Specialty Metals Metal Products Fabricators • Refractory Materials Material Metals • Metals Fabricators Machining Precious Metal Alloy Alloys • Precision Cutting Finishing Specialty Metal • Lamp Seal Custom Foil Seals •

ATTACHMENT 1 (7 of 8)

E PLURIBUS UNUM

(Out of Many One)

ANNUIT COEPTIS
(He Has Favored Our Undertakings)

NOVOS ORDO SECLORUM
(A New Order of the Ages)

Am. Steel Pipe Supply Corp.

P.O. Box 7
Pacific, Mo. 63069, U.S.A.

Solving Pipe Procurement Problems Around The World.

Black figures = wall thickness(inches)		ANSI PIPE SCHEDULES													Blue figures = weight per foot (pounds)		
Pipe Size	O.D Inches	5s	TRUE 5	10s	TRUE 10	20	30	40s & STD	TRUE 40	60	80s & XH	TRUE 80	100	120	140	160	XXH
1/8	.405		0.35 .1383	.049 .1863	.049 .1863			.068 .2447	.068 .2447		.095 .3145	.095 .3145					
1/4	.540		.049 .2570	.065 .3297	.065 .3297			.088 .4248	.088 .4248		.119 .5351	.119 .5351					
3/8	.675		.049 .3276	.065 .4235	.065 .4235			.091 .5676	.091 .5678		.126 .7388	.126 .7388					
1/2	840	.065 .5383	.065 .5383	.083 .6710	.083 .6710			.109 .8510	.109 .8510		147 1.088	147 1.088				187 1.304	294 1.714
3/4	1.050	.065 .6838	.065 .6838	.083 .8572	.083 .8572			113 1.131	113 1.131		154 1.474	154 1.474				.218 1.937	308 2.441
1	1.315	.065 .8678	.065 .8678	109 1.404	190 1.404			133 1.679	133 1.679		179 2.172	179 2.172				.250 2.844	.358 3.659
11/4	1.660	065 1.107	.065 1.107	109 1.806	109 1.806			140 2.273	140 2.273		191 2.987	191 2.987				250 3.765	382 5.214
1 1/2	1.900	065 1.274	.065 1.274	109 2.638	109 2.638			145 2.718	145 2.718		200 3.631	200 3.631				281 4.859	.400 6.408

Am Steel Pipe Supply Corp -- ANSI Chart

ATTACHMENT 1 (8 of 8)

2	2.375	.085 1.604	.065 1.604	109 2.638	109 2.638			154 3.653	154 3.653		.218 5.022	218 5.022				.344 7.462	436 9.029
2 1/2	2.875	083 2.475	.083 2.475	120 3.531	120 3.531			203 5.793	203 5.793		276 7.661	276 7.661				.375 10.01	.562 13.70
3	3 500	.083 3.029	083 3.029	120 4.332	120 4.332			216 7.576	216 7.576		.300 10.25	.300 10.25				.437 14.32	.600 18.58
3 1/2	4 0	.083 3.472	.083 3.472	.120 4.97	.120 4.97			226 9.109	226 9.109		.318 12.51	.318 12.51					.636 22.85
4	4 5	083 3.915	083 3.915	120 5.613	120 5.613			.237 10.79	.237 10.79	.281 12.66	.337 14.98	.337 14.98		.437 19.01		.531 22.51	.674 27.54
4 1/2	5 0							.247 12.53			.355 17.81						.710 32.53
5	5.563	109 6.349	109 6.349	134 7.770	134 7.770			.258 14.62	.258 14.62		.375 20.78	.375 20.78		.500 27.04		.625 32.96	.750 38.55
6	6.625	109 7.585	109 7.585	134 9.289	134 9.289			.280 18.97	.280 18.97		.432 28.57	.432 28.57		.562 36.39		.718 45.30	.864 53.16
7	7.625							.301 23.57			.500 38.05						.875 62.08
8	8 625	109 9.914	109 9.914	.148 13.40	.148 13.40	.250 22.36	.277 24.70	.322 28.55	.322 28.55	.406 35.64	.500 43.39	.500 43.39	.593 50.87	.718 60.63	.812 67.76	.906 74.69	.875 72.42
9	9.625							.342 33.90			.500 48.72						
10	10 75	.134 15.19	.134 15.19	.165 18.65	.165 18.65	.250 28.04	.307 34.24	.365 40.48	.365 40.48	.500 54.74	.500 54.74	.593 64.33	.718 76.93	.843 89.20	1.000 104.1	1.125 115.7	
11	11.75							.375 45.65			.500 60.07						
12	12.75	.156 21.07	.165 22.18	.180 24.20	.180 24.20	.250 33.38	.330 43.77	.375 49.56	.406 53.53	.562 73.16	.500 65.42	.687 88.51	.843 107.2	1.000 125.5	1.125 139.7	1.312 160.3	
14	14 0	.156 23.06		.188 27.73	.250 36.71	.312 45.68	.375 54.57	.375 54.57	.437 63.67	.593 84.91	.500 72.09	.750 106.1	.937 130.7	1.093 150.7	1.250 170.2	1.406 189.1	
16	16.0	.165 27.90		.188 31.75	.250 42.05	.312 52.36	.375 62.58	.375 62.58	.500 82.77	.656 107.5	.500 82.77	.843 136.5	1.031 164.8	1.218 192.3	1.437 223.5	1.593 245.1	
18	18.0	.165 31.43		.188 35.76	.250 47.39	.312 59.03	.437 82.06	.375 70.59	.562 104.8	.750 138.2	.500 93.45	.937 170.8	1.156 208.0	1.375 244.1	1.562 274.2	1.781 308.5	
20	20 0	.188 39.78		.218 46.05	.250 52.73	.375 78.60	.500 104.1	.375 78.60	.593 122.9	.812 166.4	.500 104.1	1.031 208.9	1.281 256.10	1.500 296.4	1.750 341.1	1.968 379.0	
24	24.0	.218 55.37		.250 63.41	.250 63.41	.375 94.62	.562 140.8	.375 94.62	.687 171.2	.968 238.1	.500 125.5	1.218 296.4	1.531 367.4	1.812 429.4	2.062 483.1	2.343 541.9	
26	26.0				.312 85.60	.500 136.2		.375 102.8			.500 136.2						
28	28.0				.312 92.26	.500 146.8	.625 182.7	.375 110.6									
30	30.0	.250 79.43		.312 98.93	.312 98.93	.500 157.5	.625 196.1	.375 118.6			.500 157.5						
32	32.0				.312 105.8	.500 168.2	.625 209.4	.375 126.7	.688 230.1		.500 168.2						
34	34.0				.312 112.3	.500 178.9	.625 222.8	.375 134.7	.688 244.8								
36	36 0				.312 118.9		.625 236.1	.375 142.7	.750 282.3		.500 189.6						
40	40.0							.375 158.7			.500 210.9						
42	42.0							.375 166.7			.500 221.6						
48	48.0							.375 190.7			.500 253.6						

Send mail to webmaster@steel-pipe.com with questions or comments about this web site
Last modified: May 11, 2004

http://www steel-pipe com/ansi_chart htm 2/16/2007

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Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-C-002
Discipline:	Civil		
Subject:	Cable Tension Calculations		
Computer Program:			
Computer Program Version:			

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation **X** Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 3 sheets Figures - 1 sheet Att. 1 - 4 sheets Total = 9 sheets	Steve Niehoff	Mark Sieracke	Brian Horvath	John Briest	9/28/07 7/29/2007

Summary of Revisions	

Sheet 1 of 3
File No. 2186-351-11
Calculation No. 0060-SC-C-002

Weaver Boos Consultants, LLC

Made By SN	Date 06/20/07	Subject	Cable Tension Calculations
Chkd By JB	Date 8/01/07		Hanford ERDF Vadose Zone Monitoring

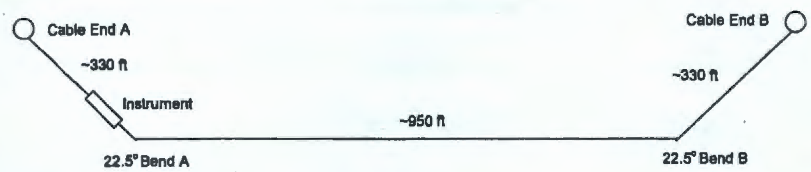
Objective: To calculate the tension applied to the cable as the monitoring device is pulled through the vadose zone monitoring system. The calculated tension is then compared to the allowable load on the selected cable.

Methods: The tension in the cable is calculated using the cable pulling equations. These equations estimate the tension in straight pipe and pipe bends based on the weight of the cable. bend angle, and coefficient of friction. References are listed below:

American Polywater (undated). "Estimating Tension When Pulling Cable into Conduit." *Technical Talk* newsletter, Volume 1.

Giancoli, Douglas C. (1989). *Physics for Scientists and Engineers with Modern Physics - Volume 1*. Prentice Hall, Inc., Englewood Cliffs, New Jersey. 502 pp.

Given: The cable system will be pulled through the four-inch diameter non-perforated stainless steel pipelines trenched into the cell subgrade just beneath the admix liner. The cable must be designed to withstand loads from its own weight, the weight of the instrument, and the frictional forces generated as it passes through the pipeline. A schematic of the cable system is shown below:



The cable is assumed to consist of grade 316 stainless steel wire rope (7x19). Typical properties of the wire rope are shown below:

Wire rope diameter =	0.25 inches
Working load limit =	1,160 lbs (see attached)
Cable weight =	0.11 lbs/ft (see attached)
Coefficient of friction (μ) =	1.0 (conservative, based on 0.7 for steel-on-steel from attached)

Calculations: For purposes of this calculation, it is assumed that the instrument is being pulled up toward Cable End A, and that Cable End B provides no additional resistance. To provide a conservative analysis, gravitational effects on the section of cable between Cable End B and Bend B are ignored (i.e., the weight of this cable section is assumed to contribute to the overall cable tension. In addition, an instrument weight of 50 pounds is assumed. This value is assumed to be conservative since a solid two-inch diameter, two-foot long rod made of lead would weigh only 31 pounds.

Weaver Boos Consultants, LLC

Made By SN	Date 06/20/07	Subject	Cable Tension Calculations
Chkd By JB	Date 8/01/07		Hanford ERDF Vadose Zone Monitoring

For cable that is pulled through straight sections of conduit, the cable tension is calculated using the following equation:

$$T_{out} = T_{in} + LW\mu \qquad \text{(American Polywater, undated)}$$

where
T_{out} = Tension out of cable segment (pounds)
T_{in} = Tension into cable segment (pounds)
L = Length of cable segment (feet)
W = Unit weight of cable (pounds per foot)
μ = Coefficient of friction (unitless)

For cable that is pulled through a bend, the cable tension is calculated using the following equation:

$$T_{out} = T_{in}e^{\mu\theta} \qquad \text{(American Polywater, undated)}$$

where
T_{out} = Tension out of cable segment (pounds)
T_{in} = Tension into cable segment (pounds)
μ = Coefficient of friction (unitless)
θ = Bend angle (radians)

Beginning at Cable End B, the tension in each segment of cable is calculated as follows:

Straight Section from Cable End B to Bend B

T_{in} = 0 pounds (Cable End B assumed to provide no additional resistance)
L = 330 feet (see diagram above)
W = 0.11 pounds/foot (from above)
μ = 1.0 (from above)

T_{out} = 36.3 pounds

Bend B

T_{in} = 36.3 pounds (from previous segment)
μ = 1.0 (from above)
θ = 22.5 degrees = 0.393 radians

T_{out} = 53.8 pounds

Straight Section from Bend B to Bend A

T_{in} = 53.8 pounds (from previous segment)
L = 950 feet (see diagram above)
W = 0.11 pounds/foot (from above)
μ = 1.0 (from above)

T_{out} = 158.3 pounds

Weaver Boos Consultants, LLC

Made By	SN	Date	06/20/07	Subject	Cable Tension Calculations
Chkd By	JB	Date	8/01/07		Hanford ERDF Vadose Zone Monitoring

Bend A

T_{in} = 158.3 pounds (from previous segment)
μ = 1.0 (from above)
θ = 22.5 degrees = 0.393 radians

T_{out} = 234.4 pounds

Straight Section from Bend A to Cable End A

T_{in} = 234.4 pounds (from previous segment)
L = 330 feet (see diagram above)
W = 0.11 pounds/foot (from above)
μ = 1.0 (from above)

T_{out} = 270.7 pounds

Instrument Contribution

T_{in} = 270.7 pounds (from previous segment)
Instrument weight = 50 pounds (assumed)

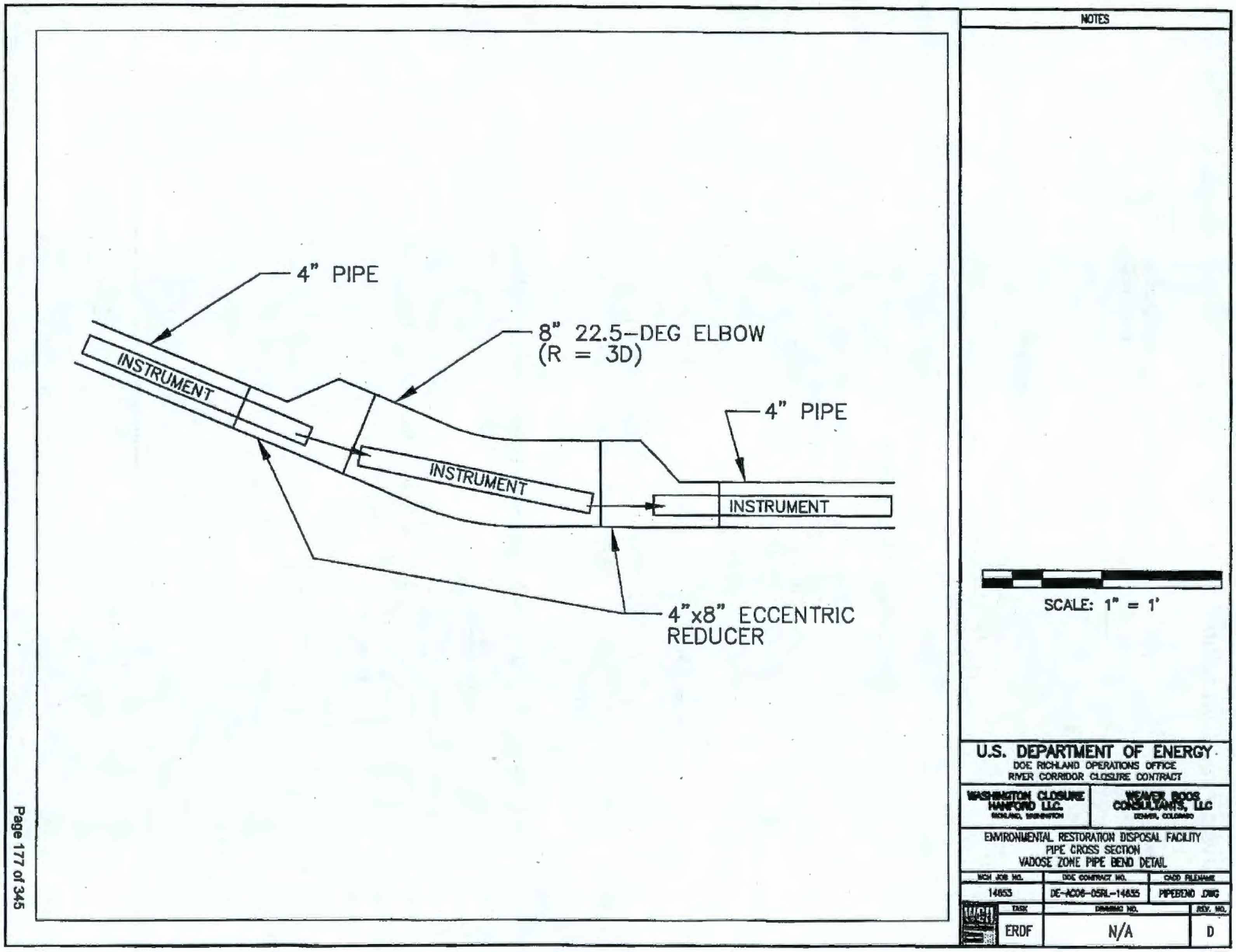
T_{out} = 320.7 pounds

The factor of safety (FS) is then calculated by using the following equation:

$$FS = \frac{WLL}{T_{max}}$$

where T_{max} = Maximum cable tension = 320.7 pounds (calculated above)
WLL = Working load limit of selected cable = 1,160 pounds (from above)

FS = 3.62

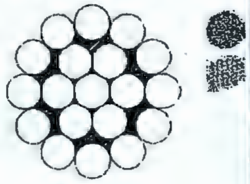

4" PIPE
8" 22.5-DEG ELBOW
(R = 3D)
4" PIPE
INSTRUMENT
INSTRUMENT
INSTRUMENT
4"x8" ECCENTRIC
REDUCER
NOTES
SCALE: 1" = 1'
U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT
WASHINGTON CLOSURE
HANFORD LLC.
CONSULTANTS, LLC
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
PIPE CROSS SECTION
VADOSE ZONE PIPE BEND DETAIL
WCH JOB NO.
14853
DOE CONTRACT NO.
DE-AC06-05RL-14655
CADD FILENAME
PIPEBEND .DWG
TASK
ERDF
DRAWING NO.
N/A
REV. NO.
D

WIRE ROPE

Attachment 1 (1 of 4)

WIRE ROPE 1 X 19

316 STAINLESS STEEL

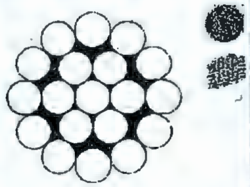


ITEM	SIZE	SPOOL			
			(lb)	(minimum lb)	(lb)
S0701-0001	1/16	CUTS	110	550	1.00*
S0701-0001-5	1/16	5000 FT	110	550	44.00
S0701-0002	3/32	CUTS	200	1,000	2.00*
S0701-0002-5	3/32	5000 FT	200	1,000	105.00
S0701-0003	1/8	CUTS	360	1,800	4.00*
S0701-0003-5	1/8	5000 FT	360	1,800	184.00
S0701-0004	5/32	CUTS	580	2,900	6.00*
S0701-0004-5	5/32	5000 FT	580	2,900	280.00
S0701-0005	3/16	CUTS	840	4,200	8.00*
S0701-0005-5	3/16	5000 FT	840	4,200	403.00
S0701-0006	7/32	CUTS	1,080	5,400	10.00*
S0701-0006-5	7/32	2500 FT	1,080	5,400	278.00
S0701-0007	1/4	CUTS	1,420	7,100	14.00*
S0701-0007-5	1/4	2500 FT	1,420	7,100	360.00
S0701-0008	9/32	CUTS	1,840	9,200	17.00*
S0701-0008-5	9/32	2500 FT	1,840	9,200	458.00
S0701-0009	5/16	CUTS	2,200	11,000	21.00*
S0701-0009-5	5/16	2500 FT	2,200	11,000	[illegible]
S0701-0010	3/8	CUTS	3,200	16,000	29.00*
S0701-0010-5	3/8	2500 FT	3,200	16,000	731.00
S0701-0011	1/2	CUTS	3,800	19,000	44.00*

NOTE:
CAN BE SUPPLIED IN A SPOOL OF THE LENGTH SHOWN OR CAN BE CUT TO YOUR REQUEST (IN FEET). ALL 1X19 WIRE IS LEFT HAND LAY.
* = WEIGHT PER 100' IN POUNDS, WITHOUT REEL.
SPOOL WEIGHT INCLUDES REEL.

WIRE ROPE 1 X 19

304 STAINLESS STEEL



ITEM	SIZE	SPOOL	WLL	BL	WT
			(lb)	(minimum lb)	(lb)
S0702-0003	1/8	CUTS	420	2,100	[illegible]
S0702-0003-5	1/8	5000 FT	420	2,100	[illegible]
S0702-0004	5/32	CUTS	640	3,200	[illegible]
S0702-0004-5	5/32	5000 FT	640	3,200	[illegible]
S0702-0005	3/16	CUTS	940	4,700	[illegible]
S0702-0005-5	3/16	5000 FT	940	4,700	405.00
S0702-0007	1/4	CUTS	1,700	8,500	[illegible]
S0702-0007-5	1/4	1000 FT	1,700	8,500	147.00

NOTE:
OTHER SIZES ARE STOCKED OR CAN BE ORDERED. PLEASE CALL FOR SPECIFICS. CAN BE SUPPLIED IN A SPOOL OF THE LENGTH SHOWN OR CAN BE CUT TO YOUR REQUEST (IN FEET).
* = WEIGHT PER 100' IN POUNDS, WITHOUT REEL.

WIRE ROPE 7 X 19

316 STAINLESS STEEL

ITEM	SIZE	SPOOL	WLL	BL	WT
			(lb)	(minimum lb)	(lb)
S0703-0002	3/32	CUTS	180	[illegible]	2.00
S0703-0002-5	3/32	5000 FT	180	[illegible]	[illegible]
S0703-0003	1/8	CUTS	320	1,800	3.00
S0703-0003-5	1/8	5000 FT	320	1,800	[illegible]
S0703-0004	5/32	CUTS	480	2,900	[illegible]
S0703-0004-5	5/32	5000 FT	480	[illegible]	[illegible]
S0703-0005	3/16	CUTS	680	3,400	7.00
S0703-0005-5	3/16	5000 FT	680	3,400	340.00
S0703-0006	7/32	CUTS	900	[illegible]	9.00
S0703-0006-5	7/32	2500 FT	900	[illegible]	[illegible]
S0703-0007	1/4	CUTS	[illegible]	[illegible]	11.00
S0703-0007-5	1/4	2500 FT	[illegible]	[illegible]	[illegible]
S0703-0008	9/32	CUTS	[illegible]	[illegible]	14.00
S0703-0008-5	9/32	2500 FT	[illegible]	[illegible]	[illegible]
S0703-0009	5/16	CUTS	[illegible]	[illegible]	[illegible]
S0703-0009-5	5/16	2500 FT	[illegible]	[illegible]	[illegible]
S0703-0010	3/8	CUTS	2,200	[illegible]	[illegible]
S0703-0010-5	3/8	2500 FT	2,200	[illegible]	[illegible]
S0703-0012	1/2	CUTS	3,800	19,000	44.00
S0703-0012-1	1/2	1000 FT	3,800	19,000	464.00

NOTE:
CAN BE SUPPLIED IN A SPOOL OF THE LENGTH SHOWN OR CAN BE CUT TO YOUR REQUEST (IN FEET).
* = WEIGHT PER 100' IN POUNDS, WITHOUT REEL.
SPOOL WEIGHT INCLUDES REEL.

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ATTACHMENT 1 (2 of 4)

American Polywater's

TechnicalTalk

ROUTE TO:

A PUBLICATION FOR ENGINEERS INVOLVED IN ELECTRICAL CABLE INSTALLATION

Volume 1

ESTIMATING TENSION WHEN PULLING CABLE INTO CONDUIT

The Problem

When you calculate cable pulling tensions, what friction coefficient should you use? User responses vary . . some answer "0.5" others "0.4," or "0 35". Who's right?? What coefficient of friction provides the best tension estimates and correlation for field planning and optimal cable system design?

The Basics

To answer this question, we need to understand more about "coefficient of friction." What exactly is a "coefficient of friction" (COF) Can we find friction coefficients in an appropriate reference book?

Let's start with a simple physics class example . a wooden block (say, 5 kgs in weight) on a horizontal steel plate. Say it takes 2 kgs force (19 6 N) to pull (drag) the block across the plate. The coefficient of friction (wood on steel) is defined as the ratio of this "dragging force" (2 kgs) to the normal force (weight of 5 kg). In this case, the friction coefficient would be 4 Note that the COF is a dimensionless number

Experience tells us that if we replace the wooden block with a 5 kg rubber block, it will take a greater force to drag the rubber block (say, 6 kgs force). The measured coefficient of friction (rubber/steel) would be 1 2. What's important to note from these examples is that there is no single coefficient of friction. *The friction coefficient varies with the rubbing surfaces*

Cable/Conduit

Replace the block with cable and the plate with conduit, and we have cable pulling . . with a few complications. Neither the cable nor the conduit is flat. There may be more than one cable, which can result in complex rubbing surfaces Pulls are not straight, and forces other than gravitational weight occur at conduit bends Finally, our Polywater® Pulling Lubricants change and lower the friction coefficient

Even with these differences, the friction coefficient in cable pulling continues to depend on cable jacket type, conduit type and lubricant type. "General" coefficients don't mean much The most accurate tension estimates come from friction coefficients specific to the cable, conduit and pulling lubricant

Pulling Equations

Tension estimation in cable pulling is calculated using the cable pulling equations. The equations apply the physics from our simple example to the unique character of cable pulling. This includes the non-gravitational forces in conduit bends

Looking at a simplified form of the equations will clarify:

Straight Conduit $T_{out} = T_{in} + LW\mu$

Conduit Bend $T_{out} = T_{in} e^{\mu\theta}$

Where:

T_{out} = Tension Out
T_{in} = Tension In
L = Length of Straight Run
W = Weight of Cable (per length)
μ = Coefficient of Friction
θ = Angle of Bend
e = Natural Log Base

Note the significant effect on tension that small changes in μ (friction coefficient) can cause, especially in conduit bends where this friction coefficient is in the exponent Inaccurate friction coefficients lead to poor correlation of tension calculations with actual tensions. Unfortunately, it is in multi-bend pulls, where the tension and sidewall pressure are of most concern, that the use of an inaccurate coefficient of friction produces the greatest error

Where can you find or how can you determine meaningful friction coefficients?

EPRI Study Helpful

The Electric Power Research Institute (EPRI) is a utility funded research group in the United States The EPRI study, "Maximum Safe Pulling Lengths for Solid Dielectric Insulated Cables," provides insight, and some surprises, on lubricated cable friction and its measurement.

Attachment 1
(3 of 4)

The EPRI research showed that lubricated coefficient of friction changes with varying normal force (the force pushing the cable against the conduit wall). The EPRI report defines two different friction coefficients, one at "high sidewall bearing pressure" (High SBP) (going around bends) and the other at "low sidewall bearing pressure" (Low SBP) (straight pulls). Surprisingly, the High SBP friction coefficient is usually lower than the Low SBP friction coefficient, often lower by a factor of more than 2.

The EPRI report goes on to recommend that the High SBP friction coefficient be used in calculations when normal force on the cable is over 220 Kg/M (150 lbs/ft), and that otherwise the Low SBP coefficient of friction be used.

Polywater Research Clarifying

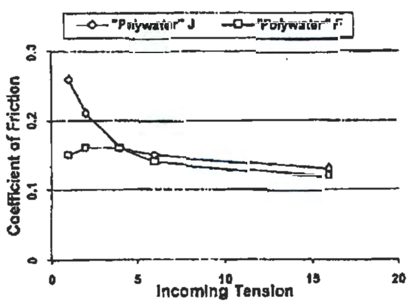
American Polywater studies confirm the variance in friction coefficient with normal pressure. We have determined that the friction at low normal bearing force is a measure of hydrodynamic friction, which is roughly proportional to lubricant viscosity (internal gel strength of the lubricant).

In contrast to the EPRI work, however, our research indicates the conversion in friction to the High SBP type occurs continuously and at bearing pressures much less than 220 Kg/M (150 lbs/ft).

Pulling Tests

One test illustrating this "variable" friction coefficient involves pulling cable through multiple, consecutive 90° duct bends (a helix). The incoming cable tension and total degrees of bend can both be varied. From the pulling force (measured with a load cell) required to move the cable, we can calculate a coefficient of friction using the pulling equations we studied earlier.

The graph below shows measured friction coefficients plotted against the tension on the cable as it enters the conduit helix. For this graph, the conduit was high density polyethlene with 540° of bend. The cable had a polyethylene jacket.



To explain the graph, first you must know that Polywater® J and Polywater® F are two of American Polywater's high-performance cable pulling lubricants ("J" is usually used for electrical cable and "F" for fiber optic cable). They are similar chemically, except that "J" is a gel lubricant (higher viscosity) and "F" is a liquid.

Where the lines converge on the above graph, and the slope levels, the low bearing pressure friction has disappeared and the cable and lubricant are in a high bearing pressure mode. By calculating the sidewall-bearing pressures (defined as tension out of the bend divided by bend radius) at the point of convergence, we find that the change from Low SBP friction to High SBP friction is complete at 6 Kg/M bearing pressure.

Because power cable's stiffness and resulting "spring" tend to increase conduit contact pressure, power cable pulling ends up in the "high bearing pressure" mode most of the time. Field-measured tensions tend to support this conclusion.

On the other hand, lighter, flexible cables (fiber optic, etc.) often demonstrate both types of friction during pulling. This is one reason why a lower viscosity, liquid lubricant like Polywater® F is best for the installation of this type of cable.

Pull-Planner™ 2000 Has Friction Data Base

We've seen that coefficient of friction varies with cable jacket and conduit type, and that it is necessary to use accurate coefficients to calculate meaningful pulling tensions.

American Polywater's laboratory has developed extensive friction data for different cable jacket and conduit types, at appropriate bearing pressures. This data is in an internal data base in our Pull-Planner™ 2000 for Windows™ Software.

The Pull-Planner™ 2000 provides a convenient way to calculate cable pulling tensions on a PC. It enables "what if" scenarios with cable, conduit, pull length, COF, incoming tension, and more. Lubricant quantities can be calculated, and calculations can be saved or printed out. The full version of the planner runs in metric or english units.

Pull-Planner™ 2000 Preview

A preview of the Pull-Planner™ 2000 is available. Use the Internet to go to www.polywater.com to preview or order the Pull-Planner™ 2000.

Our web site (www.polywater.com) also has copies of other technical studies of interest in cable installation. Visit and leave us your e-mail to stay up-to-date.

Feel free to call or write us if you have questions or would like to discuss friction measurement or tension calculation. If you wish to view a 12-minute video on "Cable Installation Engineering," please call and ask for our Customer Service Department.

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ATTACHMENT 1 (4 of 4)

TABLE 5–1
Coefficients of friction[1]

Surfaces	Coefficient of static friction, μ_s	Coefficient of kinetic friction, μ_k
Wood on wood	0.4	0.2
Wood (waxed) on wet snow	0.14	0.1
Ice on ice	0.1	0.03
Metal on metal (lubricated)	0.15	0.07
Steel on steel (unlubricated)	0.7	0.6
Rubber on dry concrete	1.0	0.8
Rubber on wet concrete	0.7	0.5
Teflon on teflon in air	0.04	0.04
Teflon on steel in air	0.04	0.04
Lubricated ball bearings	<0.01	<0.01
Synovial joints (in human limbs)	0.01	0.01

[1] Values are approximate and are intended only as a guide

to the two surfaces, and the magnitude of the normal force, F_N, which acts perpendicular to the surfaces. It is not a vector equation since the two forces are perpendicular to one another. The term μ_k is called the *coefficient of kinetic friction* and its value depends on the two surfaces; measured values for a variety of surfaces are given in Table 5–1. These are only approximate however, since μ depends on whether the surfaces are wet or dry, on how much they have been sanded or rubbed and if any burrs remain.

What we have been discussing up to now is *kinetic friction*, when one body slides over another. There is also *static friction*, which refers to a force parallel to the two surfaces that can arise even when they are not sliding. Suppose an object such as a desk is resting on a horizontal floor. If no horizontal force is exerted on the desk, there also is no friction force. But now, suppose you try to push the desk, but it doesn't move; you are exerting a horizontal force, but the desk isn't moving, so there must be another force on the desk keeping it from moving ($F_{net} = 0$). This is the force of *static friction* exerted by the floor on the desk. If you push with a greater force without moving the desk, the force of static friction also has increased. If you push hard enough, the desk will finally start to move. At this point, you have exceeded the maximum force of static friction, which is given by $F_{fr} = \mu_s F_N$, where μ_s is the *coefficient of static friction* (Table 5–1). Since the force of static friction varies from zero to this maximum value, we can write

$$F_{fr} \leq \mu_s F_N \qquad \text{[static friction]}$$

You may have noticed that it is often easier to keep a heavy object (like a desk) moving than it is to start it moving in the first place. This is a reflection of the fact that μ_s is almost always greater than μ_k. (It can never be less. Why?)

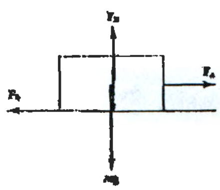

FIGURE 5–1 Example 5–1. Determining the force of static friction for various magnitudes of the applied force F_A

EXAMPLE 5–1 A 10-kg box rests on a horizontal floor. The coefficient of static friction is $\mu_s = 0.40$ and the coefficient of kinetic friction is $\mu_k = 0.30$. Determine the force of friction, F_{fr}, acting on the box if a horizontal external applied force F_A is exerted on it of magnitude (*a*) 0, (*b*) 10 N, (*c*) 20 N, (*d*) 38 N, and (*e*) 40 N.

SOLUTION Figure 5–1 shows a free-body diagram of the box. In the vertical direction there is no motion, so $F_N - mg = 0$. Hence the normal force for all cases is $F_N = mg = (10\ \text{kg})(9.8\ \text{m/s}^2) = 98\ \text{N}$. (*a*) No force is applied, the box doesn't move, and $F_{fr} = 0$. (*b*) The force of static friction will oppose any applied force up to a maximum of $\mu_s F_N = (0.40)(98\ \text{N}) = 39.2\ \text{N}$. The applied force is $F_A = 10$ N. Thus the box

APPENDIX H

CREST PAD BUILDING FOUNDATION – 0060-SC-S-001

Weaver Boos Consultants, LLC

Calculation Cover Sheet

Project Title:	ERDF Cells 7-10	Job No.	14655
Area:	600 Area	Calc. No.	0060-SC-S-001
Discipline:	Civil		
Subject:	Crest Pad Building Foundation		
Computer Program:	STAAD Pro 2006		
Computer Program Version:	2006.1002.US.REL		

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be throughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation **X** Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover - 1 sheet Calc. - 10 sheets STAAD - 135 Total = 146 sheets	Mark H. Foster	Robert F. Weaver	[signature]	[signature]	9/28/07

Summary of Revisions	

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By MARK FOSTER Date 1/30/07 Subject WASHINGTON CLOSURE HANFORD Sheet 1 of ____

Ckd By ROBERT WEAVER Date 2.21.07 ERDF CREST PAD BLDG. FNDTN. File No. ____

DESIGN CRITERIA

APPLICABLE BUILDING CODE

2006 I B C (EFFECTIVE JULY 1, 2007 AS AMENDED BY THE STATE OF WASHINGTON)

BUILDING LOADS

FLOOR LIVE LOADS

PUMP ROOM = 200 PSF
ELEC. ROOM = 300 PSF

2006 IBC - TBL-1607.1
LIGHT MANUFACTURING
UNIFORM LL = 125 PSF
SAY OK TO CONSERV LIVE LOADS. ✓

ROOF LOADS

MIN. LIVE LOAD = 20 PSF
GROUND SNOW, P_g = 10 PSF (FIG. 1608.2, IBC)

WIND DESIGN DATA

WIND SPEED = 85 MPH (FIG. 1609, IBC)
IMPORTANCE FACTOR = 1.15 (TBL. 6-1, ASCE 7)
OCCUPANCY CATEGORY = III (TBL 1604.5, IBC)
WIND EXPOSURE CATEGORY = C (1609.4.3, IBC)
INTERNAL PRESSURE COEFF. = ±0.18 (FIG. 6-5, ASCE 7)

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DESIGN CRITERIA, CONTIN.

ROOF SNOW LOAD

(ASCE 7 REFERENCE)

FLAT ROOF SNOW LOAD $p_f = 0.7 C_e C_t I p_g \geq I p_g$ (7.3)

SNOW EXPOSURE FACTOR, $C_e =$ 0.9 (TBL. 7.2)

SNOW LOAD IMPORTANCE FACTOR, $I =$ 1.1 (TBL. 7-4)

THERMAL FACTOR, $C_t =$ 1.1 (TBL. 7-3)

GROUND SNOW LOAD, p_g = 10 PSF (FIG. 7-1)

$p_f = 0.7(0.9)(1.1)(1.1)(10 psf)$ = ~~7.6 PSF~~

BUT NOT LESS THAN $(1.1)(10)$ = 11.0 PSF

$C_s = 1.0$ (FIG 7-2b)

$p_s = C_s p_f$ = 11.0 PSF

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DESIGN CRITERIA, CONTIN.

EARTHQUAKE DESIGN DATA (1603.1.5, IBC)

SEISMIC IMPORTANCE FACTOR 1.25 (TBL. 11.5-1, ASCE 7)
OCCUPANCY CATEGORY III (TBL. 1604.5, IBC)
MAPPED MCE SPECTRAL RESPONSE ACCELERATION
$S_S = 47\%$ (FIG 22.1, ASCE 7)
$S_1 = 15\%$ (FIG. 22.2, ASCE 7)

*SITE CLASS D (TBL. 20.3-1, ASCE 7)
SPECTRAL RESPONSE COEFFICIENTS
$S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3}(1.44)(0.47) = 0.451$

$S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3}(2.2)(0.14) = 0.20$

SEISMIC DESIGN CATEGORY C (TBL. 11.6-1 & 6-2, ASCE 7)

SEISMIC FORCE RESISTING SYSTEM

(N-S) ORDINARY STEEL MOMENT FRAME - C.4. - LATERAL

$R = 3.5 \quad \Omega_0 = 3 \qquad C_d = 3$

(E-W) ORDINARY STEEL CONCENTRICALLY BRACED FRAME - B.4.

$R = 3\frac{1}{4} \quad \Omega_0 = 2 \qquad C_d = 3\frac{1}{4}$

* LIMITED GEOTECHNICAL DATA IN THE VICINITY OF THE CREST PAD BUILDING IS AVAILABLE. BASED ON "N" VALUES OF BORING 699-35-68B & 699-35-69B AND SOIL TYPES LISTED IN AVAILABLE BORINGS, USE SITE CLASS D.

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SEISMIC LOADS.

$V = C_s W$ (12.8.1, ASCE-7)

$C_s = \dfrac{S_{DS}}{(R/I)} \leq \dfrac{S_{D1}}{T(\frac{R}{I})}$ FOR $T \leq T_L$ OR $\dfrac{S_{D1} T_L}{T^2(\frac{R}{I})}$ FOR $T > T_L$

AND $C_s \geq 0.01$ (12.8-5, ASCE-7)

$C_s = \dfrac{0.451}{\left(\frac{3.5}{1.25}\right)} = 0.161$

$T = C_u T_a \Rightarrow C_u = 1.5 \quad T_a = C_t h_n^x = 0.028(15.83')^{0.8} = 0.255$

$T = 1.5(0.255) = 0.383\ s$

$T_L = 16$ (11.4.5, ASCE-7) (FIG. 22-15, ASCE7)

FOR $T \leq T_L$ $C_s = \dfrac{0.2}{0.383(\frac{3.5}{1.25})} = 0.186$

(N-S) $V = 0.161(W)$

(E-W) $V = \dfrac{0.451}{(3.25/1.25)} = 0.173(W)$

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SEISMIC LOADS (CONTIN.)

W = EFFECTIVE SEISMIC WEIGHT (12.7.2, ASCE 7)

BUILDING FRAME DL.
ASSUME 50 #/FT

$DL = 3\,(50\,\#/FT)(2(15') + 20')(1/1000) = 7.5$ KIPS

ROOF D.L.
ASSUME 20 #/SFT

$DL = 20\,\#/SFT\,(20')(27')(1/1000) = 10.8$ KIPS

EXTERIOR WALLS.
ASSUME 15 #/SFT

$DL = 2(15\,\#/SFT)[15'(27') + (15')(20')](1/1000) = 21.1$ KIPS

INTERIOR PARTITION

(4.2.2, ASCE 7) $DL = 15\,\#/SFT\,(15')(20')(1/1000) = 4.5$ KIPS
(12.7.2-#2, ASCE 7) $DL = 10\,\#/SFT\,(20')(27')(1/1000) = 5.4$ KIPS ⇐ CONTROLS

$W = 7.5^k + 10.8^k + 21.1^k + 5.4^k = 44.8^k$

$V_{N\text{-}S} = 0.161\,(44.8^k) = 7.2^K$

$V_{EW} = 0.173\,(44.8^k) = 7.8^K$

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WIND LOADS

BASIC WIND SPEED, $V = 85\,mph$ (FIG. 6-1, ASCE 7)

WIND DIRECTIONALITY FACTOR, $K_d = 0.85$ (TBL. 6-4, ASCE 7)

IMPORTANCE FACTOR, $I = 1.15$ (TBL. 6-1, ASCE 7)

VELOCITY PRESSURE EXPOSURE COEFFICIENTS (TBL. 6-3, ASCE 7)

$$K_z = K_h = 0.86$$

TOPOGRAPHIC FACTOR K_{zt} (2-D ESCARPMENT) (6.5.7, ASCE 7)

$$K_{zt} = (1 + K_1 K_2 K_3)^2$$

$K_1 = 0.43$ WHERE $H/L_h = {}^{*}15'/22.5' = 0.67$

$$^{*}H = \begin{array}{lr} \text{CREST ELEV.} = & 730.0 \\ \text{TOE ELEV.} = & -715.0 \\ \hline & 15' \end{array}$$

$$L_h = 3(15)/2 = 22.5'$$

↳ 3:1 SLOPE

PER NOTE #2 → USE $2H = L_h$ FOR K_2 & K_3

$K_2 = 0.5$ FOR $x/L_h = 60'/2(H) = 2$

$K_3 = 0.08$ FOR $z/L_h = 30'/30' = 1$

$$K_{zt} = [1 + (0.43 * 0.5 * 0.08)]^2 = 1.03$$

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WIND LOADS (CONTIN.)

ENCLOSED ⇒ ENCLOSURE CLASSIFICATION

INTERNAL PRESSURE COEFFICIENT w/ COMBINED GUST FACTOR $GC_{pi} = \pm 0.18$ (FIG. 6-5, ASCE 7)

EXTERNAL PRESSURE COEFF. w/ COMBINED GUST FACTOR (FIG. 6-10, ASCE 7)
(4.76° ROOF ANGLE)
(LOW RISE WALL & ROOF)

BUILDING SURFACE	GC_{pf}
1	0.40
2	−0.69
3	−0.37
4	−0.29
5	−0.45
6	−0.45
1E	0.61
2E	−1.07
3E	−0.53
4E	−0.43

VELOCITY PRESSURE q_z OR q_h

$$q_z = 0.00256\, K_z\, K_{zt}\, K_d\, V^2 I \quad (\text{lb/ft}^2)$$

$$q_z = 0.00256\,(0.86)(1.03)(0.85)(85)^2(1.15)$$

$$= 16.0 \text{ psf}$$

$$q_h = 16.0 \text{ psf}$$

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WIND LOAD CONTIN..

CALCULATE LOAD CONDITIONS FOR MAX BASE SHEAR

$V_{NS} = \Sigma\, q_h [(GC_{pf}) \div (GC_{pi})] * A$ (6.5.12.2.2, ASCE 7)

$= 16psf [(0.4+0.18)](15')(27'-6')(1/1000)$ ① 2.92^k
$+16psf [(0.29-0.18)](15')(21')(1/1000)$ ④ 0.55^k
$+16psf [(0.61+0.18)](15')(6')(1/1000)$ (1E) 1.14^k
$+16psf [(0.43-0.18)](15')(6')(1/1000)$ (4E) 0.36^k

4.97^k

$A_{LONG} = 15'(20) + 10'(0.83') = 308.3\ FT^2$

$V_{E-W} = 16psf [(0.4+0.18)](308.3-(6' * 15')-(0.25' * 6'))(1/1000) = 2.01^k$
$+16psf [(0.29-0.18)](91.5\,SFT)(1/1000) = 0.16^k$
$+16psf [(0.61+0.18)](216.8\,SFT)(1/1000) = 2.74^k$
$+16psf [(0.43-0.18)](91.5\,SFT)(1/1000) = 0.366^k$

5.27

$0.7 V_{EQ} > V_W$

EARTHQUAKE LOADS CONTROL FOR LATERAL LOADING CONDITIONS

WIND CONTROLS FOR UPLIFT

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By MARK FOSTER Date 2/1/07 Subject WASHINGTON CLOSURE HANFORD Sheet 9 of ____

Ckd By ROBERT WEAVER Date 2-2-07 ERDF CREST PAD BUILDING FNDTN. File No. ____

FOUNDATION DESIGN

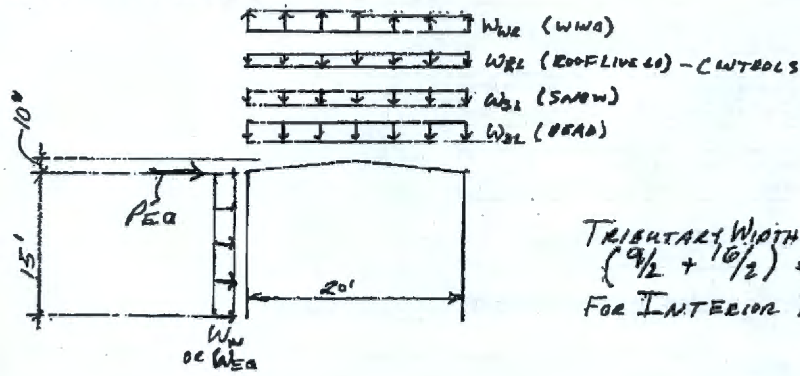
ALLOWABLE BEARING PRESSURE 2000 psf (TBL. 1804.2, IBC)

METAL BUILDING MANUFACTURER SHALL PROVIDE DESIGN CALCULATIONS & SEALED PLANS FOR THE CREST PAD BUILDING. CHECK PROPOSED FOUNDATIONS FOR THE REQUIRED 2006 IBC AS AMENDED BY THE STATE OF WASHINGTON.

WEAVER BOOS CONSULTANTS
☐ 70 West Madison, Suite 4250 • Chicago, IL 60602 • (312) 922-1030
☐ 1335 Dublin Rd., Suite 105C • Columbus, OH 43215 • (614) 487-8347
☐ 6420 Southwest Blvd, Suite 206 • Fort Worth, TX 76109 • (817) 735-9770
☐ 1944 N Griffith Blvd, Unit A • Griffith, IN 46319 • (219) 923-9609
☐ 1813 N Mill St, Suite A • Naperville, IL 60563 • (630) 717-4848
☑ 630 East Bronson St, Suite 1 • South Bend, IN 46601 • (574) 232-4826
☐ 2021 Timberbrook Lane • Springfield, IL 62702 • (217) 787-0290
☐ 801 North Second St, Suite 202 • St Louis, MO 63102 • (314) 621-8140

By MARK FOSTER Date 2/13/07 Subject WASHINGTON CLOSURE HANFORD Sheet 10 of ____
Ckd By ROBERT WEAVER Date 2-21-07 ERDF CREST PAD FNDTN File No ____

NORTH-SOUTH LATERAL ANALYSIS



TRIBUTARY WIDTH = $(9/2 + 16/2) = 12.5'$
FOR INTERIOR FRAME

$$W_W = 16_{PSF}(0.4+0.18)(12.5')(1/1000) = 0.116$$
$$+16\ (0.27-0.18)(12.5')(1/1000) = \underline{0.022}$$
$$0.138\ ^{k}/_{FT}$$

$$W_{WL} = 16\ (0.37+0.18)(12.5')(1/1000) = 0.110\ ^{k}/_{FT}$$
$$16\ (0.69+0.18)(12.5')(1/1000) = 0.174\ ^{k}/_{FT}$$

$$W_{RL} = 20_{PSF}\ (12.5')(1/1000) = 0.25\ ^{k}/_{FT}$$
$$W_{DL} = 20_{PSF}\ (12.5')(1/1000) = 0.25\ ^{k}/_{FT}$$
$$W_{SL} = 11_{PSF}\ (12.5')(1/1000) = 0.138\ ^{k}/_{FT}$$

CONTROLING LOAD CASE IS #2 $D + \cancel{H}^{0} + \cancel{F}^{0} + L + \cancel{T}$ (2.4, ASCE 7)
CHECK BEARING (ASSUME 2'x2' x2.5' FOOTING)
$(.25 * 20') + (0.25 * 20) = 10^k / 2_{COL} = 5^k + (0.15^k/ft^3)(2.5)(2)(2)) / 2_{KSF\ ALLOWABLE} = 3.25\ SF$

MIN FOOTING WIDTH $= 1.8^{FT}$ ✓ OK

	Job No	Sheet No	Rev
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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Job Information

	Engineer	Checked	Approved
Name:	MHF	WW	
Date:	20-Feb-07		

Structure Type	SPACE FRAME

Number of Nodes	23	Highest Node	23
Number of Elements	40	Highest Beam	41

Number of Basic Load Cases	6
Number of Combination Load Cases	11

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	3	SEISMIC (EQ X)
Primary	4	SEISMIC (EQ Z)
Primary	1	DEAD LOAD (DL)
Primary	2	ROOF LIVE LOAD (LL)
Primary	5	LATERAL WIND (WL)
Primary	9	RVRS WIND
Combination	6	DL + .75 (WL) + .75 (LL)
Combination	7	DEAD LOAD + ROOF LIVE LOAD
Combination	8	DL + WL
Combination	10	DL + 0.7 (EQX)
Combination	11	DL + 0.7 (EQ Z)
Combination	12	1.063 (DL) + 0.7 (EQ X)
Combination	13	1.063 (DL) + 0.7 (EQ Z)
Combination	14	1.0474(DL) + 0.525(EQ X) + .75 (LL)
Combination	15	1.0474(DL) + 0.525(EQ Z) + .75 (LL)
Combination	16	DL + .75 (WL) + .75 (LL)
Combination	17	DL + RVRS WIND

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Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	1.000	0.000	0.000
2	1.000	15.000	0.000
3	10.000	16.000	0.000
4	19.000	15.000	0.000
5	19.000	0.000	0.000
6	1.000	0.000	9.000
7	1.000	15.000	9.000
8	10.000	16.000	9.000
9	19.000	15.000	9.000
10	19.000	0.000	9.000
11	1.000	0.000	-16.000
12	1.000	15.000	-16.000
13	10.000	16.000	-16.000
14	19.000	15.000	-16.000
15	19.000	0.000	-16.000
16	1.000	7.500	-16.000
17	1.000	7.500	0.000
18	1.000	7.500	9.000
19	19.000	7.500	9.000
20	19.000	7.500	0.000
21	19.000	7.500	-16.000
22	1.000	11.250	-16.000
23	1.000	11.250	0.000

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	17	7.500	3	0
2	2	3	9.055	3	0
3	3	4	9.055	3	0
4	4	20	7.500	3	0
5	6	18	7.500	3	0
6	7	8	9.055	3	0
7	8	9	9.055	3	0
8	9	19	7.500	3	0
9	11	16	7.500	3	0
10	12	13	9.055	3	0
11	13	14	9.055	3	0
12	14	21	7.500	3	0
13	7	1	17.493	2	0
14	2	6	17.493	2	0
15	9	5	17.493	2	0
16	4	10	17.493	2	0

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Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
17	3	14	18.385	2	0
18	13	4	18.385	2	0
19	13	2	18.385	2	0
20	3	12	18.385	2	0
21	12	2	16.000	1	0
22	2	7	9.000	1	0
23	4	9	9.000	1	0
24	4	14	16.000	1	0
25	3	8	9.000	1	0
26	3	13	16.000	1	0
27	16	22	3.750	3	0
28	17	23	3.750	3	0
30	18	7	7.500	3	0
31	17	18	9.000	1	0
32	10	10	7.500	3	0
33	18	19	18.000	1	0
34	20	6	7.500	3	0
35	20	19	9.000	1	0
36	21	15	7.500	3	0
37	20	21	18.000	1	0
38	21	16	18.000	1	0
39	22	12	3.750	3	0
40	23	2	3.750	3	0
41	23	22	16.000	1	0

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
1	8ZS2.5X048	0.679	0.991	6.562	0.000	STEEL
2	Cir 0.50	0.196	0.003	0.003	0.006	STEEL
3	W8X10	2.960	2.100	30.800	0.035	STEEL

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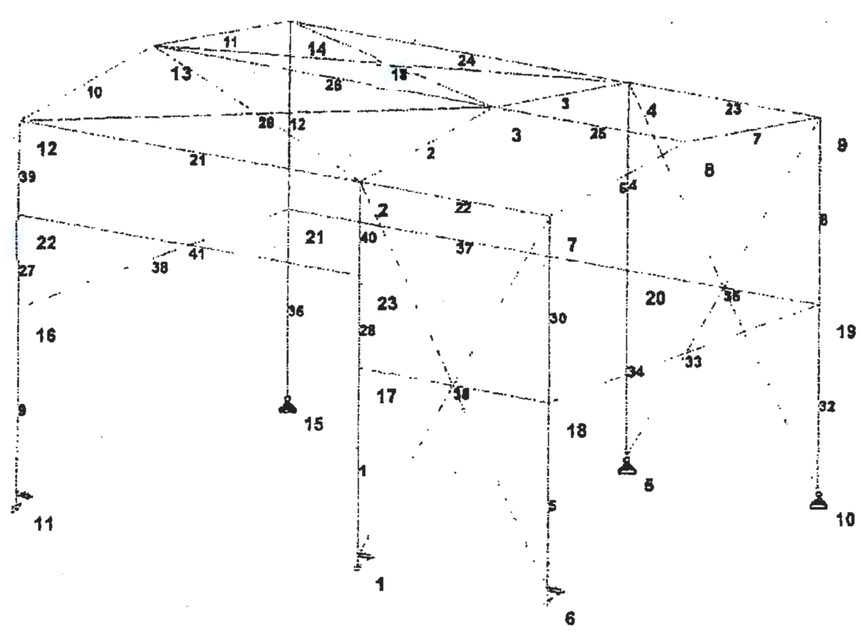

CREST PAD BUILDING WIRE FRAME

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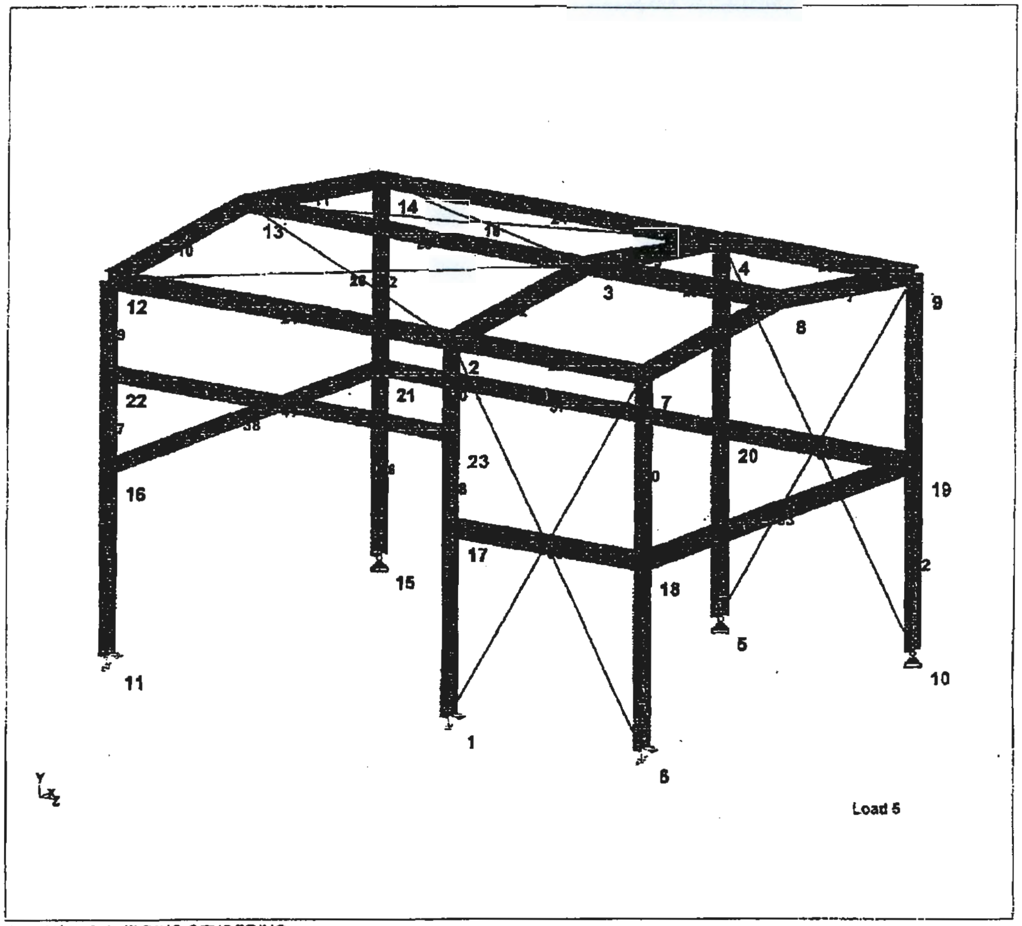

CREST PAD BUILDING RENDERING

Materials

Mat	Name	E (kip/in²)	ν	Density (kip/in³)	α (1/°K)
1	STEEL	29E 3	0.300	0.000	3.61E-6
2	STAINLESSSTEEL	28E 3	0.300	0.000	5.5E-6
3	ALUMINUM	10E 3	0.330	0.000	7.11E-6
4	CONCRETE	3.15E 3	0.170	0.000	3.06E-6

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Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip ft/deg)	rY (kip ft/deg)	rZ (kip ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	-
5	Fixed	Fixed	Fixed	-	-	-
6	Fixed	Fixed	Fixed	Fixed	Fixed	-
10	Fixed	Fixed	Fixed	-	-	-
11	Fixed	Fixed	Fixed	Fixed	Fixed	-
15	Fixed	Fixed	Fixed	-	-	-

Releases

There is no data of this type

Basic Load Cases

Number	Name
3	SEISMIC (EQ X)
4	SEISMIC (EQ Z)
1	DEAD LOAD (DL)
2	ROOF LIVE LOAD (LL)
5	LATERAL WIND (WL)
9	RVRS WIND

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
6	DL + .75 (WL) + .75 (LL)	1	DEAD LOAD (DL)	1.00
		5	LATERAL WIND (WL)	0.75
		2	ROOF LIVE LOAD (LL)	0.75
7	DEAD LOAD + ROOF LIVE LOAD	1	DEAD LOAD (DL)	1.00
		2	ROOF LIVE LOAD (LL)	1.00
8	DL + WL	1	DEAD LOAD (DL)	1.00
		5	LATERAL WIND (WL)	1.00
10	DL + 0.7 (EQX)	1	DEAD LOAD (DL)	1.00
		3	SEISMIC (EQ X)	0.70
11	DL + 0.7 (EQ Z)	1	DEAD LOAD (DL)	1.00
		4	SEISMIC (EQ Z)	0.70
12	1.063 (DL) + 0.7 (EQ X)	1	DEAD LOAD (DL)	1.06
		3	SEISMIC (EQ X)	0.70
13	1.063 (DL) + 0.7 (EQ Z)	1	DEAD LOAD (DL)	1.06
		4	SEISMIC (EQ Z)	0.70
14	1.0474(DL) + 0.525(EQ X) + .75 (LL)	1	DEAD LOAD (DL)	1.05
		3	SEISMIC (EQ X)	0.52
		2	ROOF LIVE LOAD (LL)	0.75

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Combination Load Cases Cont...

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
15	1.0474(DL) + 0.525(EQ Z) + .75 (LL)	1	DEAD LOAD (DL)	1.05
		4	SEISMIC (EQ Z)	0.52
		2	ROOF LIVE LOAD (LL)	0.75
16	DL + .75 (WL) + .75 (LL)	1	DEAD LOAD (DL)	1.00
		9	RVRS WIND	0.75
		2	ROOF LIVE LOAD (LL)	0.75
17	DL + RVRS WIND	1	DEAD LOAD (DL)	1.00
		9	RVRS WIND	1.00

Wind Load Definition : Type 3

Intensity (psi)	Height (ft)
N/A	N/A

Wind Load Definition : Type 4

Intensity (psi)	Height (ft)
N/A	N/A

Wind Load Definition : Type 5

Intensity (psi)	Height (ft)
N/A	N/A

Wind Load Definition : Type 6

Intensity (psi)	Height (ft)
N/A	N/A

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Beam Loads : 1 DEAD LOAD (DL)

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
2	UNI	lbf/ft	GY	-250.000	0.000	-	9.000	-
3	UNI	lbf/ft	GY	-250.000	0.000	-	9.000	-
6	UNI	lbf/ft	GY	-110.000	0.000	-	9.000	-
7	UNI	lbf/ft	GY	-110.000	0.000	-	9.000	-
10	UNI	lbf/ft	GY	-180.000	0.000	-	9.000	-
11	UNI	lbf/ft	GY	-180.000	0.000	-	9.000	-

Selfweight : 1 DEAD LOAD (DL)

Direction	Factor
Y	1.000

Beam Loads : 2 ROOF LIVE LOAD (LL)

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
2	UNI	lbf/ft	GY	-250.000	0.000	-	9.000	-
3	UNI	lbf/ft	GY	-250.000	0.000	-	9.000	-
6	UNI	lbf/ft	GY	-110.000	0.000	-	9.000	-
7	UNI	lbf/ft	GY	-110.000	0.000	-	9.000	-
10	UNI	lbf/ft	GY	-180.000	0.000	-	9.000	-
11	UNI	lbf/ft	GY	-180.000	0.000	-	9.000	-

Wind Loading : 5 LATERAL WIND (WL)

Direction	Type	Factor
X	1	1.000
[	1	1.000

Wind Loading : 9 RVRS WIND

Direction	Type	Factor
X	1	1.000
[	1	1.000

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Reaction Summary

			Horizontal	Vertical	Horizontal	Moment		
	Node	L/C	FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
Max FX	1	7:DEAD LOAD	0.545	4.081	-0.099	0.029	-0.012	0.000
Min FX	6	8:DL + WL	-2.483	-0.065	-0.013	-3.008	-0.007	0.000
Max FY	5	16:DL + .75 (W	-1.467	4.188	-0.034	0.000	0.000	0.000
Min FY	1	9:RVRS WIND	-1.165	-0.831	-0.165	-2.970	-0.003	0.000
Max FZ	10	17:DL + RVRS	-1.420	1.447	0.214	0.000	0.000	0.000
Min FZ	1	17:DL + RVRS	-0.901	1.037	-0.215	-2.954	-0.009	0.000
Max MX	6	7:DEAD LOAD	-0.160	1.746	0.100	0.080	-0.009	0.000
Min MX	6	9:RVRS WIND	-1.513	-0.811	-0.067	-3.137	-0.005	0.000
Max MY	11	7:DEAD LOAD	-0.253	2.964	-0.001	-0.022	0.004	0.000
Min MY	1	16:DL + .75 (W	-0.400	2.905	-0.210	-2.201	-0.013	0.000
Max MZ	1	3:SEISMIC (EC	-0.000	0.001	-0.051	-0.004	0.000	0.000
Min MZ	1	3:SEISMIC (EC	-0.000	0.001	-0.051	-0.004	0.000	0.000

Reactions

		Horizontal	Vertical	Horizontal	Moment		
Node	L/C	FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
1	3:SEISMIC (EC	-0.000	0.001	-0.051	-0.004	0.000	0.000
	4:SEISMIC (EC	-0.000	0.001	-0.051	-0.004	0.000	0.000
	1:DEAD LOAD	0.264	1.868	-0.050	0.016	-0.006	0.000
	2:ROOF LIVE I	0.280	2.213	-0.049	0.014	-0.006	0.000
	5:LATERAL WI	-2.236	-0.800	-0.163	-2.911	-0.001	0.000
	9:RVRS WIND	-1.165	-0.831	-0.165	-2.970	-0.003	0.000
	6:DL + .75 (WL	-1.202	2.928	-0.208	-2.157	-0.011	0.000
	7:DEAD LOAD	0.545	4.081	-0.099	0.029	-0.012	0.000
	8:DL + WL	-1.972	1.068	-0.212	-2.895	-0.007	0.000
	10:DL + 0.7 (E	0.264	1.869	-0.085	0.013	-0.006	0.000
	11:DL + 0.7 (E	0.264	1.869	-0.085	0.013	-0.006	0.000
	12:1.063 (DL) +	0.281	1.986	-0.089	0.014	-0.006	0.000
	13:1.063 (DL) +	0.281	1.986	-0.089	0.014	-0.006	0.000
	14:1.0474(DL)	0.487	3.617	-0.116	0.025	-0.011	0.000
	15:1.0474(DL)	0.487	3.617	-0.116	0.025	-0.011	0.000
	16:DL + .75 (W	-0.400	2.905	-0.210	-2.201	-0.013	0.000
	17:DL + RVRS	-0.901	1.037	-0.215	-2.954	-0.009	0.000
5	3:SEISMIC (EC	0.000	0.001	-0.051	0.000	0.000	0.000
	4:SEISMIC (EC	0.000	0.001	-0.051	0.000	0.000	0.000
	1:DEAD LOAD	-0.262	1.849	-0.049	0.000	0.000	0.000
	2:ROOF LIVE I	-0.277	2.198	-0.049	0.000	0.000	0.000
	5:LATERAL WI	-0.353	0.906	0.066	0.000	0.000	0.000
	9:RVRS WIND	-1.331	0.922	0.069	0.000	0.000	0.000
	6:DL + .75 (WL	-0.734	4.176	-0.036	0.000	0.000	0.000
	7:DEAD LOAD	-0.539	4.047	-0.098	0.000	0.000	0.000

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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Reactions Cont...

		Horizontal	Vertical	Horizontal	Moment		
Node	L/C	FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
	8:DL + WL	-0.614	2.754	0.017	0.000	0.000	0.000
	10:DL + 0.7 (E(	-0.261	1.849	-0.084	0.000	0.000	0.000
	11:DL + 0.7 (E(	-0.261	1.849	-0.084	0.000	0.000	0.000
	12:1.063 (DL) +	-0.278	1.966	-0.088	0.000	0.000	0.000
	13:1.063 (DL) +	-0.278	1.966	-0.088	0.000	0.000	0.000
	14:1.0474(DL)	-0.482	3.585	-0.116	0.000	0.000	0.000
	15:1.0474(DL)	-0.482	3.585	-0.116	0.000	0.000	0.000
	16:DL + .75 (W	-1.467	4.188	-0.034	0.000	0.000	0.000
	17:DL + RVRS	-1.592	2.770	0.020	0.000	0.000	0.000
6	3:SEISMIC (EC	0.000	-0.001	0.051	-0.008	0.000	0.000
	4:SEISMIC (EC	0.000	-0.001	0.051	-0.008	0.000	0.000
	1:DEAD LOAD	-0.078	0.725	0.051	0.065	-0.004	0.000
	2:ROOF LIVE I	-0.082	1.021	0.049	0.015	-0.005	0.000
	5:LATERAL WI	-2.405	-0.790	-0.064	-3.074	-0.003	0.000
	9:RVRS WIND	-1.513	-0.811	-0.067	-3.137	-0.005	0.000
	6:DL + .75 (WL	-1.943	0.898	0.040	-2.229	-0.010	0.000
	7:DEAD LOAD	-0.160	1.746	0.100	0.080	-0.009	0.000
	8:DL + WL	-2.483	-0.065	-0.013	-3.008	-0.007	0.000
	10:DL + 0.7 (E(	-0.078	0.725	0.087	0.060	-0.004	0.000
	11:DL + 0.7 (E(	-0.078	0.725	0.087	0.060	-0.004	0.000
	12:1.063 (DL) +	-0.083	0.770	0.090	0.064	-0.005	0.000
	13:1.063 (DL) +	-0.083	0.770	0.090	0.064	-0.005	0.000
	14:1.0474(DL)	-0.143	1.525	0.117	0.075	-0.008	0.000
	15:1.0474(DL)	-0.143	1.525	0.117	0.075	-0.008	0.000
	16:DL + .75 (W	-1.274	0.883	0.038	-2.276	-0.012	0.000
	17:DL + RVRS	-1.591	-0.086	-0.016	-3.072	-0.009	0.000
10	3:SEISMIC (EC	0.000	-0.000	0.051	0.000	0.000	0.000
	4:SEISMIC (EC	0.000	-0.000	0.051	0.000	0.000	0.000
	1:DEAD LOAD	0.076	0.723	0.050	0.000	0.000	0.000
	2:ROOF LIVE I	0.080	1.016	0.049	0.000	0.000	0.000
	5:LATERAL WI	-0.824	0.694	0.162	0.000	0.000	0.000
	9:RVRS WIND	-1.496	0.724	0.164	0.000	0.000	0.000
	6:DL + .75 (WL	-0.482	2.007	0.207	0.000	0.000	0.000
	7:DEAD LOAD	0.156	1.740	0.098	0.000	0.000	0.000
	8:DL + WL	-0.748	1.418	0.211	0.000	0.000	0.000
	10:DL + 0.7 (E(	0.076	0.723	0.085	0.000	0.000	0.000
	11:DL + 0.7 (E(	0.076	0.723	0.085	0.000	0.000	0.000
	12:1.063 (DL) +	0.081	0.769	0.089	0.000	0.000	0.000
	13:1.063 (DL) +	0.081	0.769	0.089	0.000	0.000	0.000
	14:1.0474(DL)	0.139	1.520	0.115	0.000	0.000	0.000
	15:1.0474(DL)	0.139	1.520	0.115	0.000	0.000	0.000
	16:DL + .75 (W	-0.986	2.028	0.209	0.000	0.000	0.000
	17:DL + RVRS	-1.420	1.447	0.214	0.000	0.000	0.000
11	3:SEISMIC (EC	0.000	-0.000	0.000	0.003	0.000	0.000

Weaver Boos Consultants Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 11	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Reactions Cont...

		Horizontal	Vertical	Horizontal	Moment		
Node	L/C	FX (kip)	FY (kip)	FZ (kip)	MX (kip'in)	MY (kip'in)	MZ (kip'in)
	4:SEISMIC (EC	0.000	-0.000	0.000	0.003	0.000	0.000
	1:DEAD LOAD	-0.124	1.323	-0.001	-0.040	0.002	0.000
	2:ROOF LIVE I	-0.129	1.641	0.000	0.018	0.002	0.000
	5:LATERAL WI	-0.152	-0.309	-0.026	-1.904	-0.002	0.000
	9:RVRS WIND	-0.158	-0.317	-0.027	-1.950	-0.001	0.000
	6:DL + .75 (WL	-0.334	2.322	-0.020	-1.454	0.002	0.000
	7:DEAD LOAD	-0.253	2.964	-0.001	-0.022	0.004	0.000
	8:DL + WL	-0.276	1.013	-0.027	-1.944	-0.000	0.000
	10:DL + 0.7 (E	-0.124	1.323	-0.001	-0.038	0.002	0.000
	11:DL + 0.7 (E	-0.124	1.323	-0.001	-0.038	0.002	0.000
	12:1.063 (DL) +	-0.132	1.406	-0.001	-0.040	0.002	0.000
	13:1.063 (DL) +	-0.132	1.406	-0.001	-0.040	0.002	0.000
	14:1.0474(DL)	-0.227	2.616	-0.001	-0.027	0.003	0.000
	15:1.0474(DL)	-0.227	2.616	-0.001	-0.027	0.003	0.000
	16:DL + .75 (W	-0.339	2.316	-0.021	-1.489	0.002	0.000
	17:DL + RVRS	-0.282	1.006	-0.028	-1.990	0.000	0.000
15	3:SEISMIC (EC	-0.000	-0.000	0.000	0.000	0.000	0.000
	4:SEISMIC (EC	-0.000	-0.000	0.000	0.000	0.000	0.000
	1:DEAD LOAD	0.123	1.314	-0.001	0.000	0.000	0.000
	2:ROOF LIVE I	0.128	1.631	0.000	0.000	0.000	0.000
	5:LATERAL WI	-0.151	0.300	0.025	0.000	0.000	0.000
	9:RVRS WIND	-0.157	0.314	0.026	0.000	0.000	0.000
	6:DL + .75 (WL	0.106	2.762	0.018	0.000	0.000	0.000
	7:DEAD LOAD	0.251	2.945	-0.001	0.000	0.000	0.000
	8:DL + WL	-0.028	1.614	0.024	0.000	0.000	0.000
	10:DL + 0.7 (E	0.123	1.314	-0.001	0.000	0.000	0.000
	11:DL + 0.7 (E	0.123	1.314	-0.001	0.000	0.000	0.000
	12:1.063 (DL) +	0.131	1.397	-0.001	0.000	0.000	0.000
	13:1.063 (DL) +	0.131	1.397	-0.001	0.000	0.000	0.000
	14:1.0474(DL)	0.225	2.599	-0.001	0.000	0.000	0.000
	15:1.0474(DL)	0.225	2.599	-0.001	0.000	0.000	0.000
	16:DL + .75 (W	0.102	2.772	0.018	0.000	0.000	0.000
	17:DL + RVRS	-0.033	1.627	0.025	0.000	0.000	0.000

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Reaction Envelope

		Horizontal	Vertical	Horizontal	Moment		
Node	Env	FX (kip)	FY (kip)	FZ (kip)	MX (kip in)	MY (kip in)	MZ (kip in)
1	+ve	0.545	4.081	0.000	0.029	0.000	0.000
1	+ve	Load: 7	Load: 7	-	Load: 7	Load: 3	-
1	-ve	-2.236	-0.831	-0.215	-2.970	-0.013	0.000
1	-ve	Load: 5	Load: 9.	Load: 17	Load: 9	Load: 16	-
5	+ve	0.000	4.188	0.069	0.000	0.000	0.000
5	+ve	Load: 3	Load: 16	Load: 9	-	-	-
5	-ve	-1.592	0.000	-0.115	0.000	0.000	0.000
5	-ve	Load: 17	-	Load: 14	-	-	-
6	+ve	0.000	1.746	0.117	0.080	0.000	0.000
6	+ve	Load: 3	Load: 7	Load: 14	Load: 7	Load: 3	-
6	-ve	-2.483	-0.811	-0.067	-3.137	-0.012	0.000
6	-ve	Load: 8	Load: 9	Load: 8	Load: 9	Load: 16	-
10	+ve	0.156	2.028	0.214	0.000	0.000	0.000
10	+ve	Load: 7	Load: 16	Load: 17	-	-	-
10	-ve	-1.496	-0.000	0.000	0.000	0.000	0.000
10	-ve	Load: 9	Load: 3	-	-	-	-
11	+ve	0.000	2.864	0.000	0.018	0.004	0.000
11	+ve	Load: 3	Load: 7	Load: 2	Load: 2	Load: 7	-
11	-ve	-0.339	-0.317	-0.028	-1.890	-0.002	0.000
11	-ve	Load: 16	Load: 9	Load: 17	Load: 17	Load: 5	-
15	+ve	0.251	2.945	0.026	0.000	0.000	0.000
15	+ve	Load: 7	Load: 7	Load: 9	-	-	-
15	-ve	-0.157	-0.000	-0.001	0.000	0.000	0.000
15	-ve	Load: 9	Load: 3	Load: 12	-	-	-

Support Reaction

Node	L/C	Force-X (kip)	Force-Y (kip)	Force-Z (kip)	Moment-X (kip in)	Moment-Y (kip in)	Moment-Z (kip in)
1	3	-0.000	0.001	-0.051	-0.004	0.000	0.000
	4	-0.000	0.001	-0.061	-0.004	0.000	0.000
	1	0.264	1.868	-0.050	0.016	-0.006	0.000
	2	0.280	2.213	-0.049	0.014	-0.006	0.000
	5	-2.236	-0.800	-0.163	-2.911	-0.001	0.000
	9	-1.165	-0.831	-0.165	-2.970	-0.003	0.000
	6	-1.202	2.928	-0.208	-2.157	-0.011	0.000
	7	0.545	4.081	-0.099	0.029	-0.012	0.000
	8	-1.972	1.068	-0.212	-2.895	-0.007	0.000
	10	0.264	1.869	-0.085	0.013	-0.006	0.000
	11	0.264	1.869	-0.085	0.013	-0.006	0.000
	12	0.281	1.986	-0.089	0.014	-0.006	0.000
	13	0.281	1.986	-0.089	0.014	-0.006	0.000
	14	0.487	3.617	-0.116	0.025	-0.011	0.000

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Support Reaction Cont...

Node	L/C	Force-X (kip)	Force-Y (kip)	Force-Z (kip)	Moment-X (kip'in)	Moment-Y (kip'in)	Moment-Z (kip'in)
	15	0.487	3.617	-0.116	0.025	-0.011	0.000
	16	-0.400	2.905	-0.210	-2.201	-0.013	0.000
	17	-0.901	1.037	-0.215	-2.954	-0.009	0.000
5	3	0.000	0.001	-0.051	0.000	0.000	0.000
	4	0.000	0.001	-0.051	0.000	0.000	0.000
	1	-0.262	1.849	-0.049	0.000	0.000	0.000
	2	-0.277	2.198	-0.049	0.000	0.000	0.000
	5	-0.353	0.906	0.066	0.000	0.000	0.000
	9	-1.331	0.922	0.069	0.000	0.000	0.000
	6	-0.734	4.176	-0.036	0.000	0.000	0.000
	7	-0.539	4.047	-0.098	0.000	0.000	0.000
	8	-0.614	2.754	0.017	0.000	0.000	0.000
	10	-0.261	1.849	-0.084	0.000	0.000	0.000
	11	-0.261	1.849	-0.084	0.000	0.000	0.000
	12	-0.278	1.966	-0.088	0.000	0.000	0.000
	13	-0.278	1.966	-0.088	0.000	0.000	0.000
	14	-0.482	3.585	-0.115	0.000	0.000	0.000
	15	-0.482	3.585	-0.115	0.000	0.000	0.000
	16	-1.467	4.188	-0.034	0.000	0.000	0.000
	17	-1.592	2.770	0.020	0.000	0.000	0.000
6	3	0.000	-0.001	0.051	-0.008	0.000	0.000
	4	0.000	-0.001	0.051	-0.008	0.000	0.000
	1	-0.078	0.725	0.051	0.065	-0.004	0.000
	2	-0.082	1.021	0.049	0.015	-0.005	0.000
	5	-2.405	-0.790	-0.064	-3.074	-0.003	0.000
	9	-1.513	-0.811	-0.067	-3.137	-0.005	0.000
	6	-1.943	0.898	0.040	-2.229	-0.010	0.000
	7	-0.160	1.746	0.100	0.080	-0.009	0.000
	8	-2.483	-0.065	-0.013	-3.008	-0.007	0.000
	10	-0.078	0.725	0.087	0.060	-0.004	0.000
	11	-0.078	0.725	0.087	0.060	-0.004	0.000
	12	-0.083	0.770	0.090	0.064	-0.005	0.000
	13	-0.083	0.770	0.090	0.064	-0.005	0.000
	14	-0.143	1.525	0.117	0.075	-0.008	0.000
	15	-0.143	1.525	0.117	0.075	-0.008	0.000
	16	-1.274	0.883	0.038	-2.276	-0.012	0.000
	17	-1.591	-0.088	-0.016	-3.072	-0.009	0.000
10	3	0.000	-0.000	0.051	0.000	0.000	0.000
	4	0.000	-0.000	0.051	0.000	0.000	0.000
	1	0.076	0.723	0.050	0.000	0.000	0.000
	2	0.080	1.016	0.049	0.000	0.000	0.000
	5	-0.824	0.694	0.162	0.000	0.000	0.000
	9	-1.496	0.724	0.184	0.000	0.000	0.000
	6	-0.482	2.007	0.207	0.000	0.000	0.000
	7	0.156	1.740	0.098	0.000	0.000	0.000

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	Job No 2186-351	Sheet No 14	Rev
WEAVER BOOS CONSULTANTS — Software licensed to Weaver Boos Consultants	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Support Reaction Cont...

Node	L/C	Force-X (kip)	Force-Y (kip)	Force-Z (kip)	Moment-X (kip`in)	Moment-Y (kip`in)	Moment-Z (kip`in)
	8	-0.748	1.418	0.211	0.000	0.000	0.000
	10	0.078	0.723	0.085	0.000	0.000	0.000
	11	0.078	0.723	0.085	0.000	0.000	0.000
	12	0.081	0.769	0.089	0.000	0.000	0.000
	13	0.081	0.769	0.089	0.000	0.000	0.000
	14	0.139	1.520	0.115	0.000	0.000	0.000
	15	0.139	1.520	0.115	0.000	0.000	0.000
	16	-0.986	2.028	0.209	0.000	0.000	0.000
	17	-1.420	1.447	0.214	0.000	0.000	0.000
11	3	0.000	-0.000	0.000	0.003	0.000	0.000
	4	0.000	-0.000	0.000	0.003	0.000	0.000
	1	-0.124	1.323	-0.001	-0.040	0.002	0.000
	2	-0.129	1.641	0.000	0.018	0.002	0.000
	5	-0.152	-0.309	-0.026	-1.904	-0.002	0.000
	9	-0.158	-0.317	-0.027	-1.950	-0.001	0.000
	6	-0.334	2.322	-0.020	-1.454	0.002	0.000
	7	-0.253	2.964	-0.001	-0.022	0.004	0.000
	8	-0.276	1.013	-0.027	-1.944	-0.000	0.000
	10	-0.124	1.323	-0.001	-0.038	0.002	0.000
	11	-0.124	1.323	-0.001	-0.038	0.002	0.000
	12	-0.132	1.406	-0.001	-0.040	0.002	0.000
	13	-0.132	1.406	-0.001	-0.040	0.002	0.000
	14	-0.227	2.616	-0.001	-0.027	0.003	0.000
	15	-0.227	2.616	-0.001	-0.027	0.003	0.000
	16	-0.339	2.316	-0.021	-1.489	0.002	0.000
	17	-0.282	1.006	-0.028	-1.990	0.000	0.000
15	3	-0.000	-0.000	0.000	0.000	0.000	0.000
	4	-0.000	-0.000	0.000	0.000	0.000	0.000
	1	0.123	1.314	-0.001	0.000	0.000	0.000
	2	0.128	1.631	0.000	0.000	0.000	0.000
	5	-0.151	0.300	0.025	0.000	0.000	0.000
	9	-0.157	0.314	0.026	0.000	0.000	0.000
	6	0.108	2.762	0.018	0.000	0.000	0.000
	7	0.251	2.945	-0.001	0.000	0.000	0.000
	8	-0.028	1.614	0.024	0.000	0.000	0.000
	10	0.123	1.314	-0.001	0.000	0.000	0.000
	11	0.123	1.314	-0.001	0.000	0.000	0.000
	12	0.131	1.397	-0.001	0.000	0.000	0.000
	13	0.131	1.397	-0.001	0.000	0.000	0.000
	14	0.225	2.599	-0.001	0.000	0.000	0.000
	15	0.225	2.599	-0.001	0.000	0.000	0.000
	16	0.102	2.772	0.018	0.000	0.000	0.000
	17	-0.033	1.627	0.025	0.000	0.000	0.000

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 15	Rev
	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
1	1	0.000	660.945	14.731	0.000	675.676	-199.127	-0.089
		0.083	663.067	15.409	-256.575	935.051	-199.127	-0.089
		0.167	665.190	16.086	-513.150	1.19E 3	-199.127	-0.089
		0.250	667.312	16.764	-769.724	1.45E 3	-199.127	-0.089
		0.333	669.435	17.441	-1.03E 3	1.71E 3	-199.127	-0.089
		0.417	671.557	18.118	-1.28E 3	1.97E 3	-199.127	-0.089
		0.500	673.680	18.796	-1.54E 3	2.23E 3	-199.127	-0.089
		0.583	675.802	19.473	-1.8E 3	2.49E 3	-199.127	-0.089
		0.667	677.925	20.150	-2.05E 3	2.75E 3	-199.127	-0.089
		0.750	680.047	20.828	-2.31E 3	3.01E 3	-199.127	-0.089
		0.833	682.170	21.505	-2.57E 3	3.27E 3	-199.127	-0.089
		0.917	684.292	22.182	-2.82E 3	3.53E 3	-199.127	-0.089
		1.000	686.415	22.860	-3.08E 3	3.79E 3	-199.127	-0.089
	2	0.000	775.320	12.690	-0.000	788.010	-211.532	0.116
		0.083	775.320	11.811	-272.558	1.06E 3	-211.532	0.116
		0.167	775.320	10.932	-545.117	1.33E 3	-211.532	0.116
		0.250	775.320	10.052	-817.675	1.6E 3	-211.532	0.116
		0.333	775.320	9.173	-1.09E 3	1.87E 3	-211.532	0.116
		0.417	775.320	8.294	-1.36E 3	2.15E 3	-211.532	0.116
		0.500	775.320	7.414	-1.64E 3	2.42E 3	-211.532	0.116
		0.583	775.320	6.535	-1.91E 3	2.69E 3	-211.532	0.116
		0.667	775.320	5.656	-2.18E 3	2.96E 3	-211.532	0.116
		0.750	775.320	4.777	-2.45E 3	3.23E 3	-211.532	0.116
		0.833	775.320	3.897	-2.73E 3	3.5E 3	-211.532	0.116
		0.917	775.320	3.018	-3E 3	3.78E 3	-211.532	0.116
		1.000	775.320	2.139	-3.27E 3	4.05E 3	-211.532	0.116
	3	0.000	29.123	-3.578	0.000	32.701	0.004	-0.052
		0.083	29.123	-3.182	0.005	32.310	0.004	-0.052
		0.167	29.123	-2.786	0.010	31.919	0.004	-0.052
		0.250	29.123	-2.390	0.015	31.528	0.004	-0.052
		0.333	29.123	-1.994	0.020	31.137	0.004	-0.052
		0.417	29.123	-1.598	0.025	30.746	0.004	-0.052
		0.500	29.123	-1.202	0.030	30.355	0.004	-0.052
		0.583	29.123	-0.806	0.035	29.964	0.004	-0.052
		0.667	29.123	-0.410	0.040	29.573	0.004	-0.052
		0.750	29.123	-0.014	0.045	29.182	0.004	-0.052
		0.833	29.123	0.382	0.050	29.554	0.004	-0.052
		0.917	29.123	0.778	0.055	29.955	0.004	-0.052
		1.000	29.123	1.174	0.060	30.356	0.004	-0.052
	4	0.000	29.123	-3.578	0.000	32.701	0.004	-0.052
		0.083	29.123	-3.182	0.005	32.310	0.004	-0.052
		0.167	29.123	-2.786	0.010	31.919	0.004	-0.052
		0.250	29.123	-2.390	0.015	31.528	0.004	-0.052
		0.333	29.123	-1.994	0.020	31.137	0.004	-0.052
		0.417	29.123	-1.598	0.025	30.746	0.004	-0.052

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 16	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	29.123	-1.202	0.030	30.355	0.004	-0.052
		0.583	29.123	-0.806	0.035	29.964	0.004	-0.052
		0.667	29.123	-0.410	0.040	29.573	0.004	-0.052
		0.750	29.123	-0.014	0.045	29.182	0.004	-0.052
		0.833	29.123	0.382	0.050	29.554	0.004	-0.052
		0.917	29.123	0.778	0.055	29.955	0.004	-0.052
		1.000	29.123	1.174	0.060	30.356	0.004	-0.052
	5	0.000	-211.658	-2.73E 3	-0.000	-2.94E 3	495.264	-53.869
		0.083	-211.658	-2.32E 3	638.146	-3.17E 3	495.264	-53.869
		0.167	-211.658	-1.91E 3	1.28E 3	-3.4E 3	495.264	-53.869
		0.250	-211.658	-1.51E 3	1.91E 3	-3.63E 3	495.264	-53.869
		0.333	-211.658	-1.1E 3	2.55E 3	-3.86E 3	495.264	-53.869
		0.417	-211.658	-689.793	3.19E 3	-4.09E 3	495.264	-53.869
		0.500	-211.658	-281.640	3.83E 3	-4.32E 3	495.264	-53.869
		0.583	-211.658	126.513	4.47E 3	-4.81E 3	495.264	-53.869
		0.667	-211.658	534.665	5.11E 3	-5.85E 3	495.264	-53.869
		0.750	-211.658	942.818	5.74E 3	-6.9E 3	495.264	-53.869
		0.833	-211.658	1.35E 3	6.38E 3	-7.94E 3	495.264	-53.869
		0.917	-211.658	1.76E 3	7.02E 3	-8.99E 3	495.264	-53.869
		1.000	-211.658	2.17E 3	7.66E 3	-10E 3	495.264	-53.869
	6	0.000	1.08E 3	-2.02E 3	-0.000	3.11E 3	13.672	-40.404
		0.083	1.09E 3	-1.72E 3	17.616	2.82E 3	13.672	-40.404
		0.167	1.09E 3	-1.41E 3	35.232	2.53E 3	13.672	-40.404
		0.250	1.09E 3	-1.11E 3	52.848	2.25E 3	13.672	-40.404
		0.333	1.09E 3	-799.138	70.464	1.96E 3	13.672	-40.404
		0.417	1.09E 3	-493.006	88.079	1.68E 3	13.672	-40.404
		0.500	1.1E 3	-186.874	105.696	1.39E 3	13.672	-40.404
		0.583	1.1E 3	119.259	123.311	1.34E 3	13.672	-40.404
		0.667	1.1E 3	425.391	140.928	1.67E 3	13.672	-40.404
		0.750	1.1E 3	731.524	158.543	1.99E 3	13.672	-40.404
		0.833	1.1E 3	1.04E 3	176.159	2.32E 3	13.672	-40.404
		0.917	1.11E 3	1.34E 3	193.775	2.64E 3	13.672	-40.404
		1.000	1.11E 3	1.65E 3	211.391	2.97E 3	13.672	-40.404
	7	0.000	1.44E 3	27.422	0.000	1.46E 3	-410.659	0.027
		0.083	1.44E 3	27.220	-529.133	1.99E 3	-410.659	0.027
		0.167	1.44E 3	27.018	-1.06E 3	2.53E 3	-410.659	0.027
		0.250	1.44E 3	26.816	-1.59E 3	3.06E 3	-410.659	0.027
		0.333	1.44E 3	26.614	-2.12E 3	3.59E 3	-410.659	0.027
		0.417	1.45E 3	26.412	-2.65E 3	4.12E 3	-410.659	0.027
		0.500	1.45E 3	26.210	-3.17E 3	4.65E 3	-410.659	0.027
		0.583	1.45E 3	26.008	-3.7E 3	5.18E 3	-410.659	0.027
		0.667	1.46E 3	25.806	-4.23E 3	5.71E 3	-410.659	0.027
		0.750	1.46E 3	25.604	-4.76E 3	6.24E 3	-410.659	0.027
		0.833	1.46E 3	25.402	-5.29E 3	6.77E 3	-410.659	0.027
		0.917	1.46E 3	25.200	-5.82E 3	7.31E 3	-410.659	0.027

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WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 17	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	1.46E 3	24.998	-6.35E 3	7.84E 3	-410.859	0.027
	8	0.000	449.287	-2.72E 3	-0.000	3.17E 3	296.137	-53.958
		0.083	451.410	-2.31E 3	381.571	3.14E 3	296.137	-53.958
		0.167	453.532	-1.9E 3	763.143	3.11E 3	296.137	-53.958
		0.250	455.656	-1.49E 3	1.14E 3	3.09E 3	296.137	-53.958
		0.333	457.777	-1.08E 3	1.53E 3	3.06E 3	296.137	-53.958
		0.417	459.900	-671.674	1.91E 3	3.04E 3	296.137	-53.958
		0.500	462.022	-262.844	2.29E 3	3.01E 3	296.137	-53.958
		0.583	464.145	145.986	2.67E 3	3.28E 3	296.137	-53.958
		0.667	466.267	554.816	3.05E 3	4.07E 3	296.137	-53.958
		0.750	468.390	963.646	3.43E 3	4.87E 3	296.137	-53.958
		0.833	470.512	1.37E 3	3.82E 3	5.66E 3	296.137	-53.958
		0.917	472.635	1.78E 3	4.2E 3	6.45E 3	296.137	-53.958
		1.000	474.757	2.19E 3	4.58E 3	7.24E 3	296.137	-53.958
	9	0.000	-221.315	-2.79E 3	0.000	-3.01E 3	373.085	-54.933
		0.083	-221.315	-2.37E 3	480.719	-3.07E 3	373.085	-54.933
		0.167	-221.315	-1.95E 3	961.439	-3.14E 3	373.085	-54.933
		0.250	-221.315	-1.54E 3	1.44E 3	-3.2E 3	373.085	-54.933
		0.333	-221.315	-1.12E 3	1.92E 3	-3.27E 3	373.085	-54.933
		0.417	-221.315	-704.590	2.4E 3	-3.33E 3	373.085	-54.933
		0.500	-221.315	-288.370	2.88E 3	-3.39E 3	373.085	-54.933
		0.583	-221.315	127.849	3.37E 3	-3.71E 3	373.085	-54.933
		0.667	-221.315	544.069	3.85E 3	-4.61E 3	373.085	-54.933
		0.750	-221.315	960.288	4.33E 3	-5.51E 3	373.085	-54.933
		0.833	-221.315	1.38E 3	4.81E 3	-6.41E 3	373.085	-54.933
		0.917	-221.315	1.79E 3	5.29E 3	-7.3E 3	373.085	-54.933
		1.000	-221.315	2.21E 3	5.77E 3	-8.2E 3	373.085	-54.933
	10	0.000	681.331	12.227	0.000	693.558	-199.124	-0.126
		0.083	683.453	13.181	-256.571	953.206	-199.124	-0.126
		0.167	685.576	14.136	-513.143	1.21E 3	-199.124	-0.126
		0.250	687.698	15.090	-769.714	1.47E 3	-199.124	-0.126
		0.333	689.821	16.045	-1.03E 3	1.73E 3	-199.124	-0.126
		0.417	691.943	16.999	-1.28E 3	1.99E 3	-199.124	-0.126
		0.500	694.066	17.954	-1.54E 3	2.25E 3	-199.124	-0.126
		0.583	696.188	18.908	-1.8E 3	2.51E 3	-199.124	-0.126
		0.667	698.311	19.863	-2.05E 3	2.77E 3	-199.124	-0.126
		0.750	700.433	20.817	-2.31E 3	3.03E 3	-199.124	-0.126
		0.833	702.556	21.772	-2.57E 3	3.29E 3	-199.124	-0.126
		0.917	704.678	22.727	-2.82E 3	3.55E 3	-199.124	-0.126
		1.000	706.801	23.681	-3.08E 3	3.81E 3	-199.124	-0.126
	11	0.000	681.331	12.227	0.000	693.558	-199.124	-0.126
		0.083	683.453	13.181	-256.571	953.206	-199.124	-0.126
		0.167	685.576	14.136	-513.143	1.21E 3	-199.124	-0.126
		0.250	687.698	15.090	-769.714	1.47E 3	-199.124	-0.126
		0.333	689.821	16.045	-1.03E 3	1.73E 3	-199.124	-0.126

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 18	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	691.943	16.999	-1.28E 3	1.99E 3	-199.124	-0.126
		0.500	694.066	17.954	-1.54E 3	2.25E 3	-199.124	-0.126
		0.583	696.188	18.908	-1.8E 3	2.51E 3	-199.124	-0.126
		0.667	698.311	19.863	-2.05E 3	2.77E 3	-199.124	-0.126
		0.750	700.433	20.817	-2.31E 3	3.03E 3	-199.124	-0.126
		0.833	702.556	21.772	-2.57E 3	3.29E 3	-199.124	-0.126
		0.917	704.678	22.727	-2.82E 3	3.55E 3	-199.124	-0.126
		1.000	706.801	23.681	-3.08E 3	3.81E 3	-199.124	-0.126
	12	0.000	722.970	13.155	0.000	736.125	-211.669	-0.132
		0.083	725.227	14.152	-272.736	1.01E 3	-211.669	-0.132
		0.167	727.483	15.149	-545.471	1.29E 3	-211.669	-0.132
		0.250	729.739	16.146	-818.207	1.56E 3	-211.669	-0.132
		0.333	731.995	17.144	-1.09E 3	1.84E 3	-211.669	-0.132
		0.417	734.251	18.141	-1.36E 3	2.12E 3	-211.669	-0.132
		0.500	736.508	19.138	-1.64E 3	2.39E 3	-211.669	-0.132
		0.583	738.764	20.135	-1.91E 3	2.67E 3	-211.669	-0.132
		0.667	741.020	21.132	-2.18E 3	2.94E 3	-211.669	-0.132
		0.750	743.276	22.130	-2.45E 3	3.22E 3	-211.669	-0.132
		0.833	745.532	23.127	-2.73E 3	3.5E 3	-211.669	-0.132
		0.917	747.789	24.124	-3E 3	3.77E 3	-211.669	-0.132
		1.000	750.045	25.121	-3.27E 3	4.05E 3	-211.669	-0.132
	13	0.000	722.970	13.155	0.000	736.125	-211.669	-0.132
		0.083	725.227	14.152	-272.736	1.01E 3	-211.669	-0.132
		0.167	727.483	15.149	-545.471	1.29E 3	-211.669	-0.132
		0.250	729.739	16.146	-818.207	1.56E 3	-211.669	-0.132
		0.333	731.995	17.144	-1.09E 3	1.84E 3	-211.669	-0.132
		0.417	734.251	18.141	-1.36E 3	2.12E 3	-211.669	-0.132
		0.500	736.508	19.138	-1.64E 3	2.39E 3	-211.669	-0.132
		0.583	738.764	20.135	-1.91E 3	2.67E 3	-211.669	-0.132
		0.667	741.020	21.132	-2.18E 3	2.94E 3	-211.669	-0.132
		0.750	743.276	22.130	-2.45E 3	3.22E 3	-211.669	-0.132
		0.833	745.532	23.127	-2.73E 3	3.5E 3	-211.669	-0.132
		0.917	747.789	24.124	-3E 3	3.77E 3	-211.669	-0.132
		1.000	750.045	25.121	-3.27E 3	4.05E 3	-211.669	-0.132
	14	0.000	1.29E 3	23.069	0.000	1.31E 3	-367.213	-0.034
		0.083	1.29E 3	23.327	-473.153	1.79E 3	-367.213	-0.034
		0.167	1.29E 3	23.584	-946.305	2.26E 3	-367.213	-0.034
		0.250	1.3E 3	23.842	-1.42E 3	2.74E 3	-367.213	-0.034
		0.333	1.3E 3	24.100	-1.89E 3	3.21E 3	-367.213	-0.034
		0.417	1.3E 3	24.358	-2.37E 3	3.69E 3	-367.213	-0.034
		0.500	1.3E 3	24.616	-2.84E 3	4.17E 3	-367.213	-0.034
		0.583	1.3E 3	24.874	-3.31E 3	4.64E 3	-367.213	-0.034
		0.667	1.31E 3	25.132	-3.79E 3	5.12E 3	-367.213	-0.034
		0.750	1.31E 3	25.390	-4.26E 3	5.59E 3	-367.213	-0.034
		0.833	1.31E 3	25.648	-4.73E 3	6.07E 3	-367.213	-0.034

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 19	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	1.31E 3	25.905	-5.2E 3	6.54E 3	-367.213	-0.034
		1.000	1.32E 3	26.163	-5.68E 3	7.02E 3	-367.213	-0.034
	15	0.000	1.29E 3	23.069	0.000	1.31E 3	-367.213	-0.034
		0.083	1.29E 3	23.327	-473.153	1.79E 3	-367.213	-0.034
		0.167	1.29E 3	23.584	-946.305	2.26E 3	-367.213	-0.034
		0.250	1.3E 3	23.842	-1.42E 3	2.74E 3	-367.213	-0.034
		0.333	1.3E 3	24.100	-1.89E 3	3.21E 3	-367.213	-0.034
		0.417	1.3E 3	24.358	-2.37E 3	3.69E 3	-367.213	-0.034
		0.500	1.3E 3	24.616	-2.84E 3	4.17E 3	-367.213	-0.034
		0.583	1.3E 3	24.874	-3.31E 3	4.64E 3	-367.213	-0.034
		0.667	1.31E 3	25.132	-3.79E 3	5.12E 3	-367.213	-0.034
		0.750	1.31E 3	25.390	-4.26E 3	5.59E 3	-367.213	-0.034
		0.833	1.31E 3	25.648	-4.73E 3	6.07E 3	-367.213	-0.034
		0.917	1.31E 3	25.905	-5.2E 3	6.54E 3	-367.213	-0.034
		1.000	1.32E 3	26.163	-5.68E 3	7.02E 3	-367.213	-0.034
	16	0.000	1.08E 3	-2.07E 3	0.000	3.14E 3	-77.962	-41.202
		0.083	1.08E 3	-1.75E 3	-100.454	2.93E 3	-77.962	-41.202
		0.167	1.08E 3	-1.44E 3	-200.908	2.72E 3	-77.962	-41.202
		0.250	1.08E 3	-1.13E 3	-301.363	2.51E 3	-77.962	-41.202
		0.333	1.08E 3	-816.286	-401.817	2.3E 3	-77.962	-41.202
		0.417	1.09E 3	-504.104	-502.271	2.09E 3	-77.962	-41.202
		0.500	1.09E 3	-191.921	-602.725	1.88E 3	-77.962	-41.202
		0.583	1.09E 3	120.261	-703.179	1.91E 3	-77.962	-41.202
		0.667	1.09E 3	432.444	-803.634	2.33E 3	-77.962	-41.202
		0.750	1.1E 3	744.626	-904.088	2.74E 3	-77.962	-41.202
		0.833	1.1E 3	1.06E 3	-1E 3	3.16E 3	-77.962	-41.202
		0.917	1.1E 3	1.37E 3	-1.1E 3	3.57E 3	-77.962	-41.202
		1.000	1.1E 3	1.68E 3	-1.21E 3	3.99E 3	-77.962	-41.202
	17	0.000	439.630	-2.77E 3	0.000	3.21E 3	173.958	-55.023
		0.083	441.752	-2.35E 3	224.144	3.02E 3	173.958	-55.023
		0.167	443.875	-1.94E 3	448.289	2.83E 3	173.958	-55.023
		0.250	445.997	-1.52E 3	672.433	2.64E 3	173.958	-55.023
		0.333	448.120	-1.1E 3	896.578	2.45E 3	173.958	-55.023
		0.417	450.242	-686.472	1.12E 3	2.26E 3	173.958	-55.023
		0.500	452.365	-269.575	1.34E 3	2.07E 3	173.958	-55.023
		0.583	454.487	147.322	1.57E 3	2.17E 3	173.958	-55.023
		0.667	456.610	564.219	1.79E 3	2.81E 3	173.958	-55.023
		0.750	458.732	981.116	2.02E 3	3.48E 3	173.958	-55.023
		0.833	460.855	1.4E 3	2.24E 3	4.1E 3	173.958	-55.023
		0.917	462.977	1.81E 3	2.47E 3	4.74E 3	173.958	-55.023
		1.000	465.100	2.23E 3	2.69E 3	5.39E 3	173.958	-55.023
2	1	0.000	185.907	-93.868	-8.11E 3	8.39E 3	1.54E 3	-2.435
		0.083	179.195	-71.593	-3.83E 3	4.08E 3	1.4E 3	-2.435
		0.167	172.483	-49.319	-1.75E 3	1.98E 3	1.27E 3	-2.435
		0.250	165.771	-27.044	113.362	306.176	1.13E 3	-2.435

WEAVER BOOS CONSULTANTS	Job No 2186-351	Sheet No 20	Rev
Software licensed to Weaver Boos Consultants	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	159.059	-4.769	1.77E 3	1.94E 3	998.827	-2.435
		0.417	152.346	17.505	3.22E 3	3.39E 3	864.658	-2.435
		0.500	145.634	39.780	4.46E 3	4.65E 3	730.489	-2.435
		0.583	138.922	62.054	5.49E 3	5.69E 3	596.320	-2.435
		0.667	132.210	84.329	6.32E 3	6.53E 3	462.151	-2.435
		0.750	125.497	106.604	6.93E 3	7.16E 3	327.982	-2.435
		0.833	118.785	128.878	7.34E 3	7.59E 3	193.813	-2.435
		0.917	112.073	151.153	7.53E 3	7.8E 3	59.644	-2.435
		1.000	105.361	173.427	7.52E 3	7.8E 3	-64.265	-2.435
	2	0.000	195.691	-104.270	-6.49E 3	6.79E 3	1.62E 3	-2.778
		0.083	188.696	-78.856	-4.08E 3	4.34E 3	1.48E 3	-2.778
		0.167	181.700	-53.443	-1.88E 3	2.12E 3	1.34E 3	-2.778
		0.250	174.705	-28.029	90.474	293.208	1.2E 3	-2.778
		0.333	167.710	-2.615	1.85E 3	2.02E 3	1.06E 3	-2.778
		0.417	160.715	22.798	3.39E 3	3.57E 3	920.096	-2.778
		0.500	153.719	48.212	4.71E 3	4.91E 3	780.306	-2.778
		0.583	146.724	73.625	5.82E 3	6.04E 3	640.516	-2.778
		0.667	139.729	99.039	6.7E 3	6.94E 3	500.726	-2.778
		0.750	132.734	124.453	7.37E 3	7.63E 3	360.937	-2.778
		0.833	125.739	149.866	7.83E 3	8.1E 3	221.147	-2.778
		0.917	118.743	175.280	8.06E 3	8.36E 3	81.357	-2.778
		1.000	111.748	200.693	8.08E 3	8.39E 3	-48.173	-2.778
	3	0.000	16.556	1.928	0.124	18.608	0.008	0.073
		0.083	16.556	1.259	0.137	17.952	0.008	0.073
		0.167	16.556	0.590	0.151	17.297	0.008	0.073
		0.250	16.556	-0.078	0.164	16.798	0.008	0.073
		0.333	16.556	-0.747	0.177	17.480	0.008	0.073
		0.417	16.556	-1.416	0.190	18.161	0.008	0.073
		0.500	16.556	-2.084	0.203	18.843	0.008	0.073
		0.583	16.556	-2.753	0.216	19.525	0.008	0.073
		0.667	16.556	-3.422	0.229	20.206	0.008	0.073
		0.750	16.556	-4.090	0.242	20.888	0.008	0.073
		0.833	16.556	-4.759	0.255	21.570	0.008	0.073
		0.917	16.556	-5.427	0.268	22.252	0.008	0.073
		1.000	16.556	-6.096	0.281	22.933	0.008	0.073
	4	0.000	16.556	1.928	0.124	18.608	0.008	0.073
		0.083	16.556	1.259	0.137	17.952	0.008	0.073
		0.167	16.556	0.590	0.151	17.297	0.008	0.073
		0.250	16.556	-0.078	0.164	16.798	0.008	0.073
		0.333	16.556	-0.747	0.177	17.480	0.008	0.073
		0.417	16.556	-1.416	0.190	18.161	0.008	0.073
		0.500	16.556	-2.084	0.203	18.843	0.008	0.073
		0.583	16.556	-2.753	0.216	19.525	0.008	0.073
		0.667	16.556	-3.422	0.229	20.206	0.008	0.073
		0.750	16.556	-4.090	0.242	20.888	0.008	0.073

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 21	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	16.556	-4.759	0.255	21.570	0.008	0.073
		0.917	16.556	-5.427	0.268	22.252	0.008	0.073
		1.000	16.556	-6.096	0.281	22.933	0.008	0.073
	5	0.000	187.638	-661.041	7.87E 3	8.72E 3	-472.481	-9.532
		0.083	187.638	-573.838	7.13E 3	7.89E 3	-472.481	-9.532
		0.167	187.638	-486.635	6.4E 3	7.07E 3	-472.481	-9.532
		0.250	187.638	-399.432	5.66E 3	6.25E 3	-472.481	-9.532
		0.333	187.638	-312.229	4.93E 3	5.43E 3	-472.481	-9.532
		0.417	187.638	-225.025	4.19E 3	4.61E 3	-472.481	-9.532
		0.500	187.638	-137.822	3.46E 3	3.78E 3	-472.481	-9.532
		0.583	187.638	-50.619	2.72E 3	2.96E 3	-472.481	-9.532
		0.667	187.638	36.584	1.99E 3	2.21E 3	-472.481	-9.532
		0.750	187.638	123.787	1.25E 3	1.56E 3	-472.481	-9.532
		0.833	187.638	210.990	517.436	916.064	-472.481	-9.532
		0.917	187.638	298.193	-217.608	703.439	-472.481	-9.532
		1.000	187.638	385.396	-952.652	1.53E 3	-472.481	-9.532
	6	0.000	473.404	-667.851	-5.08E 3	6.22E 3	2.4E 3	-11.668
		0.083	461.445	-561.114	-1.54E 3	2.56E 3	2.16E 3	-11.668
		0.167	449.487	-454.377	1.63E 3	2.54E 3	1.92E 3	-11.668
		0.250	437.528	-347.640	4.43E 3	5.21E 3	1.68E 3	-11.668
		0.333	425.569	-240.902	6.85E 3	7.52E 3	1.44E 3	-11.668
		0.417	413.611	-134.165	8.91E 3	9.45E 3	1.2E 3	-11.668
		0.500	401.652	-27.428	10.6E 3	11E 3	961.358	-11.668
		0.583	389.693	79.309	11.9E 3	12.4E 3	722.346	-11.668
		0.667	377.735	186.046	12.8E 3	13.4E 3	483.335	-11.668
		0.750	365.776	292.783	13.4E 3	14.1E 3	244.324	-11.668
		0.833	353.817	399.520	13.6E 3	14.3E 3	5.312	-11.668
		0.917	341.859	506.258	13.4E 3	14.3E 3	-233.699	-11.668
		1.000	329.900	612.995	12.9E 3	13.8E 3	-454.755	-11.668
	7	0.000	381.598	-198.138	-12.6E 3	13.2E 3	3.15E 3	-5.213
		0.083	367.891	-150.450	-7.91E 3	8.42E 3	2.88E 3	-5.213
		0.167	354.183	-102.761	-3.84E 3	4.1E 3	2.61E 3	-5.213
		0.250	340.476	-55.073	203.835	599.385	2.33E 3	-5.213
		0.333	326.769	-7.385	3.62E 3	3.95E 3	2.06E 3	-5.213
		0.417	313.061	40.303	6.61E 3	6.96E 3	1.78E 3	-5.213
		0.500	299.354	87.992	9.17E 3	9.56E 3	1.51E 3	-5.213
		0.583	285.646	135.680	11.3E 3	11.7E 3	1.24E 3	-5.213
		0.667	271.939	183.368	13E 3	13.5E 3	962.878	-5.213
		0.750	258.231	231.056	14.3E 3	14.8E 3	688.919	-5.213
		0.833	244.524	278.744	15.2E 3	15.7E 3	414.960	-5.213
		0.917	230.816	326.433	15.8E 3	16.2E 3	141.001	-5.213
		1.000	217.109	374.121	15.6E 3	16.2E 3	-112.438	-5.213
	8	0.000	373.545	-754.909	1.75E 3	2.88E 3	1.06E 3	-11.967
		0.083	366.833	-645.431	3.3E 3	4.32E 3	928.853	-11.967
		0.167	360.121	-535.954	4.64E 3	5.54E 3	794.684	-11.967

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Job Title Crest Pad Bldg	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	353.408	-426.476	5.78E 3	6.56E 3	660.515	-11.967
		0.333	346.696	-316.998	6.7E 3	7.36E 3	526.346	-11.967
		0.417	339.984	-207.520	7.41E 3	7.96E 3	392.177	-11.967
		0.500	333.272	-98.043	7.92E 3	8.35E 3	258.008	-11.967
		0.583	326.559	11.435	8.22E 3	8.55E 3	123.839	-11.967
		0.667	319.847	120.913	8.3E 3	8.75E 3	-10.330	-11.967
		0.750	313.135	230.391	8.18E 3	8.73E 3	-144.499	-11.967
		0.833	306.423	339.868	7.86E 3	8.5E 3	-278.668	-11.967
		0.917	299.710	449.346	7.32E 3	8.07E 3	-412.837	-11.967
		1.000	292.998	558.824	6.57E 3	7.42E 3	-536.746	-11.967
	9	0.000	-13.653	-666.167	8.44E 3	-9.12E 3	-442.175	-9.875
		0.083	-13.653	-576.833	7.75E 3	-8.34E 3	-442.175	-9.875
		0.167	-13.653	-485.499	7.06E 3	-7.56E 3	-442.175	-9.875
		0.250	-13.653	-395.166	6.37E 3	-6.78E 3	-442.175	-9.875
		0.333	-13.653	-304.832	5.69E 3	-6.01E 3	-442.175	-9.875
		0.417	-13.653	-214.499	5E 3	-5.23E 3	-442.175	-9.875
		0.500	-13.653	-124.165	4.31E 3	-4.45E 3	-442.175	-9.875
		0.583	-13.653	-33.831	3.62E 3	-3.67E 3	-442.175	-9.875
		0.667	-13.653	56.502	2.94E 3	-3.01E 3	-442.175	-9.875
		0.750	-13.653	146.836	2.25E 3	-2.41E 3	-442.175	-9.875
		0.833	-13.653	237.170	1.56E 3	-1.81E 3	-442.175	-9.875
		0.917	-13.653	327.503	871.564	-1.21E 3	-442.175	-9.875
		1.000	-13.653	417.837	183.668	-615.157	-442.175	-9.875
	10	0.000	197.497	-92.519	-6.11E 3	6.4E 3	1.54E 3	-2.384
		0.083	190.784	-70.712	-3.83E 3	4.09E 3	1.4E 3	-2.384
		0.167	184.072	-48.906	-1.75E 3	1.99E 3	1.27E 3	-2.384
		0.250	177.360	-27.099	113.476	317.935	1.13E 3	-2.384
		0.333	170.648	-5.292	1.77E 3	1.95E 3	998.833	-2.384
		0.417	163.936	16.514	3.22E 3	3.4E 3	864.664	-2.384
		0.500	157.223	38.321	4.46E 3	4.66E 3	730.495	-2.384
		0.583	150.511	60.127	5.49E 3	5.7E 3	596.326	-2.384
		0.667	143.799	81.934	6.32E 3	6.54E 3	462.157	-2.384
		0.750	137.087	103.741	6.93E 3	7.17E 3	327.988	-2.384
		0.833	130.374	125.547	7.34E 3	7.59E 3	193.819	-2.384
		0.917	123.662	147.354	7.54E 3	7.81E 3	59.650	-2.384
		1.000	116.950	169.160	7.52E 3	7.81E 3	-84.259	-2.384
	11	0.000	197.497	-92.519	-6.11E 3	6.4E 3	1.54E 3	-2.384
		0.083	190.784	-70.712	-3.83E 3	4.09E 3	1.4E 3	-2.384
		0.167	184.072	-48.906	-1.75E 3	1.99E 3	1.27E 3	-2.384
		0.250	177.360	-27.099	113.476	317.935	1.13E 3	-2.384
		0.333	170.648	-5.292	1.77E 3	1.95E 3	998.833	-2.384
		0.417	163.936	16.514	3.22E 3	3.4E 3	864.664	-2.384
		0.500	157.223	38.321	4.46E 3	4.66E 3	730.495	-2.384
		0.583	150.511	60.127	5.49E 3	5.7E 3	596.326	-2.384
		0.667	143.799	81.934	6.32E 3	6.54E 3	462.157	-2.384

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 23	Rev
Job Title Crest Pad Bldg	Part		
	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.750	137.087	103.741	6.93E 3	7.17E 3	327.988	-2.384
		0.833	130.374	125.547	7.34E 3	7.59E 3	193.819	-2.384
		0.917	123.662	147.354	7.54E 3	7.81E 3	59.650	-2.384
		1.000	116.950	169.160	7.52E 3	7.81E 3	-64.259	-2.384
	12	0.000	209.209	-98.432	-6.5E 3	6.81E 3	1.63E 3	-2.537
		0.083	202.074	-75.222	-4.07E 3	4.35E 3	1.49E 3	-2.537
		0.167	194.939	-52.013	-1.86E 3	2.11E 3	1.35E 3	-2.537
		0.250	187.804	-28.803	120.618	337.224	1.2E 3	-2.537
		0.333	180.668	-5.593	1.88E 3	2.07E 3	1.06E 3	-2.537
		0.417	173.533	17.617	3.42E 3	3.62E 3	919.137	-2.537
		0.500	166.398	40.827	4.74E 3	4.95E 3	776.516	-2.537
		0.583	159.263	64.037	5.84E 3	6.06E 3	633.894	-2.537
		0.667	152.128	87.247	6.72E 3	6.95E 3	491.272	-2.537
		0.750	144.993	110.457	7.37E 3	7.62E 3	348.651	-2.537
		0.833	137.858	133.666	7.8E 3	8.07E 3	206.029	-2.537
		0.917	130.723	156.876	8.01E 3	8.3E 3	63.408	-2.537
		1.000	123.588	180.086	8E 3	8.3E 3	-68.308	-2.537
	13	0.000	209.209	-98.432	-6.5E 3	6.81E 3	1.63E 3	-2.537
		0.083	202.074	-75.222	-4.07E 3	4.35E 3	1.49E 3	-2.537
		0.167	194.939	-52.013	-1.86E 3	2.11E 3	1.35E 3	-2.537
		0.250	187.804	-28.803	120.618	337.224	1.2E 3	-2.537
		0.333	180.668	-5.593	1.88E 3	2.07E 3	1.06E 3	-2.537
		0.417	173.533	17.617	3.42E 3	3.62E 3	919.137	-2.537
		0.500	166.398	40.827	4.74E 3	4.95E 3	776.516	-2.537
		0.583	159.263	64.037	5.84E 3	6.06E 3	633.894	-2.537
		0.667	152.128	87.247	6.72E 3	6.95E 3	491.272	-2.537
		0.750	144.993	110.457	7.37E 3	7.62E 3	348.651	-2.537
		0.833	137.858	133.666	7.8E 3	8.07E 3	206.029	-2.537
		0.917	130.723	156.876	8.01E 3	8.3E 3	63.408	-2.537
		1.000	123.588	180.086	8E 3	8.3E 3	-68.308	-2.537
	14	0.000	350.180	-175.508	-11.3E 3	11.8E 3	2.82E 3	-4.595
		0.083	337.903	-133.468	-7.07E 3	7.54E 3	2.58E 3	-4.595
		0.167	325.626	-91.428	-3.25E 3	3.67E 3	2.33E 3	-4.595
		0.250	313.349	-49.389	186.676	549.414	2.09E 3	-4.595
		0.333	301.072	-7.349	3.24E 3	3.55E 3	1.84E 3	-4.595
		0.417	288.796	34.690	5.92E 3	6.24E 3	1.6E 3	-4.595
		0.500	276.519	76.730	8.21E 3	8.56E 3	1.35E 3	-4.595
		0.583	264.242	118.770	10.1E 3	10.5E 3	1.1E 3	-4.595
		0.667	251.965	160.809	11.6E 3	12.1E 3	859.606	-4.595
		0.750	239.688	202.849	12.8E 3	13.2E 3	614.235	-4.595
		0.833	227.411	244.888	13.6E 3	14E 3	368.864	-4.595
		0.917	215.134	286.928	13.9E 3	14.4E 3	123.494	-4.595
		1.000	202.858	328.968	13.9E 3	14.5E 3	-103.436	-4.595
	15	0.000	350.180	-175.508	-11.3E 3	11.8E 3	2.82E 3	-4.595
		0.083	337.903	-133.468	-7.07E 3	7.54E 3	2.58E 3	-4.595

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 24	Rev
	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.167	325.626	-91.428	-3.25E 3	3.67E 3	2.33E 3	-4.595
		0.250	313.349	-49.389	186.676	549.414	2.09E 3	-4.595
		0.333	301.072	-7.349	3.24E 3	3.55E 3	1.84E 3	-4.595
		0.417	288.796	34.690	5.92E 3	6.24E 3	1.6E 3	-4.595
		0.500	276.519	76.730	8.21E 3	8.56E 3	1.35E 3	-4.595
		0.583	264.242	118.770	10.1E 3	10.5E 3	1.1E 3	-4.595
		0.667	251.965	160.809	11.6E 3	12.1E 3	859.608	-4.595
		0.750	239.688	202.849	12.8E 3	13.2E 3	614.235	-4.595
		0.833	227.411	244.888	13.6E 3	14E 3	368.864	-4.595
		0.917	215.134	286.928	13.9E 3	14.4E 3	123.494	-4.595
		1.000	202.858	328.968	13.9E 3	14.5E 3	-103.436	-4.595
	16	0.000	322.436	-671.695	-4.65E 3	5.64E 3	2.42E 3	-11.924
		0.083	310.477	-562.610	-1.07E 3	1.95E 3	2.18E 3	-11.924
		0.167	298.519	-453.525	2.13E 3	2.88E 3	1.94E 3	-11.924
		0.250	286.560	-344.440	4.96E 3	5.59E 3	1.7E 3	-11.924
		0.333	274.601	-235.355	7.42E 3	7.93E 3	1.46E 3	-11.924
		0.417	262.643	-126.270	9.51E 3	9.9E 3	1.22E 3	-11.924
		0.500	250.684	-17.185	11.2E 3	11.5E 3	984.087	-11.924
		0.583	238.725	91.900	12.6E 3	12.9E 3	745.076	-11.924
		0.667	226.767	200.985	13.5E 3	14E 3	506.065	-11.924
		0.750	214.808	310.070	14.1E 3	14.7E 3	267.053	-11.924
		0.833	202.849	419.155	14.4E 3	15E 3	28.042	-11.924
		0.917	190.891	528.240	14.2E 3	15E 3	-210.969	-11.924
		1.000	178.932	637.325	13.7E 3	14.5E 3	-432.026	-11.924
	17	0.000	172.254	-760.035	2.32E 3	3.26E 3	1.09E 3	-12.309
		0.083	165.542	-647.426	3.92E 3	4.73E 3	959.159	-12.309
		0.167	158.830	-534.818	5.31E 3	6E 3	824.990	-12.309
		0.250	152.118	-422.210	6.49E 3	7.06E 3	690.821	-12.309
		0.333	145.405	-309.602	7.46E 3	7.91E 3	556.652	-12.309
		0.417	138.693	-196.993	8.22E 3	8.56E 3	422.483	-12.309
		0.500	131.981	-84.385	8.77E 3	8.99E 3	288.314	-12.309
		0.583	125.269	28.223	9.12E 3	9.27E 3	154.145	-12.309
		0.667	118.557	140.831	9.25E 3	9.51E 3	19.976	-12.309
		0.750	111.844	253.440	9.18E 3	9.54E 3	-114.193	-12.309
		0.833	105.132	366.048	8.9E 3	9.37E 3	-248.362	-12.309
		0.917	98.420	478.656	8.41E 3	8.98E 3	-382.531	-12.309
		1.000	91.708	591.264	7.71E 3	8.39E 3	-506.440	-12.309
3	1	0.000	105.092	163.275	7.62E 3	7.79E 3	75.026	2.231
		0.083	111.804	142.867	7.54E 3	7.79E 3	-59.143	2.231
		0.167	118.516	122.458	7.34E 3	7.58E 3	-193.312	2.231
		0.250	125.229	102.050	6.93E 3	7.16E 3	-327.481	2.231
		0.333	131.941	81.642	6.32E 3	6.53E 3	-461.650	2.231
		0.417	138.653	61.234	5.5E 3	5.7E 3	-595.819	2.231
		0.500	145.365	40.826	4.47E 3	4.65E 3	-729.988	2.231
		0.583	152.077	20.417	3.23E 3	3.4E 3	-864.157	2.231

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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.667	158.790	0.009	1.78E 3	1.94E 3	-998.326	2.231
		0.750	165.502	-20.399	120.960	306.861	-1.13E 3	2.231
		0.833	172.214	-40.807	-1.75E 3	1.96E 3	-1.27E 3	2.231
		0.917	178.926	-61.215	-3.82E 3	4.06E 3	-1.4E 3	2.231
		1.000	185.639	-81.623	-6.1E 3	6.37E 3	-1.52E 3	2.231
	2	0.000	111.486	187.339	8.08E 3	8.38E 3	59.032	2.506
		0.083	118.481	164.412	8.06E 3	8.35E 3	-80.758	2.506
		0.167	125.477	141.484	7.83E 3	8.1E 3	-220.548	2.506
		0.250	132.472	118.557	7.38E 3	7.63E 3	-360.338	2.506
		0.333	139.467	95.630	6.71E 3	6.94E 3	-500.127	2.506
		0.417	146.462	72.702	5.82E 3	6.04E 3	-639.917	2.506
		0.500	153.458	49.775	4.72E 3	4.92E 3	-779.707	2.506
		0.583	160.453	26.848	3.4E 3	3.58E 3	-919.497	2.506
		0.667	167.448	3.920	1.86E 3	2.03E 3	-1.06E 3	2.506
		0.750	174.443	-19.007	99.445	292.895	-1.2E 3	2.606
		0.833	181.439	-41.935	-1.87E 3	2.1E 3	-1.34E 3	2.506
		0.917	188.434	-64.862	-4.07E 3	4.32E 3	-1.48E 3	2.506
		1.000	195.429	-87.789	-6.47E 3	6.76E 3	-1.61E 3	2.506
	3	0.000	16.553	-6.442	0.281	23.277	-0.000	-0.082
		0.083	16.553	-5.695	0.281	22.529	-0.000	-0.082
		0.167	16.553	-4.947	0.281	21.782	-0.000	-0.082
		0.250	16.553	-4.200	0.281	21.034	-0.000	-0.082
		0.333	16.553	-3.452	0.281	20.287	-0.000	-0.082
		0.417	16.553	-2.705	0.281	19.539	-0.000	-0.082
		0.500	16.553	-1.957	0.281	18.792	-0.000	-0.082
		0.583	16.553	-1.209	0.281	18.044	-0.000	-0.082
		0.667	16.553	-0.462	0.281	17.296	-0.000	-0.082
		0.750	16.553	0.286	0.281	17.120	-0.000	-0.082
		0.833	16.553	1.033	0.281	17.868	-0.000	-0.082
		0.917	16.553	1.781	0.281	18.615	-0.000	-0.082
		1.000	16.553	2.528	0.281	19.363	-0.000	-0.082
	4	0.000	16.553	-6.442	0.281	23.277	-0.000	-0.082
		0.083	16.553	-5.695	0.281	22.529	-0.000	-0.082
		0.167	16.553	-4.947	0.281	21.782	-0.000	-0.082
		0.250	16.553	-4.200	0.281	21.034	-0.000	-0.082
		0.333	16.553	-3.452	0.281	20.287	-0.000	-0.082
		0.417	16.553	-2.705	0.281	19.539	-0.000	-0.082
		0.500	16.553	-1.957	0.281	18.792	-0.000	-0.082
		0.583	16.553	-1.209	0.281	18.044	-0.000	-0.082
		0.667	16.553	-0.462	0.281	17.296	-0.000	-0.082
		0.750	16.553	0.286	0.281	17.120	-0.000	-0.082
		0.833	16.553	1.033	0.281	17.868	-0.000	-0.082
		0.917	16.553	1.781	0.281	18.615	-0.000	-0.082
		1.000	16.553	2.528	0.281	19.363	-0.000	-0.082
	5	0.000	190.022	-458.125	-952.650	1.6E 3	-398.026	-10.375

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	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.083	190.022	-363.214	-1.67E 3	2.13E 3	-398.026	-10.375
		0.167	190.022	-268.303	-2.19E 3	2.65E 3	-398.026	-10.375
		0.250	190.022	-173.391	-2.81E 3	3.17E 3	-398.026	-10.375
		0.333	190.022	-78.480	-3.43E 3	3.7E 3	-398.026	-10.375
		0.417	190.022	16.432	-4.05E 3	4.26E 3	-398.026	-10.375
		0.500	190.022	111.343	-4.67E 3	4.97E 3	-398.026	-10.375
		0.583	190.022	206.254	-5.29E 3	5.68E 3	-398.026	-10.375
		0.667	190.022	301.166	-5.91E 3	6.4E 3	-398.026	-10.375
		0.750	190.022	396.077	-6.53E 3	7.11E 3	-398.026	-10.375
		0.833	190.022	490.988	-7.14E 3	7.83E 3	-398.026	-10.375
		0.917	190.022	585.900	-7.76E 3	8.54E 3	-398.026	-10.375
		1.000	190.022	680.811	-8.38E 3	9.25E 3	-398.026	-10.375
	6	0.000	331.223	-39.815	12.9E 3	13.2E 3	-179.220	-3.671
		0.083	343.181	-6.235	12.4E 3	12.8E 3	-418.231	-3.671
		0.167	355.140	27.346	11.6E 3	12E 3	-657.242	-3.671
		0.250	367.099	60.925	10.4E 3	10.8E 3	-896.254	-3.671
		0.333	379.057	94.504	8.78E 3	9.25E 3	-1.14E 3	-3.671
		0.417	391.016	128.084	6.83E 3	7.35E 3	-1.37E 3	-3.671
		0.500	402.975	161.664	4.5E 3	5.07E 3	-1.61E 3	-3.671
		0.583	414.933	195.244	1.81E 3	2.42E 3	-1.85E 3	-3.671
		0.667	426.892	228.824	-1.26E 3	1.91E 3	-2.09E 3	-3.671
		0.750	438.851	262.403	-4.7E 3	5.4E 3	-2.33E 3	-3.671
		0.833	450.809	295.983	-8.51E 3	9.26E 3	-2.57E 3	-3.671
		0.917	462.768	329.563	-12.7E 3	13.5E 3	-2.81E 3	-3.671
		1.000	474.727	363.143	-17.2E 3	18.1E 3	-3.03E 3	-3.671
	7	0.000	216.578	350.614	15.6E 3	16.2E 3	134.058	4.737
		0.083	230.285	307.278	15.6E 3	16.1E 3	-139.901	4.737
		0.167	243.993	263.943	15.2E 3	15.7E 3	-413.860	4.737
		0.250	257.700	220.607	14.3E 3	14.8E 3	-687.819	4.737
		0.333	271.408	177.272	13E 3	13.5E 3	-961.778	4.737
		0.417	285.115	133.936	11.3E 3	11.7E 3	-1.24E 3	4.737
		0.500	298.823	90.601	9.18E 3	9.57E 3	-1.51E 3	4.737
		0.583	312.530	47.265	6.62E 3	6.98E 3	-1.78E 3	4.737
		0.667	326.238	3.929	3.63E 3	3.96E 3	-2.06E 3	4.737
		0.750	339.945	-39.406	220.405	599.757	-2.33E 3	4.737
		0.833	353.653	-82.742	-3.62E 3	4.06E 3	-2.61E 3	4.737
		0.917	367.360	-126.077	-7.89E 3	8.38E 3	-2.88E 3	4.737
		1.000	381.068	-169.413	-12.6E 3	13.1E 3	-3.13E 3	4.737
	8	0.000	295.113	-294.850	6.57E 3	7.16E 3	-323.000	-8.144
		0.083	301.826	-220.347	5.96E 3	6.49E 3	-457.169	-8.144
		0.167	308.538	-145.844	5.15E 3	5.6E 3	-591.338	-8.144
		0.250	315.250	-71.341	4.12E 3	4.51E 3	-725.507	-8.144
		0.333	321.962	3.162	2.89E 3	3.22E 3	-859.676	-8.144
		0.417	328.675	77.665	1.45E 3	1.86E 3	-993.845	-8.144
		0.500	335.387	152.169	-200.741	688.297	-1.13E 3	-8.144

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.583	342.099	226.672	-2.06E 3	2.63E 3	-1.26E 3	-8.144
		0.667	348.811	301.175	-4.13E 3	4.78E 3	-1.4E 3	-8.144
		0.750	355.524	375.678	-6.4E 3	7.14E 3	-1.53E 3	-8.144
		0.833	362.236	450.181	-8.89E 3	9.7E 3	-1.66E 3	-8.144
		0.917	368.948	524.684	-11.6E 3	12.5E 3	-1.8E 3	-8.144
		1.000	375.660	599.188	-14.5E 3	15.5E 3	-1.92E 3	-8.144
	9	0.000	-2.952	-404.364	183.670	-590.986	-452.049	-9.542
		0.083	-2.952	-317.070	-519.588	-839.611	-452.049	-9.542
		0.167	-2.952	-229.776	-1.22E 3	-1.46E 3	-452.049	-9.542
		0.250	-2.952	-142.483	-1.93E 3	-2.07E 3	-452.049	-9.542
		0.333	-2.952	-55.189	-2.63E 3	-2.69E 3	-452.049	-9.542
		0.417	-2.952	32.104	-3.33E 3	-3.37E 3	-452.049	-9.542
		0.500	-2.952	119.398	-4.04E 3	-4.16E 3	-452.049	-9.542
		0.583	-2.952	206.692	-4.74E 3	-4.95E 3	-452.049	-9.542
		0.667	-2.952	293.985	-5.44E 3	-5.74E 3	-452.049	-9.542
		0.750	-2.952	381.279	-6.15E 3	-6.53E 3	-452.049	-9.542
		0.833	-2.952	468.572	-6.85E 3	-7.32E 3	-452.049	-9.542
		0.917	-2.952	555.866	-7.55E 3	-8.11E 3	-452.049	-9.542
		1.000	-2.952	643.160	-8.26E 3	-8.9E 3	-452.049	-9.542
	10	0.000	116.679	158.765	7.52E 3	7.8E 3	75.026	2.174
		0.083	123.391	138.880	7.54E 3	7.8E 3	-59.143	2.174
		0.167	130.104	118.996	7.34E 3	7.59E 3	-193.312	2.174
		0.250	136.816	99.111	6.94E 3	7.17E 3	-327.481	2.174
		0.333	143.528	79.226	6.32E 3	6.54E 3	-461.650	2.174
		0.417	150.240	59.341	5.5E 3	5.71E 3	-595.819	2.174
		0.500	156.953	39.456	4.47E 3	4.66E 3	-729.988	2.174
		0.583	163.665	19.571	3.23E 3	3.41E 3	-864.157	2.174
		0.667	170.377	-0.314	1.78E 3	1.95E 3	-998.326	2.174
		0.750	177.089	-20.199	121.157	318.445	-1.13E 3	2.174
		0.833	183.802	-40.084	-1.75E 3	1.97E 3	-1.27E 3	2.174
		0.917	190.514	-59.969	-3.82E 3	4.07E 3	-1.4E 3	2.174
		1.000	197.226	-79.854	-6.1E 3	6.38E 3	-1.52E 3	2.174
	11	0.000	116.679	158.765	7.52E 3	7.8E 3	75.026	2.174
		0.083	123.391	138.880	7.54E 3	7.8E 3	-59.143	2.174
		0.167	130.104	118.996	7.34E 3	7.59E 3	-193.312	2.174
		0.250	136.816	99.111	6.94E 3	7.17E 3	-327.481	2.174
		0.333	143.528	79.226	6.32E 3	6.54E 3	-461.650	2.174
		0.417	150.240	59.341	5.5E 3	5.71E 3	-595.819	2.174
		0.500	156.953	39.456	4.47E 3	4.66E 3	-729.988	2.174
		0.583	163.665	19.571	3.23E 3	3.41E 3	-864.157	2.174
		0.667	170.377	-0.314	1.78E 3	1.95E 3	-998.326	2.174
		0.750	177.089	-20.199	121.157	318.445	-1.13E 3	2.174
		0.833	183.802	-40.084	-1.75E 3	1.97E 3	-1.27E 3	2.174
		0.917	190.514	-59.969	-3.82E 3	4.07E 3	-1.4E 3	2.174
		1.000	197.226	-79.854	-6.1E 3	6.38E 3	-1.52E 3	2.174

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
	12	0.000	123.300	169.052	8E 3	8.29E 3	79.753	2.314
		0.083	130.435	147.881	8.01E 3	8.29E 3	-62.869	2.314
		0.167	137.570	126.710	7.8E 3	8.07E 3	-205.491	2.314
		0.250	144.705	105.540	7.37E 3	7.62E 3	-348.112	2.314
		0.333	151.840	84.369	6.72E 3	6.96E 3	-490.734	2.314
		0.417	158.976	63.198	5.85E 3	6.07E 3	-633.356	2.314
		0.500	166.111	42.028	4.75E 3	4.96E 3	-775.977	2.314
		0.583	173.246	20.857	3.43E 3	3.62E 3	-918.599	2.314
		0.667	180.381	-0.314	1.89E 3	2.07E 3	-1.06E 3	2.314
		0.750	187.516	-21.484	128.778	337.778	-1.2E 3	2.314
		0.833	194.651	-42.655	-1.85E 3	2.09E 3	-1.35E 3	2.314
		0.917	201.786	-63.825	-4.06E 3	4.33E 3	-1.49E 3	2.314
		1.000	208.921	-84.996	-6.49E 3	6.78E 3	-1.62E 3	2.314
	13	0.000	123.300	169.052	8E 3	8.29E 3	79.753	2.314
		0.083	130.435	147.881	8.01E 3	8.29E 3	-62.869	2.314
		0.167	137.570	126.710	7.8E 3	8.07E 3	-205.491	2.314
		0.250	144.705	105.540	7.37E 3	7.62E 3	-348.112	2.314
		0.333	151.840	84.369	6.72E 3	6.96E 3	-490.734	2.314
		0.417	158.976	63.198	5.85E 3	6.07E 3	-633.356	2.314
		0.500	166.111	42.028	4.75E 3	4.96E 3	-775.977	2.314
		0.583	173.246	20.857	3.43E 3	3.62E 3	-918.599	2.314
		0.667	180.381	-0.314	1.89E 3	2.07E 3	-1.06E 3	2.314
		0.750	187.516	-21.484	128.778	337.778	-1.2E 3	2.314
		0.833	194.651	-42.655	-1.85E 3	2.09E 3	-1.35E 3	2.314
		0.917	201.786	-63.825	-4.06E 3	4.33E 3	-1.49E 3	2.314
		1.000	208.921	-84.996	-6.49E 3	6.78E 3	-1.62E 3	2.314
	14	0.000	202.378	308.136	13.9E 3	14.5E 3	122.856	4.173
		0.083	214.655	269.958	13.9E 3	14.4E 3	-122.515	4.173
		0.167	226.932	231.779	13.6E 3	14E 3	-367.886	4.173
		0.250	239.209	193.600	12.8E 3	13.2E 3	-613.257	4.173
		0.333	251.486	155.422	11.7E 3	12.1E 3	-858.628	4.173
		0.417	263.763	117.243	10.1E 3	10.5E 3	-1.1E 3	4.173
		0.500	276.039	79.065	8.22E 3	8.57E 3	-1.35E 3	4.173
		0.583	288.316	40.886	5.93E 3	6.26E 3	-1.59E 3	4.173
		0.667	300.593	2.707	3.25E 3	3.58E 3	-1.84E 3	4.173
		0.750	312.870	-35.471	201.425	549.766	-2.09E 3	4.173
		0.833	325.147	-73.650	-3.23E 3	3.63E 3	-2.33E 3	4.173
		0.917	337.424	-111.828	-7.05E 3	7.5E 3	-2.58E 3	4.173
		1.000	349.700	-150.007	-11.2E 3	11.7E 3	-2.8E 3	4.173
	15	0.000	202.378	308.136	13.9E 3	14.5E 3	122.856	4.173
		0.083	214.655	269.958	13.9E 3	14.4E 3	-122.515	4.173
		0.167	226.932	231.779	13.6E 3	14E 3	-367.886	4.173
		0.250	239.209	193.600	12.8E 3	13.2E 3	-613.257	4.173
		0.333	251.486	155.422	11.7E 3	12.1E 3	-858.628	4.173
		0.417	263.763	117.243	10.1E 3	10.5E 3	-1.1E 3	4.173

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 29	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	276.039	79.065	8.22E 3	8.57E 3	-1.35E 3	4.173
		0.583	288.316	40.886	5.93E 3	6.26E 3	-1.59E 3	4.173
		0.667	300.593	2.707	3.25E 3	3.56E 3	-1.84E 3	4.173
		0.750	312.870	-35.471	201.425	549.768	-2.09E 3	4.173
		0.833	325.147	-73.650	-3.23E 3	3.63E 3	-2.33E 3	4.173
		0.917	337.424	-111.828	-7.05E 3	7.5E 3	-2.58E 3	4.173
		1.000	349.700	-150.007	-11.2E 3	11.7E 3	-2.8E 3	4.173
	16	0.000	186.492	0.506	13.7E 3	13.9E 3	-219.737	-3.046
		0.083	198.451	28.373	13.2E 3	13.4E 3	-458.749	-3.046
		0.167	210.410	56.239	12.3E 3	12.6E 3	-697.760	-3.046
		0.250	222.368	84.106	11E 3	11.3E 3	-936.771	-3.046
		0.333	234.327	111.972	9.38E 3	9.73E 3	-1.18E 3	-3.046
		0.417	246.286	139.839	7.37E 3	7.75E 3	-1.41E 3	-3.046
		0.500	258.244	167.705	4.98E 3	5.4E 3	-1.65E 3	-3.046
		0.583	270.203	195.572	2.22E 3	2.69E 3	-1.89E 3	-3.046
		0.667	282.162	223.438	-911.271	1.42E 3	-2.13E 3	-3.046
		0.750	294.120	251.305	-4.41E 3	4.96E 3	-2.37E 3	-3.046
		0.833	306.079	279.171	-8.29E 3	8.87E 3	-2.61E 3	-3.046
		0.917	318.038	307.038	-12.5E 3	13.2E 3	-2.85E 3	-3.046
		1.000	329.996	334.904	-17.2E 3	17.8E 3	-3.07E 3	-3.046
	17	0.000	102.140	-241.089	7.71E 3	8.06E 3	-377.023	-7.311
		0.083	108.852	-174.203	7.02E 3	7.3E 3	-511.193	-7.311
		0.167	115.564	-107.318	6.12E 3	6.34E 3	-645.361	-7.311
		0.250	122.276	-40.433	5.01E 3	5.17E 3	-779.530	-7.311
		0.333	128.988	26.453	3.69E 3	3.85E 3	-913.700	-7.311
		0.417	135.701	93.338	2.17E 3	2.39E 3	-1.05E 3	-7.311
		0.500	142.413	160.224	431.310	733.947	-1.18E 3	-7.311
		0.583	149.125	227.109	-1.51E 3	1.89E 3	-1.32E 3	-7.311
		0.667	155.837	293.995	-3.66E 3	4.11E 3	-1.45E 3	-7.311
		0.750	162.550	360.880	-6.02E 3	6.55E 3	-1.58E 3	-7.311
		0.833	169.262	427.766	-8.59E 3	9.19E 3	-1.72E 3	-7.311
		0.917	175.974	494.651	-11.4E 3	12E 3	-1.85E 3	-7.311
		1.000	182.686	561.536	-14.4E 3	15.1E 3	-1.98E 3	-7.311
4	1	0.000	716.698	-161.497	-6.1E 3	6.98E 3	197.762	-3.496
		0.083	714.575	-135.005	-5.85E 3	6.7E 3	197.762	-3.496
		0.167	712.453	-108.513	-5.59E 3	6.41E 3	197.762	-3.496
		0.250	710.330	-82.021	-5.34E 3	6.13E 3	197.762	-3.496
		0.333	708.208	-55.529	-5.08E 3	5.85E 3	197.762	-3.496
		0.417	706.085	-29.037	-4.83E 3	5.56E 3	197.762	-3.496
		0.500	703.963	-2.545	-4.57E 3	5.28E 3	197.762	-3.496
		0.583	701.840	23.946	-4.32E 3	5.05E 3	197.762	-3.496
		0.667	699.718	50.438	-4.06E 3	4.81E 3	197.762	-3.496
		0.750	697.596	76.930	-3.81E 3	4.58E 3	197.762	-3.496
		0.833	695.473	103.422	-3.56E 3	4.35E 3	197.762	-3.496
		0.917	693.350	129.914	-3.3E 3	4.12E 3	197.762	-3.496

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	691.226	156.406	-3.05E 3	3.89E 3	197.762	-3.496
	2	0.000	770.560	4.376	-6.47E 3	7.25E 3	209.564	0.022
		0.083	770.560	4.208	-6.2E 3	6.98E 3	209.564	0.022
		0.167	770.560	4.040	-5.93E 3	6.71E 3	209.564	0.022
		0.250	770.560	3.873	-5.66E 3	6.44E 3	209.564	0.022
		0.333	770.560	3.705	-5.39E 3	6.17E 3	209.564	0.022
		0.417	770.560	3.537	-5.12E 3	5.9E 3	209.564	0.022
		0.500	770.560	3.369	-4.85E 3	5.63E 3	209.564	0.022
		0.583	770.560	3.202	-4.58E 3	5.36E 3	209.564	0.022
		0.667	770.560	3.034	-4.31E 3	5.09E 3	209.564	0.022
		0.750	770.560	2.866	-4.04E 3	4.82E 3	209.564	0.022
		0.833	770.560	2.698	-3.77E 3	4.55E 3	209.564	0.022
		0.917	770.560	2.531	-3.5E 3	4.28E 3	209.564	0.022
		1.000	770.560	2.363	-3.23E 3	4.01E 3	209.564	0.022
	3	0.000	28.978	-2.602	0.281	31.861	-0.010	-0.059
		0.083	28.978	-2.155	0.269	31.401	-0.010	-0.059
		0.167	28.978	-1.707	0.256	30.941	-0.010	-0.059
		0.250	28.978	-1.259	0.244	30.481	-0.010	-0.059
		0.333	28.978	-0.812	0.231	30.021	-0.010	-0.059
		0.417	28.978	-0.364	0.219	29.561	-0.010	-0.059
		0.500	28.978	0.083	0.206	29.268	-0.010	-0.059
		0.583	28.978	0.531	0.194	29.703	-0.010	-0.059
		0.667	28.978	0.979	0.182	30.138	-0.010	-0.059
		0.750	28.978	1.426	0.169	30.573	-0.010	-0.059
		0.833	28.978	1.874	0.157	31.008	-0.010	-0.059
		0.917	28.978	2.321	0.144	31.444	-0.010	-0.059
		1.000	28.978	2.769	0.132	31.879	-0.010	-0.059
	4	0.000	28.978	-2.602	0.281	31.861	-0.010	-0.059
		0.083	28.978	-2.155	0.269	31.401	-0.010	-0.059
		0.167	28.978	-1.707	0.256	30.941	-0.010	-0.059
		0.250	28.978	-1.259	0.244	30.481	-0.010	-0.059
		0.333	28.978	-0.812	0.231	30.021	-0.010	-0.059
		0.417	28.978	-0.364	0.219	29.561	-0.010	-0.059
		0.500	28.978	0.083	0.206	29.268	-0.010	-0.059
		0.583	28.978	0.531	0.194	29.703	-0.010	-0.059
		0.667	28.978	0.979	0.182	30.138	-0.010	-0.059
		0.750	28.978	1.426	0.169	30.573	-0.010	-0.059
		0.833	28.978	1.874	0.157	31.008	-0.010	-0.059
		0.917	28.978	2.321	0.144	31.444	-0.010	-0.059
		1.000	28.978	2.769	0.132	31.879	-0.010	-0.059
	5	0.000	275.628	-1.81E 3	-8.38E 3	10.5E 3	273.130	-38.382
		0.083	275.628	-1.52E 3	-8.03E 3	9.83E 3	273.130	-38.382
		0.167	275.628	-1.23E 3	-7.68E 3	9.18E 3	273.130	-38.382
		0.250	275.628	-938.136	-7.33E 3	8.54E 3	273.130	-38.382
		0.333	275.628	-647.324	-6.98E 3	7.9E 3	273.130	-38.382

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	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	275.528	-356.513	-6.62E 3	7.26E 3	273.130	-38.382
		0.500	275.528	-65.701	-6.27E 3	6.61E 3	273.130	-38.382
		0.583	275.528	225.110	-5.92E 3	6.42E 3	273.130	-38.382
		0.667	275.528	515.922	-5.57E 3	6.36E 3	273.130	-38.382
		0.750	275.528	806.733	-5.22E 3	6.3E 3	273.130	-38.382
		0.833	275.528	1.1E 3	-4.86E 3	6.24E 3	273.130	-38.382
		0.917	275.528	1.39E 3	-4.51E 3	6.18E 3	273.130	-38.382
		1.000	275.528	1.68E 3	-4.16E 3	6.11E 3	273.130	-38.382
	6	0.000	1.5E 3	-1.52E 3	-17.2E 3	20.3E 3	559.783	-32.266
		0.083	1.5E 3	-1.27E 3	-16.5E 3	19.3E 3	559.783	-32.266
		0.167	1.5E 3	-1.03E 3	-15.8E 3	18.3E 3	559.783	-32.266
		0.250	1.49E 3	-782.718	-15.1E 3	17.4E 3	559.783	-32.266
		0.333	1.49E 3	-538.244	-14.4E 3	16.4E 3	559.783	-32.266
		0.417	1.49E 3	-293.769	-13.6E 3	15.4E 3	559.783	-32.266
		0.500	1.49E 3	-49.294	-12.9E 3	14.5E 3	559.783	-32.266
		0.583	1.49E 3	195.181	-12.2E 3	13.9E 3	559.783	-32.266
		0.667	1.48E 3	439.655	-11.5E 3	13.4E 3	559.783	-32.266
		0.750	1.48E 3	684.130	-10.8E 3	12.9E 3	559.783	-32.266
		0.833	1.48E 3	928.605	-10E 3	12.4E 3	559.783	-32.266
		0.917	1.48E 3	1.17E 3	-9.31E 3	12E 3	559.783	-32.266
		1.000	1.48E 3	1.42E 3	-8.59E 3	11.5E 3	559.783	-32.266
	7	0.000	1.49E 3	-157.121	-12.6E 3	14.2E 3	407.326	-3.474
		0.083	1.49E 3	-130.797	-12.1E 3	13.7E 3	407.326	-3.474
		0.167	1.48E 3	-104.473	-11.5E 3	13.1E 3	407.326	-3.474
		0.250	1.48E 3	-78.149	-11E 3	12.6E 3	407.326	-3.474
		0.333	1.48E 3	-51.824	-10.5E 3	12E 3	407.326	-3.474
		0.417	1.48E 3	-25.500	-9.95E 3	11.5E 3	407.326	-3.474
		0.500	1.47E 3	0.824	-9.43E 3	10.9E 3	407.326	-3.474
		0.583	1.47E 3	27.148	-8.9E 3	10.4E 3	407.326	-3.474
		0.667	1.47E 3	53.472	-8.38E 3	9.9E 3	407.326	-3.474
		0.750	1.47E 3	79.797	-7.85E 3	9.4E 3	407.326	-3.474
		0.833	1.47E 3	106.121	-7.33E 3	8.9E 3	407.326	-3.474
		0.917	1.46E 3	132.445	-6.8E 3	8.4E 3	407.326	-3.474
		1.000	1.46E 3	158.769	-6.28E 3	7.9E 3	407.326	-3.474
	8	0.000	992.226	-1.97E 3	-14.5E 3	17.5E 3	470.892	-41.878
		0.083	990.103	-1.65E 3	-13.9E 3	16.5E 3	470.892	-41.878
		0.167	987.981	-1.34E 3	-13.3E 3	15.6E 3	470.892	-41.878
		0.250	985.858	-1.02E 3	-12.7E 3	14.7E 3	470.892	-41.878
		0.333	983.736	-702.853	-12.1E 3	13.7E 3	470.892	-41.878
		0.417	981.613	-385.550	-11.5E 3	12.8E 3	470.892	-41.878
		0.500	979.491	-68.247	-10.8E 3	11.9E 3	470.892	-41.878
		0.583	977.368	249.057	-10.2E 3	11.5E 3	470.892	-41.878
		0.667	975.246	566.360	-9.63E 3	11.2E 3	470.892	-41.878
		0.750	973.123	883.664	-9.03E 3	10.9E 3	470.892	-41.878
		0.833	971.001	1.2E 3	-8.42E 3	10.6E 3	470.892	-41.878

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	968.678	1.52E 3	-7.81E 3	10.3E 3	470.892	-41.878
		1.000	966.756	1.84E 3	-7.21E 3	10E 3	470.892	-41.878
	9	0.000	279.513	-1.86E 3	-8.26E 3	10.4E 3	106.538	-39.378
		0.083	279.513	-1.56E 3	-8.12E 3	9.96E 3	106.538	-39.378
		0.167	279.513	-1.26E 3	-7.98E 3	9.52E 3	106.538	-39.378
		0.250	279.513	-962.474	-7.84E 3	9.09E 3	106.538	-39.378
		0.333	279.513	-664.114	-7.71E 3	8.65E 3	106.538	-39.378
		0.417	279.513	-365.754	-7.57E 3	8.21E 3	106.538	-39.378
		0.500	279.513	-67.395	-7.43E 3	7.78E 3	106.538	-39.378
		0.583	279.513	230.965	-7.29E 3	7.8E 3	106.538	-39.378
		0.667	279.513	529.324	-7.16E 3	7.97E 3	106.538	-39.378
		0.750	279.513	827.684	-7.02E 3	8.13E 3	106.538	-39.378
		0.833	279.513	1.13E 3	-6.88E 3	8.29E 3	106.538	-39.378
		0.917	279.513	1.42E 3	-6.75E 3	8.45E 3	106.538	-39.378
		1.000	279.513	1.72E 3	-6.61E 3	8.61E 3	106.538	-39.378
	10	0.000	736.982	-163.319	-6.1E 3	7E 3	197.756	-3.538
		0.083	734.860	-136.513	-5.85E 3	6.72E 3	197.756	-3.538
		0.167	732.737	-109.708	-5.59E 3	6.44E 3	197.756	-3.538
		0.250	730.615	-82.903	-5.34E 3	6.15E 3	197.756	-3.538
		0.333	728.492	-56.098	-5.08E 3	5.87E 3	197.756	-3.538
		0.417	726.370	-29.292	-4.83E 3	5.58E 3	197.756	-3.538
		0.500	724.247	-2.487	-4.57E 3	5.3E 3	197.756	-3.538
		0.583	722.125	24.318	-4.32E 3	5.07E 3	197.756	-3.538
		0.667	720.002	51.123	-4.06E 3	4.84E 3	197.756	-3.538
		0.750	717.880	77.929	-3.81E 3	4.61E 3	197.756	-3.538
		0.833	715.757	104.734	-3.55E 3	4.38E 3	197.756	-3.538
		0.917	713.635	131.539	-3.3E 3	4.15E 3	197.756	-3.538
		1.000	711.512	158.344	-3.05E 3	3.92E 3	197.756	-3.538
	11	0.000	736.982	-163.319	-6.1E 3	7E 3	197.756	-3.538
		0.083	734.860	-136.513	-5.85E 3	6.72E 3	197.756	-3.538
		0.167	732.737	-109.708	-5.59E 3	6.44E 3	197.756	-3.538
		0.250	730.615	-82.903	-5.34E 3	6.15E 3	197.756	-3.538
		0.333	728.492	-56.098	-5.08E 3	5.87E 3	197.756	-3.538
		0.417	726.370	-29.292	-4.83E 3	5.58E 3	197.756	-3.538
		0.500	724.247	-2.487	-4.57E 3	5.3E 3	197.756	-3.538
		0.583	722.125	24.318	-4.32E 3	5.07E 3	197.756	-3.538
		0.667	720.002	51.123	-4.06E 3	4.84E 3	197.756	-3.538
		0.750	717.880	77.929	-3.81E 3	4.61E 3	197.756	-3.538
		0.833	715.757	104.734	-3.55E 3	4.38E 3	197.756	-3.538
		0.917	713.635	131.539	-3.3E 3	4.15E 3	197.756	-3.538
		1.000	711.512	158.344	-3.05E 3	3.92E 3	197.756	-3.538
	12	0.000	782.134	-173.493	-6.49E 3	7.44E 3	210.215	-3.758
		0.083	779.878	-145.019	-6.22E 3	7.14E 3	210.215	-3.758
		0.167	777.622	-116.544	-5.95E 3	6.84E 3	210.215	-3.758
		0.250	775.365	-88.070	-5.67E 3	6.54E 3	210.215	-3.758

		Job No 2186-351	Sheet No 33	Rev
Software licensed to Weaver Boos Consultants		Part		
Job Title Crest Pad Bldg		Ref		
		By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford		File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	773.109	-59.596	-5.4E 3	6.24E 3	210.215	-3.758
		0.417	770.853	-31.122	-5.13E 3	5.94E 3	210.215	-3.758
		0.500	768.597	-2.647	-4.86E 3	5.63E 3	210.215	-3.758
		0.583	766.341	25.827	-4.59E 3	5.38E 3	210.215	-3.758
		0.667	764.084	54.301	-4.32E 3	5.14E 3	210.215	-3.758
		0.750	761.828	82.775	-4.05E 3	4.89E 3	210.215	-3.758
		0.833	759.572	111.250	-3.78E 3	4.65E 3	210.215	-3.758
		0.917	757.316	139.724	-3.51E 3	4.41E 3	210.215	-3.758
		1.000	755.060	168.198	-3.24E 3	4.16E 3	210.215	-3.758
	13	0.000	782.134	-173.493	-6.49E 3	7.44E 3	210.215	-3.758
		0.083	779.878	-145.019	-6.22E 3	7.14E 3	210.215	-3.758
		0.167	777.622	-116.544	-5.95E 3	6.84E 3	210.215	-3.758
		0.250	775.365	-88.070	-5.67E 3	6.54E 3	210.215	-3.758
		0.333	773.109	-59.596	-5.4E 3	6.24E 3	210.215	-3.758
		0.417	770.853	-31.122	-5.13E 3	5.94E 3	210.215	-3.758
		0.500	768.597	-2.647	-4.86E 3	5.63E 3	210.215	-3.758
		0.583	766.341	25.827	-4.59E 3	5.38E 3	210.215	-3.758
		0.667	764.084	54.301	-4.32E 3	5.14E 3	210.215	-3.758
		0.750	761.828	82.775	-4.05E 3	4.89E 3	210.215	-3.758
		0.833	759.572	111.250	-3.78E 3	4.65E 3	210.215	-3.758
		0.917	757.316	139.724	-3.51E 3	4.41E 3	210.215	-3.758
		1.000	755.060	168.198	-3.24E 3	4.16E 3	210.215	-3.758
	14	0.000	1.34E 3	-167.236	-11.2E 3	12.8E 3	364.304	-3.677
		0.083	1.34E 3	-139.379	-10.8E 3	12.3E 3	364.304	-3.677
		0.167	1.34E 3	-111.523	-10.3E 3	11.8E 3	364.304	-3.677
		0.250	1.34E 3	-83.666	-9.84E 3	11.3E 3	364.304	-3.677
		0.333	1.33E 3	-55.809	-9.37E 3	10.8E 3	364.304	-3.677
		0.417	1.33E 3	-27.952	-8.9E 3	10.3E 3	364.304	-3.677
		0.500	1.33E 3	-0.095	-8.43E 3	9.78E 3	364.304	-3.677
		0.583	1.33E 3	27.762	-7.96E 3	9.32E 3	364.304	-3.677
		0.667	1.33E 3	55.618	-7.49E 3	8.87E 3	364.304	-3.677
		0.750	1.32E 3	83.475	-7.02E 3	8.43E 3	364.304	-3.677
		0.833	1.32E 3	111.332	-6.55E 3	7.99E 3	364.304	-3.677
		0.917	1.32E 3	139.189	-6.09E 3	7.54E 3	364.304	-3.677
		1.000	1.32E 3	167.046	-5.62E 3	7.1E 3	364.304	-3.677
	15	0.000	1.34E 3	-167.236	-11.2E 3	12.8E 3	364.304	-3.677
		0.083	1.34E 3	-139.379	-10.8E 3	12.3E 3	364.304	-3.677
		0.167	1.34E 3	-111.523	-10.3E 3	11.8E 3	364.304	-3.677
		0.250	1.34E 3	-83.666	-9.84E 3	11.3E 3	364.304	-3.677
		0.333	1.33E 3	-55.809	-9.37E 3	10.8E 3	364.304	-3.677
		0.417	1.33E 3	-27.952	-8.9E 3	10.3E 3	364.304	-3.677
		0.500	1.33E 3	-0.095	-8.43E 3	9.76E 3	364.304	-3.677
		0.583	1.33E 3	27.762	-7.96E 3	9.32E 3	364.304	-3.677
		0.667	1.33E 3	55.618	-7.49E 3	8.87E 3	364.304	-3.677
		0.750	1.32E 3	83.475	-7.02E 3	8.43E 3	364.304	-3.677

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 34	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	1.32E 3	111.332	-6.55E 3	7.99E 3	364.304	-3.677
		0.917	1.32E 3	139.189	-6.09E 3	7.54E 3	364.304	-3.677
		1.000	1.32E 3	167.046	-5.62E 3	7.1E 3	364.304	-3.677
	16	0.000	1.5E 3	-1.55E 3	-17.2E 3	20.2E 3	434.839	-33.013
		0.083	1.5E 3	-1.3E 3	-16.6E 3	19.4E 3	434.839	-33.013
		0.167	1.5E 3	-1.05E 3	-16E 3	18.6E 3	434.839	-33.013
		0.250	1.5E 3	-800.972	-15.5E 3	17.8E 3	434.839	-33.013
		0.333	1.5E 3	-550.836	-14.9E 3	17E 3	434.839	-33.013
		0.417	1.49E 3	-300.700	-14.3E 3	16.1E 3	434.839	-33.013
		0.500	1.49E 3	-50.565	-13.8E 3	15.3E 3	434.839	-33.013
		0.583	1.49E 3	199.571	-13.2E 3	14.9E 3	434.839	-33.013
		0.667	1.49E 3	449.707	-12.7E 3	14.6E 3	434.839	-33.013
		0.750	1.49E 3	699.843	-12.1E 3	14.3E 3	434.839	-33.013
		0.833	1.48E 3	949.978	-11.6E 3	14E 3	434.839	-33.013
		0.917	1.48E 3	1.2E 3	-11E 3	13.7E 3	434.839	-33.013
		1.000	1.48E 3	1.45E 3	-10.4E 3	13.4E 3	434.839	-33.013
	17	0.000	996.211	-2.02E 3	-14.4E 3	17.4E 3	304.300	-42.874
		0.083	994.088	-1.69E 3	-14E 3	16.7E 3	304.300	-42.874
		0.167	991.966	-1.37E 3	-13.6E 3	15.9E 3	304.300	-42.874
		0.250	989.843	-1.04E 3	-13.2E 3	15.2E 3	304.300	-42.874
		0.333	987.721	-719.643	-12.8E 3	14.5E 3	304.300	-42.874
		0.417	985.598	-394.792	-12.4E 3	13.8E 3	304.300	-42.874
		0.500	983.476	-69.940	-12E 3	13.1E 3	304.300	-42.874
		0.583	981.353	254.911	-11.6E 3	12.9E 3	304.300	-42.874
		0.667	979.231	579.763	-11.2E 3	12.8E 3	304.300	-42.874
		0.750	977.108	904.614	-10.8E 3	12.7E 3	304.300	-42.874
		0.833	974.986	1.23E 3	-10.4E 3	12.6E 3	304.300	-42.874
		0.917	972.863	1.55E 3	-10E 3	12.6E 3	304.300	-42.874
		1.000	970.741	1.88E 3	-9.65E 3	12.5E 3	304.300	-42.874
5	1	0.000	274.654	61.323	0.000	335.977	58.248	1.456
		0.083	276.776	50.294	75.052	402.123	58.248	1.456
		0.167	278.899	39.266	150.105	468.270	58.248	1.456
		0.250	281.022	28.238	225.157	534.416	58.248	1.456
		0.333	283.144	17.209	300.209	600.563	58.248	1.456
		0.417	285.266	6.181	375.262	666.709	58.248	1.456
		0.500	287.389	-4.847	450.314	742.550	58.248	1.456
		0.583	289.512	-15.876	525.366	830.754	58.248	1.456
		0.667	291.634	-26.904	600.418	918.957	58.248	1.456
		0.750	293.756	-37.933	675.471	1.01E 3	58.248	1.456
		0.833	295.879	-48.961	750.523	1.1E 3	58.248	1.456
		0.917	298.001	-59.989	825.575	1.18E 3	58.248	1.456
		1.000	300.124	-71.018	900.628	1.27E 3	58.248	1.456
	2	0.000	372.435	14.067	-0.000	386.502	60.849	0.162
		0.083	372.435	12.837	78.404	463.675	60.849	0.162
		0.167	372.435	11.607	156.807	540.849	60.849	0.162

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 35	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	372.435	10.377	235.211	618.022	60.849	0.162
		0.333	372.435	9.147	313.614	695.196	60.849	0.162
		0.417	372.435	7.917	392.018	772.369	60.849	0.162
		0.500	372.435	6.687	470.421	849.543	60.849	0.162
		0.583	372.435	5.457	548.825	926.716	60.849	0.162
		0.667	372.435	4.227	627.228	1E 3	60.849	0.162
		0.750	372.435	2.997	705.632	1.08E 3	60.849	0.162
		0.833	372.435	1.767	784.035	1.16E 3	60.849	0.162
		0.917	372.435	0.537	862.438	1.24E 3	60.849	0.162
		1.000	372.435	-0.693	940.842	1.31E 3	60.849	0.162
	3	0.000	28.725	-7.794	-0.000	36.518	-0.006	-0.193
		0.083	28.725	-6.329	-0.007	35.061	-0.006	-0.193
		0.167	28.725	-4.865	-0.015	33.604	-0.006	-0.193
		0.250	28.725	-3.400	-0.022	32.147	-0.006	-0.193
		0.333	28.725	-1.936	-0.030	30.690	-0.006	-0.193
		0.417	28.725	-0.471	-0.037	29.233	-0.006	-0.193
		0.500	28.725	0.993	-0.044	29.763	-0.006	-0.193
		0.583	28.725	2.458	-0.052	31.235	-0.006	-0.193
		0.667	28.725	3.922	-0.059	32.707	-0.006	-0.193
		0.750	28.725	5.387	-0.067	34.178	-0.006	-0.193
		0.833	28.725	6.851	-0.074	35.650	-0.006	-0.193
		0.917	28.725	8.316	-0.081	37.122	-0.006	-0.193
		1.000	28.725	9.780	-0.089	38.594	-0.006	-0.193
	4	0.000	28.725	-7.794	-0.000	36.518	-0.006	-0.193
		0.083	28.725	-6.329	-0.007	35.061	-0.006	-0.193
		0.167	28.725	-4.865	-0.015	33.604	-0.006	-0.193
		0.250	28.725	-3.400	-0.022	32.147	-0.006	-0.193
		0.333	28.725	-1.936	-0.030	30.690	-0.006	-0.193
		0.417	28.725	-0.471	-0.037	29.233	-0.006	-0.193
		0.500	28.725	0.993	-0.044	29.763	-0.006	-0.193
		0.583	28.725	2.458	-0.052	31.235	-0.006	-0.193
		0.667	28.725	3.922	-0.059	32.707	-0.006	-0.193
		0.750	28.725	5.387	-0.067	34.178	-0.006	-0.193
		0.833	28.725	6.851	-0.074	35.650	-0.006	-0.193
		0.917	28.725	8.316	-0.081	37.122	-0.006	-0.193
		1.000	28.725	9.780	-0.089	38.594	-0.006	-0.193
	5	0.000	-266.959	-2.88E 3	-0.000	-3.15E 3	620.794	-59.023
		0.083	-266.959	-2.44E 3	799.892	-3.5E 3	620.794	-59.023
		0.167	-266.959	-1.99E 3	1.6E 3	-3.86E 3	620.794	-59.023
		0.250	-266.959	-1.54E 3	2.4E 3	-4.21E 3	620.794	-59.023
		0.333	-266.959	-1.09E 3	3.2E 3	-4.56E 3	620.794	-59.023
		0.417	-266.959	-647.552	4E 3	-4.91E 3	620.794	-59.023
		0.500	-266.959	-200.349	4.8E 3	-5.27E 3	620.794	-59.023
		0.583	-266.959	246.854	5.6E 3	-6.11E 3	620.794	-59.023
		0.667	-266.959	694.057	6.4E 3	-7.36E 3	620.794	-59.023

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.750	-266.959	1.14E 3	7.2E 3	-8.61E 3	620.794	-59.023
		0.833	-266.959	1.59E 3	8E 3	-9.85E 3	620.794	-59.023
		0.917	-266.959	2.04E 3	8.8E 3	-11.1E 3	620.794	-59.023
		1.000	-266.959	2.48E 3	9.6E 3	-12.3E 3	620.794	-59.023
	6	0.000	353.761	-2.09E 3	-0.000	2.44E 3	569.480	-42.690
		0.083	355.884	-1.77E 3	733.774	2.86E 3	569.480	-42.690
		0.167	358.006	-1.44E 3	1.47E 3	3.27E 3	569.480	-42.690
		0.250	360.129	-1.12E 3	2.2E 3	3.68E 3	569.480	-42.690
		0.333	362.251	-796.997	2.94E 3	4.09E 3	569.480	-42.690
		0.417	364.374	-473.545	3.67E 3	4.51E 3	569.480	-42.690
		0.500	366.496	-150.094	4.4E 3	4.92E 3	569.480	-42.690
		0.583	368.619	173.357	5.14E 3	5.68E 3	569.480	-42.690
		0.667	370.741	496.809	5.87E 3	6.74E 3	569.480	-42.690
		0.750	372.864	820.260	6.6E 3	7.8E 3	569.480	-42.690
		0.833	374.986	1.14E 3	7.34E 3	8.86E 3	569.480	-42.690
		0.917	377.109	1.47E 3	8.07E 3	9.92E 3	569.480	-42.690
		1.000	379.231	1.79E 3	8.81E 3	11E 3	569.480	-42.690
	7	0.000	647.089	75.390	0.000	722.479	119.097	1.618
		0.083	649.212	63.131	153.458	865.799	119.097	1.618
		0.167	651.334	50.873	306.912	1.01E 3	119.097	1.618
		0.250	653.457	38.615	460.367	1.15E 3	119.097	1.618
		0.333	655.579	26.356	613.823	1.3E 3	119.097	1.618
		0.417	657.702	14.098	767.279	1.44E 3	119.097	1.618
		0.500	659.824	1.839	920.735	1.58E 3	119.097	1.618
		0.583	661.947	-10.419	1.07E 3	1.75E 3	119.097	1.618
		0.667	664.069	-22.677	1.23E 3	1.91E 3	119.097	1.618
		0.750	666.192	-34.936	1.38E 3	2.08E 3	119.097	1.618
		0.833	668.314	-47.194	1.53E 3	2.25E 3	119.097	1.618
		0.917	670.437	-59.453	1.69E 3	2.42E 3	119.097	1.618
		1.000	672.559	-71.711	1.84E 3	2.59E 3	119.097	1.618
	8	0.000	7.695	-2.82E 3	-0.000	2.83E 3	679.042	-57.567
		0.083	9.818	-2.39E 3	874.944	3.27E 3	679.042	-57.567
		0.167	11.940	-1.96E 3	1.75E 3	3.71E 3	679.042	-57.567
		0.250	14.063	-1.51E 3	2.62E 3	4.15E 3	679.042	-57.567
		0.333	16.185	-1.08E 3	3.5E 3	4.59E 3	679.042	-57.567
		0.417	18.308	-641.371	4.37E 3	5.03E 3	679.042	-57.567
		0.500	20.430	-205.196	5.25E 3	5.48E 3	679.042	-57.567
		0.583	22.553	230.978	6.12E 3	6.38E 3	679.042	-57.567
		0.667	24.675	667.153	7E 3	7.69E 3	679.042	-57.567
		0.750	26.798	1.1E 3	7.87E 3	9E 3	679.042	-57.567
		0.833	28.920	1.54E 3	8.75E 3	10.3E 3	679.042	-57.567
		0.917	31.043	1.98E 3	9.62E 3	11.6E 3	679.042	-57.567
		1.000	33.165	2.41E 3	10.5E 3	12.9E 3	679.042	-57.567
	9	0.000	-274.486	-2.94E 3	-0.000	-3.22E 3	631.510	-60.229
		0.083	-274.486	-2.49E 3	813.699	-3.57E 3	631.510	-60.229

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	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.167	-274.486	-2.03E 3	1.63E 3	-3.93E 3	631.510	-60.229
		0.250	-274.486	-1.57E 3	2.44E 3	-4.29E 3	631.510	-60.229
		0.333	-274.486	-1.12E 3	3.25E 3	-4.65E 3	631.510	-60.229
		0.417	-274.486	-661.153	4.07E 3	-5E 3	631.510	-60.229
		0.500	-274.486	-204.807	4.88E 3	-5.36E 3	631.510	-60.229
		0.583	-274.486	251.540	5.7E 3	-6.22E 3	631.510	-60.229
		0.667	-274.486	707.886	6.51E 3	-7.49E 3	631.510	-60.229
		0.750	-274.486	1.16E 3	7.32E 3	-8.76E 3	631.510	-60.229
		0.833	-274.486	1.62E 3	8.14E 3	-10E 3	631.510	-60.229
		0.917	-274.486	2.08E 3	8.95E 3	-11.3E 3	631.510	-60.229
		1.000	-274.486	2.53E 3	9.76E 3	-12.6E 3	631.510	-60.229
	10	0.000	294.761	55.867	0.000	350.629	58.244	1.320
		0.083	296.884	45.864	75.047	417.795	58.244	1.320
		0.167	299.006	35.861	150.094	484.962	58.244	1.320
		0.250	301.129	25.858	225.141	552.128	58.244	1.320
		0.333	303.251	15.854	300.188	619.294	58.244	1.320
		0.417	305.374	5.851	375.236	686.461	58.244	1.320
		0.500	307.496	-4.152	450.283	761.931	58.244	1.320
		0.583	309.619	-14.155	525.330	849.104	58.244	1.320
		0.667	311.741	-24.159	600.377	936.277	58.244	1.320
		0.750	313.864	-34.162	675.424	1.02E 3	58.244	1.320
		0.833	315.986	-44.165	750.471	1.11E 3	58.244	1.320
		0.917	318.109	-54.168	825.518	1.2E 3	58.244	1.320
		1.000	320.231	-64.171	900.566	1.28E 3	58.244	1.320
	11	0.000	294.761	55.867	0.000	350.629	58.244	1.320
		0.083	296.884	45.864	75.047	417.795	58.244	1.320
		0.167	299.006	35.861	150.094	484.962	58.244	1.320
		0.250	301.129	25.858	225.141	552.128	58.244	1.320
		0.333	303.251	15.854	300.188	619.294	58.244	1.320
		0.417	305.374	5.851	375.236	686.461	58.244	1.320
		0.500	307.496	-4.152	450.283	761.931	58.244	1.320
		0.583	309.619	-14.155	525.330	849.104	58.244	1.320
		0.667	311.741	-24.159	600.377	936.277	58.244	1.320
		0.750	313.864	-34.162	675.424	1.02E 3	58.244	1.320
		0.833	315.986	-44.165	750.471	1.11E 3	58.244	1.320
		0.917	318.109	-54.168	825.518	1.2E 3	58.244	1.320
		1.000	320.231	-64.171	900.566	1.28E 3	58.244	1.320
	12	0.000	312.065	59.731	0.000	371.795	61.914	1.412
		0.083	314.321	49.033	79.775	443.129	61.914	1.412
		0.167	316.577	38.335	159.551	514.462	61.914	1.412
		0.250	318.833	27.637	239.326	585.796	61.914	1.412
		0.333	321.089	16.939	319.102	657.130	61.914	1.412
		0.417	323.346	6.241	398.877	728.463	61.914	1.412
		0.500	325.602	-4.457	478.652	808.712	61.914	1.412
		0.583	327.858	-15.155	558.428	901.442	61.914	1.412

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.667	330.114	-25.853	638.203	994.171	61.914	1.412
		0.750	332.371	-36.552	717.979	1.09E 3	61.914	1.412
		0.833	334.627	-47.250	797.754	1.18E 3	61.914	1.412
		0.917	336.883	-57.948	877.530	1.27E 3	61.914	1.412
		1.000	339.139	-68.646	957.305	1.37E 3	61.914	1.412
	13	0.000	312.065	59.731	0.000	371.795	61.914	1.412
		0.083	314.321	49.033	79.775	443.129	61.914	1.412
		0.167	316.577	38.335	159.551	514.462	61.914	1.412
		0.250	318.833	27.637	239.326	585.796	61.914	1.412
		0.333	321.089	16.939	319.102	657.130	61.914	1.412
		0.417	323.346	6.241	398.877	728.463	61.914	1.412
		0.500	325.602	-4.457	478.652	808.712	61.914	1.412
		0.583	327.858	-15.155	558.428	901.442	61.914	1.412
		0.667	330.114	-25.853	638.203	994.171	61.914	1.412
		0.750	332.371	-36.552	717.979	1.09E 3	61.914	1.412
		0.833	334.627	-47.250	797.754	1.18E 3	61.914	1.412
		0.917	336.883	-57.948	877.530	1.27E 3	61.914	1.412
		1.000	339.139	-68.646	957.305	1.37E 3	61.914	1.412
	14	0.000	582.079	70.688	0.000	652.768	106.642	1.545
		0.083	584.303	58.983	137.409	780.694	106.642	1.545
		0.167	586.526	47.279	274.817	908.621	106.642	1.545
		0.250	588.749	35.574	412.226	1.04E 3	106.642	1.545
		0.333	590.972	23.869	549.634	1.16E 3	106.642	1.545
		0.417	593.195	12.164	687.043	1.29E 3	106.642	1.545
		0.500	595.418	0.459	824.451	1.42E 3	106.642	1.545
		0.583	597.641	-11.245	961.860	1.57E 3	106.642	1.545
		0.667	599.864	-22.950	1.1E 3	1.72E 3	106.642	1.545
		0.750	602.087	-34.655	1.24E 3	1.87E 3	106.642	1.545
		0.833	604.311	-46.360	1.37E 3	2.02E 3	106.642	1.545
		0.917	606.534	-58.064	1.51E 3	2.18E 3	106.642	1.545
		1.000	608.757	-69.769	1.65E 3	2.33E 3	106.642	1.545
	15	0.000	582.079	70.688	0.000	652.768	106.642	1.545
		0.083	584.303	58.983	137.409	780.694	106.642	1.545
		0.167	586.526	47.279	274.817	908.621	106.642	1.545
		0.250	588.749	35.574	412.226	1.04E 3	106.642	1.545
		0.333	590.972	23.869	549.634	1.16E 3	106.642	1.545
		0.417	593.195	12.164	687.043	1.29E 3	106.642	1.545
		0.500	595.418	0.459	824.451	1.42E 3	106.642	1.545
		0.583	597.641	-11.245	961.860	1.57E 3	106.642	1.545
		0.667	599.864	-22.950	1.1E 3	1.72E 3	106.642	1.545
		0.750	602.087	-34.655	1.24E 3	1.87E 3	106.642	1.545
		0.833	604.311	-46.360	1.37E 3	2.02E 3	106.642	1.545
		0.917	606.534	-58.064	1.51E 3	2.18E 3	106.642	1.545
		1.000	608.757	-69.769	1.65E 3	2.33E 3	106.642	1.545
	16	0.000	346.116	-2.14E 3	-0.000	2.48E 3	577.517	-43.595

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Job Title Crest Pad Bldg

Client Washington Closure Hanford

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.083	350.238	-1.8E 3	744.129	2.9E 3	577.517	-43.595
		0.167	352.361	-1.47E 3	1.49E 3	3.32E 3	577.517	-43.595
		0.250	354.483	-1.14E 3	2.23E 3	3.73E 3	577.517	-43.595
		0.333	356.606	-814.055	2.98E 3	4.15E 3	577.517	-43.595
		0.417	358.728	-483.746	3.72E 3	4.56E 3	577.517	-43.595
		0.500	360.851	-153.437	4.46E 3	4.98E 3	577.517	-43.595
		0.583	362.973	176.872	5.21E 3	5.75E 3	577.517	-43.595
		0.667	365.096	507.181	5.95E 3	6.83E 3	577.517	-43.595
		0.750	367.218	837.490	6.7E 3	7.9E 3	577.517	-43.595
		0.833	369.341	1.17E 3	7.44E 3	8.98E 3	577.517	-43.595
		0.917	371.463	1.5E 3	8.19E 3	10.1E 3	577.517	-43.595
		1.000	373.586	1.83E 3	8.93E 3	11.1E 3	577.517	-43.595
	17	0.000	0.168	-2.88E 3	-0.000	2.88E 3	689.758	-58.774
		0.083	2.291	-2.44E 3	888.751	3.33E 3	689.758	-58.774
		0.167	4.413	-1.99E 3	1.78E 3	3.77E 3	689.758	-58.774
		0.250	6.536	-1.55E 3	2.67E 3	4.22E 3	689.758	-58.774
		0.333	8.658	-1.1E 3	3.56E 3	4.66E 3	689.758	-58.774
		0.417	10.781	-654.972	4.44E 3	5.11E 3	689.758	-58.774
		0.500	12.903	-209.654	5.33E 3	5.56E 3	689.758	-58.774
		0.583	15.026	235.664	6.22E 3	6.47E 3	689.758	-58.774
		0.667	17.148	680.982	7.11E 3	7.81E 3	689.758	-58.774
		0.750	19.271	1.13E 3	8E 3	9.14E 3	689.758	-58.774
		0.833	21.393	1.57E 3	8.89E 3	10.5E 3	689.758	-58.774
		0.917	23.516	2.02E 3	9.78E 3	11.8E 3	689.758	-58.774
		1.000	25.638	2.46E 3	10.7E 3	13.2E 3	689.758	-58.774
6	1	0.000	154.969	-157.348	-3.3E 3	3.61E 3	656.176	-5.602
		0.083	152.174	-106.099	-2.33E 3	2.58E 3	600.289	-5.602
		0.167	149.379	-54.850	-1.43E 3	1.64E 3	544.403	-5.602
		0.250	146.584	-3.601	-631.388	781.573	488.516	-5.602
		0.333	143.789	47.647	85.131	276.567	432.629	-5.602
		0.417	140.994	98.896	714.705	954.595	376.742	-5.602
		0.500	138.199	150.145	1.26E 3	1.55E 3	320.856	-5.602
		0.583	135.404	201.393	1.71E 3	2.05E 3	264.969	-5.602
		0.667	132.609	252.642	2.08E 3	2.47E 3	209.082	-5.602
		0.750	129.815	303.891	2.36E 3	2.8E 3	153.195	-5.602
		0.833	127.020	355.139	2.56E 3	3.04E 3	97.309	-5.602
		0.917	124.225	406.388	2.67E 3	3.2E 3	41.422	-5.602
		1.000	121.430	457.637	2.69E 3	3.27E 3	-9.950	-5.602
	2	0.000	172.447	-169.729	-3.65E 3	3.99E 3	722.808	-5.959
		0.083	169.369	-115.220	-2.57E 3	2.85E 3	661.301	-5.959
		0.167	166.291	-60.710	-1.59E 3	1.81E 3	599.793	-5.959
		0.250	163.213	-6.200	-702.234	871.647	538.286	-5.959
		0.333	160.135	48.310	87.340	295.785	476.778	-5.959
		0.417	157.057	102.819	781.225	1.04E 3	415.271	-5.959
		0.500	153.980	157.329	1.36E 3	1.69E 3	353.763	-5.959

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.583	150.902	211.839	1.88E 3	2.24E 3	292.258	-5.959
		0.667	147.824	266.349	2.29E 3	2.7E 3	230.748	-5.959
		0.750	144.746	320.858	2.6E 3	3.07E 3	169.241	-5.959
		0.833	141.668	375.368	2.82E 3	3.33E 3	107.733	-5.959
		0.917	138.590	429.878	2.94E 3	3.5E 3	46.226	-5.959
		1.000	135.512	484.387	2.96E 3	3.58E 3	-10.767	-5.959
	3	0.000	0.011	1.054	-0.088	1.153	0.004	0.024
		0.083	0.011	0.836	-0.082	0.929	0.004	0.024
		0.167	0.011	0.618	-0.077	0.705	0.004	0.024
		0.250	0.011	0.399	-0.071	0.482	0.004	0.024
		0.333	0.011	0.181	-0.066	0.258	0.004	0.024
		0.417	0.011	-0.038	-0.060	0.109	0.004	0.024
		0.500	0.011	-0.256	-0.055	0.322	0.004	0.024
		0.583	0.011	-0.474	-0.049	0.535	0.004	0.024
		0.667	0.011	-0.693	-0.044	0.748	0.004	0.024
		0.750	0.011	-0.911	-0.038	0.961	0.004	0.024
		0.833	0.011	-1.130	-0.033	1.173	0.004	0.024
		0.917	0.011	-1.348	-0.027	1.386	0.004	0.024
		1.000	0.011	-1.566	-0.022	1.599	0.004	0.024
	4	0.000	0.011	1.054	-0.088	1.153	0.004	0.024
		0.083	0.011	0.836	-0.082	0.929	0.004	0.024
		0.167	0.011	0.618	-0.077	0.705	0.004	0.024
		0.250	0.011	0.399	-0.071	0.482	0.004	0.024
		0.333	0.011	0.181	-0.066	0.258	0.004	0.024
		0.417	0.011	-0.038	-0.060	0.109	0.004	0.024
		0.500	0.011	-0.256	-0.055	0.322	0.004	0.024
		0.583	0.011	-0.474	-0.049	0.535	0.004	0.024
		0.667	0.011	-0.693	-0.044	0.748	0.004	0.024
		0.750	0.011	-0.911	-0.038	0.961	0.004	0.024
		0.833	0.011	-1.130	-0.033	1.173	0.004	0.024
		0.917	0.011	-1.348	-0.027	1.386	0.004	0.024
		1.000	0.011	-1.566	-0.022	1.599	0.004	0.024
	5	0.000	97.015	511.124	9.15E 3	9.76E 3	-511.543	7.743
		0.083	97.015	440.286	8.35E 3	8.89E 3	-511.543	7.743
		0.167	97.015	369.448	7.56E 3	8.02E 3	-511.543	7.743
		0.250	97.015	298.610	6.76E 3	7.16E 3	-511.543	7.743
		0.333	97.015	227.772	5.97E 3	6.29E 3	-511.543	7.743
		0.417	97.015	156.934	5.17E 3	5.42E 3	-511.543	7.743
		0.500	97.015	86.096	4.37E 3	4.56E 3	-511.543	7.743
		0.583	97.015	15.259	3.58E 3	3.69E 3	-511.543	7.743
		0.667	97.015	-55.579	2.78E 3	2.93E 3	-511.543	7.743
		0.750	97.015	-126.417	1.99E 3	2.21E 3	-511.543	7.743
		0.833	97.015	-197.255	1.19E 3	1.48E 3	-511.543	7.743
		0.917	97.015	-268.093	394.507	759.615	-511.543	7.743
		1.000	97.015	-338.931	-401.307	837.253	-511.543	7.743

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
	6	0.000	357.065	98.698	824.932	1.28E 3	814.625	-4.263
		0.083	351.962	137.701	2.01E 3	2.5E 3	712.607	-4.263
		0.167	346.859	176.703	3.04E 3	3.57E 3	610.590	-4.263
		0.250	341.755	215.706	3.91E 3	4.47E 3	508.573	-4.263
		0.333	336.652	254.709	4.62E 3	5.22E 3	406.555	-4.263
		0.417	331.549	293.711	5.18E 3	5.8E 3	304.538	-4.263
		0.500	326.445	332.714	5.57E 3	6.23E 3	202.521	-4.263
		0.583	321.342	371.716	5.81E 3	6.5E 3	100.503	-4.263
		0.667	316.239	410.719	5.88E 3	6.61E 3	-1.514	-4.263
		0.750	311.135	449.721	5.8E 3	6.56E 3	-103.532	-4.263
		0.833	306.032	488.724	5.56E 3	6.36E 3	-205.549	-4.263
		0.917	300.929	527.727	5.16E 3	5.99E 3	-307.566	-4.263
		1.000	295.825	566.729	4.61E 3	5.47E 3	-401.683	-4.263
	7	0.000	327.416	-327.077	-6.95E 3	7.6E 3	1.38E 3	-11.561
		0.083	321.543	-221.318	-4.89E 3	5.44E 3	1.26E 3	-11.561
		0.167	315.670	-115.560	-3.02E 3	3.45E 3	1.14E 3	-11.561
		0.250	309.797	-9.802	-1.33E 3	1.65E 3	1.03E 3	-11.561
		0.333	303.924	95.957	172.470	572.351	909.407	-11.561
		0.417	298.052	201.715	1.5E 3	2E 3	792.013	-11.561
		0.500	292.179	307.474	2.64E 3	3.24E 3	674.619	-11.561
		0.583	286.306	413.232	3.59E 3	4.29E 3	557.225	-11.561
		0.667	280.433	518.991	4.37E 3	5.17E 3	439.830	-11.561
		0.750	274.560	624.749	4.96E 3	5.86E 3	322.436	-11.561
		0.833	268.688	730.507	5.37E 3	6.37E 3	205.042	-11.561
		0.917	262.815	836.266	5.6E 3	6.7E 3	87.648	-11.561
		1.000	256.942	942.024	5.65E 3	6.85E 3	-20.718	-11.561
	8	0.000	251.984	353.776	5.85E 3	6.45E 3	144.633	2.141
		0.083	249.189	334.187	6.03E 3	6.61E 3	88.746	2.141
		0.167	246.394	314.598	6.12E 3	6.68E 3	32.859	2.141
		0.250	243.599	295.009	6.13E 3	6.67E 3	-23.028	2.141
		0.333	240.804	275.419	6.05E 3	6.57E 3	-78.914	2.141
		0.417	238.009	255.830	5.88E 3	6.38E 3	-134.801	2.141
		0.500	235.214	236.241	5.63E 3	6.1E 3	-190.688	2.141
		0.583	232.419	216.652	5.29E 3	5.74E 3	-246.575	2.141
		0.667	229.625	197.063	4.86E 3	5.29E 3	-302.461	2.141
		0.750	226.830	177.473	4.35E 3	4.75E 3	-358.348	2.141
		0.833	224.035	157.884	3.75E 3	4.13E 3	-414.235	2.141
		0.917	221.240	138.295	3.06E 3	3.42E 3	-470.121	2.141
		1.000	218.445	118.706	2.29E 3	2.62E 3	-521.494	2.141
	9	0.000	-55.331	537.225	9.14E 3	-9.73E 3	-486.082	7.396
		0.083	-55.331	469.565	8.38E 3	-8.9E 3	-486.082	7.396
		0.167	-55.331	401.906	7.62E 3	-8.08E 3	-486.082	7.396
		0.250	-55.331	334.246	6.87E 3	-7.26E 3	-486.082	7.396
		0.333	-55.331	266.586	6.11E 3	-6.43E 3	-486.082	7.396
		0.417	-55.331	198.926	5.36E 3	-5.61E 3	-486.082	7.396

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	-55.331	131.266	4.6E 3	-4.79E 3	-486.082	7.396
		0.583	-55.331	63.606	3.84E 3	-3.96E 3	-486.082	7.396
		0.667	-55.331	-4.054	3.09E 3	-3.15E 3	-486.082	7.396
		0.750	-55.331	-71.714	2.33E 3	-2.46E 3	-486.082	7.396
		0.833	-55.331	-139.374	1.57E 3	-1.77E 3	-486.082	7.396
		0.917	-55.331	-207.034	818.021	-1.08E 3	-486.082	7.396
		1.000	-55.331	-274.694	61.818	-391.843	-486.082	7.396
	10	0.000	154.977	-156.609	-3.3E 3	3.61E 3	656.179	-5.585
		0.083	152.182	-105.514	-2.33E 3	2.58E 3	600.292	-5.585
		0.167	149.387	-54.418	-1.43E 3	1.64E 3	544.405	-5.585
		0.250	146.592	-3.322	-631.438	781.352	488.518	-5.585
		0.333	143.797	47.774	85.085	276.655	432.632	-5.585
		0.417	141.002	98.870	714.662	954.534	376.745	-5.585
		0.500	138.207	149.965	1.26E 3	1.55E 3	320.858	-5.585
		0.583	135.412	201.061	1.71E 3	2.05E 3	264.971	-5.585
		0.667	132.617	252.157	2.08E 3	2.47E 3	209.085	-5.585
		0.750	129.822	303.253	2.36E 3	2.8E 3	153.198	-5.585
		0.833	127.027	354.349	2.56E 3	3.04E 3	97.311	-5.585
		0.917	124.233	405.444	2.67E 3	3.2E 3	41.424	-5.585
		1.000	121.438	456.540	2.69E 3	3.27E 3	-9.948	-5.585
	11	0.000	154.977	-156.609	-3.3E 3	3.61E 3	656.179	-5.585
		0.083	152.182	-105.514	-2.33E 3	2.58E 3	600.292	-5.585
		0.167	149.387	-54.418	-1.43E 3	1.64E 3	544.405	-5.585
		0.250	146.592	-3.322	-631.438	781.352	488.518	-5.585
		0.333	143.797	47.774	85.085	276.655	432.632	-5.585
		0.417	141.002	98.870	714.662	954.534	376.745	-5.585
		0.500	138.207	149.965	1.26E 3	1.55E 3	320.858	-5.585
		0.583	135.412	201.061	1.71E 3	2.05E 3	264.971	-5.585
		0.667	132.617	252.157	2.08E 3	2.47E 3	209.085	-5.585
		0.750	129.822	303.253	2.36E 3	2.8E 3	153.198	-5.585
		0.833	127.027	354.349	2.56E 3	3.04E 3	97.311	-5.585
		0.917	124.233	405.444	2.67E 3	3.2E 3	41.424	-5.585
		1.000	121.438	456.540	2.69E 3	3.27E 3	-9.948	-5.585
	12	0.000	164.740	-166.522	-3.51E 3	3.84E 3	697.518	-5.938
		0.083	161.769	-112.198	-2.47E 3	2.75E 3	638.110	-5.938
		0.167	158.798	-57.873	-1.53E 3	1.74E 3	578.702	-5.938
		0.250	155.827	-3.549	-671.215	830.590	519.295	-5.938
		0.333	152.856	50.776	90.448	294.079	459.887	-5.938
		0.417	149.885	105.100	759.689	1.01E 3	400.480	-5.938
		0.500	146.914	159.424	1.34E 3	1.64E 3	341.072	-5.938
		0.583	143.943	213.749	1.82E 3	2.18E 3	281.664	-5.938
		0.667	140.972	268.073	2.21E 3	2.62E 3	222.257	-5.938
		0.750	138.001	322.398	2.51E 3	2.97E 3	162.849	-5.938
		0.833	135.030	376.722	2.72E 3	3.23E 3	103.442	-5.938
		0.917	132.059	431.047	2.83E 3	3.4E 3	44.034	-5.938

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	129.088	485.371	2.86E 3	3.47E 3	-10.575	-5.938
	13	0.000	164.740	-166.522	-3.51E 3	3.84E 3	697.518	-5.938
		0.083	161.769	-112.198	-2.47E 3	2.75E 3	638.110	-5.938
		0.167	158.798	-57.873	-1.53E 3	1.74E 3	578.702	-5.938
		0.250	155.827	-3.549	-671.215	830.590	519.295	-5.938
		0.333	152.856	50.776	90.448	294.079	459.887	-5.938
		0.417	149.885	105.100	759.689	1.01E 3	400.480	-5.938
		0.500	146.914	159.424	1.34E 3	1.64E 3	341.072	-5.938
		0.583	143.943	213.749	1.82E 3	2.18E 3	281.664	-5.938
		0.667	140.972	268.073	2.21E 3	2.62E 3	222.257	-5.938
		0.750	138.001	322.398	2.51E 3	2.97E 3	162.849	-5.938
		0.833	135.030	376.722	2.72E 3	3.23E 3	103.442	-5.938
		0.917	132.059	431.047	2.83E 3	3.4E 3	44.034	-5.938
		1.000	129.088	485.371	2.86E 3	3.47E 3	-10.575	-5.938
	14	0.000	291.655	-291.549	-6.19E 3	6.78E 3	1.23E 3	-10.324
		0.083	286.419	-197.104	-4.36E 3	4.85E 3	1.12E 3	-10.324
		0.167	281.184	-102.658	-2.69E 3	3.08E 3	1.02E 3	-10.324
		0.250	275.948	-8.213	-1.19E 3	1.47E 3	915.388	-10.324
		0.333	270.712	86.233	154.636	511.581	810.721	-10.324
		0.417	265.476	180.678	1.33E 3	1.78E 3	706.055	-10.324
		0.500	260.240	275.124	2.35E 3	2.89E 3	601.389	-10.324
		0.583	255.005	369.569	3.21E 3	3.83E 3	496.722	-10.324
		0.667	249.769	464.015	3.9E 3	4.61E 3	392.056	-10.324
		0.750	244.533	558.460	4.43E 3	5.23E 3	287.389	-10.324
		0.833	239.297	652.906	4.79E 3	5.68E 3	182.723	-10.324
		0.917	234.061	747.351	4.99E 3	5.98E 3	78.057	-10.324
		1.000	228.826	841.797	5.03E 3	6.11E 3	-18.496	-10.324
	15	0.000	291.655	-291.549	-6.19E 3	6.78E 3	1.23E 3	-10.324
		0.083	286.419	-197.104	-4.36E 3	4.85E 3	1.12E 3	-10.324
		0.167	281.184	-102.658	-2.69E 3	3.08E 3	1.02E 3	-10.324
		0.250	275.948	-8.213	-1.19E 3	1.47E 3	915.388	-10.324
		0.333	270.712	86.233	154.636	511.581	810.721	-10.324
		0.417	265.476	180.678	1.33E 3	1.78E 3	706.055	-10.324
		0.500	260.240	275.124	2.35E 3	2.89E 3	601.389	-10.324
		0.583	255.005	369.569	3.21E 3	3.83E 3	496.722	-10.324
		0.667	249.769	464.015	3.9E 3	4.61E 3	392.056	-10.324
		0.750	244.533	558.460	4.43E 3	5.23E 3	287.389	-10.324
		0.833	239.297	652.906	4.79E 3	5.68E 3	182.723	-10.324
		0.917	234.061	747.351	4.99E 3	5.98E 3	78.057	-10.324
		1.000	228.826	841.797	5.03E 3	6.11E 3	-18.496	-10.324
	16	0.000	242.805	118.275	815.785	1.18E 3	833.720	-4.524
		0.083	237.702	159.661	2.03E 3	2.43E 3	731.703	-4.524
		0.167	232.599	201.047	3.09E 3	3.53E 3	629.686	-4.524
		0.250	227.495	242.433	3.99E 3	4.46E 3	527.668	-4.524
		0.333	222.392	283.819	4.73E 3	5.24E 3	425.651	-4.524

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	217.268	325.205	5.32E 3	5.86E 3	323.634	-4.524
		0.500	212.185	366.591	5.74E 3	6.32E 3	221.616	-4.524
		0.583	207.082	407.977	6.01E 3	6.62E 3	119.599	-4.524
		0.667	201.979	449.363	6.11E 3	6.76E 3	17.582	-4.524
		0.750	196.876	490.749	6.06E 3	6.75E 3	-84.436	-4.524
		0.833	191.772	532.135	5.86E 3	6.57E 3	-186.453	-4.524
		0.917	186.669	573.521	5.48E 3	6.24E 3	-288.470	-4.524
		1.000	181.565	614.907	4.95E 3	5.75E 3	-382.588	-4.524
	17	0.000	99.637	379.878	5.83E 3	6.31E 3	170.094	1.794
		0.083	96.842	363.467	6.05E 3	6.52E 3	114.207	1.794
		0.167	94.048	347.055	6.19E 3	6.63E 3	58.320	1.794
		0.250	91.253	330.644	6.24E 3	6.66E 3	2.434	1.794
		0.333	88.458	314.233	6.2E 3	6.6E 3	-53.453	1.794
		0.417	85.663	297.821	6.07E 3	6.45E 3	-109.340	1.794
		0.500	82.868	281.410	5.86E 3	6.22E 3	-165.227	1.794
		0.583	80.073	264.999	5.56E 3	5.9E 3	-221.113	1.794
		0.667	77.278	248.588	5.17E 3	5.49E 3	-277.000	1.794
		0.750	74.483	232.176	4.69E 3	5E 3	-332.887	1.794
		0.833	71.688	215.765	4.13E 3	4.42E 3	-388.774	1.794
		0.917	68.893	199.354	3.48E 3	3.75E 3	-444.660	1.794
		1.000	66.098	182.943	2.75E 3	3E 3	-496.033	1.794
7	1	0.000	121.117	442.112	2.89E 3	3.25E 3	14.124	5.227
		0.083	123.911	394.290	2.67E 3	3.18E 3	-41.763	5.227
		0.167	126.706	346.468	2.56E 3	3.03E 3	-97.650	5.227
		0.250	129.501	298.646	2.36E 3	2.79E 3	-153.537	5.227
		0.333	132.296	250.826	2.08E 3	2.46E 3	-209.423	5.227
		0.417	135.091	203.003	1.71E 3	2.05E 3	-265.310	5.227
		0.500	137.886	155.181	1.25E 3	1.55E 3	-321.197	5.227
		0.583	140.681	107.359	711.249	959.289	-377.083	5.227
		0.667	143.476	59.538	81.144	284.157	-432.970	5.227
		0.750	146.271	11.716	-635.905	793.891	-488.857	5.227
		0.833	149.066	-36.106	-1.44E 3	1.63E 3	-544.744	5.227
		0.917	151.861	-83.928	-2.33E 3	2.57E 3	-600.630	5.227
		1.000	154.655	-131.749	-3.31E 3	3.59E 3	-652.003	5.227
	2	0.000	135.176	466.882	2.96E 3	3.56E 3	14.993	5.511
		0.083	138.254	416.466	2.93E 3	3.49E 3	-46.515	5.511
		0.167	141.332	365.049	2.81E 3	3.32E 3	-108.022	5.511
		0.250	144.410	314.633	2.6E 3	3.06E 3	-169.530	5.511
		0.333	147.488	264.217	2.29E 3	2.7E 3	-231.037	5.511
		0.417	150.566	213.800	1.88E 3	2.24E 3	-292.545	5.511
		0.500	153.644	163.384	1.38E 3	1.69E 3	-354.052	5.511
		0.583	156.722	112.967	778.337	1.05E 3	-415.560	5.511
		0.667	159.800	62.551	84.003	306.353	-477.067	5.511
		0.750	162.878	12.135	-706.020	881.032	-538.574	5.511
		0.833	165.956	-38.282	-1.59E 3	1.8E 3	-600.082	5.511

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	169.033	-88.698	-2.57E 3	2.83E 3	-661.589	5.511
		1.000	172.111	-139.114	-3.65E 3	3.96E 3	-718.583	5.511
	3	0.000	0.009	-1.820	-0.022	1.851	0.008	-0.030
		0.083	0.009	-1.545	-0.010	1.564	0.008	-0.030
		0.167	0.009	-1.271	0.002	1.281	0.008	-0.030
		0.250	0.009	-0.996	0.014	1.018	0.008	-0.030
		0.333	0.009	-0.721	0.025	0.755	0.008	-0.030
		0.417	0.009	-0.446	0.037	0.492	0.008	-0.030
		0.500	0.009	-0.171	0.049	0.229	0.008	-0.030
		0.583	0.009	0.104	0.061	0.173	0.008	-0.030
		0.667	0.009	0.379	0.072	0.460	0.008	-0.030
		0.750	0.009	0.653	0.084	0.747	0.008	-0.030
		0.833	0.009	0.928	0.096	1.033	0.008	-0.030
		0.917	0.009	1.203	0.108	1.320	0.008	-0.030
		1.000	0.009	1.478	0.119	1.606	0.008	-0.030
	4	0.000	0.009	-1.820	-0.022	1.851	0.008	-0.030
		0.083	0.009	-1.545	-0.010	1.564	0.008	-0.030
		0.167	0.009	-1.271	0.002	1.281	0.008	-0.030
		0.250	0.009	-0.996	0.014	1.018	0.008	-0.030
		0.333	0.009	-0.721	0.025	0.755	0.008	-0.030
		0.417	0.009	-0.446	0.037	0.492	0.008	-0.030
		0.500	0.009	-0.171	0.049	0.229	0.008	-0.030
		0.583	0.009	0.104	0.061	0.173	0.008	-0.030
		0.667	0.009	0.379	0.072	0.460	0.008	-0.030
		0.750	0.009	0.653	0.084	0.747	0.008	-0.030
		0.833	0.009	0.928	0.096	1.033	0.008	-0.030
		0.917	0.009	1.203	0.108	1.320	0.008	-0.030
		1.000	0.009	1.478	0.119	1.606	0.008	-0.030
	5	0.000	159.111	171.051	-401.306	731.468	-442.085	5.678
		0.083	159.111	119.110	-1.09E 3	1.37E 3	-442.085	5.678
		0.167	159.111	67.170	-1.78E 3	2E 3	-442.085	5.678
		0.250	159.111	15.229	-2.46E 3	2.64E 3	-442.085	5.678
		0.333	159.111	-36.711	-3.15E 3	3.35E 3	-442.085	5.678
		0.417	159.111	-88.652	-3.84E 3	4.09E 3	-442.085	5.678
		0.500	159.111	-140.592	-4.53E 3	4.83E 3	-442.085	5.678
		0.583	159.111	-192.533	-5.22E 3	5.57E 3	-442.085	5.678
		0.667	159.111	-244.473	-5.9E 3	6.31E 3	-442.085	5.678
		0.750	159.111	-296.414	-6.59E 3	7.05E 3	-442.085	5.678
		0.833	159.111	-348.354	-7.28E 3	7.79E 3	-442.085	5.678
		0.917	159.111	-400.295	-7.97E 3	8.53E 3	-442.085	5.678
		1.000	159.111	-452.235	-8.65E 3	9.27E 3	-442.085	5.678
	6	0.000	341.832	919.811	4.61E 3	5.87E 3	-306.196	13.619
		0.083	346.936	795.222	4.05E 3	5.19E 3	-408.213	13.619
		0.167	352.039	670.632	3.34E 3	4.36E 3	-510.230	13.619
		0.250	357.142	546.043	2.46E 3	3.37E 3	-612.247	13.619

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	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	362.246	421.454	1.43E 3	2.21E 3	-714.265	13.619
		0.417	367.349	296.864	240.517	904.730	-816.282	13.619
		0.500	372.452	172.275	-1.11E 3	1.65E 3	-918.300	13.619
		0.583	377.556	47.685	-2.62E 3	3.04E 3	-1.02E 3	13.619
		0.667	382.659	-76.904	-4.28E 3	4.74E 3	-1.12E 3	13.619
		0.750	387.762	-201.493	-6.11E 3	6.7E 3	-1.22E 3	13.619
		0.833	392.866	-326.083	-8.09E 3	8.81E 3	-1.33E 3	13.619
		0.917	397.969	-450.672	-10.2E 3	11.1E 3	-1.43E 3	13.619
		1.000	403.072	-575.262	-12.5E 3	13.5E 3	-1.52E 3	13.619
	7	0.000	256.293	907.994	5.85E 3	6.81E 3	29.117	10.739
		0.083	262.166	809.756	5.6E 3	6.67E 3	-88.278	10.739
		0.167	268.039	711.517	5.37E 3	6.35E 3	-205.672	10.739
		0.250	273.911	613.279	4.96E 3	5.85E 3	-323.066	10.739
		0.333	279.784	515.041	4.37E 3	5.16E 3	-440.460	10.739
		0.417	285.657	416.803	3.59E 3	4.29E 3	-557.855	10.739
		0.500	291.530	318.565	2.63E 3	3.24E 3	-675.249	10.739
		0.583	297.403	220.327	1.49E 3	2.01E 3	-792.643	10.739
		0.667	303.275	122.088	165.146	590.510	-910.037	10.739
		0.750	309.148	23.850	-1.34E 3	1.67E 3	-1.03E 3	10.739
		0.833	315.021	-74.388	-3.03E 3	3.42E 3	-1.14E 3	10.739
		0.917	320.894	-172.626	-4.9E 3	5.4E 3	-1.26E 3	10.739
		1.000	326.767	-270.864	-6.96E 3	7.56E 3	-1.37E 3	10.739
	8	0.000	280.228	613.162	2.29E 3	3.18E 3	-427.961	10.906
		0.083	283.023	513.400	1.58E 3	2.37E 3	-483.848	10.905
		0.167	285.818	413.638	780.799	1.48E 3	-539.735	10.906
		0.250	288.612	313.876	-102.344	704.832	-595.622	10.905
		0.333	291.407	214.113	-1.07E 3	1.58E 3	-651.508	10.905
		0.417	294.202	114.351	-2.13E 3	2.54E 3	-707.395	10.905
		0.500	296.997	14.589	-3.27E 3	3.59E 3	-763.282	10.905
		0.583	299.792	-85.173	-4.5E 3	4.89E 3	-819.169	10.905
		0.667	302.587	-184.936	-5.82E 3	6.31E 3	-875.055	10.905
		0.750	305.382	-284.698	-7.23E 3	7.82E 3	-930.942	10.905
		0.833	308.177	-384.460	-8.72E 3	9.41E 3	-986.829	10.905
		0.917	310.972	-484.222	-10.3E 3	11.1E 3	-1.04E 3	10.905
		1.000	313.767	-583.984	-12E 3	12.9E 3	-1.09E 3	10.905
	9	0.000	18.037	305.976	61.818	385.831	-496.715	7.766
		0.083	18.037	234.933	-710.928	963.897	-496.715	7.766
		0.167	18.037	163.889	-1.48E 3	1.67E 3	-496.715	7.766
		0.250	18.037	92.846	-2.26E 3	2.37E 3	-496.715	7.766
		0.333	18.037	21.802	-3.03E 3	3.07E 3	-496.715	7.766
		0.417	18.037	-49.241	-3.8E 3	3.87E 3	-496.715	7.766
		0.500	18.037	-120.285	-4.57E 3	4.71E 3	-496.715	7.766
		0.583	18.037	-191.328	-5.35E 3	5.56E 3	-496.715	7.766
		0.667	18.037	-262.372	-6.12E 3	6.4E 3	-496.715	7.766
		0.750	18.037	-333.415	-6.89E 3	7.24E 3	-496.715	7.766

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	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	18.037	-404.459	-7.67E 3	8.09E 3	-496.715	7.766
		0.917	18.037	-475.502	-8.44E 3	8.93E 3	-496.715	7.766
		1.000	18.037	-546.546	-9.21E 3	9.78E 3	-496.715	7.766
	10	0.000	121.123	440.837	2.69E 3	3.25E 3	14.129	5.206
		0.083	123.918	393.208	2.67E 3	3.18E 3	-41.758	5.206
		0.167	126.713	345.579	2.56E 3	3.03E 3	-97.645	5.206
		0.250	129.508	297.949	2.36E 3	2.79E 3	-153.531	5.206
		0.333	132.302	250.320	2.08E 3	2.46E 3	-209.418	5.206
		0.417	135.097	202.691	1.71E 3	2.05E 3	-265.305	5.206
		0.500	137.892	155.061	1.25E 3	1.55E 3	-321.191	5.206
		0.583	140.687	107.432	711.291	959.410	-377.078	5.206
		0.667	143.482	59.803	81.194	284.479	-432.965	5.206
		0.750	146.277	12.173	-635.846	794.296	-488.852	5.206
		0.833	149.072	-35.456	-1.44E 3	1.62E 3	-544.738	5.206
		0.917	151.867	-83.086	-2.33E 3	2.57E 3	-600.625	5.206
		1.000	154.662	-130.715	-3.31E 3	3.59E 3	-651.998	5.206
	11	0.000	121.123	440.837	2.69E 3	3.25E 3	14.129	5.206
		0.083	123.918	393.208	2.67E 3	3.18E 3	-41.758	5.206
		0.167	126.713	345.579	2.56E 3	3.03E 3	-97.645	5.206
		0.250	129.508	297.949	2.36E 3	2.79E 3	-153.531	5.206
		0.333	132.302	250.320	2.08E 3	2.46E 3	-209.418	5.206
		0.417	135.097	202.691	1.71E 3	2.05E 3	-265.305	5.206
		0.500	137.892	155.061	1.25E 3	1.55E 3	-321.191	5.206
		0.583	140.687	107.432	711.291	959.410	-377.078	5.206
		0.667	143.482	59.803	81.194	284.479	-432.965	5.206
		0.750	146.277	12.173	-635.846	794.296	-488.852	5.206
		0.833	149.072	-35.456	-1.44E 3	1.62E 3	-544.738	5.206
		0.917	151.867	-83.086	-2.33E 3	2.57E 3	-600.625	5.206
		1.000	154.662	-130.715	-3.31E 3	3.59E 3	-651.998	5.206
	12	0.000	128.753	466.690	2.86E 3	3.45E 3	15.019	5.536
		0.083	131.724	418.048	2.83E 3	3.38E 3	-44.389	5.536
		0.167	134.695	367.406	2.72E 3	3.22E 3	-103.796	5.536
		0.250	137.666	316.764	2.51E 3	2.97E 3	-163.204	5.536
		0.333	140.637	266.122	2.21E 3	2.62E 3	-222.612	5.536
		0.417	143.608	215.480	1.82E 3	2.18E 3	-282.019	5.536
		0.500	146.579	164.838	1.33E 3	1.64E 3	-341.427	5.536
		0.583	149.550	114.196	756.100	1.02E 3	-400.834	5.536
		0.667	152.521	63.553	86.306	302.381	-460.242	5.536
		0.750	155.492	12.911	-675.908	844.311	-519.650	5.536
		0.833	158.463	-37.731	-1.63E 3	1.73E 3	-579.057	5.536
		0.917	161.434	-88.373	-2.48E 3	2.73E 3	-638.465	5.536
		1.000	164.405	-139.015	-3.52E 3	3.82E 3	-693.074	5.536
	13	0.000	128.753	466.690	2.86E 3	3.45E 3	15.019	5.536
		0.083	131.724	418.048	2.83E 3	3.38E 3	-44.389	5.536
		0.167	134.695	367.406	2.72E 3	3.22E 3	-103.796	5.536

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	137.686	316.764	2.51E 3	2.97E 3	-163.204	5.536
		0.333	140.637	266.122	2.21E 3	2.62E 3	-222.612	5.536
		0.417	143.608	215.480	1.82E 3	2.18E 3	-282.019	5.536
		0.500	146.579	164.838	1.33E 3	1.64E 3	-341.427	5.536
		0.583	149.550	114.196	756.100	1.02E 3	-400.834	5.536
		0.667	152.521	63.553	86.306	302.381	-460.242	5.536
		0.750	155.492	12.911	-675.908	844.311	-519.650	5.536
		0.833	158.463	-37.731	-1.53E 3	1.73E 3	-579.057	5.536
		0.917	161.434	-88.373	-2.48E 3	2.73E 3	-638.465	5.536
		1.000	164.405	-139.015	-3.52E 3	3.82E 3	-693.074	5.536
	14	0.000	228.245	811.524	5.03E 3	6.07E 3	26.042	9.593
		0.083	233.480	723.767	4.99E 3	5.95E 3	-78.625	9.593
		0.167	238.716	636.011	4.79E 3	5.66E 3	-183.291	9.593
		0.250	243.952	548.254	4.42E 3	5.22E 3	-287.957	9.593
		0.333	249.188	460.496	3.89E 3	4.6E 3	-392.624	9.593
		0.417	254.424	372.741	3.2E 3	3.83E 3	-497.290	9.593
		0.500	259.659	284.985	2.35E 3	2.89E 3	-601.956	9.593
		0.583	264.895	197.228	1.33E 3	1.79E 3	-706.623	9.593
		0.667	270.131	109.472	148.030	527.632	-811.289	9.593
		0.750	275.367	21.715	-1.2E 3	1.49E 3	-915.956	9.593
		0.833	280.603	-66.041	-2.7E 3	3.05E 3	-1.02E 3	9.593
		0.917	285.838	-153.798	-4.37E 3	4.81E 3	-1.13E 3	9.593
		1.000	291.074	-241.554	-6.2E 3	6.74E 3	-1.22E 3	9.593
	15	0.000	228.245	811.524	5.03E 3	6.07E 3	26.042	9.593
		0.083	233.480	723.767	4.99E 3	5.95E 3	-78.625	9.593
		0.167	238.716	636.011	4.79E 3	5.66E 3	-183.291	9.593
		0.250	243.952	548.254	4.42E 3	5.22E 3	-287.957	9.593
		0.333	249.188	460.498	3.89E 3	4.6E 3	-392.624	9.593
		0.417	254.424	372.741	3.2E 3	3.83E 3	-497.290	9.593
		0.500	259.659	284.985	2.35E 3	2.89E 3	-601.956	9.593
		0.583	264.895	197.228	1.33E 3	1.79E 3	-706.623	9.593
		0.667	270.131	109.472	148.030	527.632	-811.289	9.593
		0.750	275.367	21.715	-1.2E 3	1.49E 3	-915.956	9.593
		0.833	280.603	-66.041	-2.7E 3	3.05E 3	-1.02E 3	9.593
		0.917	285.838	-153.798	-4.37E 3	4.81E 3	-1.13E 3	9.593
		1.000	291.074	-241.554	-6.2E 3	6.74E 3	-1.22E 3	9.593
	16	0.000	236.026	1.02E 3	4.95E 3	6.21E 3	-347.168	15.185
		0.083	241.130	882.089	4.33E 3	5.46E 3	-449.186	15.185
		0.167	246.233	743.172	3.56E 3	4.55E 3	-551.203	15.185
		0.250	251.337	604.256	2.62E 3	3.47E 3	-653.220	15.185
		0.333	256.440	465.339	1.52E 3	2.25E 3	-755.238	15.185
		0.417	261.543	326.422	269.151	857.117	-857.255	15.185
		0.500	266.647	187.505	-1.14E 3	1.8E 3	-959.272	15.185
		0.583	271.750	48.589	-2.72E 3	3.04E 3	-1.06E 3	15.185
		0.667	276.853	-90.328	-4.45E 3	4.81E 3	-1.16E 3	15.185

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.750	281.956	-229.245	-6.34E 3	8.85E 3	-1.27E 3	15.185
		0.833	287.060	-368.161	-8.38E 3	9.04E 3	-1.37E 3	15.185
		0.917	292.163	-507.078	-10.6E 3	11.4E 3	-1.47E 3	15.185
		1.000	297.267	-645.994	-13E 3	13.9E 3	-1.58E 3	15.185
	17	0.000	139.153	748.088	2.75E 3	3.64E 3	-482.592	12.993
		0.083	141.948	629.223	1.96E 3	2.73E 3	-538.478	12.993
		0.167	144.743	510.357	1.07E 3	1.73E 3	-594.365	12.993
		0.250	147.538	391.492	105.812	644.843	-650.252	12.993
		0.333	150.333	272.627	-949.264	1.37E 3	-706.139	12.993
		0.417	153.128	153.762	-2.09E 3	2.4E 3	-762.025	12.993
		0.500	155.923	34.896	-3.32E 3	3.51E 3	-817.912	12.993
		0.583	158.718	-83.969	-4.64E 3	4.88E 3	-873.799	12.993
		0.667	161.513	-202.834	-6.04E 3	6.4E 3	-929.686	12.993
		0.750	164.308	-321.699	-7.53E 3	8.01E 3	-985.572	12.993
		0.833	167.102	-440.565	-9.11E 3	9.71E 3	-1.04E 3	12.993
		0.917	169.897	-559.430	-10.8E 3	11.5E 3	-1.1E 3	12.993
		1.000	172.692	-678.295	-12.5E 3	13.4E 3	-1.15E 3	12.993
8	1	0.000	334.435	-21.342	-3.31E 3	3.66E 3	268.995	-0.674
		0.083	332.312	-16.231	-2.96E 3	3.31E 3	268.995	-0.674
		0.167	330.190	-11.121	-2.62E 3	2.96E 3	268.995	-0.674
		0.250	328.067	-6.010	-2.27E 3	2.6E 3	268.995	-0.674
		0.333	325.945	-0.900	-1.92E 3	2.25E 3	268.995	-0.674
		0.417	323.822	4.211	-1.58E 3	1.9E 3	268.995	-0.674
		0.500	321.700	9.322	-1.23E 3	1.56E 3	268.995	-0.674
		0.583	319.577	14.432	-882.277	1.22E 3	268.995	-0.674
		0.667	317.455	19.543	-535.678	872.676	268.995	-0.674
		0.750	315.332	24.653	-189.079	529.065	268.995	-0.674
		0.833	313.210	29.764	157.520	500.493	268.995	-0.674
		0.917	311.087	34.874	504.119	850.080	268.995	-0.674
		1.000	308.965	39.985	850.718	1.2E 3	268.995	-0.674
	2	0.000	370.592	30.084	-3.65E 3	4.05E 3	300.048	0.493
		0.083	370.592	26.347	-3.26E 3	3.66E 3	300.048	0.493
		0.167	370.592	22.611	-2.88E 3	3.27E 3	300.048	0.493
		0.250	370.592	18.874	-2.49E 3	2.88E 3	300.048	0.493
		0.333	370.592	15.138	-2.1E 3	2.49E 3	300.048	0.493
		0.417	370.592	11.401	-1.72E 3	2.1E 3	300.048	0.493
		0.500	370.592	7.664	-1.33E 3	1.71E 3	300.048	0.493
		0.583	370.592	3.928	-943.698	1.32E 3	300.048	0.493
		0.667	370.592	0.191	-557.087	927.871	300.048	0.493
		0.750	370.592	-3.545	-170.476	544.614	300.048	0.493
		0.833	370.592	-7.282	216.135	594.009	300.048	0.493
		0.917	370.592	-11.019	602.746	984.357	300.048	0.493
		1.000	370.592	-14.755	989.357	1.37E 3	300.048	0.493
	3	0.000	26.794	-10.379	0.119	39.292	-0.006	-0.236
		0.083	26.794	-8.594	0.111	37.499	-0.006	-0.236

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		Part		
Job Title Crest Pad Bldg		Ref		
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Client Washington Closure Hanford		File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.167	28.794	-6.809	0.103	35.705	-0.006	-0.236
		0.250	28.794	-5.024	0.094	33.912	-0.006	-0.236
		0.333	28.794	-3.239	0.086	32.118	-0.006	-0.236
		0.417	28.794	-1.453	0.078	30.325	-0.006	-0.236
		0.500	28.794	0.332	0.069	29.195	-0.006	-0.236
		0.583	28.794	2.117	0.061	30.971	-0.006	-0.236
		0.667	28.794	3.902	0.052	32.748	-0.006	-0.236
		0.750	28.794	5.687	0.044	34.525	-0.006	-0.236
		0.833	28.794	7.472	0.036	36.302	-0.006	-0.236
		0.917	28.794	9.257	0.027	38.078	-0.006	-0.236
		1.000	28.794	11.042	0.019	39.855	-0.006	-0.236
	4	0.000	28.794	-10.379	0.119	39.292	-0.006	-0.236
		0.083	28.794	-8.594	0.111	37.499	-0.006	-0.236
		0.167	28.794	-6.809	0.103	35.705	-0.006	-0.236
		0.250	28.794	-5.024	0.094	33.912	-0.006	-0.236
		0.333	28.794	-3.239	0.086	32.118	-0.006	-0.236
		0.417	28.794	-1.453	0.078	30.325	-0.006	-0.236
		0.500	28.794	0.332	0.069	29.195	-0.006	-0.236
		0.583	28.794	2.117	0.061	30.971	-0.006	-0.236
		0.667	28.794	3.902	0.052	32.748	-0.006	-0.236
		0.750	28.794	5.687	0.044	34.525	-0.006	-0.236
		0.833	28.794	7.472	0.036	36.302	-0.006	-0.236
		0.917	28.794	9.257	0.027	38.078	-0.006	-0.236
		1.000	28.794	11.042	0.019	39.855	-0.006	-0.236
	5	0.000	190.406	-1.35E 3	-8.65E 3	10.2E 3	310.246	-25.932
		0.083	190.406	-1.15E 3	-8.25E 3	9.6E 3	310.246	-25.932
		0.167	190.406	-954.782	-7.85E 3	9E 3	310.246	-25.932
		0.250	190.406	-758.298	-7.46E 3	8.4E 3	310.246	-25.932
		0.333	190.406	-561.813	-7.06E 3	7.81E 3	310.246	-25.932
		0.417	190.406	-365.328	-6.66E 3	7.21E 3	310.246	-25.932
		0.500	190.406	-168.844	-6.26E 3	6.62E 3	310.246	-25.932
		0.583	190.406	27.641	-5.86E 3	6.07E 3	310.246	-25.932
		0.667	190.406	224.125	-5.46E 3	5.87E 3	310.246	-25.932
		0.750	190.406	420.610	-5.06E 3	5.67E 3	310.246	-25.932
		0.833	190.406	617.094	-4.66E 3	5.46E 3	310.246	-25.932
		0.917	190.406	813.679	-4.26E 3	5.26E 3	310.246	-25.932
		1.000	190.406	1.01E 3	-3.86E 3	5.06E 3	310.246	-25.932
	6	0.000	755.183	-1.01E 3	-12.5E 3	14.3E 3	726.716	-19.754
		0.083	753.061	-859.921	-11.6E 3	13.2E 3	726.716	-19.754
		0.167	750.938	-710.249	-10.7E 3	12.1E 3	726.716	-19.754
		0.250	748.816	-560.578	-9.73E 3	11E 3	726.716	-19.754
		0.333	746.693	-410.906	-8.79E 3	9.95E 3	726.716	-19.754
		0.417	744.571	-261.235	-7.85E 3	8.86E 3	726.716	-19.754
		0.500	742.448	-111.563	-6.92E 3	7.77E 3	726.716	-19.754
		0.583	740.326	38.108	-5.98E 3	6.76E 3	726.716	-19.754

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 51	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.667	738.203	187.780	-5.05E 3	5.97E 3	726.716	-19.754
		0.750	736.081	337.451	-4.11E 3	5.18E 3	726.716	-19.754
		0.833	733.958	487.123	-3.17E 3	4.39E 3	726.716	-19.754
		0.917	731.836	636.794	-2.24E 3	3.61E 3	726.716	-19.754
		1.000	729.713	786.466	-1.3E 3	2.82E 3	726.716	-19.754
	7	0.000	705.027	8.742	-6.96E 3	7.67E 3	569.043	-0.181
		0.083	702.904	10.116	-6.23E 3	6.94E 3	569.043	-0.181
		0.167	700.782	11.490	-5.49E 3	6.2E 3	569.043	-0.181
		0.250	698.659	12.864	-4.76E 3	5.47E 3	569.043	-0.181
		0.333	696.537	14.238	-4.03E 3	4.74E 3	569.043	-0.181
		0.417	694.414	15.612	-3.29E 3	4E 3	569.043	-0.181
		0.500	692.292	16.986	-2.56E 3	3.27E 3	569.043	-0.181
		0.583	690.169	18.360	-1.83E 3	2.53E 3	569.043	-0.181
		0.667	688.047	19.734	-1.09E 3	1.8E 3	569.043	-0.181
		0.750	685.924	21.108	-359.555	1.07E 3	569.043	-0.181
		0.833	683.802	22.482	373.665	1.08E 3	569.043	-0.181
		0.917	681.679	23.856	1.11E 3	1.81E 3	569.043	-0.181
		1.000	679.557	25.230	1.84E 3	2.54E 3	569.043	-0.181
	8	0.000	524.841	-1.37E 3	-12E 3	13.9E 3	579.241	-26.607
		0.083	522.718	-1.17E 3	-11.2E 3	12.9E 3	579.241	-26.607
		0.167	520.596	-965.903	-10.5E 3	12E 3	579.241	-26.607
		0.250	518.473	-764.308	-9.72E 3	11E 3	579.241	-26.607
		0.333	516.351	-562.713	-8.98E 3	10.1E 3	579.241	-26.607
		0.417	514.228	-361.118	-8.23E 3	9.11E 3	579.241	-26.607
		0.500	512.106	-159.522	-7.48E 3	8.16E 3	579.241	-26.607
		0.583	509.983	42.073	-6.74E 3	7.29E 3	579.241	-26.607
		0.667	507.861	243.668	-5.99E 3	6.74E 3	579.241	-26.607
		0.750	505.738	445.263	-5.25E 3	6.2E 3	579.241	-26.607
		0.833	503.616	646.858	-4.5E 3	5.65E 3	579.241	-26.607
		0.917	501.493	848.453	-3.75E 3	5.1E 3	579.241	-26.607
		1.000	499.371	1.05E 3	-3.01E 3	4.56E 3	579.241	-26.607
	9	0.000	198.168	-1.38E 3	-9.21E 3	10.8E 3	344.738	-26.643
		0.083	198.168	-1.18E 3	-8.77E 3	10.1E 3	344.738	-26.643
		0.167	198.168	-980.566	-8.32E 3	9.5E 3	344.738	-26.643
		0.250	198.168	-778.696	-7.88E 3	8.88E 3	344.738	-26.643
		0.333	198.168	-576.826	-7.43E 3	8.21E 3	344.738	-26.643
		0.417	198.168	-374.957	-6.99E 3	7.56E 3	344.738	-26.643
		0.500	198.168	-173.087	-6.55E 3	6.92E 3	344.738	-26.643
		0.583	198.168	28.783	-6.1E 3	6.33E 3	344.738	-26.643
		0.667	198.168	230.652	-5.66E 3	6.09E 3	344.738	-26.643
		0.750	198.168	432.522	-5.21E 3	5.84E 3	344.738	-26.643
		0.833	198.168	634.392	-4.77E 3	5.6E 3	344.738	-26.643
		0.917	198.168	836.262	-4.32E 3	5.36E 3	344.738	-26.643
		1.000	198.168	1.04E 3	-3.88E 3	5.12E 3	344.738	-26.643
	10	0.000	354.590	-28.607	-3.31E 3	3.69E 3	268.990	-0.839

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 52	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.083	352.468	-22.247	-2.98E 3	3.34E 3	268.990	-0.839
		0.167	350.345	-15.887	-2.62E 3	2.98E 3	268.990	-0.839
		0.250	348.223	-9.527	-2.27E 3	2.63E 3	268.990	-0.839
		0.333	346.100	-3.167	-1.92E 3	2.27E 3	268.990	-0.839
		0.417	343.978	3.194	-1.58E 3	1.92E 3	268.990	-0.839
		0.500	341.855	9.554	-1.23E 3	1.58E 3	268.990	-0.839
		0.583	339.733	15.914	-882.235	1.24E 3	268.990	-0.839
		0.667	337.610	22.274	-535.642	895.526	268.990	-0.839
		0.750	335.488	28.634	-189.048	553.170	268.990	-0.839
		0.833	333.365	34.994	157.545	525.904	268.990	-0.839
		0.917	331.243	41.354	504.138	876.735	268.990	-0.839
		1.000	329.120	47.714	850.732	1.23E 3	268.990	-0.839
	11	0.000	354.590	-28.607	-3.31E 3	3.69E 3	268.990	-0.839
		0.083	352.468	-22.247	-2.98E 3	3.34E 3	268.990	-0.839
		0.167	350.345	-15.887	-2.62E 3	2.98E 3	268.990	-0.839
		0.250	348.223	-9.527	-2.27E 3	2.63E 3	268.990	-0.839
		0.333	346.100	-3.167	-1.92E 3	2.27E 3	268.990	-0.839
		0.417	343.978	3.194	-1.58E 3	1.92E 3	268.990	-0.839
		0.500	341.855	9.554	-1.23E 3	1.58E 3	268.990	-0.839
		0.583	339.733	15.914	-882.235	1.24E 3	268.990	-0.839
		0.667	337.610	22.274	-535.642	895.526	268.990	-0.839
		0.750	335.488	28.634	-189.048	553.170	268.990	-0.839
		0.833	333.365	34.994	157.545	525.904	268.990	-0.839
		0.917	331.243	41.354	504.138	876.735	268.990	-0.839
		1.000	329.120	47.714	850.732	1.23E 3	268.990	-0.839
	12	0.000	375.660	-29.952	-3.52E 3	3.92E 3	285.937	-0.882
		0.083	373.403	-23.269	-3.15E 3	3.55E 3	285.937	-0.882
		0.167	371.147	-16.587	-2.78E 3	3.17E 3	285.937	-0.882
		0.250	368.891	-9.905	-2.41E 3	2.79E 3	285.937	-0.882
		0.333	366.635	-3.223	-2.04E 3	2.41E 3	285.937	-0.882
		0.417	364.379	3.459	-1.67E 3	2.04E 3	285.937	-0.882
		0.500	362.122	10.141	-1.31E 3	1.68E 3	285.937	-0.882
		0.583	359.866	16.823	-937.818	1.31E 3	285.937	-0.882
		0.667	357.610	23.505	-569.389	950.504	285.937	-0.882
		0.750	355.354	30.187	-200.960	586.501	285.937	-0.882
		0.833	353.097	36.869	167.469	557.436	285.937	-0.882
		0.917	350.841	43.551	535.898	930.290	285.937	-0.882
		1.000	348.585	50.233	904.327	1.3E 3	285.937	-0.882
	13	0.000	375.660	-29.952	-3.52E 3	3.92E 3	285.937	-0.882
		0.083	373.403	-23.269	-3.15E 3	3.55E 3	285.937	-0.882
		0.167	371.147	-16.587	-2.78E 3	3.17E 3	285.937	-0.882
		0.250	368.891	-9.905	-2.41E 3	2.79E 3	285.937	-0.882
		0.333	366.635	-3.223	-2.04E 3	2.41E 3	285.937	-0.882
		0.417	364.379	3.459	-1.67E 3	2.04E 3	285.937	-0.882
		0.500	362.122	10.141	-1.31E 3	1.68E 3	285.937	-0.882

Weaver Boos Consultants Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 53	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.583	359.866	16.823	-937.818	1.31E 3	285.937	-0.882
		0.667	357.610	23.505	-569.389	950.504	285.937	-0.882
		0.750	355.354	30.187	-200.960	586.501	285.937	-0.882
		0.833	353.097	36.869	167.469	557.436	285.937	-0.882
		0.917	350.841	43.551	535.898	930.290	285.937	-0.882
		1.000	348.585	50.233	904.327	1.3E 3	285.937	-0.882
	14	0.000	643.348	-5.239	-6.2E 3	6.85E 3	506.778	-0.460
		0.083	641.125	-1.752	-5.55E 3	6.19E 3	506.778	-0.460
		0.167	638.901	1.736	-4.9E 3	5.54E 3	506.778	-0.460
		0.250	636.678	5.223	-4.24E 3	4.89E 3	506.778	-0.460
		0.333	634.455	8.711	-3.59E 3	4.23E 3	506.778	-0.460
		0.417	632.232	12.198	-2.94E 3	3.58E 3	506.778	-0.460
		0.500	630.009	15.686	-2.28E 3	2.93E 3	506.778	-0.460
		0.583	627.786	19.173	-1.63E 3	2.28E 3	506.778	-0.460
		0.667	625.563	22.661	-978.657	1.63E 3	506.778	-0.460
		0.750	623.340	26.148	-325.875	975.364	506.778	-0.460
		0.833	621.117	29.636	327.106	977.859	506.778	-0.460
		0.917	618.894	33.123	980.088	1.63E 3	506.778	-0.460
		1.000	616.670	36.611	1.63E 3	2.29E 3	506.778	-0.460
	15	0.000	643.348	-5.239	-6.2E 3	6.85E 3	506.778	-0.460
		0.083	641.125	-1.752	-5.55E 3	6.19E 3	506.778	-0.460
		0.167	638.901	1.736	-4.9E 3	5.54E 3	506.778	-0.460
		0.250	636.678	5.223	-4.24E 3	4.89E 3	506.778	-0.460
		0.333	634.455	8.711	-3.59E 3	4.23E 3	506.778	-0.460
		0.417	632.232	12.198	-2.94E 3	3.58E 3	506.778	-0.460
		0.500	630.009	15.686	-2.28E 3	2.93E 3	506.778	-0.460
		0.583	627.786	19.173	-1.63E 3	2.28E 3	506.778	-0.460
		0.667	625.563	22.661	-978.657	1.63E 3	506.778	-0.460
		0.750	623.340	26.148	-325.875	975.364	506.778	-0.460
		0.833	621.117	29.636	327.106	977.859	506.778	-0.460
		0.917	618.894	33.123	980.088	1.63E 3	506.778	-0.460
		1.000	616.670	36.611	1.63E 3	2.29E 3	506.778	-0.460
	16	0.000	761.005	-1.04E 3	-13E 3	14.8E 3	752.585	-20.287
		0.083	758.882	-883.297	-12E 3	13.6E 3	752.585	-20.287
		0.167	756.760	-729.587	-11E 3	12.5E 3	752.585	-20.287
		0.250	754.637	-575.877	-10E 3	11.4E 3	752.585	-20.287
		0.333	752.514	-422.166	-9.08E 3	10.3E 3	752.585	-20.287
		0.417	750.392	-268.456	-8.11E 3	9.12E 3	752.585	-20.287
		0.500	748.270	-114.745	-7.14E 3	8E 3	752.585	-20.287
		0.583	746.147	38.965	-6.17E 3	6.95E 3	752.585	-20.287
		0.667	744.025	192.676	-5.2E 3	6.13E 3	752.585	-20.287
		0.750	741.902	346.386	-4.23E 3	5.32E 3	752.585	-20.287
		0.833	739.779	500.096	-3.26E 3	4.5E 3	752.585	-20.287
		0.917	737.657	653.806	-2.29E 3	3.68E 3	752.585	-20.287
		1.000	735.534	807.517	-1.32E 3	2.86E 3	752.585	-20.287

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 54	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
	17	0.000	532.602	-1.41E 3	-12.6E 3	14.6E 3	613.733	-27.318
		0.083	530.480	-1.2E 3	-11.7E 3	13.6E 3	613.733	-27.318
		0.167	528.357	-991.686	-10.9E 3	12.5E 3	613.733	-27.318
		0.250	526.235	-784.706	-10.1E 3	11.5E 3	613.733	-27.318
		0.333	524.112	-577.726	-9.36E 3	10.5E 3	613.733	-27.318
		0.417	521.990	-370.746	-8.57E 3	9.46E 3	613.733	-27.318
		0.500	519.867	-163.765	-7.77E 3	8.46E 3	613.733	-27.318
		0.583	517.745	43.215	-6.98E 3	7.55E 3	613.733	-27.318
		0.667	515.622	250.195	-6.19E 3	6.96E 3	613.733	-27.318
		0.750	513.500	457.175	-5.4E 3	6.37E 3	613.733	-27.318
		0.833	511.377	664.156	-4.61E 3	5.79E 3	613.733	-27.318
		0.917	509.255	871.136	-3.82E 3	5.2E 3	613.733	-27.318
		1.000	507.132	1.08E 3	-3.03E 3	4.62E 3	613.733	-27.318
9	1	0.000	446.867	-37.341	0.000	484.208	92.419	-0.945
		0.083	448.080	-30.170	119.081	598.249	92.419	-0.945
		0.167	451.112	-23.017	238.162	712.291	92.419	-0.945
		0.250	453.234	-15.855	357.244	826.332	92.419	-0.945
		0.333	455.357	-8.693	476.325	940.374	92.419	-0.945
		0.417	457.479	-1.530	595.406	1.05E 3	92.419	-0.945
		0.500	459.602	5.632	714.487	1.18E 3	92.419	-0.945
		0.583	461.724	12.794	833.568	1.31E 3	92.419	-0.945
		0.667	463.847	19.956	952.649	1.44E 3	92.419	-0.945
		0.750	465.969	27.118	1.07E 3	1.56E 3	92.419	-0.945
		0.833	468.092	34.281	1.19E 3	1.69E 3	92.419	-0.945
		0.917	470.214	41.443	1.31E 3	1.82E 3	92.419	-0.945
		1.000	472.337	48.605	1.43E 3	1.95E 3	92.419	-0.945
	2	0.000	554.402	16.733	-0.000	571.135	96.090	0.202
		0.083	554.402	15.200	123.811	693.413	96.090	0.202
		0.167	554.402	13.667	247.622	815.691	96.090	0.202
		0.250	554.402	12.134	371.434	937.969	96.090	0.202
		0.333	554.402	10.601	495.245	1.06E 3	96.090	0.202
		0.417	554.402	9.068	619.056	1.18E 3	96.090	0.202
		0.500	554.402	7.535	742.867	1.3E 3	96.090	0.202
		0.583	554.402	6.002	866.678	1.43E 3	96.090	0.202
		0.667	554.402	4.469	990.489	1.55E 3	96.090	0.202
		0.750	554.402	2.936	1.11E 3	1.67E 3	96.090	0.202
		0.833	554.402	1.403	1.24E 3	1.79E 3	96.090	0.202
		0.917	554.402	-0.130	1.36E 3	1.92E 3	96.090	0.202
		1.000	554.402	-1.663	1.49E 3	2.04E 3	96.090	0.202
	3	0.000	-0.105	2.744	0.000	-2.849	-0.071	0.090
		0.083	-0.105	2.062	-0.092	-2.259	-0.071	0.090
		0.167	-0.105	1.381	-0.183	-1.669	-0.071	0.090
		0.250	-0.105	0.700	-0.275	-1.080	-0.071	0.090
		0.333	-0.105	0.018	-0.366	-0.490	-0.071	0.090
		0.417	-0.105	-0.663	-0.458	-1.226	-0.071	0.090

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WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 55	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	-0.105	-1.344	-0.550	-1.999	-0.071	0.090
		0.583	-0.105	-2.026	-0.641	-2.772	-0.071	0.090
		0.667	-0.105	-2.707	-0.733	-3.545	-0.071	0.090
		0.750	-0.105	-3.389	-0.824	-4.318	-0.071	0.090
		0.833	-0.105	-4.070	-0.916	-5.091	-0.071	0.090
		0.917	-0.105	-4.751	-1.007	-5.864	-0.071	0.090
		1.000	-0.105	-5.433	-1.099	-6.637	-0.071	0.090
	4	0.000	-0.105	2.744	0.000	-2.849	-0.071	0.090
		0.083	-0.105	2.062	-0.092	-2.259	-0.071	0.090
		0.167	-0.105	1.381	-0.183	-1.669	-0.071	0.090
		0.250	-0.105	0.700	-0.275	-1.080	-0.071	0.090
		0.333	-0.105	0.018	-0.366	-0.490	-0.071	0.090
		0.417	-0.105	-0.663	-0.458	-1.226	-0.071	0.090
		0.500	-0.105	-1.344	-0.550	-1.999	-0.071	0.090
		0.583	-0.105	-2.026	-0.641	-2.772	-0.071	0.090
		0.667	-0.105	-2.707	-0.733	-3.545	-0.071	0.090
		0.750	-0.105	-3.389	-0.824	-4.318	-0.071	0.090
		0.833	-0.105	-4.070	-0.916	-5.091	-0.071	0.090
		0.917	-0.105	-4.751	-1.007	-5.864	-0.071	0.090
		1.000	-0.105	-5.433	-1.099	-6.637	-0.071	0.090
	5	0.000	-104.499	-1.79E 3	-0.000	-1.89E 3	112.498	-24.036
		0.083	-104.499	-1.6E 3	144.954	-1.85E 3	112.498	-24.036
		0.167	-104.499	-1.42E 3	289.907	-1.82E 3	112.498	-24.036
		0.250	-104.499	-1.24E 3	434.861	-1.78E 3	112.498	-24.036
		0.333	-104.499	-1.06E 3	579.814	-1.74E 3	112.498	-24.036
		0.417	-104.499	-875.364	724.768	-1.7E 3	112.498	-24.036
		0.500	-104.499	-693.247	869.722	-1.67E 3	112.498	-24.036
		0.583	-104.499	-511.129	1.01E 3	-1.63E 3	112.498	-24.036
		0.667	-104.499	-329.011	1.16E 3	-1.59E 3	112.498	-24.036
		0.750	-104.499	-146.893	1.3E 3	-1.56E 3	112.498	-24.036
		0.833	-104.499	35.225	1.45E 3	-1.59E 3	112.498	-24.036
		0.917	-104.499	217.343	1.59E 3	-1.92E 3	112.498	-24.036
		1.000	-104.499	399.462	1.74E 3	-2.24E 3	112.498	-24.036
	6	0.000	784.293	-1.36E 3	-0.000	2.15E 3	248.859	-18.821
		0.083	786.416	-1.22E 3	320.655	2.33E 3	248.859	-18.821
		0.167	788.538	-1.08E 3	641.309	2.51E 3	248.859	-18.821
		0.250	790.661	-936.456	961.964	2.69E 3	248.859	-18.821
		0.333	792.783	-793.854	1.28E 3	2.87E 3	248.859	-18.821
		0.417	794.906	-651.253	1.6E 3	3.05E 3	248.859	-18.821
		0.500	797.028	-508.652	1.92E 3	3.23E 3	248.859	-18.821
		0.583	799.151	-366.051	2.24E 3	3.41E 3	248.859	-18.821
		0.667	801.273	-223.450	2.57E 3	3.59E 3	248.859	-18.821
		0.750	803.396	-80.849	2.89E 3	3.77E 3	248.859	-18.821
		0.833	805.518	61.752	3.21E 3	4.07E 3	248.859	-18.821
		0.917	807.641	204.353	3.53E 3	4.54E 3	248.859	-18.821

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 56	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	809.763	346.954	3.86E 3	5E 3	248.859	-18.821
	7	0.000	1E 3	-20.608	-0.000	1.02E 3	188.508	-0.743
		0.083	1E 3	-14.979	242.892	1.26E 3	188.508	-0.743
		0.167	1.01E 3	-9.350	485.785	1.5E 3	188.508	-0.743
		0.250	1.01E 3	-3.721	728.677	1.74E 3	188.508	-0.743
		0.333	1.01E 3	1.909	971.569	1.98E 3	188.508	-0.743
		0.417	1.01E 3	7.538	1.21E 3	2.23E 3	188.508	-0.743
		0.500	1.01E 3	13.167	1.46E 3	2.48E 3	188.508	-0.743
		0.583	1.02E 3	18.796	1.7E 3	2.74E 3	188.508	-0.743
		0.667	1.02E 3	24.426	1.94E 3	2.99E 3	188.508	-0.743
		0.750	1.02E 3	30.055	2.19E 3	3.24E 3	188.508	-0.743
		0.833	1.02E 3	35.684	2.43E 3	3.49E 3	188.508	-0.743
		0.917	1.02E 3	41.313	2.67E 3	3.74E 3	188.508	-0.743
		1.000	1.03E 3	46.942	2.91E 3	3.99E 3	188.508	-0.743
	8	0.000	342.367	-1.82E 3	-0.000	2.17E 3	204.917	-24.982
		0.083	344.490	-1.63E 3	264.035	2.24E 3	204.917	-24.982
		0.167	346.612	-1.44E 3	528.070	2.32E 3	204.917	-24.982
		0.250	348.735	-1.26E 3	792.104	2.4E 3	204.917	-24.982
		0.333	350.857	-1.07E 3	1.06E 3	2.47E 3	204.917	-24.982
		0.417	352.980	-876.895	1.32E 3	2.55E 3	204.917	-24.982
		0.500	355.102	-687.615	1.58E 3	2.63E 3	204.917	-24.982
		0.583	357.225	-498.335	1.85E 3	2.7E 3	204.917	-24.982
		0.667	359.347	-309.054	2.11E 3	2.78E 3	204.917	-24.982
		0.750	361.470	-119.774	2.38E 3	2.86E 3	204.917	-24.982
		0.833	363.592	69.506	2.64E 3	3.07E 3	204.917	-24.982
		0.917	365.715	258.786	2.9E 3	3.53E 3	204.917	-24.982
		1.000	367.837	448.067	3.17E 3	3.98E 3	204.917	-24.982
	9	0.000	-107.164	-1.83E 3	-0.000	-1.94E 3	117.204	-24.653
		0.083	-107.164	-1.64E 3	151.017	-1.9E 3	117.204	-24.653
		0.167	-107.164	-1.46E 3	302.035	-1.86E 3	117.204	-24.653
		0.250	-107.164	-1.27E 3	453.052	-1.83E 3	117.204	-24.653
		0.333	-107.164	-1.08E 3	604.069	-1.79E 3	117.204	-24.653
		0.417	-107.164	-895.054	755.087	-1.76E 3	117.204	-24.653
		0.500	-107.164	-708.261	906.104	-1.72E 3	117.204	-24.653
		0.583	-107.164	-521.468	1.06E 3	-1.69E 3	117.204	-24.653
		0.667	-107.164	-334.676	1.21E 3	-1.65E 3	117.204	-24.653
		0.750	-107.164	-147.883	1.36E 3	-1.61E 3	117.204	-24.653
		0.833	-107.164	38.910	1.51E 3	-1.66E 3	117.204	-24.653
		0.917	-107.164	225.703	1.66E 3	-1.99E 3	117.204	-24.653
		1.000	-107.164	412.496	1.81E 3	-2.33E 3	117.204	-24.653
	10	0.000	446.793	-35.421	0.000	482.214	92.369	-0.882
		0.083	448.915	-28.736	119.017	596.668	92.369	-0.882
		0.167	451.038	-22.050	238.034	711.122	92.369	-0.882
		0.250	453.160	-15.365	357.051	825.577	92.369	-0.882
		0.333	455.283	-8.680	476.068	940.031	92.369	-0.882

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 57	Rev
	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	457.405	-1.995	595.085	1.05E 3	92.369	-0.882
		0.500	459.528	4.691	714.102	1.18E 3	92.369	-0.882
		0.583	461.650	11.376	833.119	1.31E 3	92.369	-0.882
		0.667	463.773	18.061	952.137	1.43E 3	92.369	-0.882
		0.750	465.895	24.746	1.07E 3	1.56E 3	92.369	-0.882
		0.833	468.018	31.432	1.19E 3	1.69E 3	92.369	-0.882
		0.917	470.140	38.117	1.31E 3	1.82E 3	92.369	-0.882
		1.000	472.263	44.802	1.43E 3	1.95E 3	92.369	-0.882
	11	0.000	446.793	-35.421	0.000	482.214	92.369	-0.882
		0.083	448.915	-28.736	119.017	596.668	92.369	-0.882
		0.167	451.038	-22.050	238.034	711.122	92.369	-0.882
		0.250	453.160	-15.365	357.051	825.577	92.369	-0.882
		0.333	455.283	-8.680	476.068	940.031	92.369	-0.882
		0.417	457.405	-1.995	595.085	1.05E 3	92.369	-0.882
		0.500	459.528	4.691	714.102	1.18E 3	92.369	-0.882
		0.583	461.650	11.376	833.119	1.31E 3	92.369	-0.882
		0.667	463.773	18.061	952.137	1.43E 3	92.369	-0.882
		0.750	465.895	24.746	1.07E 3	1.56E 3	92.369	-0.882
		0.833	468.018	31.432	1.19E 3	1.69E 3	92.369	-0.882
		0.917	470.140	38.117	1.31E 3	1.82E 3	92.369	-0.882
		1.000	472.263	44.802	1.43E 3	1.95E 3	92.369	-0.882
	12	0.000	474.945	-37.773	0.000	512.719	98.191	-0.942
		0.083	477.202	-30.637	126.519	634.358	98.191	-0.942
		0.167	479.458	-23.500	253.038	755.997	98.191	-0.942
		0.250	481.714	-16.364	379.558	877.635	98.191	-0.942
		0.333	483.970	-9.227	506.077	999.274	98.191	-0.942
		0.417	486.226	-2.091	632.596	1.12E 3	98.191	-0.942
		0.500	488.483	5.045	759.115	1.25E 3	98.191	-0.942
		0.583	490.739	12.182	885.634	1.39E 3	98.191	-0.942
		0.667	492.995	19.318	1.01E 3	1.52E 3	98.191	-0.942
		0.750	495.251	26.455	1.14E 3	1.66E 3	98.191	-0.942
		0.833	497.508	33.591	1.27E 3	1.8E 3	98.191	-0.942
		0.917	499.764	40.728	1.39E 3	1.93E 3	98.191	-0.942
		1.000	502.020	47.864	1.52E 3	2.07E 3	98.191	-0.942
	13	0.000	474.945	-37.773	0.000	512.719	98.191	-0.942
		0.083	477.202	-30.637	126.519	634.358	98.191	-0.942
		0.167	479.458	-23.500	253.038	755.997	98.191	-0.942
		0.250	481.714	-16.364	379.558	877.635	98.191	-0.942
		0.333	483.970	-9.227	506.077	999.274	98.191	-0.942
		0.417	486.226	-2.091	632.596	1.12E 3	98.191	-0.942
		0.500	488.483	5.045	759.115	1.25E 3	98.191	-0.942
		0.583	490.739	12.182	885.634	1.39E 3	98.191	-0.942
		0.667	492.995	19.318	1.01E 3	1.52E 3	98.191	-0.942
		0.750	495.251	26.455	1.14E 3	1.66E 3	98.191	-0.942
		0.833	497.508	33.591	1.27E 3	1.8E 3	98.191	-0.942

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Job Title Crest Pad Bldg	Ref	
	By MHF Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	499.764	40.728	1.39E 3	1.93E 3	98.191	-0.942
		1.000	502.020	47.864	1.52E 3	2.07E 3	98.191	-0.942
	14	0.000	883.794	-25.121	-0.000	908.915	168.829	-0.791
		0.083	886.017	-19.127	217.536	1.12E 3	168.829	-0.791
		0.167	888.240	-13.133	435.072	1.34E 3	168.829	-0.791
		0.250	890.463	-7.138	652.608	1.55E 3	168.829	-0.791
		0.333	892.686	-1.144	870.144	1.76E 3	168.829	-0.791
		0.417	894.910	4.850	1.09E 3	1.99E 3	168.829	-0.791
		0.500	897.133	10.844	1.31E 3	2.21E 3	168.829	-0.791
		0.583	899.356	16.839	1.52E 3	2.44E 3	168.829	-0.791
		0.667	901.579	22.833	1.74E 3	2.66E 3	168.829	-0.791
		0.750	903.802	28.827	1.96E 3	2.89E 3	168.829	-0.791
		0.833	906.025	34.821	2.18E 3	3.12E 3	168.829	-0.791
		0.917	908.248	40.816	2.39E 3	3.34E 3	168.829	-0.791
		1.000	910.471	46.810	2.61E 3	3.57E 3	168.829	-0.791
	15	0.000	883.794	-25.121	-0.000	908.915	168.829	-0.791
		0.083	886.017	-19.127	217.536	1.12E 3	168.829	-0.791
		0.167	888.240	-13.133	435.072	1.34E 3	168.829	-0.791
		0.250	890.463	-7.138	652.608	1.55E 3	168.829	-0.791
		0.333	892.686	-1.144	870.144	1.76E 3	168.829	-0.791
		0.417	894.910	4.850	1.09E 3	1.99E 3	168.829	-0.791
		0.500	897.133	10.844	1.31E 3	2.21E 3	168.829	-0.791
		0.583	899.356	16.839	1.52E 3	2.44E 3	168.829	-0.791
		0.667	901.579	22.833	1.74E 3	2.66E 3	168.829	-0.791
		0.750	903.802	28.827	1.96E 3	2.89E 3	168.829	-0.791
		0.833	906.025	34.821	2.18E 3	3.12E 3	168.829	-0.791
		0.917	908.248	40.816	2.39E 3	3.34E 3	168.829	-0.791
		1.000	910.471	46.810	2.61E 3	3.57E 3	168.829	-0.791
	16	0.000	782.295	-1.4E 3	-0.000	2.18E 3	252.389	-19.283
		0.083	784.417	-1.25E 3	325.203	2.36E 3	252.389	-19.283
		0.167	786.540	-1.1E 3	650.405	2.54E 3	252.389	-19.283
		0.250	788.662	-958.234	975.608	2.72E 3	252.389	-19.283
		0.333	790.785	-812.127	1.3E 3	2.9E 3	252.389	-19.283
		0.417	792.907	-666.020	1.63E 3	3.08E 3	252.389	-19.283
		0.500	795.030	-519.913	1.95E 3	3.27E 3	252.389	-19.283
		0.583	797.152	-373.806	2.28E 3	3.45E 3	252.389	-19.283
		0.667	799.275	-227.699	2.6E 3	3.63E 3	252.389	-19.283
		0.750	801.397	-81.591	2.93E 3	3.81E 3	252.389	-19.283
		0.833	803.520	64.516	3.25E 3	4.12E 3	252.389	-19.283
		0.917	805.642	210.623	3.58E 3	4.59E 3	252.389	-19.283
		1.000	807.765	356.730	3.9E 3	5.07E 3	252.389	-19.283
	17	0.000	339.703	-1.87E 3	-0.000	2.21E 3	209.623	-25.599
		0.083	341.825	-1.67E 3	270.098	2.28E 3	209.623	-25.599
		0.167	343.948	-1.48E 3	540.197	2.36E 3	209.623	-25.599
		0.250	346.070	-1.28E 3	810.295	2.44E 3	209.623	-25.599

Weaver Boos Consultants Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 59	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	348.193	-1.09E 3	1.08E 3	2.52E 3	209.623	-25.599
		0.417	350.315	-896.585	1.35E 3	2.6E 3	209.623	-25.599
		0.500	352.438	-702.630	1.62E 3	2.68E 3	209.623	-25.599
		0.583	354.560	-508.675	1.89E 3	2.75E 3	209.623	-25.599
		0.667	356.683	-314.719	2.16E 3	2.83E 3	209.623	-25.599
		0.750	358.805	-120.764	2.43E 3	2.91E 3	209.623	-25.599
		0.833	360.928	73.191	2.7E 3	3.14E 3	209.623	-25.599
		0.917	363.050	267.146	2.97E 3	3.6E 3	209.623	-25.599
		1.000	365.173	461.101	3.24E 3	4.07E 3	209.623	-25.599
10	1	0.000	272.687	52.608	-5.42E 3	5.74E 3	1.09E 3	2.904
		0.083	267.934	26.046	-3.8E 3	4.09E 3	993.981	2.904
		0.167	263.180	-0.516	-2.32E 3	2.59E 3	898.953	2.904
		0.250	258.427	-27.078	-998.935	1.28E 3	803.925	2.904
		0.333	253.673	-53.639	177.823	485.135	708.897	2.904
		0.417	248.920	-80.201	1.21E 3	1.54E 3	613.870	2.904
		0.500	244.166	-106.763	2.09E 3	2.44E 3	518.842	2.904
		0.583	239.412	-133.325	2.82E 3	3.19E 3	423.814	2.904
		0.667	234.659	-159.887	3.41E 3	3.8E 3	328.786	2.904
		0.750	229.905	-186.448	3.84E 3	4.26E 3	233.758	2.904
		0.833	225.152	-213.010	4.13E 3	4.57E 3	138.730	2.904
		0.917	220.398	-239.572	4.28E 3	4.74E 3	43.702	2.904
		1.000	215.645	-266.134	4.27E 3	4.75E 3	-43.938	2.904
	2	0.000	292.780	57.644	-5.82E 3	6.17E 3	1.16E 3	3.354
		0.083	287.743	26.963	-4.08E 3	4.4E 3	1.06E 3	3.354
		0.167	282.707	-3.717	-2.51E 3	2.8E 3	961.890	3.354
		0.250	277.670	-34.398	-1.09E 3	1.4E 3	861.242	3.354
		0.333	272.634	-65.079	169.712	507.424	760.593	3.354
		0.417	267.597	-95.759	1.27E 3	1.64E 3	659.944	3.354
		0.500	262.561	-126.440	2.22E 3	2.61E 3	559.296	3.354
		0.583	257.524	-157.120	3.01E 3	3.43E 3	458.647	3.354
		0.667	252.487	-187.801	3.65E 3	4.09E 3	357.998	3.354
		0.750	247.451	-218.482	4.13E 3	4.59E 3	257.350	3.354
		0.833	242.414	-249.162	4.45E 3	4.94E 3	156.701	3.354
		0.917	237.378	-279.843	4.62E 3	5.13E 3	56.053	3.354
		1.000	232.341	-310.523	4.63E 3	5.17E 3	-37.209	3.354
	3	0.000	16.521	-0.957	0.710	18.188	0.004	-0.076
		0.083	16.521	-0.264	0.716	17.500	0.004	-0.076
		0.167	16.521	0.430	0.722	17.673	0.004	-0.076
		0.250	16.521	1.124	0.728	18.373	0.004	-0.076
		0.333	16.521	1.817	0.734	19.072	0.004	-0.076
		0.417	16.521	2.511	0.740	19.772	0.004	-0.076
		0.500	16.521	3.204	0.746	20.471	0.004	-0.076
		0.583	16.521	3.898	0.752	21.171	0.004	-0.076
		0.667	16.521	4.592	0.758	21.871	0.004	-0.076
		0.750	16.521	5.285	0.764	22.570	0.004	-0.076

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	16.521	5.979	0.770	23.270	0.004	-0.078
		0.917	16.521	6.672	0.776	23.970	0.004	-0.076
		1.000	16.521	7.366	0.782	24.669	0.004	-0.076
	4	0.000	16.521	-0.957	0.710	18.188	0.004	-0.076
		0.083	16.521	-0.264	0.716	17.500	0.004	-0.076
		0.167	16.521	0.430	0.722	17.673	0.004	-0.076
		0.250	16.521	1.124	0.728	18.373	0.004	-0.076
		0.333	16.521	1.817	0.734	19.072	0.004	-0.078
		0.417	16.521	2.511	0.740	19.772	0.004	-0.076
		0.500	16.521	3.204	0.746	20.471	0.004	-0.076
		0.583	16.521	3.898	0.752	21.171	0.004	-0.076
		0.667	16.521	4.592	0.758	21.871	0.004	-0.076
		0.750	16.521	5.285	0.764	22.570	0.004	-0.076
		0.833	16.521	5.979	0.770	23.270	0.004	-0.076
		0.917	16.521	6.672	0.776	23.970	0.004	-0.076
		1.000	16.521	7.366	0.782	24.669	0.004	-0.076
	5	0.000	-14.306	-1.24E 3	2.2E 3	-3.46E 3	-119.061	-18.135
		0.083	-14.306	-1.08E 3	2.02E 3	-3.11E 3	-119.061	-18.135
		0.167	-14.306	-909.854	1.83E 3	-2.76E 3	-119.061	-18.135
		0.250	-14.306	-743.952	1.65E 3	-2.41E 3	-119.061	-18.135
		0.333	-14.306	-578.050	1.46E 3	-2.06E 3	-119.061	-18.135
		0.417	-14.306	-412.148	1.28E 3	-1.71E 3	-119.061	-18.135
		0.500	-14.306	-246.246	1.09E 3	-1.35E 3	-119.061	-18.135
		0.583	-14.306	-80.343	908.332	-1E 3	-119.061	-18.135
		0.667	-14.306	85.559	723.106	-822.971	-119.061	-18.135
		0.750	-14.306	251.461	537.881	-803.648	-119.061	-18.135
		0.833	-14.306	417.363	352.656	-784.325	-119.061	-18.135
		0.917	-14.306	583.265	167.430	-765.002	-119.061	-18.136
		1.000	-14.306	749.167	-17.795	-781.268	-119.061	-18.135
	6	0.000	481.543	-835.403	-8.12E 3	9.44E 3	1.87E 3	-8.182
		0.083	473.012	-760.549	-5.34E 3	6.58E 3	1.7E 3	-8.182
		0.167	464.481	-685.694	-2.83E 3	3.98E 3	1.53E 3	-8.182
		0.250	455.950	-610.840	-580.892	1.65E 3	1.36E 3	-8.182
		0.333	447.419	-535.986	1.4E 3	2.39E 3	1.19E 3	-8.182
		0.417	438.888	-481.131	3.12E 3	4.02E 3	1.02E 3	-8.182
		0.500	430.357	-386.277	4.58E 3	5.39E 3	849.017	-8.182
		0.583	421.826	-311.423	5.76E 3	6.5E 3	678.503	-8.182
		0.667	413.295	-236.568	6.69E 3	7.34E 3	507.989	-8.182
		0.750	404.764	-161.714	7.34E 3	7.91E 3	337.474	-8.182
		0.833	396.233	-86.860	7.74E 3	8.22E 3	168.960	-8.182
		0.917	387.702	-12.005	7.88E 3	8.28E 3	-3.554	-8.182
		1.000	379.171	62.849	7.73E 3	8.17E 3	-161.141	-8.182
	7	0.000	565.467	110.252	-11.2E 3	11.9E 3	2.25E 3	6.257
		0.083	555.677	53.009	-7.88E 3	8.49E 3	2.06E 3	6.257
		0.167	545.887	-4.233	-4.63E 3	5.38E 3	1.86E 3	6.257

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Software licensed to Weaver Boos Consultants

Job Title Crest Pad Bldg

Client Washington Closure Hanford

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	536.097	-61.476	-2.09E 3	2.69E 3	1.67E 3	6.257
		0.333	526.307	-118.718	347.535	992.560	1.47E 3	6.257
		0.417	516.517	-175.960	2.48E 3	3.17E 3	1.27E 3	6.257
		0.500	506.727	-233.203	4.31E 3	5.05E 3	1.08E 3	6.257
		0.583	496.936	-290.445	5.84E 3	6.62E 3	882.461	6.257
		0.667	487.146	-347.688	7.06E 3	7.89E 3	686.784	6.257
		0.750	477.356	-404.930	7.97E 3	8.86E 3	491.108	6.257
		0.833	467.566	-462.172	8.58E 3	9.51E 3	295.431	6.257
		0.917	457.776	-519.415	8.89E 3	9.87E 3	99.755	6.257
		1.000	447.986	-576.657	8.9E 3	9.92E 3	-81.147	6.257
	8	0.000	258.381	-1.19E 3	-3.21E 3	4.66E 3	969.947	-15.232
		0.083	253.628	-1.05E 3	-1.78E 3	3.08E 3	874.920	-15.232
		0.167	248.874	-910.370	-489.071	1.65E 3	779.892	-15.232
		0.250	244.121	-771.029	650.298	1.67E 3	684.864	-15.232
		0.333	239.367	-631.689	1.64E 3	2.61E 3	589.836	-15.232
		0.417	234.613	-492.349	2.49E 3	3.21E 3	494.808	-15.232
		0.500	229.860	-353.009	3.18E 3	3.76E 3	399.780	-15.232
		0.583	225.106	-213.668	3.73E 3	4.17E 3	304.752	-15.232
		0.667	220.353	-74.328	4.13E 3	4.42E 3	209.724	-15.232
		0.750	215.599	65.012	4.38E 3	4.66E 3	114.697	-15.232
		0.833	210.846	204.353	4.49E 3	4.9E 3	19.669	-15.232
		0.917	206.092	343.693	4.44E 3	4.99E 3	-75.359	-15.232
		1.000	201.338	483.033	4.25E 3	4.94E 3	-163.000	-15.232
	9	0.000	-14.826	-1.28E 3	2.27E 3	-3.56E 3	-121.343	-18.099
		0.083	-14.826	-1.11E 3	2.08E 3	-3.21E 3	-121.343	-18.099
		0.167	-14.826	-944.156	1.89E 3	-2.85E 3	-121.343	-18.099
		0.250	-14.826	-778.589	1.7E 3	-2.5E 3	-121.343	-18.099
		0.333	-14.826	-613.022	1.52E 3	-2.14E 3	-121.343	-18.099
		0.417	-14.826	-447.454	1.33E 3	-1.79E 3	-121.343	-18.099
		0.500	-14.826	-281.887	1.14E 3	-1.43E 3	-121.343	-18.099
		0.583	-14.826	-116.319	949.293	-1.08E 3	-121.343	-18.099
		0.667	-14.826	49.248	760.519	-824.593	-121.343	-18.099
		0.750	-14.826	214.815	571.745	-801.367	-121.343	-18.099
		0.833	-14.826	380.383	382.971	-778.180	-121.343	-18.099
		0.917	-14.826	545.950	194.197	-754.973	-121.343	-18.099
		1.000	-14.826	711.517	5.423	-731.767	-121.343	-18.099
	10	0.000	284.252	51.938	-5.42E 3	5.75E 3	1.09E 3	2.850
		0.083	279.498	25.862	-3.8E 3	4.1E 3	993.984	2.850
		0.167	274.745	-0.215	-2.32E 3	2.6E 3	898.956	2.850
		0.250	269.991	-26.291	-998.426	1.29E 3	803.928	2.850
		0.333	265.238	-52.367	178.337	495.942	708.900	2.850
		0.417	260.484	-78.444	1.21E 3	1.55E 3	613.872	2.850
		0.500	255.731	-104.520	2.08E 3	2.45E 3	518.844	2.850
		0.583	250.977	-130.596	2.82E 3	3.2E 3	423.816	2.850
		0.667	246.223	-156.672	3.41E 3	3.81E 3	328.789	2.850

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	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.750	241.470	-182.749	3.84E 3	4.27E 3	233.761	2.850
		0.833	236.716	-208.825	4.13E 3	4.58E 3	138.733	2.850
		0.917	231.963	-234.901	4.28E 3	4.74E 3	43.705	2.850
		1.000	227.209	-260.978	4.27E 3	4.76E 3	-43.936	2.850
	11	0.000	284.252	51.938	-5.42E 3	5.75E 3	1.09E 3	2.850
		0.083	279.498	25.862	-3.8E 3	4.1E 3	993.984	2.850
		0.167	274.745	-0.215	-2.32E 3	2.6E 3	898.956	2.850
		0.250	269.991	-26.291	-998.426	1.29E 3	803.928	2.850
		0.333	265.238	-52.367	178.337	495.942	708.900	2.850
		0.417	260.484	-78.444	1.21E 3	1.55E 3	613.872	2.850
		0.500	255.731	-104.520	2.09E 3	2.45E 3	518.844	2.850
		0.583	250.977	-130.596	2.82E 3	3.2E 3	423.816	2.850
		0.667	246.223	-156.672	3.41E 3	3.81E 3	328.789	2.850
		0.750	241.470	-182.749	3.84E 3	4.27E 3	233.761	2.850
		0.833	236.716	-208.825	4.13E 3	4.58E 3	138.733	2.850
		0.917	231.963	-234.901	4.28E 3	4.74E 3	43.705	2.850
		1.000	227.209	-260.978	4.27E 3	4.76E 3	-43.936	2.850
	12	0.000	301.431	55.252	-5.76E 3	6.11E 3	1.16E 3	3.033
		0.083	296.378	27.502	-4.03E 3	4.36E 3	1.06E 3	3.033
		0.167	291.325	-0.247	-2.47E 3	2.76E 3	955.590	3.033
		0.250	286.272	-27.997	-1.06E 3	1.38E 3	854.575	3.033
		0.333	281.219	-55.747	189.540	526.505	753.561	3.033
		0.417	276.166	-83.496	1.28E 3	1.64E 3	652.546	3.033
		0.500	271.113	-111.246	2.22E 3	2.6E 3	551.531	3.033
		0.583	266.060	-138.996	3E 3	3.4E 3	450.517	3.033
		0.667	261.007	-166.745	3.62E 3	4.05E 3	349.502	3.033
		0.750	255.954	-194.495	4.09E 3	4.54E 3	248.488	3.033
		0.833	250.901	-222.245	4.39E 3	4.87E 3	147.473	3.033
		0.917	245.848	-249.994	4.55E 3	5.04E 3	46.458	3.033
		1.000	240.795	-277.744	4.54E 3	5.06E 3	-46.704	3.033
	13	0.000	301.431	55.252	-5.76E 3	6.11E 3	1.16E 3	3.033
		0.083	296.378	27.502	-4.03E 3	4.36E 3	1.06E 3	3.033
		0.167	291.325	-0.247	-2.47E 3	2.76E 3	955.590	3.033
		0.250	286.272	-27.997	-1.06E 3	1.38E 3	854.575	3.033
		0.333	281.219	-55.747	189.540	526.505	753.561	3.033
		0.417	276.166	-83.496	1.28E 3	1.64E 3	652.546	3.033
		0.500	271.113	-111.246	2.22E 3	2.6E 3	551.531	3.033
		0.583	266.060	-138.996	3E 3	3.4E 3	450.517	3.033
		0.667	261.007	-166.745	3.62E 3	4.05E 3	349.502	3.033
		0.750	255.954	-194.495	4.09E 3	4.54E 3	248.488	3.033
		0.833	250.901	-222.245	4.39E 3	4.87E 3	147.473	3.033
		0.917	245.848	-249.994	4.55E 3	5.04E 3	46.458	3.033
		1.000	240.795	-277.744	4.54E 3	5.06E 3	-46.704	3.033
	14	0.000	513.871	97.832	-10E 3	10.6E 3	2.01E 3	5.517
		0.083	505.115	47.365	-7.04E 3	7.59E 3	1.84E 3	5.517

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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.167	496.359	-3.102	-4.32E 3	4.82E 3	1.66E 3	5.517
		0.250	487.602	-53.570	-1.86E 3	2.41E 3	1.49E 3	5.517
		0.333	478.846	-104.037	313.921	896.804	1.31E 3	5.517
		0.417	470.090	-154.504	2.22E 3	2.84E 3	1.14E 3	5.517
		0.500	461.333	-204.971	3.85E 3	4.52E 3	962.909	5.517
		0.583	452.577	-255.438	5.22E 3	5.92E 3	787.890	5.517
		0.667	443.821	-305.905	6.31E 3	7.06E 3	612.871	5.517
		0.750	435.064	-356.373	7.12E 3	7.91E 3	437.853	5.517
		0.833	426.308	-406.840	7.67E 3	8.5E 3	262.834	5.517
		0.917	417.552	-457.307	7.94E 3	8.82E 3	87.815	5.517
		1.000	408.795	-507.774	7.94E 3	8.86E 3	-73.926	5.517
	15	0.000	513.871	97.832	-10E 3	10.6E 3	2.01E 3	5.517
		0.083	505.115	47.365	-7.04E 3	7.69E 3	1.84E 3	5.517
		0.167	496.359	-3.102	-4.32E 3	4.82E 3	1.66E 3	5.517
		0.250	487.602	-53.570	-1.86E 3	2.41E 3	1.49E 3	5.517
		0.333	478.846	-104.037	313.921	896.804	1.31E 3	5.517
		0.417	470.090	-154.504	2.22E 3	2.84E 3	1.14E 3	5.517
		0.500	461.333	-204.971	3.85E 3	4.52E 3	962.909	5.517
		0.583	452.577	-255.438	5.22E 3	5.92E 3	787.890	5.517
		0.667	443.821	-305.905	6.31E 3	7.06E 3	612.871	5.517
		0.750	435.064	-356.373	7.12E 3	7.91E 3	437.853	5.517
		0.833	426.308	-406.840	7.67E 3	8.5E 3	262.834	5.517
		0.917	417.552	-457.307	7.94E 3	8.82E 3	87.815	5.517
		1.000	408.795	-507.774	7.94E 3	8.86E 3	-73.926	5.517
	16	0.000	481.153	-860.628	-8.08E 3	9.42E 3	1.87E 3	-8.155
		0.083	472.622	-786.024	-5.3E 3	6.56E 3	1.7E 3	-8.155
		0.167	464.091	-711.421	-2.79E 3	3.96E 3	1.53E 3	-8.155
		0.250	455.560	-636.818	-539.525	1.63E 3	1.36E 3	-8.155
		0.333	447.029	-562.214	1.44E 3	2.45E 3	1.19E 3	-8.155
		0.417	438.498	-487.611	3.16E 3	4.08E 3	1.02E 3	-8.155
		0.500	429.967	-413.008	4.61E 3	5.45E 3	847.308	-8.155
		0.583	421.436	-338.405	5.79E 3	6.55E 3	676.792	-8.155
		0.667	412.905	-263.801	6.71E 3	7.39E 3	506.276	-8.155
		0.750	404.374	-189.198	7.37E 3	7.96E 3	335.763	-8.155
		0.833	395.843	-114.595	7.76E 3	8.27E 3	165.249	-8.155
		0.917	387.312	-39.992	7.88E 3	8.31E 3	-5.265	-8.155
		1.000	378.781	34.612	7.74E 3	8.16E 3	-162.852	-8.155
	17	0.000	257.861	-1.22E 3	-3.15E 3	4.63E 3	967.666	-15.195
		0.083	253.108	-1.08E 3	-1.71E 3	3.05E 3	872.638	-15.195
		0.167	248.354	-944.672	-430.365	1.82E 3	777.611	-15.195
		0.250	243.600	-805.667	705.454	1.75E 3	682.583	-15.195
		0.333	238.847	-666.661	1.69E 3	2.6E 3	587.555	-15.195
		0.417	234.093	-527.655	2.53E 3	3.3E 3	492.527	-15.195
		0.500	229.340	-388.650	3.23E 3	3.84E 3	397.499	-15.195
		0.583	224.586	-249.644	3.77E 3	4.24E 3	302.471	-15.195

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.667	219.833	-110.639	4.17E 3	4.6E 3	207.443	-15.195
		0.750	215.079	28.367	4.42E 3	4.66E 3	112.415	-15.195
		0.833	210.325	167.372	4.52E 3	4.89E 3	17.388	-15.195
		0.917	205.572	306.378	4.47E 3	4.98E 3	-77.640	-15.195
		1.000	200.818	445.384	4.28E 3	4.92E 3	-165.281	-15.195
11	1	0.000	215.088	-261.068	4.27E 3	4.75E 3	51.464	-2.755
		0.083	219.842	-235.863	4.26E 3	4.73E 3	-43.564	-2.755
		0.167	224.595	-210.659	4.13E 3	4.57E 3	-138.591	-2.755
		0.250	229.349	-185.455	3.85E 3	4.26E 3	-233.619	-2.755
		0.333	234.102	-160.251	3.41E 3	3.8E 3	-328.647	-2.755
		0.417	238.856	-135.047	2.82E 3	3.2E 3	-423.675	-2.755
		0.500	243.610	-109.842	2.09E 3	2.44E 3	-518.703	-2.755
		0.583	248.363	-84.638	1.21E 3	1.54E 3	-613.731	-2.755
		0.667	253.117	-59.434	179.972	492.523	-708.759	-2.755
		0.750	257.870	-34.230	-996.570	1.29E 3	-803.786	-2.755
		0.833	262.624	-9.026	-2.32E 3	2.59E 3	-898.814	-2.755
		0.917	267.377	16.179	-3.79E 3	4.08E 3	-993.842	-2.755
		1.000	272.131	41.383	-5.41E 3	5.73E 3	-1.08E 3	-2.755
	2	0.000	231.802	-305.683	4.63E 3	5.16E 3	44.644	-3.213
		0.083	236.839	-276.286	4.62E 3	5.13E 3	-56.005	-3.213
		0.167	241.875	-246.889	4.45E 3	4.94E 3	-156.653	-3.213
		0.250	246.912	-217.493	4.13E 3	4.59E 3	-257.302	-3.213
		0.333	251.948	-188.096	3.65E 3	4.09E 3	-357.950	-3.213
		0.417	256.985	-158.699	3.02E 3	3.43E 3	-458.599	-3.213
		0.500	262.022	-129.303	2.22E 3	2.62E 3	-559.248	-3.213
		0.583	267.058	-99.906	1.28E 3	1.64E 3	-659.896	-3.213
		0.667	272.095	-70.510	170.731	513.335	-760.545	-3.213
		0.750	277.131	-41.113	-1.09E 3	1.41E 3	-861.194	-3.213
		0.833	282.168	-11.716	-2.51E 3	2.8E 3	-961.842	-3.213
		0.917	287.204	17.680	-4.08E 3	4.39E 3	-1.06E 3	-3.213
		1.000	292.241	47.077	-5.81E 3	6.15E 3	-1.16E 3	-3.213
	3	0.000	16.525	7.266	0.782	24.573	-0.020	0.074
		0.083	16.525	6.589	0.751	23.865	-0.020	0.074
		0.167	16.525	5.912	0.720	23.156	-0.020	0.074
		0.250	16.525	5.235	0.688	22.448	-0.020	0.074
		0.333	16.525	4.558	0.657	21.740	-0.020	0.074
		0.417	16.525	3.882	0.625	21.032	-0.020	0.074
		0.500	16.525	3.205	0.594	20.323	-0.020	0.074
		0.583	16.525	2.528	0.562	19.615	-0.020	0.074
		0.667	16.525	1.851	0.531	18.907	-0.020	0.074
		0.750	16.525	1.174	0.499	18.198	-0.020	0.074
		0.833	16.525	0.498	0.468	17.490	-0.020	0.074
		0.917	16.525	-0.179	0.438	17.140	-0.020	0.074
		1.000	16.525	-0.856	0.405	17.786	-0.020	0.074
	4	0.000	16.525	7.266	0.782	24.573	-0.020	0.074

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	Part			
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	By MHF	Date 20-Feb-07	Chd WW	
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14		

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.083	16.525	6.589	0.751	23.865	-0.020	0.074
		0.167	16.525	5.912	0.720	23.156	-0.020	0.074
		0.250	16.525	5.235	0.688	22.448	-0.020	0.074
		0.333	16.525	4.558	0.657	21.740	-0.020	0.074
		0.417	16.525	3.882	0.626	21.032	-0.020	0.074
		0.500	16.525	3.205	0.594	20.323	-0.020	0.074
		0.583	16.525	2.528	0.562	19.615	-0.020	0.074
		0.667	16.525	1.851	0.531	18.907	-0.020	0.074
		0.750	16.525	1.174	0.499	18.198	-0.020	0.074
		0.833	16.525	0.498	0.468	17.490	-0.020	0.074
		0.917	16.525	-0.179	0.436	17.140	-0.020	0.074
		1.000	16.525	-0.856	0.405	17.786	-0.020	0.074
	5	0.000	46.226	-619.503	-17.798	683.627	-115.687	-16.615
		0.083	46.226	-467.510	-197.774	711.509	-115.687	-16.615
		0.167	46.226	-315.517	-377.749	739.492	-115.687	-16.615
		0.250	46.226	-163.524	-557.724	767.474	-115.687	-16.615
		0.333	46.226	-11.531	-737.699	795.457	-115.687	-16.615
		0.417	46.226	140.461	-917.675	1.1E 3	-115.687	-16.615
		0.500	46.226	292.454	-1.1E 3	1.44E 3	-115.687	-16.615
		0.583	46.226	444.447	-1.28E 3	1.77E 3	-115.687	-16.615
		0.667	46.226	596.440	-1.46E 3	2.1E 3	-115.687	-16.615
		0.750	46.226	748.433	-1.64E 3	2.43E 3	-115.687	-16.615
		0.833	46.226	900.425	-1.82E 3	2.76E 3	-115.687	-16.615
		0.917	46.226	1.05E 3	-2E 3	3.1E 3	-115.687	-16.615
		1.000	46.226	1.2E 3	-2.18E 3	3.43E 3	-115.687	-16.615
	6	0.000	423.609	-954.957	7.73E 3	9.1E 3	-1.818	-17.626
		0.083	432.140	-793.710	7.59E 3	8.82E 3	-172.332	-17.626
		0.167	440.671	-632.464	7.19E 3	8.26E 3	-342.846	-17.626
		0.250	449.202	-471.218	6.52E 3	7.44E 3	-513.361	-17.626
		0.333	457.733	-309.971	5.59E 3	6.36E 3	-683.875	-17.626
		0.417	466.264	-148.725	4.4E 3	5.01E 3	-854.389	-17.626
		0.500	474.795	12.521	2.93E 3	3.42E 3	-1.02E 3	-17.626
		0.583	483.326	173.767	1.21E 3	1.86E 3	-1.2E 3	-17.626
		0.667	491.857	335.014	-785.180	1.61E 3	-1.37E 3	-17.626
		0.750	500.388	496.260	-3.04E 3	4.04E 3	-1.54E 3	-17.626
		0.833	508.919	657.506	-5.57E 3	6.73E 3	-1.71E 3	-17.626
		0.917	517.450	818.752	-8.35E 3	9.69E 3	-1.88E 3	-17.626
		1.000	525.981	979.998	-11.4E 3	12.9E 3	-2.04E 3	-17.626
	7	0.000	446.890	-566.750	8.9E 3	9.91E 3	96.108	-5.969
		0.083	456.680	-512.149	8.89E 3	9.86E 3	-99.568	-5.969
		0.167	466.471	-457.549	8.59E 3	9.51E 3	-295.245	-5.969
		0.250	476.261	-402.948	7.97E 3	8.85E 3	-490.921	-5.969
		0.333	486.051	-348.347	7.06E 3	7.89E 3	-686.598	-5.969
		0.417	495.841	-293.746	5.84E 3	6.63E 3	-882.274	-5.969
		0.500	505.631	-239.145	4.31E 3	5.06E 3	-1.08E 3	-5.969

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.583	515.421	-184.645	2.48E 3	3.18E 3	-1.27E 3	-5.969
		0.667	525.211	-129.944	350.703	1.01E 3	-1.47E 3	-5.969
		0.750	535.002	-75.343	-2.09E 3	2.7E 3	-1.66E 3	-5.969
		0.833	544.792	-20.742	-4.83E 3	5.4E 3	-1.86E 3	-5.969
		0.917	554.582	33.859	-7.88E 3	8.47E 3	-2.06E 3	-5.969
		1.000	564.372	88.459	-11.2E 3	11.9E 3	-2.24E 3	-5.969
	8	0.000	261.314	-880.570	4.25E 3	5.39E 3	-64.222	-19.370
		0.083	266.068	-703.373	4.08E 3	5.05E 3	-159.250	-19.370
		0.167	270.821	-526.176	3.78E 3	4.56E 3	-254.278	-19.370
		0.250	275.575	-348.979	3.29E 3	3.91E 3	-349.306	-19.370
		0.333	280.328	-171.782	2.67E 3	3.12E 3	-444.334	-19.370
		0.417	285.082	5.415	1.9E 3	2.2E 3	-539.362	-19.370
		0.500	289.836	182.612	991.899	1.46E 3	-634.390	-19.370
		0.583	294.589	359.809	-68.947	723.344	-729.418	-19.370
		0.667	299.343	537.006	-1.28E 3	2.11E 3	-824.445	-19.370
		0.750	304.096	714.203	-2.63E 3	3.65E 3	-919.473	-19.370
		0.833	308.850	891.400	-4.14E 3	5.34E 3	-1.01E 3	-19.370
		0.917	313.603	1.07E 3	-5.79E 3	7.17E 3	-1.11E 3	-19.370
		1.000	318.357	1.25E 3	-7.59E 3	9.15E 3	-1.2E 3	-19.370
	9	0.000	47.889	-706.555	5.419	759.863	-122.193	-17.929
		0.083	47.889	-542.538	-184.676	775.105	-122.193	-17.929
		0.167	47.889	-378.522	-374.776	801.187	-122.193	-17.929
		0.250	47.889	-214.505	-564.874	827.268	-122.193	-17.929
		0.333	47.889	-50.489	-754.971	853.349	-122.193	-17.929
		0.417	47.889	113.527	-945.069	1.11E 3	-122.193	-17.929
		0.500	47.889	277.544	-1.14E 3	1.46E 3	-122.193	-17.929
		0.583	47.889	441.560	-1.33E 3	1.81E 3	-122.193	-17.929
		0.667	47.889	605.577	-1.52E 3	2.17E 3	-122.193	-17.929
		0.750	47.889	769.593	-1.71E 3	2.52E 3	-122.193	-17.929
		0.833	47.889	933.610	-1.9E 3	2.88E 3	-122.193	-17.929
		0.917	47.889	1.1E 3	-2.09E 3	3.23E 3	-122.193	-17.929
		1.000	47.889	1.26E 3	-2.28E 3	3.59E 3	-122.193	-17.929
	10	0.000	226.656	-255.982	4.27E 3	4.75E 3	51.450	-2.703
		0.083	231.409	-231.251	4.28E 3	4.74E 3	-43.578	-2.703
		0.167	236.163	-206.521	4.14E 3	4.58E 3	-138.606	-2.703
		0.250	240.916	-181.790	3.85E 3	4.27E 3	-233.633	-2.703
		0.333	245.670	-157.060	3.41E 3	3.81E 3	-328.661	-2.703
		0.417	250.423	-132.330	2.82E 3	3.21E 3	-423.689	-2.703
		0.500	255.177	-107.599	2.09E 3	2.45E 3	-518.717	-2.703
		0.583	259.931	-82.869	1.21E 3	1.55E 3	-613.745	-2.703
		0.667	264.684	-58.138	180.344	503.166	-708.773	-2.703
		0.750	269.438	-33.408	-996.220	1.3E 3	-803.801	-2.703
		0.833	274.191	-8.677	-2.32E 3	2.6E 3	-898.829	-2.703
		0.917	278.945	16.053	-3.79E 3	4.09E 3	-993.856	-2.703
		1.000	283.698	40.784	-5.41E 3	5.74E 3	-1.08E 3	-2.703

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	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
	11	0.000	226.656	-255.982	4.27E 3	4.75E 3	51.450	-2.703
		0.083	231.409	-231.251	4.28E 3	4.74E 3	-43.578	-2.703
		0.167	236.163	-206.521	4.14E 3	4.58E 3	-138.606	-2.703
		0.250	240.916	-181.790	3.85E 3	4.27E 3	-233.633	-2.703
		0.333	245.670	-157.060	3.41E 3	3.81E 3	-328.661	-2.703
		0.417	250.423	-132.330	2.82E 3	3.21E 3	-423.689	-2.703
		0.500	255.177	-107.599	2.09E 3	2.45E 3	-518.717	-2.703
		0.583	259.931	-82.869	1.21E 3	1.55E 3	-613.745	-2.703
		0.667	264.684	-58.138	180.344	503.166	-708.773	-2.703
		0.750	269.438	-33.408	-996.220	1.3E 3	-803.801	-2.703
		0.833	274.191	-8.677	-2.32E 3	2.6E 3	-898.829	-2.703
		0.917	278.945	16.053	-3.79E 3	4.09E 3	-993.856	-2.703
		1.000	283.698	40.784	-5.41E 3	5.74E 3	-1.08E 3	-2.703
	12	0.000	240.206	-272.429	4.54E 3	5.05E 3	54.692	-2.877
		0.083	245.259	-246.111	4.55E 3	5.04E 3	-46.322	-2.877
		0.167	250.312	-219.782	4.4E 3	4.87E 3	-147.337	-2.877
		0.250	255.365	-193.474	4.09E 3	4.54E 3	-248.351	-2.877
		0.333	260.418	-167.156	3.62E 3	4.05E 3	-349.366	-2.877
		0.417	265.471	-140.837	3E 3	3.41E 3	-450.381	-2.877
		0.500	270.524	-114.519	2.22E 3	2.61E 3	-551.395	-2.877
		0.583	275.577	-88.201	1.29E 3	1.65E 3	-652.410	-2.877
		0.667	280.630	-61.883	191.682	534.195	-753.425	-2.877
		0.750	285.684	-35.564	-1.06E 3	1.38E 3	-854.439	-2.877
		0.833	290.737	-9.246	-2.47E 3	2.77E 3	-955.454	-2.877
		0.917	295.790	17.072	-4.03E 3	4.34E 3	-1.06E 3	-2.877
		1.000	300.843	43.391	-5.75E 3	6.1E 3	-1.15E 3	-2.877
	13	0.000	240.206	-272.429	4.54E 3	5.05E 3	54.692	-2.877
		0.083	245.259	-246.111	4.55E 3	5.04E 3	-46.322	-2.877
		0.167	250.312	-219.792	4.4E 3	4.87E 3	-147.337	-2.877
		0.250	255.365	-193.474	4.09E 3	4.54E 3	-248.351	-2.877
		0.333	260.418	-167.156	3.62E 3	4.05E 3	-349.366	-2.877
		0.417	265.471	-140.837	3E 3	3.41E 3	-450.381	-2.877
		0.500	270.524	-114.519	2.22E 3	2.61E 3	-551.395	-2.877
		0.583	275.577	-88.201	1.29E 3	1.65E 3	-652.410	-2.877
		0.667	280.630	-61.883	191.682	534.195	-753.425	-2.877
		0.750	285.684	-35.564	-1.06E 3	1.38E 3	-854.439	-2.877
		0.833	290.737	-9.246	-2.47E 3	2.77E 3	-955.454	-2.877
		0.917	295.790	17.072	-4.03E 3	4.34E 3	-1.06E 3	-2.877
		1.000	300.843	43.391	-5.75E 3	6.1E 3	-1.15E 3	-2.877
	14	0.000	407.811	-498.890	7.94E 3	8.85E 3	87.376	-5.257
		0.083	416.567	-450.799	7.94E 3	8.81E 3	-87.642	-5.257
		0.167	425.323	-402.708	7.67E 3	8.5E 3	-262.661	-5.257
		0.250	434.079	-354.617	7.12E 3	7.91E 3	-437.680	-5.257
		0.333	442.836	-306.526	6.31E 3	7.06E 3	-612.698	-5.257
		0.417	451.592	-258.435	5.22E 3	5.93E 3	-787.717	-5.257

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	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	460.348	-210.344	3.86E 3	4.53E 3	-962.736	-5.257
		0.583	469.105	-162.253	2.22E 3	2.85E 3	-1.14E 3	-5.257
		0.667	477.861	-114.162	316.830	908.852	-1.31E 3	-5.257
		0.750	486.617	-66.071	-1.88E 3	2.41E 3	-1.49E 3	-5.257
		0.833	495.374	-17.980	-4.31E 3	4.83E 3	-1.66E 3	-5.257
		0.917	504.130	30.111	-7.04E 3	7.57E 3	-1.84E 3	-5.257
		1.000	512.886	78.202	-10E 3	10.6E 3	-2E 3	-5.257
	15	0.000	407.811	-498.890	7.94E 3	8.85E 3	87.376	-5.257
		0.083	416.567	-450.799	7.94E 3	8.81E 3	-87.642	-5.257
		0.167	425.323	-402.708	7.67E 3	8.5E 3	-262.661	-5.257
		0.250	434.079	-354.617	7.12E 3	7.91E 3	-437.680	-5.257
		0.333	442.836	-306.526	6.31E 3	7.06E 3	-612.698	-5.257
		0.417	451.592	-258.435	5.22E 3	5.93E 3	-787.717	-5.257
		0.500	460.348	-210.344	3.86E 3	4.53E 3	-962.736	-5.257
		0.583	469.105	-162.253	2.22E 3	2.85E 3	-1.14E 3	-5.257
		0.667	477.861	-114.162	316.830	908.852	-1.31E 3	-5.257
		0.750	486.617	-66.071	-1.88E 3	2.41E 3	-1.49E 3	-5.257
		0.833	495.374	-17.980	-4.31E 3	4.83E 3	-1.66E 3	-5.257
		0.917	504.130	30.111	-7.04E 3	7.57E 3	-1.84E 3	-5.257
		1.000	512.886	78.202	-10E 3	10.6E 3	-2E 3	-5.257
	16	0.000	424.856	-1.02E 3	7.74E 3	9.19E 3	-6.698	-18.612
		0.083	433.387	-849.982	7.8E 3	8.88E 3	-177.212	-18.612
		0.167	441.918	-679.718	7.19E 3	8.31E 3	-347.726	-18.612
		0.250	450.449	-509.454	6.52E 3	7.48E 3	-518.241	-18.612
		0.333	458.980	-339.190	5.58E 3	6.38E 3	-688.755	-18.612
		0.417	467.511	-168.926	4.38E 3	5.01E 3	-859.269	-18.612
		0.500	476.042	1.338	2.91E 3	3.38E 3	-1.03E 3	-18.612
		0.583	484.573	171.602	1.17E 3	1.83E 3	-1.2E 3	-18.612
		0.667	493.104	341.866	-828.501	1.66E 3	-1.37E 3	-18.612
		0.750	501.635	512.130	-3.09E 3	4.11E 3	-1.54E 3	-18.612
		0.833	510.166	682.394	-5.62E 3	6.82E 3	-1.71E 3	-18.612
		0.917	518.697	852.658	-8.42E 3	9.79E 3	-1.88E 3	-18.612
		1.000	527.228	1.02E 3	-11.5E 3	13E 3	-2.04E 3	-18.612
	17	0.000	262.977	-967.622	4.28E 3	5.51E 3	-70.729	-20.684
		0.083	267.730	-778.402	4.09E 3	5.14E 3	-165.757	-20.684
		0.167	272.484	-589.181	3.76E 3	4.62E 3	-260.785	-20.684
		0.250	277.238	-399.961	3.28E 3	3.96E 3	-355.813	-20.684
		0.333	281.991	-210.740	2.65E 3	3.15E 3	-450.841	-20.684
		0.417	286.745	-21.519	1.88E 3	2.19E 3	-545.868	-20.684
		0.500	291.498	167.701	954.362	1.41E 3	-640.896	-20.684
		0.583	296.252	356.922	-118.586	769.760	-735.924	-20.684
		0.667	301.005	546.143	-1.34E 3	2.18E 3	-830.952	-20.684
		0.750	305.759	735.363	-2.7E 3	3.74E 3	-925.980	-20.684
		0.833	310.513	924.584	-4.22E 3	5.45E 3	-1.02E 3	-20.684
		0.917	315.266	1.11E 3	-5.88E 3	7.31E 3	-1.12E 3	-20.684

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 69	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	320.020	1.3E 3	-7.69E 3	9.31E 3	-1.2E 3	-20.684
12	1	0.000	507.530	238.446	-5.41E 3	6.18E 3	442.431	4.995
		0.083	505.408	200.601	-4.84E 3	5.55E 3	442.431	4.995
		0.167	503.285	162.755	-4.27E 3	4.94E 3	442.431	4.995
		0.250	501.163	124.909	-3.7E 3	4.33E 3	442.431	4.995
		0.333	499.040	87.064	-3.13E 3	3.72E 3	442.431	4.995
		0.417	496.918	49.218	-2.56E 3	3.11E 3	442.431	4.995
		0.500	494.795	11.373	-1.99E 3	2.5E 3	442.431	4.995
		0.583	492.673	-26.473	-1.42E 3	1.94E 3	442.431	4.995
		0.667	490.550	-64.319	-852.226	1.41E 3	442.431	4.995
		0.750	488.428	-102.164	-282.155	872.747	442.431	4.995
		0.833	486.305	-140.010	287.916	914.231	442.431	4.995
		0.917	484.183	-177.855	857.988	1.52E 3	442.431	4.995
		1.000	482.060	-215.701	1.43E 3	2.13E 3	442.431	4.995
	2	0.000	550.853	-25.291	-5.81E 3	6.39E 3	478.440	-0.423
		0.083	550.853	-22.084	-5.2E 3	5.77E 3	478.440	-0.423
		0.167	550.853	-18.878	-4.58E 3	5.15E 3	478.440	-0.423
		0.250	550.853	-15.671	-3.96E 3	4.53E 3	478.440	-0.423
		0.333	550.853	-12.464	-3.35E 3	3.91E 3	478.440	-0.423
		0.417	550.853	-9.258	-2.73E 3	3.29E 3	478.440	-0.423
		0.500	550.853	-6.051	-2.12E 3	2.67E 3	478.440	-0.423
		0.583	550.853	-2.844	-1.5E 3	2.05E 3	478.440	-0.423
		0.667	550.853	0.362	-882.507	1.43E 3	478.440	-0.423
		0.750	550.853	3.569	-266.039	820.461	478.440	-0.423
		0.833	550.853	6.776	350.429	908.058	478.440	-0.423
		0.917	550.853	9.983	966.897	1.53E 3	478.440	-0.423
		1.000	550.853	13.189	1.58E 3	2.15E 3	478.440	-0.423
	3	0.000	-0.030	14.237	0.405	-14.671	-0.112	0.332
		0.083	-0.030	11.718	0.260	-12.007	-0.112	0.332
		0.167	-0.030	9.199	0.115	-9.343	-0.112	0.332
		0.250	-0.030	6.680	-0.030	-6.739	-0.112	0.332
		0.333	-0.030	4.161	-0.175	-4.365	-0.112	0.332
		0.417	-0.030	1.642	-0.320	-1.991	-0.112	0.332
		0.500	-0.030	-0.877	-0.465	-1.372	-0.112	0.332
		0.583	-0.030	-3.396	-0.610	-4.036	-0.112	0.332
		0.667	-0.030	-5.915	-0.755	-6.700	-0.112	0.332
		0.750	-0.030	-8.434	-0.900	-9.364	-0.112	0.332
		0.833	-0.030	-10.953	-1.045	-12.028	-0.112	0.332
		0.917	-0.030	-13.472	-1.190	-14.692	-0.112	0.332
		1.000	-0.030	-15.991	-1.335	-17.356	-0.112	0.332
	4	0.000	-0.030	14.237	0.405	-14.671	-0.112	0.332
		0.083	-0.030	11.718	0.260	-12.007	-0.112	0.332
		0.167	-0.030	9.199	0.115	-9.343	-0.112	0.332
		0.250	-0.030	6.680	-0.030	-6.739	-0.112	0.332
		0.333	-0.030	4.161	-0.175	-4.365	-0.112	0.332

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 70	Rev
Job Title Crest Pad Bldg	Part		
	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	-0.030	1.642	-0.320	-1.991	-0.112	0.332
		0.500	-0.030	-0.877	-0.465	-1.372	-0.112	0.332
		0.583	-0.030	-3.396	-0.610	-4.036	-0.112	0.332
		0.667	-0.030	-5.915	-0.755	-6.700	-0.112	0.332
		0.750	-0.030	-8.434	-0.900	-9.364	-0.112	0.332
		0.833	-0.030	-10.953	-1.045	-12.028	-0.112	0.332
		0.917	-0.030	-13.472	-1.190	-14.692	-0.112	0.332
		1.000	-0.030	-15.991	-1.335	-17.356	-0.112	0.332
	5	0.000	61.390	-973.737	-2.18E 3	3.21E 3	110.120	-16.458
		0.083	61.390	-849.037	-2.04E 3	2.95E 3	110.120	-16.458
		0.167	61.390	-724.338	-1.89E 3	2.68E 3	110.120	-16.458
		0.250	61.390	-599.638	-1.75E 3	2.41E 3	110.120	-16.458
		0.333	61.390	-474.938	-1.61E 3	2.15E 3	110.120	-16.458
		0.417	61.390	-350.238	-1.47E 3	1.88E 3	110.120	-16.458
		0.500	61.390	-225.539	-1.33E 3	1.61E 3	110.120	-16.458
		0.583	61.390	-100.839	-1.18E 3	1.35E 3	110.120	-16.458
		0.667	61.390	23.861	-1.04E 3	1.13E 3	110.120	-16.458
		0.750	61.390	148.561	-900.485	1.11E 3	110.120	-16.458
		0.833	61.390	273.260	-758.595	1.09E 3	110.120	-16.458
		0.917	61.390	397.960	-616.706	1.08E 3	110.120	-16.458
		1.000	61.390	522.660	-474.816	1.06E 3	110.120	-16.458
	6	0.000	966.713	-510.825	-11.4E 3	12.9E 3	883.851	-7.666
		0.083	964.590	-452.741	-10.3E 3	11.7E 3	883.851	-7.666
		0.167	962.468	-394.656	-9.13E 3	10.5E 3	883.851	-7.666
		0.250	960.345	-336.572	-7.99E 3	9.29E 3	883.851	-7.666
		0.333	958.223	-278.488	-6.85E 3	8.09E 3	883.851	-7.666
		0.417	956.100	-220.404	-5.71E 3	6.89E 3	883.851	-7.666
		0.500	953.978	-162.320	-4.57E 3	5.69E 3	883.851	-7.666
		0.583	951.855	-104.235	-3.43E 3	4.49E 3	883.851	-7.666
		0.667	949.733	-46.151	-2.3E 3	3.29E 3	883.851	-7.666
		0.750	947.610	11.933	-1.16E 3	2.12E 3	883.851	-7.666
		0.833	945.488	70.017	-18.208	1.03E 3	883.851	-7.666
		0.917	943.365	128.102	1.12E 3	2.19E 3	883.851	-7.666
		1.000	941.243	186.186	2.26E 3	3.39E 3	883.851	-7.666
	7	0.000	1.06E 3	213.156	-11.2E 3	12.5E 3	920.871	4.572
		0.083	1.06E 3	178.516	-10E 3	11.3E 3	920.871	4.572
		0.167	1.05E 3	143.877	-8.85E 3	10.1E 3	920.871	4.572
		0.250	1.05E 3	109.239	-7.67E 3	8.83E 3	920.871	4.572
		0.333	1.05E 3	74.600	-6.48E 3	7.61E 3	920.871	4.572
		0.417	1.05E 3	39.961	-5.29E 3	6.38E 3	920.871	4.572
		0.500	1.05E 3	5.322	-4.11E 3	5.16E 3	920.871	4.572
		0.583	1.04E 3	-29.317	-2.92E 3	3.99E 3	920.871	4.572
		0.667	1.04E 3	-63.956	-1.73E 3	2.84E 3	920.871	4.572
		0.750	1.04E 3	-98.595	-546.194	1.69E 3	920.871	4.572
		0.833	1.04E 3	-133.234	638.346	1.81E 3	920.871	4.572

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2166-351	Sheet No 71	Rev
Job Title Crest Pad Bldg	Part		
	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	1.04E 3	-167.673	1.82E 3	3.03E 3	920.871	4.572
		1.000	1.03E 3	-202.512	3.01E 3	4.25E 3	920.871	4.572
	8	0.000	568.921	-735.291	-7.59E 3	8.89E 3	552.551	-11.463
		0.083	566.798	-648.437	-6.88E 3	8.09E 3	552.551	-11.463
		0.167	564.676	-561.583	-6.17E 3	7.29E 3	552.551	-11.463
		0.250	562.553	-474.728	-5.45E 3	6.49E 3	552.551	-11.463
		0.333	560.431	-387.874	-4.74E 3	5.69E 3	552.551	-11.463
		0.417	558.308	-301.020	-4.03E 3	4.89E 3	552.551	-11.463
		0.500	556.186	-214.166	-3.32E 3	4.09E 3	552.551	-11.463
		0.583	554.063	-127.312	-2.61E 3	3.29E 3	552.551	-11.463
		0.667	551.941	-40.458	-1.89E 3	2.49E 3	552.551	-11.463
		0.750	549.818	46.396	-1.18E 3	1.78E 3	552.551	-11.463
		0.833	547.696	133.250	-470.679	1.15E 3	552.551	-11.463
		0.917	545.573	220.105	241.282	1.01E 3	552.551	-11.463
		1.000	543.451	306.959	953.243	1.8E 3	552.551	-11.463
	9	0.000	64.691	-998.696	-2.28E 3	3.34E 3	115.468	-16.911
		0.083	64.691	-870.565	-2.13E 3	3.06E 3	115.468	-16.911
		0.167	64.691	-742.434	-1.98E 3	2.79E 3	115.468	-16.911
		0.250	64.691	-614.303	-1.83E 3	2.51E 3	115.468	-16.911
		0.333	64.691	-486.173	-1.68E 3	2.23E 3	115.468	-16.911
		0.417	64.691	-358.042	-1.53E 3	1.95E 3	115.468	-16.911
		0.500	64.691	-229.911	-1.38E 3	1.68E 3	115.468	-16.911
		0.583	64.691	-101.780	-1.23E 3	1.4E 3	115.468	-16.911
		0.667	64.691	26.351	-1.09E 3	1.18E 3	115.468	-16.911
		0.750	64.691	154.481	-936.719	1.16E 3	115.468	-16.911
		0.833	64.691	282.612	-787.939	1.14E 3	115.468	-16.911
		0.917	64.691	410.743	-639.158	1.11E 3	115.468	-16.911
		1.000	64.691	538.874	-490.378	1.09E 3	115.468	-16.911
	10	0.000	507.510	248.412	-5.41E 3	6.17E 3	442.352	5.228
		0.083	505.387	208.803	-4.84E 3	5.56E 3	442.352	5.228
		0.167	503.264	169.194	-4.27E 3	4.95E 3	442.352	5.228
		0.250	501.142	129.585	-3.7E 3	4.33E 3	442.352	5.228
		0.333	499.020	89.976	-3.13E 3	3.72E 3	442.352	5.228
		0.417	496.897	50.367	-2.56E 3	3.11E 3	442.352	5.228
		0.500	494.775	10.758	-1.99E 3	2.5E 3	442.352	5.228
		0.583	492.652	-28.850	-1.42E 3	1.94E 3	442.352	5.228
		0.667	490.530	-68.459	-852.755	1.41E 3	442.352	5.228
		0.750	488.407	-108.068	-282.785	879.280	442.352	5.228
		0.833	486.284	-147.677	287.185	921.147	442.352	5.228
		0.917	484.162	-187.286	857.155	1.53E 3	442.352	5.228
		1.000	482.040	-226.895	1.43E 3	2.14E 3	442.352	5.228
	11	0.000	507.510	248.412	-5.41E 3	6.17E 3	442.352	5.228
		0.083	505.387	208.803	-4.84E 3	5.56E 3	442.352	5.228
		0.167	503.264	169.194	-4.27E 3	4.95E 3	442.352	5.228
		0.250	501.142	129.585	-3.7E 3	4.33E 3	442.352	5.228

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Job Title Crest Pad Bldg

Part

Ref

By MHF Date 20-Feb-07 Chd WW

Client Washington Closure Hanford

File Crest Pad Bldg AW.std Date/Time 21-Mar-2007 09:14

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	499.020	89.976	-3.13E 3	3.72E 3	442.352	5.228
		0.417	496.897	50.367	-2.56E 3	3.11E 3	442.352	5.228
		0.500	494.775	10.758	-1.99E 3	2.5E 3	442.352	5.228
		0.583	492.652	-28.850	-1.42E 3	1.94E 3	442.352	5.228
		0.667	490.530	-68.459	-852.755	1.41E 3	442.352	5.228
		0.750	488.407	-108.068	-282.785	879.260	442.352	5.228
		0.833	486.284	-147.677	287.185	921.147	442.352	5.228
		0.917	484.162	-187.286	857.155	1.53E 3	442.352	5.228
		1.000	482.040	-226.895	1.43E 3	2.14E 3	442.352	5.228
	12	0.000	539.484	263.434	-5.75E 3	6.56E 3	470.226	5.542
		0.083	537.228	221.441	-5.15E 3	5.91E 3	470.226	5.542
		0.167	534.971	179.448	-4.54E 3	5.26E 3	470.226	5.542
		0.250	532.715	137.454	-3.94E 3	4.61E 3	470.226	5.542
		0.333	530.459	95.461	-3.33E 3	3.96E 3	470.226	5.542
		0.417	528.203	53.468	-2.72E 3	3.31E 3	470.226	5.542
		0.500	525.947	11.475	-2.12E 3	2.66E 3	470.226	5.542
		0.583	523.690	-30.518	-1.51E 3	2.07E 3	470.226	5.542
		0.667	521.434	-72.511	-906.445	1.5E 3	470.226	5.542
		0.750	519.178	-114.505	-300.561	934.243	470.226	5.542
		0.833	516.922	-156.498	305.324	978.743	470.226	5.542
		0.917	514.665	-198.491	911.208	1.62E 3	470.226	5.542
		1.000	512.409	-240.484	1.52E 3	2.27E 3	470.226	5.542
	13	0.000	539.484	263.434	-5.75E 3	6.56E 3	470.226	5.542
		0.083	537.228	221.441	-5.15E 3	5.91E 3	470.226	5.542
		0.167	534.971	179.448	-4.54E 3	5.26E 3	470.226	5.542
		0.250	532.715	137.454	-3.94E 3	4.61E 3	470.226	5.542
		0.333	530.459	95.461	-3.33E 3	3.96E 3	470.226	5.542
		0.417	528.203	53.468	-2.72E 3	3.31E 3	470.226	5.542
		0.500	525.947	11.475	-2.12E 3	2.66E 3	470.226	5.542
		0.583	523.690	-30.518	-1.51E 3	2.07E 3	470.226	5.542
		0.667	521.434	-72.511	-906.445	1.5E 3	470.226	5.542
		0.750	519.178	-114.505	-300.561	934.243	470.226	5.542
		0.833	516.922	-156.498	305.324	978.743	470.226	5.542
		0.917	514.665	-198.491	911.208	1.62E 3	470.226	5.542
		1.000	512.409	-240.484	1.52E 3	2.27E 3	470.226	5.542
	14	0.000	944.711	238.255	-10E 3	11.2E 3	822.173	5.089
		0.083	942.488	199.698	-8.97E 3	10.1E 3	822.173	5.089
		0.167	940.265	161.141	-7.91E 3	9.01E 3	822.173	5.089
		0.250	938.042	122.584	-6.85E 3	7.91E 3	822.173	5.089
		0.333	935.819	84.027	-5.79E 3	6.81E 3	822.173	5.089
		0.417	933.596	45.470	-4.73E 3	5.71E 3	822.173	5.089
		0.500	931.373	6.913	-3.67E 3	4.61E 3	822.173	5.089
		0.583	929.150	-31.644	-2.61E 3	3.58E 3	822.173	5.089
		0.667	926.928	-70.201	-1.55E 3	2.55E 3	822.173	5.089
		0.750	924.703	-108.758	-495.531	1.53E 3	822.173	5.089

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	922.480	-147.315	563.837	1.63E 3	822.173	5.089
		0.917	920.257	-185.872	1.62E 3	2.73E 3	822.173	5.089
		1.000	918.034	-224.429	2.68E 3	3.83E 3	822.173	5.089
	15	0.000	944.711	238.255	-10E 3	11.2E 3	822.173	5.089
		0.083	942.488	199.698	-8.97E 3	10.1E 3	822.173	5.089
		0.167	940.265	161.141	-7.91E 3	9.01E 3	822.173	5.089
		0.250	938.042	122.584	-6.85E 3	7.91E 3	822.173	5.089
		0.333	935.819	84.027	-5.79E 3	6.81E 3	822.173	5.089
		0.417	933.596	45.470	-4.73E 3	5.71E 3	822.173	5.089
		0.500	931.373	6.913	-3.67E 3	4.61E 3	822.173	5.089
		0.583	929.150	-31.644	-2.61E 3	3.58E 3	822.173	5.089
		0.667	926.926	-70.201	-1.55E 3	2.55E 3	822.173	5.089
		0.750	924.703	-108.758	-495.531	1.53E 3	822.173	5.089
		0.833	922.480	-147.315	563.837	1.63E 3	822.173	5.089
		0.917	920.257	-185.872	1.62E 3	2.73E 3	822.173	5.089
		1.000	918.034	-224.429	2.68E 3	3.83E 3	822.173	5.089
	16	0.000	969.188	-529.544	-11.5E 3	13E 3	887.862	-8.006
		0.083	967.066	-468.886	-10.3E 3	11.8E 3	887.862	-8.006
		0.167	964.943	-408.229	-9.19E 3	10.6E 3	887.862	-8.006
		0.250	962.821	-347.571	-8.05E 3	9.36E 3	887.862	-8.006
		0.333	960.698	-286.914	-6.9E 3	8.15E 3	887.862	-8.006
		0.417	958.576	-226.256	-5.76E 3	6.95E 3	887.862	-8.006
		0.500	956.453	-165.599	-4.62E 3	5.74E 3	887.862	-8.006
		0.583	954.331	-104.941	-3.47E 3	4.53E 3	887.862	-8.006
		0.667	952.208	-44.284	-2.33E 3	3.32E 3	887.862	-8.006
		0.750	950.086	16.374	-1.18E 3	2.15E 3	887.862	-8.006
		0.833	947.963	77.031	-40.216	1.07E 3	887.862	-8.006
		0.917	945.841	137.689	1.1E 3	2.19E 3	887.862	-8.006
		1.000	943.718	198.346	2.25E 3	3.39E 3	887.862	-8.006
	17	0.000	572.222	-760.249	-7.69E 3	9.02E 3	557.900	-11.916
		0.083	570.099	-669.964	-6.97E 3	8.21E 3	557.900	-11.916
		0.167	567.977	-579.679	-6.25E 3	7.4E 3	557.900	-11.916
		0.250	565.854	-489.394	-5.53E 3	6.59E 3	557.900	-11.916
		0.333	563.732	-399.109	-4.81E 3	5.78E 3	557.900	-11.916
		0.417	561.609	-308.824	-4.09E 3	4.96E 3	557.900	-11.916
		0.500	559.487	-218.538	-3.38E 3	4.15E 3	557.900	-11.916
		0.583	557.364	-128.253	-2.66E 3	3.34E 3	557.900	-11.916
		0.667	555.242	-37.968	-1.94E 3	2.53E 3	557.900	-11.916
		0.750	553.119	52.317	-1.22E 3	1.82E 3	557.900	-11.916
		0.833	550.997	142.602	-500.023	1.19E 3	557.900	-11.916
		0.917	548.874	232.888	218.829	1E 3	557.900	-11.916
		1.000	546.752	323.172	937.681	1.81E 3	557.900	-11.916
27	1	0.000	479.350	48.604	1.44E 3	1.97E 3	-443.752	-0.398
		0.083	480.412	50.113	1.15E 3	1.68E 3	-443.752	-0.398
		0.167	481.473	51.622	865.917	1.4E 3	-443.752	-0.398

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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	482.534	53.131	580.031	1.12E 3	-443.752	-0.398
		0.333	483.595	54.640	294.144	832.379	-443.752	-0.398
		0.417	484.657	56.149	8.257	549.063	-443.752	-0.398
		0.500	485.718	57.658	-277.629	821.006	-443.752	-0.398
		0.583	486.779	59.167	-563.516	1.11E 3	-443.752	-0.398
		0.667	487.840	60.676	-849.403	1.4E 3	-443.752	-0.398
		0.750	488.902	62.185	-1.14E 3	1.69E 3	-443.752	-0.398
		0.833	489.963	63.695	-1.42E 3	1.97E 3	-443.752	-0.398
		0.917	491.024	65.204	-1.71E 3	2.26E 3	-443.752	-0.398
		1.000	492.085	66.713	-1.99E 3	2.55E 3	-443.752	-0.398
	2	0.000	554.413	-1.662	1.59E 3	2.15E 3	-479.816	0.735
		0.083	554.413	-4.445	1.29E 3	1.84E 3	-479.816	0.735
		0.167	554.413	-7.228	975.927	1.54E 3	-479.816	0.735
		0.250	554.413	-10.011	666.807	1.23E 3	-479.816	0.735
		0.333	554.413	-12.794	357.686	924.893	-479.816	0.735
		0.417	554.413	-15.576	48.566	618.555	-479.816	0.735
		0.500	554.413	-18.359	-260.555	833.327	-479.816	0.735
		0.583	554.413	-21.142	-569.676	1.15E 3	-479.816	0.735
		0.667	554.413	-23.925	-878.796	1.46E 3	-479.816	0.735
		0.750	554.413	-26.708	-1.19E 3	1.77E 3	-479.816	0.735
		0.833	554.413	-29.491	-1.5E 3	2.08E 3	-479.816	0.735
		0.917	554.413	-32.273	-1.81E 3	2.39E 3	-479.816	0.735
		1.000	554.413	-35.056	-2.12E 3	2.7E 3	-479.816	0.735
	3	0.000	-0.103	-5.432	-1.272	-6.808	0.128	0.090
		0.083	-0.103	-5.774	-1.190	-7.067	0.128	0.090
		0.167	-0.103	-6.115	-1.107	-7.325	0.128	0.090
		0.250	-0.103	-6.456	-1.024	-7.584	0.128	0.090
		0.333	-0.103	-6.798	-0.942	-7.843	0.128	0.090
		0.417	-0.103	-7.139	-0.859	-8.101	0.128	0.090
		0.500	-0.103	-7.480	-0.776	-8.360	0.128	0.090
		0.583	-0.103	-7.822	-0.694	-8.619	0.128	0.090
		0.667	-0.103	-8.163	-0.611	-8.877	0.128	0.090
		0.750	-0.103	-8.504	-0.528	-9.136	0.128	0.090
		0.833	-0.103	-8.846	-0.446	-9.395	0.128	0.090
		0.917	-0.103	-9.187	-0.363	-9.653	0.128	0.090
		1.000	-0.103	-9.528	-0.281	-9.912	0.128	0.090
	4	0.000	-0.103	-5.432	-1.272	-6.808	0.128	0.090
		0.083	-0.103	-5.774	-1.190	-7.067	0.128	0.090
		0.167	-0.103	-6.115	-1.107	-7.325	0.128	0.090
		0.250	-0.103	-6.456	-1.024	-7.584	0.128	0.090
		0.333	-0.103	-6.798	-0.942	-7.843	0.128	0.090
		0.417	-0.103	-7.139	-0.859	-8.101	0.128	0.090
		0.500	-0.103	-7.480	-0.776	-8.360	0.128	0.090
		0.583	-0.103	-7.822	-0.694	-8.619	0.128	0.090
		0.667	-0.103	-8.163	-0.611	-8.877	0.128	0.090

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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.750	-0.103	-8.504	-0.528	-9.136	0.128	0.090
		0.833	-0.103	-8.846	-0.446	-9.395	0.128	0.090
		0.917	-0.103	-9.187	-0.363	-9.653	0.128	0.090
		1.000	-0.103	-9.528	-0.281	-9.912	0.128	0.090
	5	0.000	-73.343	399.419	463.338	-936.098	112.802	-22.647
		0.083	-73.343	485.215	536.009	-1.09E 3	112.802	-22.647
		0.167	-73.343	571.011	608.681	-1.25E 3	112.802	-22.647
		0.250	-73.343	656.806	681.354	-1.41E 3	112.802	-22.647
		0.333	-73.343	742.602	754.027	-1.57E 3	112.802	-22.647
		0.417	-73.343	828.398	826.700	-1.73E 3	112.802	-22.647
		0.500	-73.343	914.194	899.372	-1.89E 3	112.802	-22.647
		0.583	-73.343	999.990	972.045	-2.05E 3	112.802	-22.647
		0.667	-73.343	1.09E 3	1.04E 3	-2.2E 3	112.802	-22.647
		0.750	-73.343	1.17E 3	1.12E 3	-2.36E 3	112.802	-22.647
		0.833	-73.343	1.26E 3	1.19E 3	-2.52E 3	112.802	-22.647
		0.917	-73.343	1.34E 3	1.26E 3	-2.68E 3	112.802	-22.647
		1.000	-73.343	1.43E 3	1.34E 3	-2.84E 3	112.802	-22.647
	6	0.000	840.153	346.921	2.98E 3	4.17E 3	-719.012	-16.833
		0.083	841.215	410.690	2.52E 3	3.77E 3	-719.012	-16.833
		0.167	842.276	474.459	2.05E 3	3.37E 3	-719.012	-16.833
		0.250	843.337	538.228	1.59E 3	2.97E 3	-719.012	-16.833
		0.333	844.398	601.997	1.13E 3	2.57E 3	-719.012	-16.833
		0.417	845.460	665.765	664.706	2.18E 3	-719.012	-16.833
		0.500	846.521	729.534	201.484	1.78E 3	-719.012	-16.833
		0.583	847.582	793.303	-261.739	1.9E 3	-719.012	-16.833
		0.667	848.643	857.072	-724.961	2.43E 3	-719.012	-16.833
		0.750	849.704	920.841	-1.19E 3	2.96E 3	-719.012	-16.833
		0.833	850.766	984.609	-1.65E 3	3.49E 3	-719.012	-16.833
		0.917	851.827	1.05E 3	-2.11E 3	4.01E 3	-719.012	-16.833
		1.000	852.888	1.11E 3	-2.58E 3	4.54E 3	-719.012	-16.833
	7	0.000	1.03E 3	46.941	3.03E 3	4.11E 3	-923.568	0.336
		0.083	1.03E 3	45.668	2.44E 3	3.52E 3	-923.568	0.336
		0.167	1.04E 3	44.394	1.84E 3	2.92E 3	-923.568	0.336
		0.250	1.04E 3	43.120	1.25E 3	2.33E 3	-923.568	0.336
		0.333	1.04E 3	41.846	651.830	1.73E 3	-923.568	0.336
		0.417	1.04E 3	40.573	56.823	1.14E 3	-923.568	0.336
		0.500	1.04E 3	39.299	-538.184	1.62E 3	-923.568	0.336
		0.583	1.04E 3	38.025	-1.13E 3	2.21E 3	-923.568	0.336
		0.667	1.04E 3	36.751	-1.73E 3	2.81E 3	-923.568	0.336
		0.750	1.04E 3	35.478	-2.32E 3	3.4E 3	-923.568	0.336
		0.833	1.04E 3	34.204	-2.92E 3	4E 3	-923.568	0.336
		0.917	1.05E 3	32.930	-3.51E 3	4.59E 3	-923.568	0.336
		1.000	1.05E 3	31.656	-4.11E 3	5.19E 3	-923.568	0.336
	8	0.000	406.008	448.023	1.9E 3	2.76E 3	-330.950	-23.045
		0.083	407.069	535.328	1.69E 3	2.63E 3	-330.950	-23.045

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	By MHF	Date 20-Feb-07	Chd WW
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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.167	408.130	622.633	1.47E 3	2.51E 3	-330.950	-23.045
		0.250	409.192	709.937	1.26E 3	2.38E 3	-330.950	-23.045
		0.333	410.253	797.242	1.05E 3	2.26E 3	-330.950	-23.045
		0.417	411.314	884.547	834.957	2.13E 3	-330.950	-23.045
		0.500	412.375	971.852	621.743	2.01E 3	-330.950	-23.045
		0.583	413.437	1.06E 3	408.529	1.88E 3	-330.950	-23.045
		0.667	414.498	1.15E 3	195.315	1.76E 3	-330.950	-23.045
		0.750	415.559	1.23E 3	-17.899	1.67E 3	-330.950	-23.045
		0.833	416.620	1.32E 3	-231.112	1.97E 3	-330.950	-23.045
		0.917	417.682	1.41E 3	-444.326	2.27E 3	-330.950	-23.045
		1.000	418.743	1.5E 3	-657.540	2.57E 3	-330.950	-23.045
	9	0.000	-74.823	412.452	487.960	-975.236	115.452	-22.968
		0.083	-74.823	499.466	562.340	-1.14E 3	115.452	-22.968
		0.167	-74.823	586.479	636.720	-1.3E 3	115.452	-22.968
		0.250	-74.823	673.493	711.100	-1.46E 3	115.452	-22.968
		0.333	-74.823	760.506	785.480	-1.62E 3	115.452	-22.968
		0.417	-74.823	847.520	859.859	-1.78E 3	115.452	-22.968
		0.500	-74.823	934.533	934.239	-1.94E 3	115.452	-22.968
		0.583	-74.823	1.02E 3	1.01E 3	-2.1E 3	115.452	-22.968
		0.667	-74.823	1.11E 3	1.08E 3	-2.27E 3	115.452	-22.968
		0.750	-74.823	1.2E 3	1.16E 3	-2.43E 3	115.452	-22.968
		0.833	-74.823	1.28E 3	1.23E 3	-2.59E 3	115.452	-22.968
		0.917	-74.823	1.37E 3	1.31E 3	-2.75E 3	115.452	-22.968
		1.000	-74.823	1.46E 3	1.38E 3	-2.91E 3	115.452	-22.968
	10	0.000	479.278	44.801	1.44E 3	1.96E 3	-443.662	-0.335
		0.083	480.339	46.071	1.15E 3	1.68E 3	-443.662	-0.335
		0.167	481.401	47.341	865.142	1.39E 3	-443.662	-0.335
		0.250	482.462	48.611	579.314	1.11E 3	-443.662	-0.335
		0.333	483.523	49.882	293.485	826.890	-443.662	-0.335
		0.417	484.585	51.152	7.656	543.392	-443.662	-0.335
		0.500	485.646	52.422	-278.173	816.240	-443.662	-0.335
		0.583	486.707	53.692	-564.002	1.1E 3	-443.662	-0.335
		0.667	487.768	54.962	-849.830	1.39E 3	-443.662	-0.335
		0.750	488.830	56.232	-1.14E 3	1.68E 3	-443.662	-0.335
		0.833	489.891	57.503	-1.42E 3	1.97E 3	-443.662	-0.335
		0.917	490.952	58.773	-1.71E 3	2.26E 3	-443.662	-0.335
		1.000	492.013	60.043	-1.99E 3	2.55E 3	-443.662	-0.335
	11	0.000	479.278	44.801	1.44E 3	1.96E 3	-443.662	-0.335
		0.083	480.339	46.071	1.15E 3	1.68E 3	-443.662	-0.335
		0.167	481.401	47.341	865.142	1.39E 3	-443.662	-0.335
		0.250	482.462	48.611	579.314	1.11E 3	-443.662	-0.335
		0.333	483.523	49.882	293.485	826.890	-443.662	-0.335
		0.417	484.585	51.152	7.656	543.392	-443.662	-0.335
		0.500	485.646	52.422	-278.173	816.240	-443.662	-0.335
		0.583	486.707	53.692	-564.002	1.1E 3	-443.662	-0.335

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.667	487.768	54.962	-849.830	1.39E 3	-443.662	-0.335
		0.750	488.830	56.232	-1.14E 3	1.68E 3	-443.662	-0.335
		0.833	489.891	57.503	-1.42E 3	1.97E 3	-443.662	-0.335
		0.917	490.952	58.773	-1.71E 3	2.26E 3	-443.662	-0.335
		1.000	492.013	60.043	-1.99E 3	2.55E 3	-443.662	-0.335
	12	0.000	509.477	47.863	1.53E 3	2.08E 3	-471.619	-0.360
		0.083	510.605	49.228	1.22E 3	1.78E 3	-471.619	-0.360
		0.167	511.734	50.593	919.695	1.48E 3	-471.619	-0.360
		0.250	512.862	51.959	615.855	1.18E 3	-471.619	-0.360
		0.333	513.990	53.324	312.016	879.329	-471.619	-0.360
		0.417	515.118	54.689	8.176	577.983	-471.619	-0.360
		0.500	516.246	56.054	-295.663	867.964	-471.619	-0.360
		0.583	517.374	57.420	-599.503	1.17E 3	-471.619	-0.360
		0.667	518.502	58.785	-903.343	1.48E 3	-471.619	-0.360
		0.750	519.630	60.150	-1.21E 3	1.79E 3	-471.619	-0.360
		0.833	520.758	61.515	-1.51E 3	2.09E 3	-471.619	-0.360
		0.917	521.887	62.881	-1.81E 3	2.4E 3	-471.619	-0.360
		1.000	523.015	64.246	-2.12E 3	2.71E 3	-471.619	-0.360
	13	0.000	509.477	47.863	1.53E 3	2.08E 3	-471.619	-0.360
		0.083	510.605	49.228	1.22E 3	1.78E 3	-471.619	-0.360
		0.167	511.734	50.593	919.695	1.48E 3	-471.619	-0.360
		0.250	512.862	51.959	615.855	1.18E 3	-471.619	-0.360
		0.333	513.990	53.324	312.016	879.329	-471.619	-0.360
		0.417	515.118	54.689	8.176	577.983	-471.619	-0.360
		0.500	516.246	56.054	-295.663	867.964	-471.619	-0.360
		0.583	517.374	57.420	-599.503	1.17E 3	-471.619	-0.360
		0.667	518.502	58.785	-903.343	1.48E 3	-471.619	-0.360
		0.750	519.630	60.150	-1.21E 3	1.79E 3	-471.619	-0.360
		0.833	520.758	61.515	-1.51E 3	2.09E 3	-471.619	-0.360
		0.917	521.887	62.881	-1.81E 3	2.4E 3	-471.619	-0.360
		1.000	523.015	64.246	-2.12E 3	2.71E 3	-471.619	-0.360
	14	0.000	917.827	46.809	2.7E 3	3.67E 3	-824.580	0.181
		0.083	918.939	46.123	2.17E 3	3.13E 3	-824.580	0.181
		0.167	920.050	45.437	1.64E 3	2.6E 3	-824.580	0.181
		0.250	921.162	44.752	1.11E 3	2.07E 3	-824.580	0.181
		0.333	922.273	44.066	575.857	1.54E 3	-824.580	0.181
		0.417	923.385	43.380	44.622	1.01E 3	-824.580	0.181
		0.500	924.496	42.695	-486.613	1.45E 3	-824.580	0.181
		0.583	925.608	42.009	-1.02E 3	1.99E 3	-824.580	0.181
		0.667	926.720	41.323	-1.55E 3	2.52E 3	-824.580	0.181
		0.750	927.831	40.637	-2.08E 3	3.05E 3	-824.580	0.181
		0.833	928.943	39.952	-2.61E 3	3.58E 3	-824.580	0.181
		0.917	930.054	39.266	-3.14E 3	4.11E 3	-824.580	0.181
		1.000	931.166	38.580	-3.67E 3	4.64E 3	-824.580	0.181
	15	0.000	917.827	46.809	2.7E 3	3.67E 3	-824.580	0.181

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 78	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest-Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.083	918.939	46.123	2.17E 3	3.13E 3	-824.580	0.181
		0.167	920.050	45.437	1.64E 3	2.6E 3	-824.580	0.181
		0.250	921.162	44.752	1.11E 3	2.07E 3	-824.580	0.181
		0.333	922.273	44.066	575.857	1.54E 3	-824.580	0.181
		0.417	923.385	43.380	44.622	1.01E 3	-824.580	0.181
		0.500	924.496	42.695	-486.613	1.45E 3	-824.580	0.181
		0.583	925.608	42.009	-1.02E 3	1.99E 3	-824.580	0.181
		0.667	926.720	41.323	-1.55E 3	2.52E 3	-824.580	0.181
		0.750	927.831	40.637	-2.08E 3	3.05E 3	-824.580	0.181
		0.833	928.943	39.952	-2.61E 3	3.58E 3	-824.580	0.181
		0.917	930.054	39.266	-3.14E 3	4.11E 3	-824.580	0.181
		1.000	931.166	38.580	-3.67E 3	4.64E 3	-824.580	0.181
	16	0.000	839.042	356.696	3E 3	4.2E 3	-717.025	-17.074
		0.083	840.104	421.378	2.54E 3	3.8E 3	-717.025	-17.074
		0.167	841.165	486.060	2.08E 3	3.4E 3	-717.025	-17.074
		0.250	842.226	550.743	1.61E 3	3.01E 3	-717.025	-17.074
		0.333	843.287	615.425	1.15E 3	2.61E 3	-717.025	-17.074
		0.417	844.349	680.107	689.578	2.21E 3	-717.025	-17.074
		0.500	845.410	744.789	227.634	1.82E 3	-717.025	-17.074
		0.583	846.471	809.471	-234.308	1.89E 3	-717.025	-17.074
		0.667	847.533	874.153	-696.250	2.42E 3	-717.025	-17.074
		0.750	848.594	938.835	-1.16E 3	2.95E 3	-717.025	-17.074
		0.833	849.655	1E 3	-1.62E 3	3.47E 3	-717.025	-17.074
		0.917	850.716	1.07E 3	-2.08E 3	4E 3	-717.025	-17.074
		1.000	851.777	1.13E 3	-2.54E 3	4.53E 3	-717.025	-17.074
	17	0.000	404.527	461.056	1.93E 3	2.79E 3	-328.300	-23.367
		0.083	405.588	549.579	1.71E 3	2.67E 3	-328.300	-23.367
		0.167	406.650	638.101	1.5E 3	2.55E 3	-328.300	-23.367
		0.250	407.711	726.624	1.29E 3	2.43E 3	-328.300	-23.367
		0.333	408.772	815.146	1.08E 3	2.3E 3	-328.300	-23.367
		0.417	409.833	903.669	868.117	2.18E 3	-328.300	-23.367
		0.500	410.895	992.192	656.610	2.06E 3	-328.300	-23.367
		0.583	411.956	1.08E 3	445.103	1.94E 3	-328.300	-23.367
		0.667	413.017	1.17E 3	233.597	1.82E 3	-328.300	-23.367
		0.750	414.078	1.26E 3	22.090	1.69E 3	-328.300	-23.367
		0.833	415.140	1.35E 3	-189.417	1.95E 3	-328.300	-23.367
		0.917	416.201	1.43E 3	-400.923	2.25E 3	-328.300	-23.367
		1.000	417.262	1.52E 3	-612.430	2.55E 3	-328.300	-23.367
28	1	0.000	689.930	-86.650	-3.08E 3	3.86E 3	-197.660	0.540
		0.083	690.991	-88.694	-3.21E 3	3.99E 3	-197.660	0.540
		0.167	692.052	-90.738	-3.33E 3	4.12E 3	-197.660	0.540
		0.250	693.114	-92.782	-3.46E 3	4.25E 3	-197.660	0.540
		0.333	694.175	-94.826	-3.59E 3	4.38E 3	-197.660	0.540
		0.417	695.236	-96.870	-3.72E 3	4.51E 3	-197.660	0.540
		0.500	696.297	-98.914	-3.84E 3	4.64E 3	-197.660	0.540

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.583	697.358	-100.959	-3.97E 3	4.77E 3	-197.660	0.540
		0.667	698.420	-103.003	-4.1E 3	4.9E 3	-197.660	0.540
		0.750	699.481	-105.047	-4.22E 3	5.03E 3	-197.660	0.540
		0.833	700.542	-107.091	-4.35E 3	5.16E 3	-197.660	0.540
		0.917	701.603	-109.135	-4.48E 3	5.29E 3	-197.660	0.540
		1.000	702.665	-111.179	-4.61E 3	5.42E 3	-197.660	0.540
	2	0.000	775.352	-0.642	-3.27E 3	4.05E 3	-209.614	0.370
		0.083	775.352	-2.044	-3.41E 3	4.18E 3	-209.614	0.370
		0.167	775.352	-3.446	-3.54E 3	4.32E 3	-209.614	0.370
		0.250	775.352	-4.848	-3.68E 3	4.46E 3	-209.614	0.370
		0.333	775.352	-6.249	-3.81E 3	4.59E 3	-209.614	0.370
		0.417	775.352	-7.651	-3.95E 3	4.73E 3	-209.614	0.370
		0.500	775.352	-9.053	-4.08E 3	4.87E 3	-209.614	0.370
		0.583	775.352	-10.455	-4.22E 3	5E 3	-209.614	0.370
		0.667	775.352	-11.857	-4.35E 3	5.14E 3	-209.614	0.370
		0.750	775.352	-13.259	-4.49E 3	5.27E 3	-209.614	0.370
		0.833	775.352	-14.661	-4.62E 3	5.41E 3	-209.614	0.370
		0.917	775.352	-16.063	-4.76E 3	5.55E 3	-209.614	0.370
		1.000	775.352	-17.465	-4.89E 3	5.68E 3	-209.614	0.370
	3	0.000	29.135	-6.858	0.060	36.053	0.004	-0.566
		0.083	29.135	-4.713	0.062	33.910	0.004	-0.566
		0.167	29.135	-2.567	0.065	31.768	0.004	-0.566
		0.250	29.135	-0.422	0.068	29.625	0.004	-0.566
		0.333	29.135	1.724	0.070	30.929	0.004	-0.566
		0.417	29.135	3.869	0.073	33.077	0.004	-0.566
		0.500	29.135	6.015	0.076	35.225	0.004	-0.566
		0.583	29.135	8.160	0.078	37.373	0.004	-0.566
		0.667	29.135	10.306	0.081	39.522	0.004	-0.566
		0.750	29.135	12.451	0.084	41.670	0.004	-0.566
		0.833	29.135	14.597	0.086	43.818	0.004	-0.566
		0.917	29.135	16.742	0.089	45.966	0.004	-0.566
		1.000	29.135	18.888	0.092	48.114	0.004	-0.566
	4	0.000	29.135	-6.858	0.060	36.053	0.004	-0.566
		0.083	29.135	-4.713	0.062	33.910	0.004	-0.566
		0.167	29.135	-2.567	0.065	31.768	0.004	-0.566
		0.250	29.135	-0.422	0.068	29.625	0.004	-0.566
		0.333	29.135	1.724	0.070	30.929	0.004	-0.566
		0.417	29.135	3.869	0.073	33.077	0.004	-0.566
		0.500	29.135	6.015	0.076	35.225	0.004	-0.566
		0.583	29.135	8.160	0.078	37.373	0.004	-0.566
		0.667	29.135	10.306	0.081	39.522	0.004	-0.566
		0.750	29.135	12.451	0.084	41.670	0.004	-0.566
		0.833	29.135	14.597	0.086	43.818	0.004	-0.566
		0.917	29.135	16.742	0.089	45.966	0.004	-0.566
		1.000	29.135	18.888	0.092	48.114	0.004	-0.566

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WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
	5	0.000	-185.465	-1.99E 3	7.66E 3	-9.83E 3	12.783	-85.272
		0.083	-185.465	-1.67E 3	7.67E 3	-9.52E 3	12.783	-85.272
		0.167	-185.465	-1.34E 3	7.67E 3	-9.2E 3	12.783	-85.272
		0.250	-185.465	-1.02E 3	7.68E 3	-8.89E 3	12.783	-85.272
		0.333	-185.465	-698.220	7.69E 3	-8.57E 3	12.783	-85.272
		0.417	-185.465	-375.176	7.7E 3	-8.26E 3	12.783	-85.272
		0.500	-185.465	-52.133	7.71E 3	-7.94E 3	12.783	-85.272
		0.583	-185.465	270.911	7.72E 3	-8.17E 3	12.783	-85.272
		0.667	-185.465	593.955	7.72E 3	-8.5E 3	12.783	-85.272
		0.750	-185.465	916.998	7.73E 3	-8.83E 3	12.783	-85.272
		0.833	-185.465	1.24E 3	7.74E 3	-9.17E 3	12.783	-85.272
		0.917	-185.465	1.56E 3	7.75E 3	-9.5E 3	12.783	-85.272
		1.000	-185.465	1.89E 3	7.76E 3	-9.83E 3	12.783	-85.272
	6	0.000	1.13E 3	-1.56E 3	211.394	2.92E 3	-345.283	-63.137
		0.083	1.13E 3	-1.34E 3	-11.054	2.49E 3	-345.283	-63.137
		0.167	1.13E 3	-1.1E 3	-233.502	2.47E 3	-345.283	-63.137
		0.250	1.14E 3	-862.366	-455.950	2.45E 3	-345.283	-63.137
		0.333	1.14E 3	-623.179	-678.398	2.44E 3	-345.283	-63.137
		0.417	1.14E 3	-383.991	-900.846	2.42E 3	-345.283	-63.137
		0.500	1.14E 3	-144.804	-1.12E 3	2.41E 3	-345.283	-63.137
		0.583	1.14E 3	94.383	-1.35E 3	2.58E 3	-345.283	-63.137
		0.667	1.14E 3	333.571	-1.57E 3	3.04E 3	-345.283	-63.137
		0.750	1.14E 3	572.758	-1.79E 3	3.51E 3	-345.283	-63.137
		0.833	1.14E 3	811.945	-2.01E 3	3.97E 3	-345.283	-63.137
		0.917	1.14E 3	1.05E 3	-2.24E 3	4.43E 3	-345.283	-63.137
		1.000	1.15E 3	1.29E 3	-2.46E 3	4.89E 3	-345.283	-63.137
	7	0.000	1.47E 3	-87.292	-6.35E 3	7.9E 3	-407.274	0.910
		0.083	1.47E 3	-90.738	-6.61E 3	8.17E 3	-407.274	0.910
		0.167	1.47E 3	-94.184	-6.87E 3	8.44E 3	-407.274	0.910
		0.250	1.47E 3	-97.630	-7.14E 3	8.7E 3	-407.274	0.910
		0.333	1.47E 3	-101.076	-7.4E 3	8.97E 3	-407.274	0.910
		0.417	1.47E 3	-104.522	-7.66E 3	9.24E 3	-407.274	0.910
		0.500	1.47E 3	-107.968	-7.92E 3	9.5E 3	-407.274	0.910
		0.583	1.47E 3	-111.414	-8.19E 3	9.77E 3	-407.274	0.910
		0.667	1.47E 3	-114.860	-8.45E 3	10E 3	-407.274	0.910
		0.750	1.47E 3	-118.306	-8.71E 3	10.3E 3	-407.274	0.910
		0.833	1.48E 3	-121.752	-8.97E 3	10.6E 3	-407.274	0.910
		0.917	1.48E 3	-125.198	-9.24E 3	10.8E 3	-407.274	0.910
		1.000	1.48E 3	-128.644	-9.5E 3	11.1E 3	-407.274	0.910
	8	0.000	504.465	-2.08E 3	4.58E 3	7.16E 3	-184.877	-84.732
		0.083	505.526	-1.76E 3	4.46E 3	6.72E 3	-184.877	-84.732
		0.167	506.587	-1.44E 3	4.34E 3	6.28E 3	-184.877	-84.732
		0.250	507.649	-1.11E 3	4.22E 3	5.84E 3	-184.877	-84.732
		0.333	508.710	-793.047	4.1E 3	5.4E 3	-184.877	-84.732
		0.417	509.771	-472.047	3.98E 3	4.97E 3	-184.877	-84.732

Weaver Boos Consultants	Job No 2186-351	Sheet No 81	Rev
Software licensed to Weaver Boos Consultants	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	510.832	-151.047	3.86E 3	4.53E 3	-184.877	-84.732
		0.583	511.894	169.952	3.75E 3	4.43E 3	-184.877	-84.732
		0.667	512.956	490.952	3.63E 3	4.63E 3	-184.877	-84.732
		0.750	514.016	811.952	3.51E 3	4.83E 3	-184.877	-84.732
		0.833	515.077	1.13E 3	3.39E 3	5.04E 3	-184.877	-84.732
		0.917	516.139	1.45E 3	3.27E 3	5.24E 3	-184.877	-84.732
		1.000	517.200	1.77E 3	3.15E 3	5.44E 3	-184.877	-84.732
	9	0.000	-194.521	-2.05E 3	5.77E 3	-8.01E 3	171.907	-87.575
		0.083	-194.521	-1.71E 3	5.88E 3	-7.79E 3	171.907	-87.575
		0.167	-194.521	-1.38E 3	5.99E 3	-7.57E 3	171.907	-87.575
		0.250	-194.521	-1.05E 3	6.1E 3	-7.35E 3	171.907	-87.575
		0.333	-194.521	-718.235	6.21E 3	-7.12E 3	171.907	-87.575
		0.417	-194.521	-386.464	6.32E 3	-6.9E 3	171.907	-87.575
		0.500	-194.521	-54.693	6.43E 3	-6.68E 3	171.907	-87.575
		0.583	-194.521	277.078	6.54E 3	-7.02E 3	171.907	-87.575
		0.667	-194.521	608.849	6.65E 3	-7.46E 3	171.907	-87.575
		0.750	-194.521	940.620	6.77E 3	-7.9E 3	171.907	-87.575
		0.833	-194.521	1.27E 3	6.88E 3	-8.34E 3	171.907	-87.575
		0.917	-194.521	1.6E 3	6.99E 3	-8.79E 3	171.907	-87.575
		1.000	-194.521	1.94E 3	7.1E 3	-9.23E 3	171.907	-87.575
	10	0.000	710.324	-91.451	-3.08E 3	3.88E 3	-197.657	0.143
		0.083	711.386	-91.993	-3.21E 3	4.01E 3	-197.657	0.143
		0.167	712.447	-92.536	-3.33E 3	4.14E 3	-197.657	0.143
		0.250	713.508	-93.078	-3.46E 3	4.27E 3	-197.657	0.143
		0.333	714.569	-93.620	-3.59E 3	4.4E 3	-197.657	0.143
		0.417	715.631	-94.162	-3.72E 3	4.53E 3	-197.657	0.143
		0.500	716.692	-94.704	-3.84E 3	4.65E 3	-197.657	0.143
		0.583	717.753	-95.247	-3.97E 3	4.78E 3	-197.657	0.143
		0.667	718.814	-95.789	-4.1E 3	4.91E 3	-197.657	0.143
		0.750	719.876	-96.331	-4.22E 3	5.04E 3	-197.657	0.143
		0.833	720.937	-96.873	-4.35E 3	5.17E 3	-197.657	0.143
		0.917	721.998	-97.415	-4.48E 3	5.3E 3	-197.657	0.143
		1.000	723.059	-97.957	-4.61E 3	5.43E 3	-197.657	0.143
	11	0.000	710.324	-91.451	-3.08E 3	3.88E 3	-197.657	0.143
		0.083	711.386	-91.993	-3.21E 3	4.01E 3	-197.657	0.143
		0.167	712.447	-92.536	-3.33E 3	4.14E 3	-197.657	0.143
		0.250	713.508	-93.078	-3.46E 3	4.27E 3	-197.657	0.143
		0.333	714.569	-93.620	-3.59E 3	4.4E 3	-197.657	0.143
		0.417	715.631	-94.162	-3.72E 3	4.53E 3	-197.657	0.143
		0.500	716.692	-94.704	-3.84E 3	4.65E 3	-197.657	0.143
		0.583	717.753	-95.247	-3.97E 3	4.78E 3	-197.657	0.143
		0.667	718.814	-95.789	-4.1E 3	4.91E 3	-197.657	0.143
		0.750	719.876	-96.331	-4.22E 3	5.04E 3	-197.657	0.143
		0.833	720.937	-96.873	-4.35E 3	5.17E 3	-197.657	0.143
		0.917	721.998	-97.415	-4.48E 3	5.3E 3	-197.657	0.143

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Job Title Crest Pad Bldg	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	723.059	-97.957	-4.61E 3	5.43E 3	-197.657	0.143
	12	0.000	753.790	-96.910	-3.27E 3	4.12E 3	-210.109	0.177
		0.083	754.918	-97.581	-3.41E 3	4.26E 3	-210.109	0.177
		0.167	756.046	-98.252	-3.54E 3	4.4E 3	-210.109	0.177
		0.250	757.174	-98.923	-3.68E 3	4.54E 3	-210.109	0.177
		0.333	758.302	-99.594	-3.81E 3	4.67E 3	-210.109	0.177
		0.417	759.430	-100.265	-3.95E 3	4.81E 3	-210.109	0.177
		0.500	760.558	-100.936	-4.08E 3	4.95E 3	-210.109	0.177
		0.583	761.687	-101.607	-4.22E 3	5.08E 3	-210.109	0.177
		0.667	762.815	-102.278	-4.36E 3	5.22E 3	-210.109	0.177
		0.750	763.943	-102.949	-4.49E 3	5.36E 3	-210.109	0.177
		0.833	765.071	-103.620	-4.63E 3	5.5E 3	-210.109	0.177
		0.917	766.199	-104.291	-4.76E 3	5.63E 3	-210.109	0.177
		1.000	767.327	-104.962	-4.9E 3	5.77E 3	-210.109	0.177
	13	0.000	753.790	-96.910	-3.27E 3	4.12E 3	-210.109	0.177
		0.083	754.918	-97.581	-3.41E 3	4.26E 3	-210.109	0.177
		0.167	756.046	-98.252	-3.54E 3	4.4E 3	-210.109	0.177
		0.250	757.174	-98.923	-3.68E 3	4.54E 3	-210.109	0.177
		0.333	758.302	-99.594	-3.81E 3	4.67E 3	-210.109	0.177
		0.417	759.430	-100.265	-3.95E 3	4.81E 3	-210.109	0.177
		0.500	760.558	-100.936	-4.08E 3	4.95E 3	-210.109	0.177
		0.583	761.687	-101.607	-4.22E 3	5.08E 3	-210.109	0.177
		0.667	762.815	-102.278	-4.36E 3	5.22E 3	-210.109	0.177
		0.750	763.943	-102.949	-4.49E 3	5.36E 3	-210.109	0.177
		0.833	765.071	-103.620	-4.63E 3	5.5E 3	-210.109	0.177
		0.917	766.199	-104.291	-4.76E 3	5.63E 3	-210.109	0.177
		1.000	767.327	-104.962	-4.9E 3	5.77E 3	-210.109	0.177
	14	0.000	1.32E 3	-94.839	-5.68E 3	7.09E 3	-364.237	0.545
		0.083	1.32E 3	-96.905	-5.91E 3	7.33E 3	-364.237	0.545
		0.167	1.32E 3	-98.971	-6.15E 3	7.57E 3	-364.237	0.545
		0.250	1.32E 3	-101.037	-6.38E 3	7.81E 3	-364.237	0.545
		0.333	1.32E 3	-103.103	-6.62E 3	8.04E 3	-364.237	0.545
		0.417	1.33E 3	-105.169	-6.85E 3	8.28E 3	-364.237	0.545
		0.500	1.33E 3	-107.235	-7.09E 3	8.52E 3	-364.237	0.545
		0.583	1.33E 3	-109.301	-7.32E 3	8.76E 3	-364.237	0.545
		0.667	1.33E 3	-111.367	-7.56E 3	8.99E 3	-364.237	0.545
		0.750	1.33E 3	-113.433	-7.79E 3	9.23E 3	-364.237	0.545
		0.833	1.33E 3	-115.499	-8.02E 3	9.47E 3	-364.237	0.545
		0.917	1.33E 3	-117.565	-8.26E 3	9.71E 3	-364.237	0.545
		1.000	1.33E 3	-119.631	-8.49E 3	9.95E 3	-364.237	0.545
	15	0.000	1.32E 3	-94.839	-5.68E 3	7.09E 3	-364.237	0.545
		0.083	1.32E 3	-96.905	-5.91E 3	7.33E 3	-364.237	0.545
		0.167	1.32E 3	-98.971	-6.15E 3	7.57E 3	-364.237	0.545
		0.250	1.32E 3	-101.037	-6.38E 3	7.81E 3	-364.237	0.545
		0.333	1.32E 3	-103.103	-6.62E 3	8.04E 3	-364.237	0.545

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Weaver Boos Consultants Software licensed to Weaver Boos Consultants		Part		
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Client Washington Closure Hanford		File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	1.33E 3	-105.169	-6.85E 3	8.28E 3	-364.237	0.545
		0.500	1.33E 3	-107.235	-7.09E 3	8.52E 3	-364.237	0.545
		0.583	1.33E 3	-109.301	-7.32E 3	8.76E 3	-364.237	0.545
		0.667	1.33E 3	-111.367	-7.56E 3	8.99E 3	-364.237	0.545
		0.750	1.33E 3	-113.433	-7.79E 3	9.23E 3	-364.237	0.545
		0.833	1.33E 3	-115.499	-8.02E 3	9.47E 3	-364.237	0.545
		0.917	1.33E 3	-117.565	-8.26E 3	9.71E 3	-364.237	0.545
		1.000	1.33E 3	-119.631	-8.49E 3	9.95E 3	-364.237	0.545
	16	0.000	1.13E 3	-1.62E 3	-1.21E 3	3.95E 3	-225.940	-64.864
		0.083	1.13E 3	-1.38E 3	-1.35E 3	3.85E 3	-225.940	-64.864
		0.167	1.13E 3	-1.13E 3	-1.5E 3	3.75E 3	-225.940	-64.864
		0.250	1.13E 3	-883.922	-1.64E 3	3.65E 3	-225.940	-64.864
		0.333	1.13E 3	-638.190	-1.79E 3	3.56E 3	-225.940	-64.864
		0.417	1.13E 3	-392.457	-1.93E 3	3.46E 3	-225.940	-64.864
		0.500	1.13E 3	-146.724	-2.08E 3	3.36E 3	-225.940	-64.864
		0.583	1.13E 3	99.008	-2.22E 3	3.46E 3	-225.940	-64.864
		0.667	1.13E 3	344.741	-2.37E 3	3.85E 3	-225.940	-64.864
		0.750	1.14E 3	590.474	-2.52E 3	4.24E 3	-225.940	-64.864
		0.833	1.14E 3	836.207	-2.66E 3	4.63E 3	-225.940	-64.864
		0.917	1.14E 3	1.08E 3	-2.81E 3	5.03E 3	-225.940	-64.864
		1.000	1.14E 3	1.33E 3	-2.95E 3	5.42E 3	-225.940	-64.864
	17	0.000	495.409	-2.13E 3	2.69E 3	5.32E 3	-25.752	-87.036
		0.083	496.470	-1.8E 3	2.67E 3	4.97E 3	-25.752	-87.036
		0.167	497.531	-1.47E 3	2.66E 3	4.63E 3	-25.752	-87.036
		0.250	498.593	-1.14E 3	2.64E 3	4.28E 3	-25.752	-87.036
		0.333	499.654	-813.061	2.62E 3	3.94E 3	-25.752	-87.036
		0.417	500.715	-483.334	2.61E 3	3.59E 3	-25.752	-87.036
		0.500	501.776	-153.608	2.59E 3	3.25E 3	-25.752	-87.036
		0.583	502.837	176.119	2.57E 3	3.25E 3	-25.752	-87.036
		0.667	503.899	505.846	2.56E 3	3.57E 3	-25.752	-87.036
		0.750	504.960	835.573	2.54E 3	3.88E 3	-25.752	-87.036
		0.833	506.021	1.17E 3	2.52E 3	4.2E 3	-25.752	-87.036
		0.917	507.083	1.5E 3	2.51E 3	4.51E 3	-25.752	-87.036
		1.000	508.144	1.82E 3	2.49E 3	4.82E 3	-25.752	-87.036
30	1	0.000	310.729	36.148	866.232	1.21E 3	-269.620	0.541
		0.083	312.852	32.051	518.828	863.730	-269.620	0.541
		0.167	314.974	27.954	171.423	514.351	-269.620	0.541
		0.250	317.097	23.857	-175.981	516.934	-269.620	0.541
		0.333	319.219	19.759	-523.385	862.364	-269.620	0.541
		0.417	321.342	15.662	-870.790	1.21E 3	-269.620	0.541
		0.500	323.464	11.565	-1.22E 3	1.55E 3	-269.620	0.541
		0.583	325.587	7.468	-1.57E 3	1.9E 3	-269.620	0.541
		0.667	327.709	3.371	-1.91E 3	2.24E 3	-269.620	0.541
		0.750	329.832	-0.726	-2.26E 3	2.59E 3	-269.620	0.541
		0.833	331.954	-4.824	-2.61E 3	2.94E 3	-269.620	0.541

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	334.077	-8.921	-2.96E 3	3.3E 3	-269.620	0.541
		1.000	336.199	-13.018	-3.3E 3	3.65E 3	-269.620	0.541
	2	0.000	372.491	-7.595	1.01E 3	1.39E 3	-300.785	-0.346
		0.083	372.491	-4.977	618.075	995.542	-300.785	-0.346
		0.167	372.491	-2.359	230.514	605.363	-300.785	-0.346
		0.250	372.491	0.260	-157.047	529.798	-300.785	-0.346
		0.333	372.491	2.878	-544.609	919.977	-300.785	-0.346
		0.417	372.491	5.496	-932.170	1.31E 3	-300.785	-0.346
		0.500	372.491	8.114	-1.32E 3	1.7E 3	-300.785	-0.346
		0.583	372.491	10.732	-1.71E 3	2.09E 3	-300.785	-0.346
		0.667	372.491	13.350	-2.09E 3	2.48E 3	-300.785	-0.346
		0.750	372.491	15.968	-2.48E 3	2.87E 3	-300.785	-0.346
		0.833	372.491	18.586	-2.87E 3	3.26E 3	-300.785	-0.346
		0.917	372.491	21.204	-3.26E 3	3.65E 3	-300.785	-0.346
		1.000	372.491	23.822	-3.65E 3	4.04E 3	-300.785	-0.346
	3	0.000	28.711	14.186	-0.029	42.926	-0.004	0.321
		0.083	28.711	11.751	-0.034	40.497	-0.004	0.321
		0.167	28.711	9.316	-0.039	38.067	-0.004	0.321
		0.250	28.711	6.881	-0.044	35.637	-0.004	0.321
		0.333	28.711	4.447	-0.049	33.207	-0.004	0.321
		0.417	28.711	2.012	-0.054	30.777	-0.004	0.321
		0.500	28.711	-0.423	-0.058	29.193	-0.004	0.321
		0.583	28.711	-2.858	-0.063	31.633	-0.004	0.321
		0.667	28.711	-5.293	-0.068	34.072	-0.004	0.321
		0.750	28.711	-7.727	-0.073	36.512	-0.004	0.321
		0.833	28.711	-10.162	-0.078	38.952	-0.004	0.321
		0.917	28.711	-12.597	-0.083	41.391	-0.004	0.321
		1.000	28.711	-15.032	-0.088	43.831	-0.004	0.321
	4	0.000	28.711	14.186	-0.029	42.926	-0.004	0.321
		0.083	28.711	11.751	-0.034	40.497	-0.004	0.321
		0.167	28.711	9.316	-0.039	38.067	-0.004	0.321
		0.250	28.711	6.881	-0.044	35.637	-0.004	0.321
		0.333	28.711	4.447	-0.049	33.207	-0.004	0.321
		0.417	28.711	2.012	-0.054	30.777	-0.004	0.321
		0.500	28.711	-0.423	-0.058	29.193	-0.004	0.321
		0.583	28.711	-2.858	-0.063	31.633	-0.004	0.321
		0.667	28.711	-5.293	-0.068	34.072	-0.004	0.321
		0.750	28.711	-7.727	-0.073	36.512	-0.004	0.321
		0.833	28.711	-10.162	-0.078	38.952	-0.004	0.321
		0.917	28.711	-12.597	-0.083	41.391	-0.004	0.321
		1.000	28.711	-15.032	-0.088	43.831	-0.004	0.321
	5	0.000	-153.014	-1.21E 3	3.85E 3	-5.22E 3	342.358	-28.882
		0.083	-153.014	-995.556	4.3E 3	-5.44E 3	342.358	-28.882
		0.167	-153.014	-776.720	4.74E 3	-5.67E 3	342.358	-28.882
		0.250	-153.014	-557.884	5.18E 3	-5.89E 3	342.358	-28.882

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	-153.014	-339.048	5.62E 3	-8.11E 3	342.358	-28.882
		0.417	-153.014	-120.212	6.06E 3	-8.33E 3	342.358	-28.882
		0.500	-153.014	98.623	6.5E 3	-8.75E 3	342.358	-28.882
		0.583	-153.014	317.459	6.94E 3	-7.41E 3	342.358	-28.882
		0.667	-153.014	536.295	7.38E 3	-8.07E 3	342.358	-28.882
		0.750	-153.014	755.131	7.83E 3	-8.73E 3	342.358	-28.882
		0.833	-153.014	973.967	8.27E 3	-9.39E 3	342.358	-28.882
		0.917	-153.014	1.19E 3	8.71E 3	-10.1E 3	342.358	-28.882
		1.000	-153.014	1.41E 3	9.15E 3	-10.7E 3	342.358	-28.882
	6	0.000	475.336	-880.342	4.51E 3	5.87E 3	-238.440	-21.380
		0.083	477.459	-718.348	4.2E 3	5.4E 3	-238.440	-21.380
		0.167	479.581	-556.355	3.9E 3	4.93E 3	-238.440	-21.380
		0.250	481.704	-394.362	3.59E 3	4.47E 3	-238.440	-21.380
		0.333	483.826	-232.369	3.28E 3	4E 3	-238.440	-21.380
		0.417	485.949	-70.375	2.98E 3	3.53E 3	-238.440	-21.380
		0.500	488.071	91.618	2.67E 3	3.25E 3	-238.440	-21.380
		0.583	490.194	253.611	2.36E 3	3.1E 3	-238.440	-21.380
		0.667	492.316	415.605	2.05E 3	2.96E 3	-238.440	-21.380
		0.750	494.439	577.598	1.75E 3	2.82E 3	-238.440	-21.380
		0.833	496.561	739.591	1.44E 3	2.68E 3	-238.440	-21.380
		0.917	498.684	901.584	1.13E 3	2.53E 3	-238.440	-21.380
		1.000	500.806	1.06E 3	824.908	2.39E 3	-238.440	-21.380
	7	0.000	683.219	28.554	1.87E 3	2.58E 3	-570.405	0.195
		0.083	685.342	27.074	1.14E 3	1.85E 3	-570.405	0.195
		0.167	687.464	25.595	401.937	1.11E 3	-570.405	0.195
		0.250	689.587	24.116	-333.028	1.05E 3	-570.405	0.195
		0.333	691.710	22.637	-1.07E 3	1.78E 3	-570.405	0.195
		0.417	693.832	21.158	-1.8E 3	2.52E 3	-570.405	0.195
		0.500	695.955	19.679	-2.54E 3	3.25E 3	-570.405	0.195
		0.583	698.077	18.200	-3.27E 3	3.99E 3	-570.405	0.195
		0.667	700.199	16.721	-4.01E 3	4.72E 3	-570.405	0.195
		0.750	702.322	15.241	-4.74E 3	5.46E 3	-570.405	0.195
		0.833	704.445	13.762	-5.48E 3	6.2E 3	-570.405	0.195
		0.917	706.567	12.283	-6.21E 3	6.93E 3	-570.405	0.195
		1.000	708.690	10.804	-6.95E 3	7.67E 3	-570.405	0.195
	8	0.000	157.715	-1.18E 3	4.72E 3	6.06E 3	72.738	-28.342
		0.083	159.837	-963.505	4.81E 3	5.94E 3	72.738	-28.342
		0.167	161.960	-748.766	4.91E 3	5.82E 3	72.738	-28.342
		0.250	164.082	-534.028	5E 3	5.7E 3	72.738	-28.342
		0.333	166.205	-319.289	5.1E 3	5.58E 3	72.738	-28.342
		0.417	168.327	-104.550	5.19E 3	5.46E 3	72.738	-28.342
		0.500	170.450	110.189	5.28E 3	5.56E 3	72.738	-28.342
		0.583	172.572	324.927	5.38E 3	5.87E 3	72.738	-28.342
		0.667	174.695	539.666	5.47E 3	6.19E 3	72.738	-28.342
		0.750	176.817	754.405	5.56E 3	6.5E 3	72.738	-28.342

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	178.940	989.143	5.68E 3	6.81E 3	72.738	-28.342
		0.917	181.062	1.18E 3	5.75E 3	7.12E 3	72.738	-28.342
		1.000	183.185	1.4E 3	5.85E 3	7.43E 3	72.738	-28.342
	9	0.000	-157.516	-1.25E 3	3.88E 3	-5.28E 3	340.032	-29.654
		0.083	-157.516	-1.02E 3	4.32E 3	-5.5E 3	340.032	-29.654
		0.167	-157.516	-798.341	4.75E 3	-5.71E 3	340.032	-29.654
		0.250	-157.516	-573.655	5.19E 3	-5.92E 3	340.032	-29.654
		0.333	-157.516	-348.970	5.63E 3	-6.14E 3	340.032	-29.654
		0.417	-157.516	-124.285	6.07E 3	-6.35E 3	340.032	-29.654
		0.500	-157.516	100.401	6.51E 3	-6.77E 3	340.032	-29.654
		0.583	-157.516	325.086	6.95E 3	-7.43E 3	340.032	-29.654
		0.667	-157.516	549.771	7.38E 3	-8.09E 3	340.032	-29.654
		0.750	-157.516	774.456	7.82E 3	-8.75E 3	340.032	-29.654
		0.833	-157.516	999.142	8.26E 3	-9.42E 3	340.032	-29.654
		0.917	-157.516	1.22E 3	8.7E 3	-10.1E 3	340.032	-29.654
		1.000	-157.516	1.45E 3	9.14E 3	-10.7E 3	340.032	-29.654
	10	0.000	330.827	46.078	866.212	1.24E 3	-269.622	0.766
		0.083	332.949	40.277	518.804	892.030	-269.622	0.766
		0.167	335.072	34.475	171.396	540.943	-269.622	0.766
		0.250	337.194	28.674	-176.012	541.880	-269.622	0.766
		0.333	339.317	22.872	-523.419	885.608	-269.622	0.766
		0.417	341.439	17.071	-870.827	1.23E 3	-269.622	0.766
		0.500	343.562	11.269	-1.22E 3	1.57E 3	-269.622	0.766
		0.583	345.684	5.467	-1.57E 3	1.92E 3	-269.622	0.766
		0.667	347.807	-0.334	-1.91E 3	2.26E 3	-269.622	0.766
		0.750	349.929	-6.136	-2.26E 3	2.62E 3	-269.622	0.766
		0.833	352.052	-11.937	-2.61E 3	2.97E 3	-269.622	0.766
		0.917	354.174	-17.739	-2.96E 3	3.33E 3	-269.622	0.766
		1.000	356.297	-23.540	-3.3E 3	3.68E 3	-269.622	0.766
	11	0.000	330.827	46.078	866.212	1.24E 3	-269.622	0.766
		0.083	332.949	40.277	518.804	892.030	-269.622	0.766
		0.167	335.072	34.475	171.396	540.943	-269.622	0.766
		0.250	337.194	28.674	-176.012	541.880	-269.622	0.766
		0.333	339.317	22.872	-523.419	885.608	-269.622	0.766
		0.417	341.439	17.071	-870.827	1.23E 3	-269.622	0.766
		0.500	343.562	11.269	-1.22E 3	1.57E 3	-269.622	0.766
		0.583	345.684	5.467	-1.57E 3	1.92E 3	-269.622	0.766
		0.667	347.807	-0.334	-1.91E 3	2.26E 3	-269.622	0.766
		0.750	349.929	-6.136	-2.26E 3	2.62E 3	-269.622	0.766
		0.833	352.052	-11.937	-2.61E 3	2.97E 3	-269.622	0.766
		0.917	354.174	-17.739	-2.96E 3	3.33E 3	-269.622	0.766
		1.000	356.297	-23.540	-3.3E 3	3.68E 3	-269.622	0.766
	12	0.000	350.403	48.358	920.784	1.32E 3	-286.608	0.800
		0.083	352.659	42.296	551.490	946.445	-286.608	0.800
		0.167	354.915	36.236	182.196	673.347	-286.608	0.800

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 87	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	357.172	30.177	-187.098	574.446	-286.608	0.800
		0.333	359.428	24.117	-556.393	939.937	-286.608	0.800
		0.417	361.684	18.057	-925.687	1.31E 3	-286.608	0.800
		0.500	363.940	11.998	-1.29E 3	1.67E 3	-286.608	0.800
		0.583	366.196	5.938	-1.66E 3	2.04E 3	-286.608	0.800
		0.667	368.453	-0.122	-2.03E 3	2.4E 3	-286.608	0.800
		0.750	370.709	-6.181	-2.4E 3	2.78E 3	-286.608	0.800
		0.833	372.965	-12.241	-2.77E 3	3.16E 3	-286.608	0.800
		0.917	375.221	-18.301	-3.14E 3	3.53E 3	-286.608	0.800
		1.000	377.477	-24.360	-3.51E 3	3.91E 3	-286.608	0.800
	13	0.000	350.403	48.356	920.784	1.32E 3	-286.608	0.800
		0.083	352.659	42.296	551.490	946.445	-286.608	0.800
		0.167	354.915	36.236	182.196	573.347	-286.608	0.800
		0.250	357.172	30.177	-187.098	574.446	-286.608	0.800
		0.333	359.428	24.117	-556.393	930.937	-286.608	0.800
		0.417	361.684	18.057	-925.687	1.31E 3	-286.608	0.800
		0.500	363.940	11.998	-1.29E 3	1.67E 3	-286.608	0.800
		0.583	366.196	5.938	-1.66E 3	2.04E 3	-286.608	0.800
		0.667	368.453	-0.122	-2.03E 3	2.4E 3	-286.608	0.800
		0.750	370.709	-6.181	-2.4E 3	2.78E 3	-286.608	0.800
		0.833	372.965	-12.241	-2.77E 3	3.16E 3	-286.608	0.800
		0.917	375.221	-18.301	-3.14E 3	3.53E 3	-286.608	0.800
		1.000	377.477	-24.360	-3.51E 3	3.91E 3	-286.608	0.800
	14	0.000	619.899	39.613	1.66E 3	2.32E 3	-507.991	0.476
		0.083	622.122	36.007	1.01E 3	1.67E 3	-507.991	0.476
		0.167	624.345	32.401	352.414	1.01E 3	-507.991	0.476
		0.250	626.568	28.795	-302.131	957.494	-507.991	0.476
		0.333	628.791	25.189	-956.676	1.61E 3	-507.991	0.476
		0.417	631.014	21.583	-1.61E 3	2.26E 3	-507.991	0.476
		0.500	633.238	17.977	-2.27E 3	2.92E 3	-507.991	0.476
		0.583	635.461	14.370	-2.92E 3	3.57E 3	-507.991	0.476
		0.667	637.684	10.764	-3.57E 3	4.22E 3	-507.991	0.476
		0.750	639.907	7.158	-4.23E 3	4.88E 3	-507.991	0.476
		0.833	642.130	3.552	-4.88E 3	5.53E 3	-507.991	0.476
		0.917	644.353	-0.054	-5.54E 3	6.18E 3	-507.991	0.476
		1.000	646.576	-3.660	-6.19E 3	6.84E 3	-507.991	0.476
	15	0.000	619.899	39.613	1.66E 3	2.32E 3	-507.991	0.476
		0.083	622.122	36.007	1.01E 3	1.67E 3	-507.991	0.476
		0.167	624.345	32.401	352.414	1.01E 3	-507.991	0.476
		0.250	626.568	28.795	-302.131	957.494	-507.991	0.476
		0.333	628.791	25.189	-956.676	1.61E 3	-507.991	0.476
		0.417	631.014	21.583	-1.61E 3	2.26E 3	-507.991	0.476
		0.500	633.238	17.977	-2.27E 3	2.92E 3	-507.991	0.476
		0.583	635.461	14.370	-2.92E 3	3.57E 3	-507.991	0.476
		0.667	637.684	10.764	-3.57E 3	4.22E 3	-507.991	0.476

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.750	639.907	7.158	-4.23E 3	4.88E 3	-507.991	0.476
		0.833	642.130	3.552	-4.88E 3	5.53E 3	-507.991	0.476
		0.917	644.353	-0.054	-5.54E 3	6.18E 3	-507.991	0.476
		1.000	646.576	-3.660	-6.19E 3	6.84E 3	-507.991	0.476
	16	0.000	471.960	-905.331	4.53E 3	5.91E 3	-240.185	-21.959
		0.083	474.082	-738.951	4.22E 3	5.43E 3	-240.185	-21.959
		0.167	476.205	-572.571	3.91E 3	4.96E 3	-240.185	-21.959
		0.250	478.327	-406.190	3.6E 3	4.49E 3	-240.185	-21.959
		0.333	480.450	-239.810	3.29E 3	4.01E 3	-240.185	-21.959
		0.417	482.572	-73.430	2.98E 3	3.54E 3	-240.185	-21.959
		0.500	484.695	92.951	2.67E 3	3.25E 3	-240.185	-21.959
		0.583	486.817	259.331	2.36E 3	3.11E 3	-240.185	-21.959
		0.667	488.940	425.712	2.05E 3	2.97E 3	-240.185	-21.959
		0.750	491.062	592.092	1.74E 3	2.83E 3	-240.185	-21.959
		0.833	493.185	758.472	1.43E 3	2.69E 3	-240.185	-21.959
		0.917	495.307	924.853	1.13E 3	2.55E 3	-240.185	-21.959
		1.000	497.430	1.09E 3	815.757	2.4E 3	-240.185	-21.959
	17	0.000	153.213	-1.21E 3	4.74E 3	6.11E 3	70.412	-29.114
		0.083	155.335	-990.975	4.84E 3	5.98E 3	70.412	-29.114
		0.167	157.458	-770.387	4.93E 3	5.85E 3	70.412	-29.114
		0.250	159.580	-549.799	5.02E 3	5.73E 3	70.412	-29.114
		0.333	161.703	-329.211	5.11E 3	5.6E 3	70.412	-29.114
		0.417	163.825	-108.622	5.2E 3	5.47E 3	70.412	-29.114
		0.500	165.948	111.966	5.29E 3	5.57E 3	70.412	-29.114
		0.583	168.070	332.554	5.38E 3	5.88E 3	70.412	-29.114
		0.667	170.193	553.142	5.47E 3	6.19E 3	70.412	-29.114
		0.750	172.315	773.730	5.56E 3	6.51E 3	70.412	-29.114
		0.833	174.438	994.318	5.65E 3	6.82E 3	70.412	-29.114
		0.917	176.560	1.21E 3	5.74E 3	7.13E 3	70.412	-29.114
		1.000	178.683	1.44E 3	5.83E 3	7.45E 3	70.412	-29.114
32	1	0.000	299.763	0.045	877.635	1.18E 3	-56.761	0.000
		0.083	297.640	0.041	804.498	1.1E 3	-56.761	0.000
		0.167	295.518	0.037	731.362	1.03E 3	-56.761	0.000
		0.250	293.395	0.033	658.226	951.655	-56.761	0.000
		0.333	291.273	0.030	585.090	876.392	-56.761	0.000
		0.417	289.150	0.026	511.954	801.130	-56.761	0.000
		0.500	287.028	0.022	438.817	725.868	-56.761	0.000
		0.583	284.905	0.019	365.681	650.605	-56.761	0.000
		0.667	282.783	0.015	292.545	575.343	-56.761	0.000
		0.750	280.660	0.011	219.409	500.080	-56.761	0.000
		0.833	278.538	0.007	146.272	424.818	-56.761	0.000
		0.917	276.416	0.004	73.136	349.555	-56.761	0.000
		1.000	274.293	0.000	0.000	274.293	-56.761	0.000
	2	0.000	370.872	5.029	917.374	1.29E 3	-59.331	0.055
		0.083	370.872	4.610	840.926	1.22E 3	-59.331	0.055

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.167	370.872	4.191	764.479	1.14E 3	-59.331	0.055
		0.250	370.872	3.772	688.031	1.06E 3	-59.331	0.055
		0.333	370.872	3.353	611.583	985.807	-59.331	0.055
		0.417	370.872	2.933	535.135	908.940	-59.331	0.055
		0.500	370.872	2.514	458.687	832.073	-59.331	0.055
		0.583	370.872	2.095	382.239	755.206	-59.331	0.055
		0.667	370.872	1.676	305.791	678.340	-59.331	0.055
		0.750	370.872	1.257	229.344	601.473	-59.331	0.055
		0.833	370.872	0.838	152.896	524.606	-59.331	0.055
		0.917	370.872	0.419	76.448	447.739	-59.331	0.055
		1.000	370.872	0.000	0.000	370.872	-59.331	0.055
	3	0.000	28.758	4.521	0.079	33.358	-0.005	0.050
		0.083	28.758	4.144	0.073	32.975	-0.005	0.050
		0.167	28.758	3.768	0.066	32.592	-0.005	0.050
		0.250	28.758	3.391	0.059	32.208	-0.005	0.050
		0.333	28.758	3.014	0.053	31.825	-0.005	0.050
		0.417	28.758	2.637	0.046	31.442	-0.005	0.050
		0.500	28.758	2.261	0.040	31.058	-0.005	0.050
		0.583	28.758	1.884	0.033	30.675	-0.005	0.050
		0.667	28.758	1.507	0.026	30.291	-0.005	0.050
		0.750	28.758	1.130	0.020	29.908	-0.005	0.050
		0.833	28.758	0.754	0.013	29.525	-0.005	0.050
		0.917	28.758	0.377	0.007	29.141	-0.005	0.050
		1.000	28.758	0.000	-0.000	28.758	-0.005	0.050
	4	0.000	28.758	4.521	0.079	33.358	-0.005	0.050
		0.083	28.758	4.144	0.073	32.975	-0.005	0.050
		0.167	28.758	3.768	0.066	32.592	-0.005	0.050
		0.250	28.758	3.391	0.059	32.208	-0.005	0.050
		0.333	28.758	3.014	0.053	31.825	-0.005	0.050
		0.417	28.758	2.637	0.046	31.442	-0.005	0.050
		0.500	28.758	2.261	0.040	31.058	-0.005	0.050
		0.583	28.758	1.884	0.033	30.675	-0.005	0.050
		0.667	28.758	1.507	0.026	30.291	-0.005	0.050
		0.750	28.758	1.130	0.020	29.908	-0.005	0.050
		0.833	28.758	0.754	0.013	29.525	-0.005	0.050
		0.917	28.758	0.377	0.007	29.141	-0.005	0.050
		1.000	28.758	0.000	-0.000	28.758	-0.005	0.050
	5	0.000	309.813	-2.51E 3	-9.59E 3	12.4E 3	620.208	-27.568
		0.083	309.813	-2.3E 3	-8.79E 3	11.4E 3	620.208	-27.568
		0.167	309.813	-2.09E 3	-7.99E 3	10.4E 3	620.208	-27.568
		0.250	309.813	-1.88E 3	-7.19E 3	9.38E 3	620.208	-27.568
		0.333	309.813	-1.67E 3	-6.39E 3	8.37E 3	620.208	-27.568
		0.417	309.813	-1.46E 3	-5.59E 3	7.37E 3	620.208	-27.568
		0.500	309.813	-1.25E 3	-4.79E 3	6.36E 3	620.208	-27.568
		0.583	309.813	-1.04E 3	-4E 3	5.36E 3	620.208	-27.568

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	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.667	309.813	-835.517	-3.2E 3	4.34E 3	620.208	-27.568
		0.750	309.813	-626.638	-2.4E 3	3.33E 3	620.208	-27.568
		0.833	309.813	-417.759	-1.6E 3	2.33E 3	620.208	-27.568
		0.917	309.813	-208.879	-799.136	1.32E 3	620.208	-27.568
		1.000	309.813	0.000	-0.000	309.813	620.208	-27.568
	6	0.000	810.276	-1.88E 3	-5.63E 3	8.31E 3	363.897	-20.634
		0.083	808.154	-1.72E 3	-5.16E 3	7.69E 3	363.897	-20.634
		0.167	806.031	-1.56E 3	-4.69E 3	7.06E 3	363.897	-20.634
		0.250	803.909	-1.41E 3	-4.22E 3	6.43E 3	363.897	-20.634
		0.333	801.786	-1.25E 3	-3.75E 3	5.8E 3	363.897	-20.634
		0.417	799.664	-1.09E 3	-3.28E 3	5.18E 3	363.897	-20.634
		0.500	797.541	-938.049	-2.81E 3	4.55E 3	363.897	-20.634
		0.583	795.419	-781.707	-2.34E 3	3.92E 3	363.897	-20.634
		0.667	793.296	-625.366	-1.88E 3	3.29E 3	363.897	-20.634
		0.750	791.174	-469.024	-1.41E 3	2.67E 3	363.897	-20.634
		0.833	789.051	-312.683	-937.759	2.04E 3	363.897	-20.634
		0.917	786.929	-156.341	-468.880	1.41E 3	363.897	-20.634
		1.000	784.806	0.000	-0.000	784.806	363.897	-20.634
	7	0.000	670.635	5.073	1.8E 3	2.47E 3	-116.092	0.056
		0.083	668.512	4.651	1.65E 3	2.32E 3	-116.092	0.056
		0.167	666.390	4.228	1.5E 3	2.17E 3	-116.092	0.056
		0.250	664.267	3.805	1.35E 3	2.01E 3	-116.092	0.056
		0.333	662.145	3.382	1.2E 3	1.86E 3	-116.092	0.056
		0.417	660.022	2.959	1.05E 3	1.71E 3	-116.092	0.056
		0.500	657.900	2.537	897.505	1.56E 3	-116.092	0.056
		0.583	655.777	2.114	747.920	1.41E 3	-116.092	0.056
		0.667	653.655	1.691	598.336	1.25E 3	-116.092	0.056
		0.750	651.532	1.268	448.752	1.1E 3	-116.092	0.056
		0.833	649.410	0.846	299.168	949.424	-116.092	0.056
		0.917	647.287	0.423	149.584	797.294	-116.092	0.056
		1.000	645.165	0.000	0.000	645.165	-116.092	0.056
	8	0.000	609.576	-2.51E 3	-8.71E 3	11.8E 3	563.447	-27.568
		0.083	607.453	-2.3E 3	-7.99E 3	10.9E 3	563.447	-27.568
		0.167	605.331	-2.09E 3	-7.26E 3	9.95E 3	563.447	-27.568
		0.250	603.208	-1.88E 3	-6.53E 3	9.02E 3	563.447	-27.568
		0.333	601.085	-1.67E 3	-5.81E 3	8.08E 3	563.447	-27.568
		0.417	598.963	-1.46E 3	-5.08E 3	7.14E 3	563.447	-27.568
		0.500	596.840	-1.25E 3	-4.36E 3	6.21E 3	563.447	-27.568
		0.583	594.718	-1.04E 3	-3.63E 3	5.27E 3	563.447	-27.568
		0.667	592.596	-835.502	-2.9E 3	4.33E 3	563.447	-27.568
		0.750	590.473	-626.627	-2.18E 3	3.4E 3	563.447	-27.568
		0.833	588.351	-417.751	-1.45E 3	2.46E 3	563.447	-27.568
		0.917	586.228	-208.876	-725.999	1.52E 3	563.447	-27.568
		1.000	584.105	0.000	-0.000	584.105	563.447	-27.568
	9	0.000	320.716	-2.56E 3	-9.77E 3	12.6E 3	631.759	-28.161

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	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.083	320.716	-2.35E 3	-8.95E 3	11.6E 3	631.759	-28.161
		0.167	320.716	-2.13E 3	-8.14E 3	10.6E 3	631.759	-28.161
		0.250	320.716	-1.92E 3	-7.33E 3	9.57E 3	631.759	-28.161
		0.333	320.716	-1.71E 3	-6.51E 3	8.54E 3	631.759	-28.161
		0.417	320.716	-1.49E 3	-5.7E 3	7.51E 3	631.759	-28.161
		0.500	320.716	-1.28E 3	-4.88E 3	6.49E 3	631.759	-28.161
		0.583	320.716	-1.07E 3	-4.07E 3	5.46E 3	631.759	-28.161
		0.667	320.716	-853.477	-3.26E 3	4.43E 3	631.759	-28.161
		0.750	320.716	-640.108	-2.44E 3	3.4E 3	631.759	-28.161
		0.833	320.716	-426.738	-1.63E 3	2.38E 3	631.759	-28.161
		0.917	320.716	-213.369	-814.019	1.35E 3	631.759	-28.161
		1.000	320.716	0.000	0.000	320.716	631.759	-28.161
	10	0.000	319.894	3.209	877.690	1.2E 3	-56.764	0.035
		0.083	317.771	2.942	804.549	1.13E 3	-56.764	0.035
		0.167	315.649	2.674	731.408	1.05E 3	-56.764	0.035
		0.250	313.526	2.407	658.268	974.201	-56.764	0.035
		0.333	311.404	2.139	585.127	898.670	-56.764	0.035
		0.417	309.281	1.872	511.986	823.139	-56.764	0.035
		0.500	307.159	1.605	438.845	747.608	-56.764	0.035
		0.583	305.036	1.337	365.704	672.077	-56.764	0.035
		0.667	302.914	1.070	292.563	596.547	-56.764	0.035
		0.750	300.791	0.802	219.423	521.016	-56.764	0.035
		0.833	298.669	0.535	146.282	445.485	-56.764	0.035
		0.917	296.546	0.267	73.141	369.954	-56.764	0.035
		1.000	294.424	0.000	0.000	294.424	-56.764	0.035
	11	0.000	319.894	3.209	877.690	1.2E 3	-56.764	0.035
		0.083	317.771	2.942	804.549	1.13E 3	-56.764	0.035
		0.167	315.649	2.674	731.408	1.05E 3	-56.764	0.035
		0.250	313.526	2.407	658.268	974.201	-56.764	0.035
		0.333	311.404	2.139	585.127	898.670	-56.764	0.035
		0.417	309.281	1.872	511.986	823.139	-56.764	0.035
		0.500	307.159	1.605	438.845	747.608	-56.764	0.035
		0.583	305.036	1.337	365.704	672.077	-56.764	0.035
		0.667	302.914	1.070	292.563	596.547	-56.764	0.035
		0.750	300.791	0.802	219.423	521.016	-56.764	0.035
		0.833	298.669	0.535	146.282	445.485	-56.764	0.035
		0.917	296.546	0.267	73.141	369.954	-56.764	0.035
		1.000	294.424	0.000	0.000	294.424	-56.764	0.035
	12	0.000	338.779	3.212	932.981	1.27E 3	-60.340	0.035
		0.083	336.522	2.944	855.233	1.19E 3	-60.340	0.035
		0.167	334.266	2.677	777.484	1.11E 3	-60.340	0.035
		0.250	332.010	2.409	699.736	1.03E 3	-60.340	0.035
		0.333	329.754	2.141	621.987	953.883	-60.340	0.035
		0.417	327.497	1.874	544.239	873.610	-60.340	0.035
		0.500	325.241	1.606	466.491	793.338	-60.340	0.035

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Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.583	322.985	1.338	388.742	713.066	-60.340	0.035
		0.667	320.729	1.071	310.994	632.793	-60.340	0.035
		0.750	318.473	0.803	233.245	552.521	-60.340	0.035
		0.833	316.216	0.535	155.497	472.249	-60.340	0.035
		0.917	313.960	0.268	77.748	391.976	-60.340	0.035
		1.000	311.704	0.000	0.000	311.704	-60.340	0.035
	13	0.000	338.779	3.212	932.981	1.27E 3	-60.340	0.035
		0.083	336.522	2.944	855.233	1.19E 3	-60.340	0.035
		0.167	334.266	2.677	777.484	1.11E 3	-60.340	0.035
		0.250	332.010	2.409	699.736	1.03E 3	-60.340	0.035
		0.333	329.754	2.141	621.987	953.883	-60.340	0.035
		0.417	327.497	1.874	544.239	873.610	-60.340	0.035
		0.500	325.241	1.606	466.491	793.338	-60.340	0.035
		0.583	322.985	1.338	388.742	713.066	-60.340	0.035
		0.667	320.729	1.071	310.994	632.793	-60.340	0.035
		0.750	318.473	0.803	233.245	552.521	-60.340	0.035
		0.833	316.216	0.535	155.497	472.249	-60.340	0.035
		0.917	313.960	0.268	77.748	391.976	-60.340	0.035
		1.000	311.704	0.000	0.000	311.704	-60.340	0.035
	14	0.000	607.224	6.192	1.61E 3	2.22E 3	-103.952	0.068
		0.083	605.000	5.676	1.47E 3	2.08E 3	-103.952	0.068
		0.167	602.777	5.160	1.34E 3	1.95E 3	-103.952	0.068
		0.250	600.554	4.644	1.21E 3	1.81E 3	-103.952	0.068
		0.333	598.331	4.128	1.07E 3	1.67E 3	-103.952	0.068
		0.417	596.108	3.612	937.596	1.54E 3	-103.952	0.068
		0.500	593.885	3.096	803.653	1.4E 3	-103.952	0.068
		0.583	591.662	2.580	669.711	1.26E 3	-103.952	0.068
		0.667	589.439	2.064	535.769	1.13E 3	-103.952	0.068
		0.750	587.216	1.548	401.827	990.590	-103.952	0.068
		0.833	584.992	1.032	267.885	853.909	-103.952	0.068
		0.917	582.769	0.516	133.942	717.228	-103.952	0.068
		1.000	580.546	0.000	0.000	580.546	-103.952	0.068
	15	0.000	607.224	6.192	1.61E 3	2.22E 3	-103.952	0.068
		0.083	605.000	5.676	1.47E 3	2.08E 3	-103.952	0.068
		0.167	602.777	5.160	1.34E 3	1.95E 3	-103.952	0.068
		0.250	600.554	4.644	1.21E 3	1.81E 3	-103.952	0.068
		0.333	598.331	4.128	1.07E 3	1.67E 3	-103.952	0.068
		0.417	596.108	3.612	937.596	1.54E 3	-103.952	0.068
		0.500	593.885	3.096	803.653	1.4E 3	-103.952	0.068
		0.583	591.662	2.580	669.711	1.26E 3	-103.952	0.068
		0.667	589.439	2.064	535.769	1.13E 3	-103.952	0.068
		0.750	587.216	1.548	401.827	990.590	-103.952	0.068
		0.833	584.992	1.032	267.885	853.909	-103.952	0.068
		0.917	582.769	0.516	133.942	717.228	-103.952	0.068
		1.000	580.546	0.000	0.000	580.546	-103.952	0.068

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	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
	16	0.000	818.454	-1.92E 3	-5.76E 3	8.5E 3	372.560	-21.079
		0.083	816.331	-1.76E 3	-5.28E 3	7.85E 3	372.560	-21.079
		0.167	814.209	-1.6E 3	-4.8E 3	7.21E 3	372.560	-21.079
		0.250	812.086	-1.44E 3	-4.32E 3	6.57E 3	372.560	-21.079
		0.333	809.964	-1.28E 3	-3.84E 3	5.93E 3	372.560	-21.079
		0.417	807.841	-1.12E 3	-3.36E 3	5.29E 3	372.560	-21.079
		0.500	805.719	-958.254	-2.88E 3	4.64E 3	372.560	-21.079
		0.583	803.596	-798.545	-2.4E 3	4E 3	372.560	-21.079
		0.667	801.474	-638.836	-1.92E 3	3.36E 3	372.560	-21.079
		0.750	799.351	-479.127	-1.44E 3	2.72E 3	372.560	-21.079
		0.833	797.229	-319.418	-960.084	2.08E 3	372.560	-21.079
		0.917	795.106	-159.709	-480.042	1.43E 3	372.560	-21.079
		1.000	792.984	0.000	0.000	792.984	372.560	-21.079
	17	0.000	620.479	-2.56E 3	-8.89E 3	12.1E 3	574.998	-28.160
		0.083	618.356	-2.35E 3	-8.15E 3	11.1E 3	574.998	-28.160
		0.167	616.234	-2.13E 3	-7.41E 3	10.2E 3	574.998	-28.160
		0.250	614.111	-1.92E 3	-6.67E 3	9.2E 3	574.998	-28.160
		0.333	611.989	-1.71E 3	-5.93E 3	8.25E 3	574.998	-28.160
		0.417	609.866	-1.49E 3	-5.19E 3	7.29E 3	574.998	-28.160
		0.500	607.744	-1.28E 3	-4.45E 3	6.33E 3	574.998	-28.160
		0.583	605.621	-1.07E 3	-3.7E 3	5.38E 3	574.998	-28.160
		0.667	603.499	-853.462	-2.96E 3	4.42E 3	574.998	-28.160
		0.750	601.376	-640.096	-2.22E 3	3.46E 3	574.998	-28.160
		0.833	599.254	-426.731	-1.48E 3	2.51E 3	574.998	-28.160
		0.917	597.131	-213.365	-740.883	1.55E 3	574.998	-28.160
		1.000	595.009	0.000	0.000	595.009	574.998	-28.160
34	1	0.000	679.708	-51.549	-3.05E 3	3.78E 3	196.962	-0.567
		0.083	677.585	-47.253	-2.79E 3	3.52E 3	196.962	-0.567
		0.167	675.463	-42.957	-2.54E 3	3.26E 3	196.962	-0.567
		0.250	673.340	-38.661	-2.28E 3	3E 3	196.962	-0.567
		0.333	671.218	-34.366	-2.03E 3	2.74E 3	196.962	-0.567
		0.417	669.095	-30.070	-1.78E 3	2.48E 3	196.962	-0.567
		0.500	666.973	-25.774	-1.52E 3	2.22E 3	196.962	-0.567
		0.583	664.850	-21.479	-1.27E 3	1.96E 3	196.962	-0.567
		0.667	662.728	-17.183	-1.02E 3	1.7E 3	196.962	-0.567
		0.750	660.605	-12.887	-761.356	1.43E 3	196.962	-0.567
		0.833	658.483	-8.591	-507.571	1.17E 3	196.962	-0.567
		0.917	656.360	-4.296	-253.785	914.441	196.962	-0.567
		1.000	654.238	0.000	0.000	654.238	196.962	-0.567
	2	0.000	770.226	-4.557	-3.23E 3	4.01E 3	209.195	-0.050
		0.083	770.226	-4.177	-2.97E 3	3.74E 3	209.195	-0.050
		0.167	770.226	-3.798	-2.7E 3	3.47E 3	209.195	-0.050
		0.250	770.226	-3.418	-2.43E 3	3.2E 3	209.195	-0.050
		0.333	770.226	-3.038	-2.16E 3	2.93E 3	209.195	-0.050
		0.417	770.226	-2.658	-1.89E 3	2.66E 3	209.195	-0.050

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	770.226	-2.279	-1.62E 3	2.39E 3	209.195	-0.050
		0.583	770.226	-1.899	-1.35E 3	2.12E 3	209.195	-0.050
		0.667	770.226	-1.519	-1.08E 3	1.85E 3	209.195	-0.050
		0.750	770.226	-1.139	-808.640	1.58E 3	209.195	-0.050
		0.833	770.226	-0.760	-539.093	1.31E 3	209.195	-0.050
		0.917	770.226	-0.380	-269.547	1.04E 3	209.195	-0.050
		1.000	770.226	-0.000	-0.000	770.226	209.195	-0.050
	3	0.000	29.042	3.092	0.132	32.265	-0.009	0.034
		0.083	29.042	2.834	0.121	31.997	-0.009	0.034
		0.167	29.042	2.576	0.110	31.728	-0.009	0.034
		0.250	29.042	2.319	0.099	31.460	-0.009	0.034
		0.333	29.042	2.061	0.088	31.191	-0.009	0.034
		0.417	29.042	1.803	0.077	30.922	-0.009	0.034
		0.500	29.042	1.546	0.066	30.654	-0.009	0.034
		0.583	29.042	1.288	0.055	30.385	-0.009	0.034
		0.667	29.042	1.031	0.044	30.116	-0.009	0.034
		0.750	29.042	0.773	0.033	29.848	-0.009	0.034
		0.833	29.042	0.515	0.022	29.579	-0.009	0.034
		0.917	29.042	0.258	0.011	29.311	-0.009	0.034
		1.000	29.042	0.000	0.000	29.042	-0.009	0.034
	4	0.000	29.042	3.092	0.132	32.265	-0.009	0.034
		0.083	29.042	2.834	0.121	31.997	-0.009	0.034
		0.167	29.042	2.576	0.110	31.728	-0.009	0.034
		0.250	29.042	2.319	0.099	31.460	-0.009	0.034
		0.333	29.042	2.061	0.088	31.191	-0.009	0.034
		0.417	29.042	1.803	0.077	30.922	-0.009	0.034
		0.500	29.042	1.546	0.066	30.654	-0.009	0.034
		0.583	29.042	1.288	0.055	30.385	-0.009	0.034
		0.667	29.042	1.031	0.044	30.116	-0.009	0.034
		0.750	29.042	0.773	0.033	29.848	-0.009	0.034
		0.833	29.042	0.515	0.022	29.579	-0.009	0.034
		0.917	29.042	0.258	0.011	29.311	-0.009	0.034
		1.000	29.042	0.000	0.000	29.042	-0.009	0.034
	5	0.000	287.576	-2.94E 3	-4.16E 3	7.39E 3	269.055	-32.316
		0.083	287.576	-2.69E 3	-3.81E 3	6.79E 3	269.055	-32.316
		0.167	287.576	-2.45E 3	-3.47E 3	6.2E 3	269.055	-32.316
		0.250	287.576	-2.2E 3	-3.12E 3	5.61E 3	269.055	-32.316
		0.333	287.576	-1.96E 3	-2.77E 3	5.02E 3	269.055	-32.316
		0.417	287.576	-1.71E 3	-2.43E 3	4.43E 3	269.055	-32.316
		0.500	287.576	-1.47E 3	-2.08E 3	3.84E 3	269.055	-32.316
		0.583	287.576	-1.22E 3	-1.73E 3	3.25E 3	269.055	-32.316
		0.667	287.576	-979.415	-1.39E 3	2.65E 3	269.055	-32.316
		0.750	287.576	-734.561	-1.04E 3	2.06E 3	269.055	-32.316
		0.833	287.576	-489.708	-693.355	1.47E 3	269.055	-32.316
		0.917	287.576	-244.854	-346.677	879.107	269.055	-32.316

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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	287.576	-0.000	0.000	287.576	269.055	-32.316
	6	0.000	1.47E 3	-2.26E 3	-8.59E 3	12.3E 3	555.650	-24.842
		0.083	1.47E 3	-2.07E 3	-7.88E 3	11.4E 3	555.650	-24.842
		0.167	1.47E 3	-1.88E 3	-7.16E 3	10.5E 3	555.650	-24.842
		0.250	1.47E 3	-1.69E 3	-6.44E 3	9.6E 3	555.650	-24.842
		0.333	1.46E 3	-1.51E 3	-5.73E 3	8.7E 3	555.650	-24.842
		0.417	1.46E 3	-1.32E 3	-5.01E 3	7.79E 3	555.650	-24.842
		0.500	1.46E 3	-1.13E 3	-4.3E 3	6.89E 3	555.650	-24.842
		0.583	1.46E 3	-941.104	-3.58E 3	5.98E 3	555.650	-24.842
		0.667	1.46E 3	-752.883	-2.86E 3	5.07E 3	555.650	-24.842
		0.750	1.45E 3	-564.663	-2.15E 3	4.17E 3	555.650	-24.842
		0.833	1.45E 3	-376.442	-1.43E 3	3.26E 3	555.650	-24.842
		0.917	1.45E 3	-188.221	-715.963	2.35E 3	555.650	-24.842
		1.000	1.45E 3	-0.000	0.000	1.45E 3	555.650	-24.842
	7	0.000	1.45E 3	-56.106	-6.28E 3	7.79E 3	406.157	-0.617
		0.083	1.45E 3	-51.430	-5.76E 3	7.26E 3	406.157	-0.617
		0.167	1.45E 3	-46.755	-5.23E 3	6.73E 3	406.157	-0.617
		0.250	1.44E 3	-42.079	-4.71E 3	6.2E 3	406.157	-0.617
		0.333	1.44E 3	-37.404	-4.19E 3	5.67E 3	406.157	-0.617
		0.417	1.44E 3	-32.728	-3.66E 3	5.14E 3	406.157	-0.617
		0.500	1.44E 3	-28.053	-3.14E 3	4.61E 3	406.157	-0.617
		0.583	1.44E 3	-23.377	-2.62E 3	4.08E 3	406.157	-0.617
		0.667	1.43E 3	-18.702	-2.09E 3	3.54E 3	406.157	-0.617
		0.750	1.43E 3	-14.026	-1.57E 3	3.01E 3	406.157	-0.617
		0.833	1.43E 3	-9.351	-1.05E 3	2.48E 3	406.157	-0.617
		0.917	1.43E 3	-4.675	-523.332	1.95E 3	406.157	-0.617
		1.000	1.42E 3	0.000	0.000	1.42E 3	406.157	-0.617
	8	0.000	967.283	-2.99E 3	-7.21E 3	11.2E 3	466.018	-32.883
		0.083	965.161	-2.74E 3	-6.61E 3	10.3E 3	466.018	-32.883
		0.167	963.038	-2.49E 3	-6E 3	9.46E 3	466.018	-32.883
		0.250	960.916	-2.24E 3	-5.4E 3	8.61E 3	466.018	-32.883
		0.333	958.793	-1.99E 3	-4.8E 3	7.76E 3	466.018	-32.883
		0.417	956.671	-1.74E 3	-4.2E 3	6.9E 3	466.018	-32.883
		0.500	954.548	-1.49E 3	-3.6E 3	6.05E 3	466.018	-32.883
		0.583	952.426	-1.25E 3	-3E 3	5.2E 3	466.018	-32.883
		0.667	950.303	-996.598	-2.4E 3	4.35E 3	466.018	-32.883
		0.750	948.181	-747.448	-1.8E 3	3.5E 3	466.018	-32.883
		0.833	946.058	-498.299	-1.2E 3	2.65E 3	466.018	-32.883
		0.917	943.936	-249.150	-600.463	1.79E 3	466.018	-32.883
		1.000	941.813	-0.000	0.000	941.813	466.018	-32.883
	9	0.000	291.846	-3E 3	-6.61E 3	9.9E 3	427.383	-33.017
		0.083	291.846	-2.75E 3	-6.06E 3	9.1E 3	427.383	-33.017
		0.167	291.846	-2.5E 3	-5.51E 3	8.3E 3	427.383	-33.017
		0.250	291.846	-2.25E 3	-4.96E 3	7.5E 3	427.383	-33.017
		0.333	291.846	-2E 3	-4.41E 3	6.7E 3	427.383	-33.017

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	291.846	-1.75E 3	-3.85E 3	5.6E 3	427.383	-33.017
		0.500	291.846	-1.5E 3	-3.3E 3	5.1E 3	427.383	-33.017
		0.583	291.846	-1.25E 3	-2.75E 3	4.3E 3	427.383	-33.017
		0.667	291.846	-1E 3	-2.2E 3	3.5E 3	427.383	-33.017
		0.750	291.846	-750.493	-1.65E 3	2.69E 3	427.383	-33.017
		0.833	291.846	-500.329	-1.1E 3	1.89E 3	427.383	-33.017
		0.917	291.846	-250.164	-550.682	1.09E 3	427.383	-33.017
		1.000	291.846	-0.000	0.000	291.846	427.383	-33.017
	10	0.000	700.037	-49.384	-3.05E 3	3.79E 3	196.956	-0.543
		0.083	697.914	-45.269	-2.79E 3	3.53E 3	196.956	-0.543
		0.167	695.792	-41.154	-2.54E 3	3.27E 3	196.956	-0.543
		0.250	693.669	-37.038	-2.28E 3	3.01E 3	196.956	-0.543
		0.333	691.547	-32.923	-2.03E 3	2.75E 3	196.956	-0.543
		0.417	689.424	-28.808	-1.78E 3	2.49E 3	196.956	-0.543
		0.500	687.302	-24.692	-1.52E 3	2.23E 3	196.956	-0.543
		0.583	685.179	-20.577	-1.27E 3	1.97E 3	196.956	-0.543
		0.667	683.057	-16.461	-1.02E 3	1.71E 3	196.956	-0.543
		0.750	680.934	-12.346	-761.333	1.45E 3	196.956	-0.543
		0.833	678.812	-8.231	-507.555	1.19E 3	196.956	-0.543
		0.917	676.689	-4.115	-253.778	934.582	196.956	-0.543
		1.000	674.567	0.000	0.000	674.567	196.956	-0.543
	11	0.000	700.037	-49.384	-3.05E 3	3.79E 3	196.956	-0.543
		0.083	697.914	-45.269	-2.79E 3	3.53E 3	196.956	-0.543
		0.167	695.792	-41.154	-2.54E 3	3.27E 3	196.956	-0.543
		0.250	693.669	-37.038	-2.28E 3	3.01E 3	196.956	-0.543
		0.333	691.547	-32.923	-2.03E 3	2.75E 3	196.956	-0.543
		0.417	689.424	-28.808	-1.78E 3	2.49E 3	196.956	-0.543
		0.500	687.302	-24.692	-1.52E 3	2.23E 3	196.956	-0.543
		0.583	685.179	-20.577	-1.27E 3	1.97E 3	196.956	-0.543
		0.667	683.057	-16.461	-1.02E 3	1.71E 3	196.956	-0.543
		0.750	680.934	-12.346	-761.333	1.45E 3	196.956	-0.543
		0.833	678.812	-8.231	-507.555	1.19E 3	196.956	-0.543
		0.917	676.689	-4.115	-253.778	934.582	196.956	-0.543
		1.000	674.567	0.000	0.000	674.567	196.956	-0.543
	12	0.000	742.858	-52.632	-3.24E 3	4.03E 3	209.365	-0.579
		0.083	740.602	-48.246	-2.97E 3	3.76E 3	209.365	-0.579
		0.167	738.346	-43.860	-2.7E 3	3.48E 3	209.365	-0.579
		0.250	736.090	-39.474	-2.43E 3	3.2E 3	209.365	-0.579
		0.333	733.834	-35.088	-2.16E 3	2.93E 3	209.365	-0.579
		0.417	731.577	-30.702	-1.89E 3	2.65E 3	209.365	-0.579
		0.500	729.321	-26.316	-1.62E 3	2.37E 3	209.365	-0.579
		0.583	727.065	-21.930	-1.35E 3	2.1E 3	209.365	-0.579
		0.667	724.809	-17.544	-1.08E 3	1.82E 3	209.365	-0.579
		0.750	722.553	-13.158	-809.298	1.55E 3	209.365	-0.579
		0.833	720.298	-8.772	-539.532	1.27E 3	209.365	-0.579

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	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	718.040	-4.386	-289.766	992.192	209.365	-0.579
		1.000	715.784	0.000	0.000	715.784	209.365	-0.579
	13	0.000	742.858	-52.632	-3.24E 3	4.03E 3	209.365	-0.579
		0.083	740.602	-48.246	-2.97E 3	3.76E 3	209.365	-0.579
		0.167	738.346	-43.860	-2.7E 3	3.48E 3	209.365	-0.579
		0.250	736.090	-39.474	-2.43E 3	3.2E 3	209.365	-0.579
		0.333	733.834	-35.088	-2.16E 3	2.93E 3	209.365	-0.579
		0.417	731.577	-30.702	-1.89E 3	2.65E 3	209.365	-0.579
		0.500	729.321	-26.316	-1.62E 3	2.37E 3	209.365	-0.579
		0.583	727.065	-21.930	-1.35E 3	2.1E 3	209.365	-0.579
		0.667	724.809	-17.544	-1.08E 3	1.82E 3	209.365	-0.579
		0.750	722.553	-13.158	-809.298	1.55E 3	209.365	-0.579
		0.833	720.296	-8.772	-539.532	1.27E 3	209.365	-0.579
		0.917	718.040	-4.386	-269.766	992.192	209.365	-0.579
		1.000	715.784	0.000	0.000	715.784	209.365	-0.579
	14	0.000	1.3E 3	-55.787	-5.62E 3	6.98E 3	363.190	-0.614
		0.083	1.3E 3	-51.138	-5.15E 3	6.5E 3	363.190	-0.614
		0.167	1.3E 3	-46.489	-4.68E 3	6.03E 3	363.190	-0.614
		0.250	1.3E 3	-41.840	-4.21E 3	5.55E 3	363.190	-0.614
		0.333	1.3E 3	-37.191	-3.74E 3	5.08E 3	363.190	-0.614
		0.417	1.29E 3	-32.542	-3.28E 3	4.6E 3	363.190	-0.614
		0.500	1.29E 3	-27.893	-2.81E 3	4.13E 3	363.190	-0.614
		0.583	1.29E 3	-23.244	-2.34E 3	3.65E 3	363.190	-0.614
		0.667	1.29E 3	-18.596	-1.87E 3	3.18E 3	363.190	-0.614
		0.750	1.28E 3	-13.947	-1.4E 3	2.7E 3	363.190	-0.614
		0.833	1.28E 3	-9.298	-935.938	2.23E 3	363.190	-0.614
		0.917	1.28E 3	-4.649	-467.969	1.75E 3	363.190	-0.614
		1.000	1.28E 3	0.000	0.000	1.28E 3	363.190	-0.614
	15	0.000	1.3E 3	-55.787	-5.62E 3	6.98E 3	363.190	-0.614
		0.083	1.3E 3	-51.138	-5.15E 3	6.5E 3	363.190	-0.614
		0.167	1.3E 3	-46.489	-4.68E 3	6.03E 3	363.190	-0.614
		0.250	1.3E 3	-41.840	-4.21E 3	5.55E 3	363.190	-0.614
		0.333	1.3E 3	-37.191	-3.74E 3	5.08E 3	363.190	-0.614
		0.417	1.29E 3	-32.542	-3.28E 3	4.6E 3	363.190	-0.614
		0.500	1.29E 3	-27.893	-2.81E 3	4.13E 3	363.190	-0.614
		0.583	1.29E 3	-23.244	-2.34E 3	3.65E 3	363.190	-0.614
		0.667	1.29E 3	-18.596	-1.87E 3	3.18E 3	363.190	-0.614
		0.750	1.28E 3	-13.947	-1.4E 3	2.7E 3	363.190	-0.614
		0.833	1.28E 3	-9.298	-935.938	2.23E 3	363.190	-0.614
		0.917	1.28E 3	-4.649	-467.969	1.75E 3	363.190	-0.614
		1.000	1.28E 3	0.000	0.000	1.28E 3	363.190	-0.614
	16	0.000	1.48E 3	-2.31E 3	-10.4E 3	14.2E 3	674.395	-25.367
		0.083	1.47E 3	-2.11E 3	-9.56E 3	13.1E 3	674.395	-25.367
		0.167	1.47E 3	-1.92E 3	-8.69E 3	12.1E 3	674.395	-25.367
		0.250	1.47E 3	-1.73E 3	-7.82E 3	11E 3	674.395	-25.367

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Job Title Crest Pad Bldg	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	1.47E 3	-1.54E 3	-6.95E 3	9.96E 3	674.395	-25.367
		0.417	1.47E 3	-1.35E 3	-6.08E 3	8.89E 3	674.395	-25.367
		0.500	1.46E 3	-1.15E 3	-5.21E 3	7.83E 3	674.395	-25.367
		0.583	1.46E 3	-961.019	-4.34E 3	6.77E 3	674.395	-25.367
		0.667	1.46E 3	-768.815	-3.48E 3	5.7E 3	674.395	-25.367
		0.750	1.46E 3	-576.611	-2.61E 3	4.64E 3	674.395	-25.367
		0.833	1.46E 3	-384.408	-1.74E 3	3.58E 3	674.395	-25.367
		0.917	1.45E 3	-192.204	-868.957	2.51E 3	674.395	-25.367
		1.000	1.45E 3	-0.000	0.000	1.45E 3	674.395	-25.367
	17	0.000	971.554	-3.05E 3	-9.65E 3	13.7E 3	624.345	-33.584
		0.083	969.431	-2.8E 3	-8.85E 3	12.6E 3	624.345	-33.584
		0.167	967.309	-2.54E 3	-8.04E 3	11.6E 3	624.345	-33.584
		0.250	965.186	-2.29E 3	-7.24E 3	10.5E 3	624.345	-33.584
		0.333	963.063	-2.04E 3	-6.44E 3	9.43E 3	624.345	-33.584
		0.417	960.941	-1.78E 3	-5.63E 3	8.37E 3	624.345	-33.584
		0.500	958.818	-1.53E 3	-4.83E 3	7.31E 3	624.345	-33.584
		0.583	956.696	-1.27E 3	-4.02E 3	6.25E 3	624.345	-33.584
		0.667	954.574	-1.02E 3	-3.22E 3	5.19E 3	624.345	-33.584
		0.750	952.451	-763.380	-2.41E 3	4.13E 3	624.345	-33.584
		0.833	950.328	-508.920	-1.61E 3	3.07E 3	624.345	-33.584
		0.917	948.206	-254.460	-804.467	2.01E 3	624.345	-33.584
		1.000	946.083	-0.000	0.000	946.083	624.345	-33.584
36	1	0.000	469.360	107.548	1.42E 3	2E 3	-91.798	1.183
		0.083	467.238	98.585	1.3E 3	1.87E 3	-91.798	1.183
		0.167	465.115	89.623	1.18E 3	1.74E 3	-91.798	1.183
		0.250	462.993	80.661	1.06E 3	1.61E 3	-91.798	1.183
		0.333	460.870	71.698	946.254	1.48E 3	-91.798	1.183
		0.417	458.748	62.736	827.973	1.35E 3	-91.798	1.183
		0.500	456.625	53.774	709.691	1.22E 3	-91.798	1.183
		0.583	454.503	44.811	591.409	1.09E 3	-91.798	1.183
		0.667	452.380	35.849	473.127	961.357	-91.798	1.183
		0.750	450.258	26.887	354.845	831.990	-91.798	1.183
		0.833	448.136	17.925	236.564	702.623	-91.798	1.183
		0.917	446.013	8.962	118.282	573.257	-91.798	1.183
		1.000	443.890	-0.000	0.000	443.890	-91.798	1.183
	2	0.000	551.006	-17.690	1.47E 3	2.04E 3	-95.332	-0.195
		0.083	551.006	-16.216	1.35E 3	1.92E 3	-95.332	-0.195
		0.167	551.006	-14.742	1.23E 3	1.79E 3	-95.332	-0.195
		0.250	551.006	-13.268	1.11E 3	1.67E 3	-95.332	-0.195
		0.333	551.006	-11.794	982.677	1.55E 3	-95.332	-0.195
		0.417	551.006	-10.319	859.843	1.42E 3	-95.332	-0.195
		0.500	551.006	-8.845	737.008	1.3E 3	-95.332	-0.195
		0.583	551.006	-7.371	614.173	1.17E 3	-95.332	-0.195
		0.667	551.006	-5.897	491.339	1.05E 3	-95.332	-0.195
		0.750	551.006	-4.423	368.504	923.932	-95.332	-0.195

WEAVER BOOS CONSULTANTS Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 99	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	551.006	-2.948	245.669	799.623	-95.332	-0.195
		0.917	551.006	-1.474	122.836	675.315	-95.332	-0.195
		1.000	551.006	0.000	-0.000	551.006	-95.332	-0.195
	3	0.000	-0.057	-4.138	-1.339	-5.534	0.087	-0.046
		0.083	-0.057	-3.793	-1.228	-5.078	0.087	-0.046
		0.167	-0.057	-3.448	-1.116	-4.622	0.087	-0.046
		0.250	-0.057	-3.103	-1.004	-4.165	0.087	-0.046
		0.333	-0.057	-2.758	-0.893	-3.709	0.087	-0.046
		0.417	-0.057	-2.414	-0.781	-3.252	0.087	-0.046
		0.500	-0.057	-2.069	-0.670	-2.796	0.087	-0.046
		0.583	-0.057	-1.724	-0.558	-2.340	0.087	-0.046
		0.667	-0.057	-1.379	-0.446	-1.883	0.087	-0.046
		0.750	-0.057	-1.034	-0.335	-1.427	0.087	-0.046
		0.833	-0.057	-0.690	-0.223	-0.970	0.087	-0.046
		0.917	-0.057	-0.345	-0.112	-0.514	0.087	-0.046
		1.000	-0.057	-0.000	0.000	-0.057	0.087	-0.046
	4	0.000	-0.057	-4.138	-1.339	-5.534	0.087	-0.046
		0.083	-0.057	-3.793	-1.228	-5.078	0.087	-0.046
		0.167	-0.057	-3.448	-1.116	-4.622	0.087	-0.046
		0.250	-0.057	-3.103	-1.004	-4.165	0.087	-0.046
		0.333	-0.057	-2.758	-0.893	-3.709	0.087	-0.046
		0.417	-0.057	-2.414	-0.781	-3.252	0.087	-0.046
		0.500	-0.057	-2.069	-0.670	-2.796	0.087	-0.046
		0.583	-0.057	-1.724	-0.558	-2.340	0.087	-0.046
		0.667	-0.057	-1.379	-0.446	-1.883	0.087	-0.046
		0.750	-0.057	-1.034	-0.335	-1.427	0.087	-0.046
		0.833	-0.057	-0.690	-0.223	-0.970	0.087	-0.046
		0.917	-0.057	-0.345	-0.112	-0.514	0.087	-0.046
		1.000	-0.057	-0.000	0.000	-0.057	0.087	-0.046
	5	0.000	101.230	-2.19E 3	-1.75E 3	4.04E 3	113.193	-24.083
		0.083	101.230	-2.01E 3	-1.6E 3	3.71E 3	113.193	-24.083
		0.167	101.230	-1.82E 3	-1.46E 3	3.38E 3	113.193	-24.083
		0.250	101.230	-1.64E 3	-1.31E 3	3.06E 3	113.193	-24.083
		0.333	101.230	-1.46E 3	-1.17E 3	2.73E 3	113.193	-24.083
		0.417	101.230	-1.28E 3	-1.02E 3	2.4E 3	113.193	-24.083
		0.500	101.230	-1.09E 3	-875.095	2.07E 3	113.193	-24.083
		0.583	101.230	-912.346	-729.246	1.74E 3	113.193	-24.083
		0.667	101.230	-729.877	-583.397	1.41E 3	113.193	-24.083
		0.750	101.230	-547.408	-437.548	1.09E 3	113.193	-24.083
		0.833	101.230	-364.938	-291.698	757.867	113.193	-24.083
		0.917	101.230	-182.469	-145.849	429.549	113.193	-24.083
		1.000	101.230	-0.000	0.000	101.230	113.193	-24.083
	6	0.000	958.537	-1.55E 3	1.21E 3	3.72E 3	-78.402	-17.025
		0.083	956.415	-1.42E 3	1.11E 3	3.49E 3	-78.402	-17.025
		0.167	954.292	-1.29E 3	1.01E 3	3.25E 3	-78.402	-17.025

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	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	952.170	-1.16E 3	909.188	3.02E 3	-78.402	-17.025
		0.333	950.047	-1.03E 3	808.167	2.79E 3	-78.402	-17.025
		0.417	947.925	-902.966	707.146	2.56E 3	-78.402	-17.025
		0.500	945.802	-773.971	606.126	2.33E 3	-78.402	-17.025
		0.583	943.680	-644.976	505.105	2.09E 3	-78.402	-17.025
		0.667	941.557	-515.981	404.084	1.86E 3	-78.402	-17.025
		0.750	939.435	-386.986	303.063	1.63E 3	-78.402	-17.025
		0.833	937.312	-257.990	202.042	1.4E 3	-78.402	-17.025
		0.917	935.190	-128.995	101.021	1.17E 3	-78.402	-17.025
		1.000	933.067	-0.000	0.000	933.067	-78.402	-17.025
	7	0.000	1.02E 3	89.857	2.89E 3	4E 3	-187.130	0.988
		0.083	1.02E 3	82.369	2.65E 3	3.75E 3	-187.130	0.988
		0.167	1.02E 3	74.881	2.41E 3	3.5E 3	-187.130	0.988
		0.250	1.01E 3	67.393	2.17E 3	3.25E 3	-187.130	0.988
		0.333	1.01E 3	59.905	1.93E 3	3E 3	-187.130	0.988
		0.417	1.01E 3	52.417	1.69E 3	2.75E 3	-187.130	0.988
		0.500	1.01E 3	44.929	1.45E 3	2.5E 3	-187.130	0.988
		0.583	1.01E 3	37.441	1.21E 3	2.25E 3	-187.130	0.988
		0.667	1E 3	29.952	984.466	2E 3	-187.130	0.988
		0.750	1E 3	22.464	723.349	1.75E 3	-187.130	0.988
		0.833	999.141	14.976	482.233	1.5E 3	-187.130	0.988
		0.917	997.018	7.488	241.117	1.25E 3	-187.130	0.988
		1.000	994.896	-0.000	-0.000	994.896	-187.130	0.988
	8	0.000	570.591	-2.08E 3	-330.809	2.98E 3	21.395	-22.900
		0.083	568.468	-1.91E 3	-303.241	2.78E 3	21.395	-22.900
		0.167	566.346	-1.74E 3	-275.674	2.58E 3	21.395	-22.900
		0.250	564.223	-1.56E 3	-248.106	2.37E 3	21.395	-22.900
		0.333	562.101	-1.39E 3	-220.539	2.17E 3	21.395	-22.900
		0.417	559.978	-1.21E 3	-192.972	1.97E 3	21.395	-22.900
		0.500	557.856	-1.04E 3	-165.404	1.76E 3	21.395	-22.900
		0.583	555.733	-867.534	-137.837	1.56E 3	21.395	-22.900
		0.667	553.611	-694.027	-110.270	1.36E 3	21.395	-22.900
		0.750	551.488	-520.521	-82.702	1.16E 3	21.395	-22.900
		0.833	549.366	-347.014	-55.135	951.514	21.395	-22.900
		0.917	547.243	-173.507	-27.567	748.317	21.395	-22.900
		1.000	545.121	-0.000	0.000	545.121	21.395	-22.900
	9	0.000	105.914	-2.24E 3	-1.81E 3	4.16E 3	117.354	-24.592
		0.083	105.914	-2.05E 3	-1.66E 3	3.82E 3	117.354	-24.592
		0.167	105.914	-1.86E 3	-1.51E 3	3.48E 3	117.354	-24.592
		0.250	105.914	-1.68E 3	-1.36E 3	3.14E 3	117.354	-24.592
		0.333	105.914	-1.49E 3	-1.21E 3	2.81E 3	117.354	-24.592
		0.417	105.914	-1.3E 3	-1.06E 3	2.47E 3	117.354	-24.592
		0.500	105.914	-1.12E 3	-907.264	2.13E 3	117.354	-24.592
		0.583	105.914	-931.629	-756.053	1.79E 3	117.354	-24.592
		0.667	105.914	-745.303	-604.843	1.46E 3	117.354	-24.592

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		By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford		File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.750	105.914	-558.977	-453.632	1.12E 3	117.354	-24.592
		0.833	105.914	-372.652	-302.421	780.987	117.354	-24.592
		0.917	105.914	-186.326	-151.211	443.451	117.354	-24.592
		1.000	105.914	-0.000	0.000	105.914	117.354	-24.592
	10	0.000	469.320	104.651	1.42E 3	1.99E 3	-91.738	1.151
		0.083	467.198	95.930	1.3E 3	1.86E 3	-91.738	1.151
		0.167	465.075	87.209	1.18E 3	1.73E 3	-91.738	1.151
		0.250	462.952	78.488	1.06E 3	1.61E 3	-91.738	1.151
		0.333	460.830	69.767	945.629	1.48E 3	-91.738	1.151
		0.417	458.708	61.047	827.426	1.35E 3	-91.738	1.151
		0.500	456.585	52.326	709.222	1.22E 3	-91.738	1.151
		0.583	454.462	43.605	591.018	1.09E 3	-91.738	1.151
		0.667	452.340	34.884	472.815	960.038	-91.738	1.151
		0.750	450.218	26.163	354.611	830.991	-91.738	1.151
		0.833	448.095	17.442	236.407	701.944	-91.738	1.151
		0.917	445.973	8.721	118.204	572.897	-91.738	1.151
		1.000	443.850	-0.000	0.000	443.850	-91.738	1.151
	11	0.000	469.320	104.651	1.42E 3	1.99E 3	-91.738	1.151
		0.083	467.198	95.930	1.3E 3	1.86E 3	-91.738	1.151
		0.167	465.075	87.209	1.18E 3	1.73E 3	-91.738	1.151
		0.250	462.952	78.488	1.06E 3	1.61E 3	-91.738	1.151
		0.333	460.830	69.767	945.629	1.48E 3	-91.738	1.151
		0.417	458.708	61.047	827.426	1.35E 3	-91.738	1.151
		0.500	456.585	52.326	709.222	1.22E 3	-91.738	1.151
		0.583	454.462	43.605	591.018	1.09E 3	-91.738	1.151
		0.667	452.340	34.884	472.815	960.038	-91.738	1.151
		0.750	450.218	26.163	354.611	830.991	-91.738	1.151
		0.833	448.095	17.442	236.407	701.944	-91.738	1.151
		0.917	445.973	8.721	118.204	572.897	-91.738	1.151
		1.000	443.850	-0.000	0.000	443.850	-91.738	1.151
	12	0.000	498.890	111.427	1.51E 3	2.12E 3	-97.521	1.226
		0.083	496.633	102.141	1.38E 3	1.98E 3	-97.521	1.226
		0.167	494.377	92.856	1.26E 3	1.84E 3	-97.521	1.226
		0.250	492.121	83.570	1.13E 3	1.71E 3	-97.521	1.226
		0.333	489.865	74.284	1.01E 3	1.57E 3	-97.521	1.226
		0.417	487.609	64.999	879.588	1.43E 3	-97.521	1.226
		0.500	485.352	55.713	753.932	1.29E 3	-97.521	1.226
		0.583	483.096	46.428	628.277	1.16E 3	-97.521	1.226
		0.667	480.840	37.142	502.622	1.02E 3	-97.521	1.226
		0.750	478.584	27.857	376.966	883.407	-97.521	1.226
		0.833	476.327	18.571	251.311	746.209	-97.521	1.226
		0.917	474.071	9.286	125.655	609.012	-97.521	1.226
		1.000	471.815	-0.000	0.000	471.815	-97.521	1.226
	13	0.000	498.890	111.427	1.51E 3	2.12E 3	-97.521	1.226
		0.083	496.633	102.141	1.38E 3	1.98E 3	-97.521	1.226

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Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.167	494.377	92.856	1.26E 3	1.84E 3	-97.521	1.226
		0.250	492.121	83.570	1.13E 3	1.71E 3	-97.521	1.226
		0.333	489.865	74.284	1.01E 3	1.57E 3	-97.521	1.226
		0.417	487.609	64.999	879.586	1.43E 3	-97.521	1.226
		0.500	485.352	55.713	753.932	1.29E 3	-97.521	1.226
		0.583	483.096	46.428	628.277	1.16E 3	-97.521	1.226
		0.667	480.840	37.142	502.622	1.02E 3	-97.521	1.226
		0.750	478.584	27.857	376.966	883.407	-97.521	1.226
		0.833	476.327	18.571	251.311	746.209	-97.521	1.226
		0.917	474.071	9.286	125.655	609.012	-97.521	1.226
		1.000	471.815	-0.000	0.000	471.815	-97.521	1.226
	14	0.000	904.832	97.205	2.59E 3	3.59E 3	-167.603	1.069
		0.083	902.609	89.105	2.38E 3	3.37E 3	-167.603	1.069
		0.167	900.386	81.004	2.16E 3	3.14E 3	-167.603	1.069
		0.250	898.163	72.904	1.94E 3	2.91E 3	-167.603	1.069
		0.333	895.940	64.804	1.73E 3	2.69E 3	-167.603	1.069
		0.417	893.716	56.703	1.51E 3	2.46E 3	-167.603	1.069
		0.500	891.493	48.603	1.3E 3	2.24E 3	-167.603	1.069
		0.583	889.270	40.502	1.08E 3	2.01E 3	-167.603	1.069
		0.667	887.047	32.402	863.823	1.78E 3	-167.603	1.069
		0.750	884.824	24.301	647.867	1.56E 3	-167.603	1.069
		0.833	882.601	16.201	431.912	1.33E 3	-167.603	1.069
		0.917	880.378	8.100	215.956	1.1E 3	-167.603	1.069
		1.000	878.155	-0.000	-0.000	878.155	-167.603	1.069
	15	0.000	904.832	97.205	2.59E 3	3.59E 3	-167.603	1.069
		0.083	902.609	89.105	2.38E 3	3.37E 3	-167.603	1.069
		0.167	900.386	81.004	2.16E 3	3.14E 3	-167.603	1.069
		0.250	898.163	72.904	1.94E 3	2.91E 3	-167.603	1.069
		0.333	895.940	64.804	1.73E 3	2.69E 3	-167.603	1.069
		0.417	893.716	56.703	1.51E 3	2.46E 3	-167.603	1.069
		0.500	891.493	48.603	1.3E 3	2.24E 3	-167.603	1.069
		0.583	889.270	40.502	1.08E 3	2.01E 3	-167.603	1.069
		0.667	887.047	32.402	863.823	1.78E 3	-167.603	1.069
		0.750	884.824	24.301	647.867	1.56E 3	-167.603	1.069
		0.833	882.601	16.201	431.912	1.33E 3	-167.603	1.069
		0.917	880.378	8.100	215.956	1.1E 3	-167.603	1.069
		1.000	878.155	-0.000	-0.000	878.155	-167.603	1.069
	16	0.000	962.050	-1.58E 3	1.16E 3	3.71E 3	-75.281	-17.407
		0.083	959.928	-1.45E 3	1.07E 3	3.48E 3	-75.281	-17.407
		0.167	957.805	-1.32E 3	969.998	3.25E 3	-75.281	-17.407
		0.250	955.683	-1.19E 3	872.998	3.02E 3	-75.281	-17.407
		0.333	953.560	-1.06E 3	775.998	2.78E 3	-75.281	-17.407
		0.417	951.438	-923.213	678.999	2.55E 3	-75.281	-17.407
		0.500	949.315	-791.326	581.999	2.32E 3	-75.281	-17.407
		0.583	947.193	-659.438	484.999	2.09E 3	-75.281	-17.407

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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.667	945.070	-527.551	387.999	1.86E 3	-75.281	-17.407
		0.750	942.948	-395.663	290.999	1.63E 3	-75.281	-17.407
		0.833	940.825	-263.775	194.000	1.4E 3	-75.281	-17.407
		0.917	938.703	-131.888	97.000	1.17E 3	-75.281	-17.407
		1.000	936.580	-0.000	-0.000	936.580	-75.281	-17.407
	17	0.000	575.275	-2.13E 3	-395.147	3.1E 3	25.556	-23.409
		0.083	573.152	-1.95E 3	-362.218	2.89E 3	25.556	-23.409
		0.167	571.030	-1.77E 3	-329.289	2.67E 3	25.556	-23.409
		0.250	568.907	-1.6E 3	-296.360	2.46E 3	25.556	-23.409
		0.333	566.785	-1.42E 3	-263.431	2.25E 3	25.556	-23.409
		0.417	564.662	-1.24E 3	-230.502	2.04E 3	25.556	-23.409
		0.500	562.540	-1.06E 3	-197.573	1.82E 3	25.556	-23.409
		0.583	560.417	-886.817	-164.644	1.61E 3	25.556	-23.409
		0.667	558.295	-709.454	-131.716	1.4E 3	25.556	-23.409
		0.750	556.172	-532.090	-98.787	1.19E 3	25.556	-23.409
		0.833	554.050	-354.727	-65.858	974.634	25.556	-23.409
		0.917	551.927	-177.364	-32.929	762.219	25.556	-23.409
		1.000	549.805	-0.000	0.000	549.805	25.556	-23.409
39	1	0.000	498.138	-334.814	-1.99E 3	2.83E 3	-442.801	-14.486
		0.083	499.199	-279.934	-2.28E 3	3.06E 3	-442.801	-14.486
		0.167	500.260	-225.053	-2.56E 3	3.29E 3	-442.801	-14.486
		0.250	501.321	-170.172	-2.85E 3	3.52E 3	-442.801	-14.486
		0.333	502.383	-115.292	-3.13E 3	3.75E 3	-442.801	-14.486
		0.417	503.444	-60.411	-3.42E 3	3.98E 3	-442.801	-14.486
		0.500	504.505	-5.530	-3.7E 3	4.21E 3	-442.801	-14.486
		0.583	505.566	49.351	-3.99E 3	4.54E 3	-442.801	-14.486
		0.667	506.628	104.231	-4.28E 3	4.89E 3	-442.801	-14.486
		0.750	507.689	159.112	-4.56E 3	5.23E 3	-442.801	-14.486
		0.833	508.750	213.993	-4.85E 3	5.57E 3	-442.801	-14.486
		0.917	509.811	268.873	-5.13E 3	5.91E 3	-442.801	-14.486
		1.000	510.873	323.754	-5.42E 3	6.25E 3	-442.801	-14.486
	2	0.000	554.271	-4.399	-2.12E 3	2.67E 3	-478.687	0.334
		0.083	554.271	-5.662	-2.42E 3	2.98E 3	-478.687	0.334
		0.167	554.271	-6.926	-2.73E 3	3.29E 3	-478.687	0.334
		0.250	554.271	-8.189	-3.04E 3	3.6E 3	-478.687	0.334
		0.333	554.271	-9.453	-3.35E 3	3.91E 3	-478.687	0.334
		0.417	554.271	-10.717	-3.66E 3	4.22E 3	-478.687	0.334
		0.500	554.271	-11.980	-3.97E 3	4.53E 3	-478.687	0.334
		0.583	554.271	-13.244	-4.27E 3	4.84E 3	-478.687	0.334
		0.667	554.271	-14.508	-4.58E 3	5.15E 3	-478.687	0.334
		0.750	554.271	-15.771	-4.89E 3	5.46E 3	-478.687	0.334
		0.833	554.271	-17.035	-5.2E 3	5.77E 3	-478.687	0.334
		0.917	554.271	-18.299	-5.51E 3	6.08E 3	-478.687	0.334
		1.000	554.271	-19.562	-5.82E 3	6.39E 3	-478.687	0.334
	3	0.000	-0.061	-31.711	-0.281	-32.052	0.128	-1.303

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Job Title Crest Pad Bldg	Part		
	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.083	-0.061	-26.774	-0.198	-27.034	0.128	-1.303
		0.167	-0.061	-21.838	-0.115	-22.015	0.128	-1.303
		0.250	-0.061	-16.902	-0.033	-16.996	0.128	-1.303
		0.333	-0.061	-11.966	0.050	-12.076	0.128	-1.303
		0.417	-0.061	-7.029	0.132	-7.223	0.128	-1.303
		0.500	-0.061	-2.093	0.215	-2.369	0.128	-1.303
		0.583	-0.061	2.843	0.297	-3.202	0.128	-1.303
		0.667	-0.061	7.779	0.380	-8.220	0.128	-1.303
		0.750	-0.061	12.716	0.462	-13.239	0.128	-1.303
		0.833	-0.061	17.652	0.545	-18.258	0.128	-1.303
		0.917	-0.061	22.588	0.628	-23.277	0.128	-1.303
		1.000	-0.061	27.525	0.710	-28.296	0.128	-1.303
	4	0.000	-0.061	-31.711	-0.281	-32.052	0.128	-1.303
		0.083	-0.061	-26.774	-0.198	-27.034	0.128	-1.303
		0.167	-0.061	-21.838	-0.115	-22.015	0.128	-1.303
		0.250	-0.061	-16.902	-0.033	-16.996	0.128	-1.303
		0.333	-0.061	-11.966	0.050	-12.076	0.128	-1.303
		0.417	-0.061	-7.029	0.132	-7.223	0.128	-1.303
		0.500	-0.061	-2.093	0.215	-2.369	0.128	-1.303
		0.583	-0.061	2.843	0.297	-3.202	0.128	-1.303
		0.667	-0.061	7.779	0.380	-8.220	0.128	-1.303
		0.750	-0.061	12.716	0.462	-13.239	0.128	-1.303
		0.833	-0.061	17.652	0.545	-18.258	0.128	-1.303
		0.917	-0.061	22.588	0.628	-23.277	0.128	-1.303
		1.000	-0.061	27.525	0.710	-28.296	0.128	-1.303
	5	0.000	-63.676	-1.03E 3	1.34E 3	-2.43E 3	112.467	-49.596
		0.083	-63.676	-845.902	1.41E 3	-2.32E 3	112.467	-49.596
		0.167	-63.676	-658.013	1.48E 3	-2.2E 3	112.467	-49.596
		0.250	-63.676	-470.124	1.55E 3	-2.09E 3	112.467	-49.596
		0.333	-63.676	-282.235	1.63E 3	-1.97E 3	112.467	-49.596
		0.417	-63.676	-94.346	1.7E 3	-1.86E 3	112.467	-49.596
		0.500	-63.676	93.543	1.77E 3	-1.93E 3	112.467	-49.596
		0.583	-63.676	281.432	1.84E 3	-2.19E 3	112.467	-49.596
		0.667	-63.676	469.321	1.92E 3	-2.45E 3	112.467	-49.596
		0.750	-63.676	657.210	1.99E 3	-2.71E 3	112.467	-49.596
		0.833	-63.676	845.099	2.06E 3	-2.97E 3	112.467	-49.596
		0.917	-63.676	1.03E 3	2.13E 3	-3.23E 3	112.467	-49.596
		1.000	-63.676	1.22E 3	2.2E 3	-3.49E 3	112.467	-49.596
	6	0.000	866.084	-1.11E 3	-2.58E 3	4.56E 3	-717.466	-51.433
		0.083	867.145	-918.607	-3.04E 3	4.83E 3	-717.466	-51.433
		0.167	868.206	-723.757	-3.5E 3	5.09E 3	-717.466	-51.433
		0.250	869.267	-528.907	-3.96E 3	5.36E 3	-717.466	-51.433
		0.333	870.328	-334.058	-4.43E 3	5.63E 3	-717.466	-51.433
		0.417	871.390	-139.208	-4.89E 3	5.9E 3	-717.466	-51.433
		0.500	872.451	55.642	-5.35E 3	6.28E 3	-717.466	-51.433

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.583	873.512	250.492	-5.81E 3	6.94E 3	-717.466	-51.433
		0.667	874.574	445.341	-6.28E 3	7.6E 3	-717.466	-51.433
		0.750	875.635	640.191	-6.74E 3	8.25E 3	-717.466	-51.433
		0.833	876.696	835.041	-7.2E 3	8.91E 3	-717.466	-51.433
		0.917	877.757	1.03E 3	-7.66E 3	9.57E 3	-717.466	-51.433
		1.000	878.819	1.22E 3	-8.12E 3	10.2E 3	-717.466	-51.433
	7	0.000	1.05E 3	-339.213	-4.11E 3	5.5E 3	-921.488	-14.153
		0.083	1.05E 3	-285.596	-4.7E 3	6.04E 3	-921.488	-14.153
		0.167	1.05E 3	-231.979	-5.3E 3	6.58E 3	-921.488	-14.153
		0.250	1.06E 3	-178.362	-5.89E 3	7.12E 3	-921.488	-14.153
		0.333	1.06E 3	-124.745	-6.48E 3	7.66E 3	-921.488	-14.153
		0.417	1.06E 3	-71.128	-7.08E 3	8.21E 3	-921.488	-14.153
		0.500	1.06E 3	-17.511	-7.67E 3	8.75E 3	-921.488	-14.153
		0.583	1.06E 3	36.107	-8.26E 3	9.36E 3	-921.488	-14.153
		0.667	1.06E 3	89.724	-8.86E 3	10E 3	-921.488	-14.153
		0.750	1.06E 3	143.341	-9.45E 3	10.7E 3	-921.488	-14.153
		0.833	1.06E 3	196.958	-10E 3	11.3E 3	-921.488	-14.153
		0.917	1.06E 3	250.575	-10.6E 3	12E 3	-921.488	-14.153
		1.000	1.07E 3	304.192	-11.2E 3	12.6E 3	-921.488	-14.153
	8	0.000	434.461	-1.37E 3	-657.521	2.46E 3	-330.334	-64.082
		0.083	435.523	-1.13E 3	-870.338	2.43E 3	-330.334	-64.082
		0.167	436.584	-883.066	-1.08E 3	2.4E 3	-330.334	-64.082
		0.250	437.645	-640.296	-1.3E 3	2.37E 3	-330.334	-64.082
		0.333	438.706	-397.527	-1.51E 3	2.35E 3	-330.334	-64.082
		0.417	439.768	-154.757	-1.72E 3	2.32E 3	-330.334	-64.082
		0.500	440.829	88.013	-1.93E 3	2.46E 3	-330.334	-64.082
		0.583	441.890	330.783	-2.15E 3	2.92E 3	-330.334	-64.082
		0.667	442.951	573.552	-2.36E 3	3.38E 3	-330.334	-64.082
		0.750	444.013	816.322	-2.57E 3	3.83E 3	-330.334	-64.082
		0.833	445.074	1.06E 3	-2.79E 3	4.29E 3	-330.334	-64.082
		0.917	446.135	1.3E 3	-3E 3	4.75E 3	-330.334	-64.082
		1.000	447.196	1.54E 3	-3.21E 3	5.2E 3	-330.334	-64.082
	9	0.000	-64.926	-1.06E 3	1.38E 3	-2.51E 3	115.143	-50.874
		0.083	-64.926	-869.948	1.45E 3	-2.39E 3	115.143	-50.874
		0.167	-64.926	-677.215	1.53E 3	-2.27E 3	115.143	-50.874
		0.250	-64.926	-484.482	1.6E 3	-2.15E 3	115.143	-50.874
		0.333	-64.926	-291.749	1.68E 3	-2.03E 3	115.143	-50.874
		0.417	-64.926	-99.016	1.75E 3	-1.92E 3	115.143	-50.874
		0.500	-64.926	93.717	1.83E 3	-1.98E 3	115.143	-50.874
		0.583	-64.926	286.450	1.9E 3	-2.25E 3	115.143	-50.874
		0.667	-64.926	479.183	1.97E 3	-2.52E 3	115.143	-50.874
		0.750	-64.926	671.916	2.05E 3	-2.79E 3	115.143	-50.874
		0.833	-64.926	864.649	2.12E 3	-3.05E 3	115.143	-50.874
		0.917	-64.926	1.06E 3	2.2E 3	-3.32E 3	115.143	-50.874
		1.000	-64.926	1.25E 3	2.27E 3	-3.59E 3	115.143	-50.874

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	Part		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
	10	0.000	498.095	-357.012	-1.99E 3	2.85E 3	-442.711	-15.399
		0.083	499.156	-298.676	-2.28E 3	3.08E 3	-442.711	-15.399
		0.167	500.217	-240.340	-2.56E 3	3.3E 3	-442.711	-15.399
		0.250	501.279	-182.004	-2.85E 3	3.53E 3	-442.711	-15.399
		0.333	502.340	-123.667	-3.13E 3	3.76E 3	-442.711	-15.399
		0.417	503.401	-65.331	-3.42E 3	3.99E 3	-442.711	-15.399
		0.500	504.462	-6.995	-3.7E 3	4.22E 3	-442.711	-15.399
		0.583	505.524	51.341	-3.99E 3	4.55E 3	-442.711	-15.399
		0.667	506.585	109.677	-4.27E 3	4.89E 3	-442.711	-15.399
		0.750	507.646	168.013	-4.56E 3	5.24E 3	-442.711	-15.399
		0.833	508.707	226.349	-4.85E 3	5.58E 3	-442.711	-15.399
		0.917	509.769	284.685	-5.13E 3	5.92E 3	-442.711	-15.399
		1.000	510.830	343.021	-5.42E 3	6.27E 3	-442.711	-15.399
	11	0.000	498.095	-357.012	-1.99E 3	2.85E 3	-442.711	-15.399
		0.083	499.156	-298.676	-2.28E 3	3.08E 3	-442.711	-15.399
		0.167	500.217	-240.340	-2.56E 3	3.3E 3	-442.711	-15.399
		0.250	501.279	-182.004	-2.85E 3	3.53E 3	-442.711	-15.399
		0.333	502.340	-123.667	-3.13E 3	3.76E 3	-442.711	-15.399
		0.417	503.401	-65.331	-3.42E 3	3.99E 3	-442.711	-15.399
		0.500	504.462	-6.995	-3.7E 3	4.22E 3	-442.711	-15.399
		0.583	505.524	51.341	-3.99E 3	4.55E 3	-442.711	-15.399
		0.667	506.585	109.677	-4.27E 3	4.89E 3	-442.711	-15.399
		0.750	507.646	168.013	-4.56E 3	5.24E 3	-442.711	-15.399
		0.833	508.707	226.349	-4.85E 3	5.58E 3	-442.711	-15.399
		0.917	509.769	284.685	-5.13E 3	5.92E 3	-442.711	-15.399
		1.000	510.830	343.021	-5.42E 3	6.27E 3	-442.711	-15.399
	12	0.000	529.477	-378.105	-2.12E 3	3.03E 3	-470.608	-16.311
		0.083	530.606	-316.311	-2.42E 3	3.27E 3	-470.608	-16.311
		0.167	531.734	-254.518	-2.73E 3	3.51E 3	-470.608	-16.311
		0.250	532.862	-192.724	-3.03E 3	3.75E 3	-470.608	-16.311
		0.333	533.990	-130.931	-3.33E 3	4E 3	-470.608	-16.311
		0.417	535.118	-69.137	-3.63E 3	4.24E 3	-470.608	-16.311
		0.500	536.246	-7.344	-3.94E 3	4.48E 3	-470.608	-16.311
		0.583	537.374	54.450	-4.24E 3	4.83E 3	-470.608	-16.311
		0.667	538.502	116.243	-4.54E 3	5.2E 3	-470.608	-16.311
		0.750	539.630	178.037	-4.86E 3	5.57E 3	-470.608	-16.311
		0.833	540.759	239.830	-5.15E 3	5.93E 3	-470.608	-16.311
		0.917	541.887	301.624	-5.45E 3	6.3E 3	-470.608	-16.311
		1.000	543.015	363.418	-5.76E 3	6.66E 3	-470.608	-16.311
	13	0.000	529.477	-378.105	-2.12E 3	3.03E 3	-470.608	-16.311
		0.083	530.606	-316.311	-2.42E 3	3.27E 3	-470.608	-16.311
		0.167	531.734	-254.518	-2.73E 3	3.51E 3	-470.608	-16.311
		0.250	532.862	-192.724	-3.03E 3	3.75E 3	-470.608	-16.311
		0.333	533.990	-130.931	-3.33E 3	4E 3	-470.608	-16.311
		0.417	535.118	-69.137	-3.63E 3	4.24E 3	-470.608	-16.311

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.500	536.246	-7.344	-3.94E 3	4.48E 3	-470.608	-16.311
		0.583	537.374	54.450	-4.24E 3	4.83E 3	-470.608	-16.311
		0.667	538.502	116.243	-4.54E 3	5.2E 3	-470.608	-16.311
		0.750	539.630	178.037	-4.85E 3	5.57E 3	-470.608	-16.311
		0.833	540.759	239.830	-5.16E 3	5.93E 3	-470.608	-16.311
		0.917	541.887	301.624	-5.45E 3	6.3E 3	-470.608	-16.311
		1.000	543.015	363.418	-5.76E 3	6.66E 3	-470.608	-16.311
	14	0.000	937.420	-370.631	-3.67E 3	4.98E 3	-822.738	-15.607
		0.083	938.532	-311.506	-4.2E 3	5.45E 3	-822.738	-15.607
		0.167	939.643	-252.380	-4.73E 3	5.93E 3	-822.738	-15.607
		0.250	940.755	-193.254	-5.26E 3	6.4E 3	-822.738	-15.607
		0.333	941.866	-134.128	-5.79E 3	6.87E 3	-822.738	-15.607
		0.417	942.978	-75.002	-6.32E 3	7.34E 3	-822.738	-15.607
		0.500	944.090	-15.876	-6.85E 3	7.81E 3	-822.738	-15.607
		0.583	945.201	43.249	-7.38E 3	8.37E 3	-822.738	-15.607
		0.667	946.313	102.375	-7.91E 3	8.96E 3	-822.738	-15.607
		0.750	947.424	161.501	-8.44E 3	9.55E 3	-822.738	-15.607
		0.833	948.536	220.627	-8.97E 3	10.1E 3	-822.738	-15.607
		0.917	949.647	279.753	-9.5E 3	10.7E 3	-822.738	-15.607
		1.000	950.759	338.879	-10E 3	11.3E 3	-822.738	-15.607
	15	0.000	937.420	-370.631	-3.67E 3	4.98E 3	-822.738	-15.607
		0.083	938.532	-311.506	-4.2E 3	5.45E 3	-822.738	-15.607
		0.167	939.643	-252.380	-4.73E 3	5.93E 3	-822.738	-15.607
		0.250	940.755	-193.254	-5.26E 3	6.4E 3	-822.738	-15.607
		0.333	941.866	-134.128	-5.79E 3	6.87E 3	-822.738	-15.607
		0.417	942.978	-75.002	-6.32E 3	7.34E 3	-822.738	-15.607
		0.500	944.090	-15.876	-6.85E 3	7.81E 3	-822.738	-15.607
		0.583	945.201	43.249	-7.38E 3	8.37E 3	-822.738	-15.607
		0.667	946.313	102.375	-7.91E 3	8.96E 3	-822.738	-15.607
		0.750	947.424	161.501	-8.44E 3	9.55E 3	-822.738	-15.607
		0.833	948.536	220.627	-8.97E 3	10.1E 3	-822.738	-15.607
		0.917	949.647	279.753	-9.5E 3	10.7E 3	-822.738	-15.607
		1.000	950.759	338.879	-10E 3	11.3E 3	-822.738	-15.607
	16	0.000	865.146	-1.14E 3	-2.54E 3	4.54E 3	-715.459	-52.392
		0.083	866.207	-936.641	-3E 3	4.81E 3	-715.459	-52.392
		0.167	867.269	-738.159	-3.47E 3	5.07E 3	-715.459	-52.392
		0.250	868.330	-539.676	-3.93E 3	5.33E 3	-715.459	-52.392
		0.333	869.391	-341.193	-4.39E 3	5.6E 3	-715.459	-52.392
		0.417	870.452	-142.710	-4.85E 3	5.86E 3	-715.459	-52.392
		0.500	871.514	55.772	-5.31E 3	6.24E 3	-715.459	-52.392
		0.583	872.575	254.255	-5.77E 3	6.9E 3	-715.459	-52.392
		0.667	873.636	452.738	-6.23E 3	7.56E 3	-715.459	-52.392
		0.750	874.697	651.220	-6.69E 3	8.22E 3	-715.459	-52.392
		0.833	875.759	849.703	-7.15E 3	8.88E 3	-715.459	-52.392
		0.917	876.820	1.05E 3	-7.61E 3	9.54E 3	-715.459	-52.392

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 108	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		1.000	877.881	1.25E 3	-8.08E 3	10.2E 3	-715.459	-52.392
	17	0.000	433.212	-1.4E 3	-612.408	2.44E 3	-327.658	-65.361
		0.083	434.273	-1.15E 3	-823.501	2.41E 3	-327.658	-65.361
		0.167	435.334	-902.266	-1.03E 3	2.37E 3	-327.658	-65.361
		0.250	436.395	-654.654	-1.25E 3	2.34E 3	-327.658	-65.361
		0.333	437.456	-407.041	-1.46E 3	2.3E 3	-327.658	-65.361
		0.417	438.518	-159.427	-1.67E 3	2.27E 3	-327.658	-65.361
		0.500	439.579	88.187	-1.88E 3	2.41E 3	-327.658	-65.361
		0.583	440.640	335.800	-2.09E 3	2.87E 3	-327.658	-65.361
		0.667	441.702	583.414	-2.3E 3	3.33E 3	-327.658	-65.361
		0.750	442.763	831.028	-2.51E 3	3.79E 3	-327.658	-65.361
		0.833	443.824	1.08E 3	-2.72E 3	4.25E 3	-327.658	-65.361
		0.917	444.885	1.33E 3	-2.93E 3	4.71E 3	-327.658	-65.361
		1.000	445.946	1.57E 3	-3.15E 3	5.17E 3	-327.658	-65.361
40	1	0.000	709.083	387.850	-4.61E 3	5.7E 3	-194.896	14.648
		0.083	710.144	332.356	-4.73E 3	5.78E 3	-194.896	14.648
		0.167	711.205	276.862	-4.86E 3	5.85E 3	-194.896	14.648
		0.250	712.266	221.367	-4.98E 3	5.92E 3	-194.896	14.648
		0.333	713.328	165.873	-5.11E 3	5.99E 3	-194.896	14.648
		0.417	714.389	110.379	-5.23E 3	6.06E 3	-194.896	14.648
		0.500	715.450	54.884	-5.36E 3	6.13E 3	-194.896	14.648
		0.583	716.511	-0.610	-5.49E 3	6.2E 3	-194.896	14.648
		0.667	717.573	-56.104	-5.61E 3	6.39E 3	-194.896	14.648
		0.750	718.634	-111.598	-5.74E 3	6.57E 3	-194.896	14.648
		0.833	719.695	-167.093	-5.86E 3	6.75E 3	-194.896	14.648
		0.917	720.756	-222.587	-5.99E 3	6.93E 3	-194.896	14.648
		1.000	721.818	-278.081	-6.11E 3	7.11E 3	-194.896	14.648
	2	0.000	775.494	27.632	-4.89E 3	5.69E 3	-206.435	0.755
		0.083	775.494	24.773	-5.02E 3	5.82E 3	-206.435	0.755
		0.167	775.494	21.914	-5.16E 3	5.95E 3	-206.435	0.755
		0.250	775.494	19.055	-5.29E 3	6.08E 3	-206.435	0.755
		0.333	775.494	16.196	-5.42E 3	6.21E 3	-206.435	0.755
		0.417	775.494	13.336	-5.56E 3	6.35E 3	-206.435	0.755
		0.500	775.494	10.477	-5.69E 3	6.48E 3	-206.435	0.755
		0.583	775.494	7.618	-5.82E 3	6.61E 3	-206.435	0.755
		0.667	775.494	4.759	-5.96E 3	6.74E 3	-206.435	0.755
		0.750	775.494	1.900	-6.09E 3	6.87E 3	-206.435	0.755
		0.833	775.494	-0.959	-6.22E 3	7E 3	-206.435	0.755
		0.917	775.494	-3.818	-6.35E 3	7.13E 3	-206.435	0.755
		1.000	775.494	-6.678	-6.49E 3	7.27E 3	-206.435	0.755
	3	0.000	29.093	18.655	0.092	47.840	0.004	0.827
		0.083	29.093	15.521	0.094	44.708	0.004	0.827
		0.167	29.093	12.387	0.097	41.577	0.004	0.827
		0.250	29.093	9.253	0.100	38.446	0.004	0.827
		0.333	29.093	6.119	0.103	35.314	0.004	0.827

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.417	29.093	2.985	0.105	32.183	0.004	0.827
		0.500	29.093	-0.150	0.108	29.351	0.004	0.827
		0.583	29.093	-3.284	0.111	32.487	0.004	0.827
		0.667	29.093	-6.418	0.113	35.624	0.004	0.827
		0.750	29.093	-9.552	0.116	38.761	0.004	0.827
		0.833	29.093	-12.686	0.119	41.898	0.004	0.827
		0.917	29.093	-15.820	0.122	45.035	0.004	0.827
		1.000	29.093	-18.954	0.124	48.172	0.004	0.827
	4	0.000	29.093	18.655	0.092	47.840	0.004	0.827
		0.083	29.093	15.521	0.094	44.708	0.004	0.827
		0.167	29.093	12.387	0.097	41.577	0.004	0.827
		0.250	29.093	9.253	0.100	38.446	0.004	0.827
		0.333	29.093	6.119	0.103	35.314	0.004	0.827
		0.417	29.093	2.985	0.105	32.183	0.004	0.827
		0.500	29.093	-0.150	0.108	29.351	0.004	0.827
		0.583	29.093	-3.284	0.111	32.487	0.004	0.827
		0.667	29.093	-6.418	0.113	35.624	0.004	0.827
		0.750	29.093	-9.552	0.116	38.761	0.004	0.827
		0.833	29.093	-12.686	0.119	41.898	0.004	0.827
		0.917	29.093	-15.820	0.122	45.035	0.004	0.827
		1.000	29.093	-18.954	0.124	48.172	0.004	0.827
	5	0.000	-195.131	-804.608	7.76E 3	-8.76E 3	14.399	-58.524
		0.083	-195.131	-582.896	7.77E 3	-8.54E 3	14.399	-58.524
		0.167	-195.131	-361.184	7.78E 3	-8.33E 3	14.399	-58.524
		0.250	-195.131	-139.471	7.78E 3	-8.12E 3	14.399	-58.524
		0.333	-195.131	82.241	7.79E 3	-8.07E 3	14.399	-58.524
		0.417	-195.131	303.953	7.8E 3	-8.3E 3	14.399	-58.524
		0.500	-195.131	525.665	7.81E 3	-8.53E 3	14.399	-58.524
		0.583	-195.131	747.377	7.82E 3	-8.76E 3	14.399	-58.524
		0.667	-195.131	969.090	7.83E 3	-8.99E 3	14.399	-58.524
		0.750	-195.131	1.19E 3	7.84E 3	-9.23E 3	14.399	-58.524
		0.833	-195.131	1.41E 3	7.85E 3	-9.46E 3	14.399	-58.524
		0.917	-195.131	1.63E 3	7.86E 3	-9.69E 3	14.399	-58.524
		1.000	-195.131	1.86E 3	7.87E 3	-9.92E 3	14.399	-58.524
	6	0.000	1.14E 3	-194.882	-2.46E 3	3.8E 3	-338.923	-28.678
		0.083	1.15E 3	-86.236	-2.68E 3	3.91E 3	-338.923	-28.678
		0.167	1.15E 3	22.409	-2.89E 3	4.06E 3	-338.923	-28.678
		0.250	1.15E 3	131.055	-3.11E 3	4.39E 3	-338.923	-28.678
		0.333	1.15E 3	239.700	-3.33E 3	4.72E 3	-338.923	-28.678
		0.417	1.15E 3	348.346	-3.55E 3	5.05E 3	-338.923	-28.678
		0.500	1.15E 3	456.991	-3.77E 3	5.38E 3	-338.923	-28.678
		0.583	1.15E 3	565.637	-3.99E 3	5.7E 3	-338.923	-28.678
		0.667	1.15E 3	674.282	-4.2E 3	6.03E 3	-338.923	-28.678
		0.750	1.15E 3	782.928	-4.42E 3	6.36E 3	-338.923	-28.678
		0.833	1.15E 3	891.573	-4.64E 3	6.69E 3	-338.923	-28.678

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	Part		
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	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.917	1.16E 3	1E 3	-4.86E 3	7.02E 3	-338.923	-28.678
		1.000	1.16E 3	1.11E 3	-5.08E 3	7.34E 3	-338.923	-28.678
	7	0.000	1.48E 3	415.482	-9.5E 3	11.4E 3	-401.331	15.403
		0.083	1.49E 3	357.129	-9.76E 3	11.6E 3	-401.331	15.403
		0.167	1.49E 3	298.776	-10E 3	11.8E 3	-401.331	15.403
		0.250	1.49E 3	240.422	-10.3E 3	12E 3	-401.331	15.403
		0.333	1.49E 3	182.069	-10.5E 3	12.2E 3	-401.331	15.403
		0.417	1.49E 3	123.715	-10.8E 3	12.4E 3	-401.331	15.403
		0.500	1.49E 3	65.362	-11E 3	12.6E 3	-401.331	15.403
		0.583	1.49E 3	7.008	-11.3E 3	12.8E 3	-401.331	15.403
		0.667	1.49E 3	-51.345	-11.6E 3	13.1E 3	-401.331	15.403
		0.750	1.49E 3	-109.699	-11.8E 3	13.4E 3	-401.331	15.403
		0.833	1.5E 3	-168.052	-12.1E 3	13.7E 3	-401.331	15.403
		0.917	1.5E 3	-226.405	-12.3E 3	14.1E 3	-401.331	15.403
		1.000	1.5E 3	-284.759	-12.6E 3	14.4E 3	-401.331	15.403
	8	0.000	513.951	-416.758	3.15E 3	4.08E 3	-180.497	-43.875
		0.083	515.013	-250.540	3.03E 3	3.8E 3	-180.497	-43.875
		0.167	516.074	-84.322	2.92E 3	3.52E 3	-180.497	-43.875
		0.250	517.135	81.896	2.8E 3	3.4E 3	-180.497	-43.875
		0.333	518.196	248.114	2.68E 3	3.45E 3	-180.497	-43.875
		0.417	519.258	414.332	2.57E 3	3.5E 3	-180.497	-43.875
		0.500	520.319	580.550	2.45E 3	3.55E 3	-180.497	-43.875
		0.583	521.380	746.768	2.34E 3	3.6E 3	-180.497	-43.875
		0.667	522.441	912.985	2.22E 3	3.65E 3	-180.497	-43.875
		0.750	523.503	1.08E 3	2.1E 3	3.71E 3	-180.497	-43.875
		0.833	524.564	1.25E 3	1.99E 3	3.76E 3	-180.497	-43.875
		0.917	525.625	1.41E 3	1.87E 3	3.81E 3	-180.497	-43.875
		1.000	526.686	1.58E 3	1.75E 3	3.86E 3	-180.497	-43.875
	9	0.000	-204.418	-821.426	7.1E 3	-8.12E 3	173.433	-59.883
		0.083	-204.418	-594.564	7.21E 3	-8.01E 3	173.433	-59.883
		0.167	-204.418	-367.701	7.32E 3	-7.89E 3	173.433	-59.883
		0.250	-204.418	-140.839	7.43E 3	-7.78E 3	173.433	-59.883
		0.333	-204.418	86.024	7.54E 3	-7.84E 3	173.433	-59.883
		0.417	-204.418	312.886	7.66E 3	-8.17E 3	173.433	-59.883
		0.500	-204.418	539.749	7.77E 3	-8.51E 3	173.433	-59.883
		0.583	-204.418	766.612	7.88E 3	-8.85E 3	173.433	-59.883
		0.667	-204.418	993.474	7.99E 3	-9.19E 3	173.433	-59.883
		0.750	-204.418	1.22E 3	8.1E 3	-9.53E 3	173.433	-59.883
		0.833	-204.418	1.45E 3	8.21E 3	-9.87E 3	173.433	-59.883
		0.917	-204.418	1.67E 3	8.33E 3	-10.2E 3	173.433	-59.883
		1.000	-204.418	1.9E 3	8.44E 3	-10.5E 3	173.433	-59.883
	10	0.000	729.448	400.909	-4.61E 3	5.74E 3	-194.893	15.228
		0.083	730.509	343.221	-4.73E 3	5.81E 3	-194.893	15.228
		0.167	731.570	285.532	-4.86E 3	5.88E 3	-194.893	15.228
		0.250	732.631	227.844	-4.98E 3	5.94E 3	-194.893	15.228

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	Part		
Job Title Crest Pad Bldg	Ref		
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Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.333	733.693	170.156	-5.11E 3	6.01E 3	-194.893	15.228
		0.417	734.754	112.468	-5.23E 3	6.08E 3	-194.893	15.228
		0.500	735.815	54.780	-5.36E 3	6.15E 3	-194.893	15.228
		0.583	736.876	-2.908	-5.49E 3	6.23E 3	-194.893	15.228
		0.667	737.938	-60.597	-5.61E 3	6.41E 3	-194.893	15.228
		0.750	738.999	-118.285	-5.74E 3	6.59E 3	-194.893	15.228
		0.833	740.060	-175.973	-5.86E 3	6.78E 3	-194.893	15.228
		0.917	741.121	-233.661	-5.99E 3	6.96E 3	-194.893	15.228
		1.000	742.183	-291.349	-6.11E 3	7.15E 3	-194.893	15.228
	11	0.000	729.448	400.909	-4.61E 3	5.74E 3	-194.893	15.228
		0.083	730.509	343.221	-4.73E 3	5.81E 3	-194.893	15.228
		0.167	731.570	285.532	-4.86E 3	5.88E 3	-194.893	15.228
		0.250	732.631	227.844	-4.98E 3	5.94E 3	-194.893	15.228
		0.333	733.693	170.156	-5.11E 3	6.01E 3	-194.893	15.228
		0.417	734.754	112.468	-5.23E 3	6.08E 3	-194.893	15.228
		0.500	735.815	54.780	-5.36E 3	6.15E 3	-194.893	15.228
		0.583	736.876	-2.908	-5.49E 3	6.23E 3	-194.893	15.228
		0.667	737.938	-60.597	-5.61E 3	6.41E 3	-194.893	15.228
		0.750	738.999	-118.285	-5.74E 3	6.59E 3	-194.893	15.228
		0.833	740.060	-175.973	-5.86E 3	6.78E 3	-194.893	15.228
		0.917	741.121	-233.661	-5.99E 3	6.96E 3	-194.893	15.228
		1.000	742.183	-291.349	-6.11E 3	7.15E 3	-194.893	15.228
	12	0.000	774.120	425.343	-4.9E 3	6.1E 3	-207.171	16.150
		0.083	775.248	364.159	-5.03E 3	6.17E 3	-207.171	16.150
		0.167	776.376	302.975	-5.16E 3	6.24E 3	-207.171	16.150
		0.250	777.504	241.790	-5.3E 3	6.32E 3	-207.171	16.150
		0.333	778.632	180.606	-5.43E 3	6.39E 3	-207.171	16.150
		0.417	779.760	119.422	-5.56E 3	6.46E 3	-207.171	16.150
		0.500	780.888	58.238	-5.7E 3	6.54E 3	-207.171	16.150
		0.583	782.017	-2.947	-5.83E 3	6.62E 3	-207.171	16.150
		0.667	783.145	-64.131	-5.96E 3	6.81E 3	-207.171	16.150
		0.750	784.273	-125.315	-6.1E 3	7.01E 3	-207.171	16.150
		0.833	785.401	-186.500	-6.23E 3	7.2E 3	-207.171	16.150
		0.917	786.529	-247.684	-6.37E 3	7.4E 3	-207.171	16.150
		1.000	787.657	-308.868	-6.5E 3	7.6E 3	-207.171	16.150
	13	0.000	774.120	425.343	-4.9E 3	6.1E 3	-207.171	16.150
		0.083	775.248	364.159	-5.03E 3	6.17E 3	-207.171	16.150
		0.167	776.376	302.975	-5.16E 3	6.24E 3	-207.171	16.150
		0.250	777.504	241.790	-5.3E 3	6.32E 3	-207.171	16.150
		0.333	778.632	180.606	-5.43E 3	6.39E 3	-207.171	16.150
		0.417	779.760	119.422	-5.56E 3	6.46E 3	-207.171	16.150
		0.500	780.888	58.238	-5.7E 3	6.54E 3	-207.171	16.150
		0.583	782.017	-2.947	-5.83E 3	6.62E 3	-207.171	16.150
		0.667	783.145	-64.131	-5.96E 3	6.81E 3	-207.171	16.150
		0.750	784.273	-125.315	-6.1E 3	7.01E 3	-207.171	16.150

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.833	785.401	-186.500	-6.23E 3	7.2E 3	-207.171	16.150
		0.917	786.529	-247.684	-6.37E 3	7.4E 3	-207.171	16.150
		1.000	787.657	-308.868	-6.5E 3	7.6E 3	-207.171	16.150
	14	0.000	1.34E 3	436.752	-8.49E 3	10.3E 3	-358.958	16.343
		0.083	1.34E 3	374.838	-8.73E 3	10.4E 3	-358.958	16.343
		0.167	1.34E 3	312.923	-8.96E 3	10.6E 3	-358.958	16.343
		0.250	1.34E 3	251.009	-9.19E 3	10.8E 3	-358.958	16.343
		0.333	1.34E 3	189.094	-9.42E 3	11E 3	-358.958	16.343
		0.417	1.35E 3	127.180	-9.65E 3	11.1E 3	-358.958	16.343
		0.500	1.35E 3	65.265	-9.88E 3	11.3E 3	-358.958	16.343
		0.583	1.35E 3	3.351	-10.1E 3	11.5E 3	-358.958	16.343
		0.667	1.35E 3	-58.564	-10.3E 3	11.8E 3	-358.958	16.343
		0.750	1.35E 3	-120.478	-10.6E 3	12E 3	-358.958	16.343
		0.833	1.35E 3	-182.392	-10.8E 3	12.3E 3	-358.958	16.343
		0.917	1.35E 3	-244.307	-11E 3	12.6E 3	-358.958	16.343
		1.000	1.35E 3	-306.221	-11.3E 3	12.9E 3	-358.958	16.343
	15	0.000	1.34E 3	436.752	-8.49E 3	10.3E 3	-358.958	16.343
		0.083	1.34E 3	374.838	-8.73E 3	10.4E 3	-358.958	16.343
		0.167	1.34E 3	312.923	-8.96E 3	10.6E 3	-358.958	16.343
		0.250	1.34E 3	251.009	-9.19E 3	10.8E 3	-358.958	16.343
		0.333	1.34E 3	189.094	-9.42E 3	11E 3	-358.958	16.343
		0.417	1.35E 3	127.180	-9.65E 3	11.1E 3	-358.958	16.343
		0.500	1.35E 3	65.265	-9.88E 3	11.3E 3	-358.958	16.343
		0.583	1.35E 3	3.351	-10.1E 3	11.5E 3	-358.958	16.343
		0.667	1.35E 3	-58.564	-10.3E 3	11.8E 3	-358.958	16.343
		0.750	1.35E 3	-120.478	-10.6E 3	12E 3	-358.958	16.343
		0.833	1.35E 3	-182.392	-10.8E 3	12.3E 3	-358.958	16.343
		0.917	1.35E 3	-244.307	-11E 3	12.6E 3	-358.958	16.343
		1.000	1.35E 3	-306.221	-11.3E 3	12.9E 3	-358.958	16.343
	16	0.000	1.14E 3	-207.496	-2.95E 3	4.3E 3	-219.647	-29.698
		0.083	1.14E 3	-94.987	-3.09E 3	4.33E 3	-219.647	-29.698
		0.167	1.14E 3	17.521	-3.24E 3	4.39E 3	-219.647	-29.698
		0.250	1.14E 3	130.029	-3.38E 3	4.65E 3	-219.647	-29.698
		0.333	1.14E 3	242.538	-3.52E 3	4.9E 3	-219.647	-29.698
		0.417	1.14E 3	355.046	-3.66E 3	5.16E 3	-219.647	-29.698
		0.500	1.14E 3	467.554	-3.8E 3	5.41E 3	-219.647	-29.698
		0.583	1.14E 3	580.063	-3.94E 3	5.67E 3	-219.647	-29.698
		0.667	1.15E 3	692.571	-4.08E 3	5.92E 3	-219.647	-29.698
		0.750	1.15E 3	805.079	-4.23E 3	6.18E 3	-219.647	-29.698
		0.833	1.15E 3	917.587	-4.37E 3	6.43E 3	-219.647	-29.698
		0.917	1.15E 3	1.03E 3	-4.51E 3	6.69E 3	-219.647	-29.698
		1.000	1.15E 3	1.14E 3	-4.65E 3	6.94E 3	-219.647	-29.698
	17	0.000	504.664	-433.576	2.49E 3	3.43E 3	-21.462	-45.235
		0.083	505.725	-262.208	2.48E 3	3.24E 3	-21.462	-45.235
		0.167	506.787	-90.840	2.46E 3	3.06E 3	-21.462	-45.235

Software licensed to Weaver Boos Consultants	Job No 2186-351	Sheet No 113	Rev
	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Beam Stress Cont...

Beam	L/C	Section	Axial (psi)	Bend-Y (psi)	Bend-Z (psi)	Combined (psi)	Shear-Y (psi)	Shear-Z (psi)
		0.250	507.848	80.529	2.45E 3	3.04E 3	-21.462	-45.235
		0.333	508.909	251.897	2.44E 3	3.2E 3	-21.462	-45.235
		0.417	509.970	423.265	2.42E 3	3.35E 3	-21.462	-45.235
		0.500	511.032	594.634	2.41E 3	3.51E 3	-21.462	-45.235
		0.583	512.093	766.002	2.39E 3	3.67E 3	-21.462	-45.235
		0.667	513.154	937.370	2.38E 3	3.83E 3	-21.462	-45.235
		0.750	514.215	1.11E 3	2.37E 3	3.99E 3	-21.462	-45.235
		0.833	515.277	1.28E 3	2.35E 3	4.15E 3	-21.462	-45.235
		0.917	516.338	1.45E 3	2.34E 3	4.31E 3	-21.462	-45.235
		1.000	517.399	1.62E 3	2.32E 3	4.46E 3	-21.462	-45.235

DESIGN OF MAT FOUNDATION

JOB DETAILS

JOB NAME		CREST PAD FNDTN	
Included Support	X (in)	Y (in)	Z (in)
1	12.000	0.000	0.000
2	228.000	0.000	0.000
3	12.000	0.000	108.000
4	228.000	0.000	108.000
5	12.000	0.000	-192.000
6	228.000	0.000	-192.000

LOAD DETAILS

INCLUDED LOADS

Load Case No	7: DEAD LOAD + ROOF LIVE LOAD
Primary	Primary
Serviceability Factor	0.000
Design Factor	1.000

Reaction Load						
NODE NO.	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
1	1.202	-2.928	0.208	2.157	0.011	0.000
5	0.734	-4.176	0.036	0.000	0.000	0.000
6	1.943	-0.898	-0.040	2.229	0.010	0.000
10	0.482	-2.007	-0.207	0.000	0.000	0.000
11	0.334	-2.322	0.020	1.454	-0.002	0.000
15	-0.106	-2.762	-0.018	0.000	0.000	0.000

Load Case No	16: DL + .75 (WL) + 75 (LL)
Primary	Primary
Serviceability Factor	0.000
Design Factor	1.000

Reaction Load						
NODE NO.	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
1	0.400	-2.905	0.210	2.201	0.013	0.000
5	1.467	-4.188	0.034	0.000	0.000	0.000
6	1.274	-0.883	-0.038	2.276	0.012	0.000
10	0.986	-2.028	-0.209	0.000	0.000	0.000
11	0.339	-2.316	0.021	1.489	-0.002	0.000
15	-0.102	-2.772	-0.018	0.000	0.000	0.000

Load Case No	19: TRUCK LOAD
Primary	Primary
Serviceability Factor	0.000
Design Factor	1.000

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Reaction Load						
NODE NO.	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)

Point Load								
X Coor (in)	Y Coor (in)	Z Coor (in)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
-90.000	0.000	-90.000	0.000	-16.000	0.000	0.000	0.000	0.000
-18.000	0.000	-18.000	0.000	-16.000	0.000	0.000	0.000	0.000

Load Case No	20: FLOOR LIVE LOAD
Primary	Primary
Serviceability Factor	0.000
Design Factor	1.000

Reaction Load						
NODE NO.	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)

Quadrilateral Load									
X1 (in)	Z1 (in)	X2 (in)	Z2 (in)	X3 (in)	Z3 (in)	X4 (in)	Z4 (in)	Y (in)	Pressure (kip/in2)
6.000	30.000	6.000	114.000	234.000	114.000	234.000	30.000	0.000	-0.002
6.000	30.000	6.000	198.000	234.000	198.000	234.000	30.000	0.000	-0.001

Load Case No	21: ELEC ROOM DL
Primary	Primary
Serviceability Factor	0.000
Design Factor	1.000

Reaction Load						
NODE NO.	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)

Quadrilateral Load									
X1 (in)	Z1 (in)	X2 (in)	Z2 (in)	X3 (in)	Z3 (in)	X4 (in)	Z4 (in)	Y (in)	Pressure (kip/in2)
0.000	30.000	0.000	120.000	240.000	120.000	240.000	30.000	0.000	-0.001

Load Case No	18: DL+.75WL+.75LL+FL LL+TRUCK+FL DL
Primary	Service
Serviceability Factor	0.000
Design Factor	1.000

Included Primary Load Case	Factor
DL + .75 (WL) + .75 (LL)	1.000
TRUCK LOAD	1.000
FLOOR LIVE LOAD	1.000
ELEC ROOM DL	1.000

	22: SLAB LOAD + DL +

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Load Case No	ROOF LL
Primary	Service
Serviceability Factor	0.000
Design Factor	1.000

Included Primary Load Case	Factor
TRUCK LOAD	1.000
FLOOR LIVE LOAD	1.000
DEAD LOAD + ROOF LIVE LOAD	1.000
ELEC ROOM DL	1.000

PROPERTIES DETAILS

Region	Thickness (in)	Material
FNDTN	30.000	Concrete

SOIL DETAILS

Boundary	Subgrade Modulus
FNDTN	0.058(kip/in2/in)

MAT DIMENSION

FNDTN			
Node No	X Coor(in)	Y Coor(in)	Z Coor(in)
1	0.000	0.000	-204.000
2	0.000	0.000	120.000
3	240.000	0.000	120.000
4	240.000	0.000	-204.000

ANALYSIS RESULTS

Node Displacement Table								
	Node	Load Case	Dx(in)	Dy(in)	Dz(in)	Rx (Rad)	Ry (Rad)	Rz (Rad)
Max Dx	1	18	0.00000	-0.04401	0.00000	0.00009	0.00000	0.00016
Max Dy	561	22	0.00000	-0.01203	0.00000	0.00006	0.00000	0.00011
Max Dz	1	18	0.00000	-0.04401	0.00000	0.00009	0.00000	0.00016
Max Rx	35	22	0.00000	-0.04872	0.00000	0.00009	0.00000	0.00017
Max Ry	1	18	0.00000	-0.04401	0.00000	0.00009	0.00000	0.00016
Max Rz	13	22	0.00000	-0.05679	0.00000	0.00006	0.00000	0.00018
Min Dx	1	18	0.00000	-0.04401	0.00000	0.00009	0.00000	0.00016
Min Dy	28	22	0.00000	-0.06163	0.00000	0.00002	0.00000	0.00014
Min Dz	1	18	0.00000	-0.04401	0.00000	0.00009	0.00000	0.00016
Min Rx	49	18	0.00000	-0.05807	0.00000	0.00002	0.00000	0.00016
Min Ry	1	18	0.00000	-0.04401	0.00000	0.00009	0.00000	0.00016
Min Rz	532	18	0.00000	-0.03604	0.00000	0.00006	0.00000	0.00010

Base Pressure Summary						
	Node	X-Coor(in)	Y-Coor(in)	Z-Coor(in)	Load Case	Base Pressure (kip/in2)
Maximum Base Pressure	28	0.000	0.000	120.000	22	0.00356

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Minimum Base Pressure	561	240.000	0.000	-204.000	22	0.00070

Contact Area				
Load Case	Area in Contact (in2)	% of Total Area	Area out of Contact (in2)	% of Total Area
18	77760.01037	100.00000	0.00000	0.00000
22	77760.01037	100.00000	0.00000	0.00000

DESIGN PARAMETERS

Panel Name	Fy (kip/in2)	Fc (kip/in2)	Top Cover (in)	Bottom Cover (in)	Min Bar Size (in)	Max Bar Size (in)	Min Spacing (in)	Max Spacing (in)	Wood and Armer Moment
FNDTN	60.000	4.000	2.000	3.000	3	11	2.000	12.000	Not Used

DESIGN OUTPUT

Bottom of Mat X Direction

Zone:-	1
Governing Moment(M_{GOV})=	-1.023(kip-in)
For F_c <4.0 $\beta = 0.85$	
ρ_{min} =	0.0018
$\rho_{max} = 0.75 \times 0.85 \times \beta \times F_c \times \frac{87000}{f_y(87000+f_y)} =$	0.021
Effective Depth(deff)=	26.813
Steel Percentage (P_{ct})= ρ_{reqd} = $\max\left[1-\left(\sqrt{1-\left(\frac{2 \times R_n \times m}{f_y}\right)}\right) \times \frac{1}{m}, \rho_{min}\right] =$	0.0018
Where $m = \frac{f_y}{0.85 \times f_c} =$	17.647
$R_n = \frac{M_{GOV}}{0.9 \times d_{eff}^2 \times width} =$	0.002
As $\rho_{min} \le \rho_{reqd} \le \rho_{max}$, Hence R_reqd is acceptable	
Steel Area Provided =	0.589(in2)
Steel Area Required =	0.579(in2)
Bar No=	4
Maximum Spacing(S_{max})(User Specified) =	12.000(in)
Minimum Spacing(S_{min})(User Specified) =	2.000(in)
Actual Spacing (S) =	4(in)
We notice $S_{min} <= S <= S_{max}$	

Print Calculation Sheet

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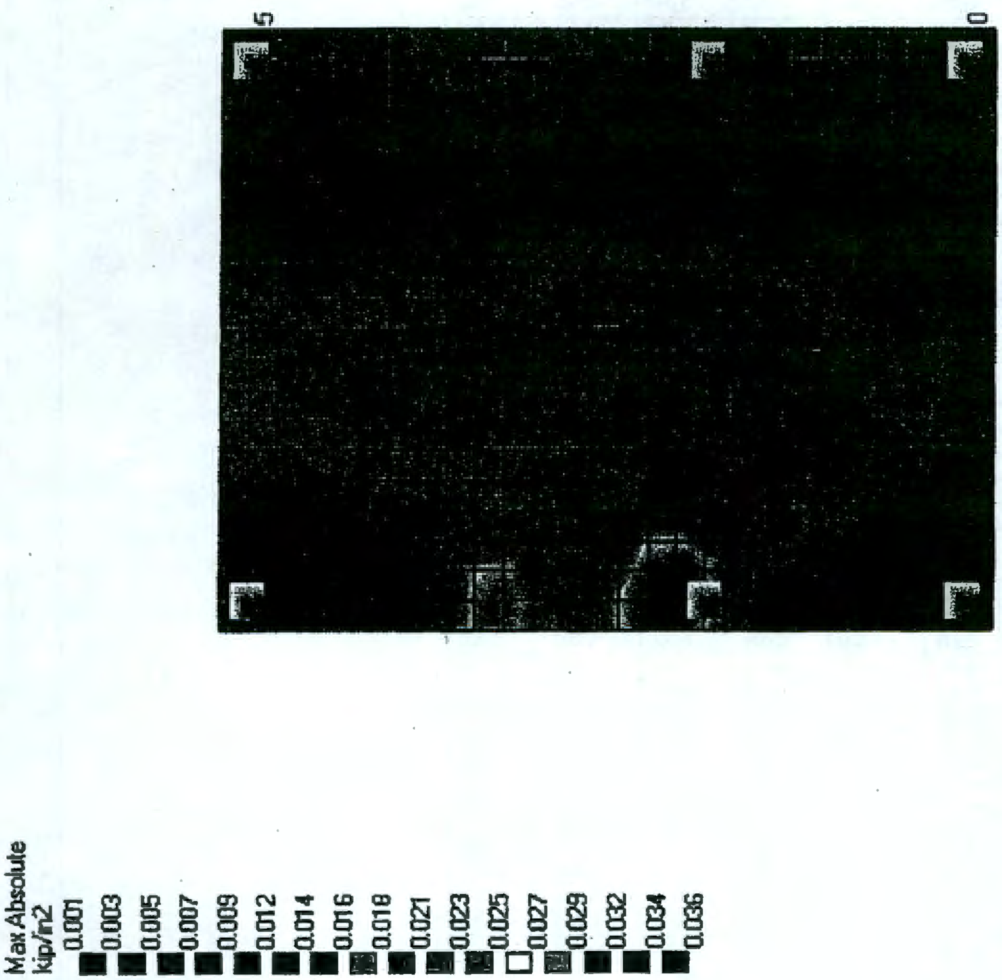
5
0
Max Absolute
kip/in2
0.001
0.003
0.005
0.007
0.009
0.012
0.014
0.016
0.018
0.021
0.023
0.025
0.027
0.029
0.032
0.034
0.036

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Support Reaction

Node	L/C	Force-X (kip)	Force-Y (kip)	Force-Z (kip)	Moment-X (kip'in)	Moment-Y (kip'in)	Moment-Z (kip'in)
1	3	-0.000	0.001	-0.051	-0.004	0.000	0.000
	4	-0.000	0.001	-0.051	-0.004	0.000	0.000
	1	0.264	1.868	-0.050	0.016	-0.006	0.000
	2	0.280	2.213	-0.049	0.014	-0.006	0.000
	5	-2.236	-0.800	-0.163	-2.911	-0.001	0.000
	9	-1.165	-0.831	-0.185	-2.970	-0.003	0.000
	6	-1.202	2.928	-0.208	-2.157	-0.011	0.000
	7	0.545	4.081	-0.099	0.029	-0.012	0.000
	8	-1.972	1.068	-0.212	-2.895	-0.007	0.000
	10	0.264	1.869	-0.085	0.013	-0.006	0.000
	11	0.264	1.869	-0.085	0.013	-0.006	0.000
	12	0.281	1.986	-0.089	0.014	-0.006	0.000
	13	0.281	1.986	-0.089	0.014	-0.006	0.000
	14	0.487	3.617	-0.116	0.025	-0.011	0.000
	15	0.487	3.617	-0.116	0.025	-0.011	0.000
	16	-0.400	2.905	-0.210	-2.201	-0.013	0.000
	17	-0.901	1.037	-0.215	-2.954	-0.009	0.000
5	3	0.000	0.001	-0.051	0.000	0.000	0.000
	4	0.000	0.001	-0.051	0.000	0.000	0.000
	1	-0.262	1.849	-0.049	0.000	0.000	0.000
	2	-0.277	2.198	-0.049	0.000	0.000	0.000
	5	-0.353	0.906	0.066	0.000	0.000	0.000
	9	-1.331	0.922	0.069	0.000	0.000	0.000
	6	-0.734	4.176	-0.038	0.000	0.000	0.000
	7	-0.539	4.047	-0.098	0.000	0.000	0.000
	8	-0.614	2.754	0.017	0.000	0.000	0.000
	10	-0.261	1.849	-0.084	0.000	0.000	0.000
	11	-0.261	1.849	-0.084	0.000	0.000	0.000
	12	-0.278	1.966	-0.088	0.000	0.000	0.000
	13	-0.278	1.966	-0.088	0.000	0.000	0.000
	14	-0.482	3.585	-0.115	0.000	0.000	0.000
	15	-0.482	3.585	-0.115	0.000	0.000	0.000
	16	-1.467	4.188	-0.034	0.000	0.000	0.000
	17	-1.592	2.770	0.020	0.000	0.000	0.000
6	3	0.000	-0.001	0.051	-0.008	0.000	0.000
	4	0.000	-0.001	0.051	-0.008	0.000	0.000
	1	-0.078	0.725	0.051	0.065	-0.004	0.000
	2	-0.082	1.021	0.049	0.015	-0.005	0.000
	5	-2.405	-0.790	-0.084	-3.074	-0.003	0.000
	9	-1.513	-0.811	-0.067	-3.137	-0.005	0.000
	6	-1.943	0.898	0.040	-2.229	-0.010	0.000
	7	-0.160	1.746	0.100	0.080	-0.009	0.000
	8	-2.483	-0.065	-0.013	-3.008	-0.007	0.000
	10	-0.078	0.725	0.087	0.060	-0.004	0.000
	11	-0.078	0.725	0.087	0.060	-0.004	0.000
	12	-0.083	0.770	0.090	0.064	-0.005	0.000

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Support Reaction Cont...

Node	L/C	Force-X (kip)	Force-Y (kip)	Force-Z (kip)	Moment-X (kip"in)	Moment-Y (kip"in)	Moment-Z (kip"in)
	13	-0.083	0.770	0.090	0.064	-0.005	0.000
	14	-0.143	1.525	0.117	0.075	-0.008	0.000
	15	-0.143	1.525	0.117	0.075	-0.008	0.000
	16	-1.274	0.883	0.038	-2.276	-0.012	0.000
	17	-1.591	-0.086	-0.016	-3.072	-0.009	0.000
10	3	0.000	-0.000	0.051	0.000	0.000	0.000
	4	0.000	-0.000	0.051	0.000	0.000	0.000
	1	0.076	0.723	0.050	0.000	0.000	0.000
	2	0.080	1.016	0.049	0.000	0.000	0.000
	5	-0.824	0.694	0.162	0.000	0.000	0.000
	9	-1.496	0.724	0.184	0.000	0.000	0.000
	6	-0.482	2.007	0.207	0.000	0.000	0.000
	7	0.156	1.740	0.098	0.000	0.000	0.000
	8	-0.748	1.418	0.211	0.000	0.000	0.000
	10	0.076	0.723	0.085	0.000	0.000	0.000
	11	0.076	0.723	0.085	0.000	0.000	0.000
	12	0.081	0.769	0.089	0.000	0.000	0.000
	13	0.081	0.769	0.089	0.000	0.000	0.000
	14	0.139	1.520	0.115	0.000	0.000	0.000
	15	0.139	1.520	0.115	0.000	0.000	0.000
	16	-0.986	2.028	0.209	0.000	0.000	0.000
	17	-1.420	1.447	0.214	0.000	0.000	0.000
11	3	0.000	-0.000	0.000	0.003	0.000	0.000
	4	0.000	-0.000	0.000	0.003	0.000	0.000
	1	-0.124	1.323	-0.001	-0.040	0.002	0.000
	2	-0.129	1.641	0.000	0.018	0.002	0.000
	5	-0.152	-0.309	-0.026	-1.904	-0.002	0.000
	9	-0.158	-0.317	-0.027	-1.950	-0.001	0.000
	6	-0.334	2.322	-0.020	-1.454	0.002	0.000
	7	-0.253	2.964	-0.001	-0.022	0.004	0.000
	8	-0.276	1.013	-0.027	-1.944	-0.000	0.000
	10	-0.124	1.323	-0.001	-0.038	0.002	0.000
	11	-0.124	1.323	-0.001	-0.038	0.002	0.000
	12	-0.132	1.406	-0.001	-0.040	0.002	0.000
	13	-0.132	1.406	-0.001	-0.040	0.002	0.000
	14	-0.227	2.616	-0.001	-0.027	0.003	0.000
	15	-0.227	2.616	-0.001	-0.027	0.003	0.000
	16	-0.339	2.316	-0.021	-1.469	0.002	0.000
	17	-0.282	1.006	-0.028	-1.990	0.000	0.000
15	3	-0.000	-0.000	0.000	0.000	0.000	0.000
	4	-0.000	-0.000	0.000	0.000	0.000	0.000
	1	0.123	1.314	-0.001	0.000	0.000	0.000
	2	0.128	1.631	0.000	0.000	0.000	0.000
	5	-0.151	0.300	0.025	0.000	0.000	0.000
	9	-0.157	0.314	0.026	0.000	0.000	0.000
	6	0.106	2.762	0.018	0.000	0.000	0.000

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	Part		
Job Title Crest Pad Bldg	Ref		
	By MHF	Date 20-Feb-07	Chd WW
Client Washington Closure Hanford	File Crest Pad Bldg AW.std	Date/Time 21-Mar-2007 09:14	

Support Reaction Cont...

Node	L/C	Force-X (kip)	Force-Y (kip)	Force-Z (kip)	Moment-X (kip*in)	Moment-Y (kip*in)	Moment-Z (kip*in)
	7	0.251	2.945	-0.001	0.000	0.000	0.000
	8	-0.028	1.614	0.024	0.000	0.000	0.000
	10	0.123	1.314	-0.001	0.000	0.000	0.000
	11	0.123	1.314	-0.001	0.000	0.000	0.000
	12	0.131	1.397	-0.001	0.000	0.000	0.000
	13	0.131	1.397	-0.001	0.000	0.000	0.000
	14	0.225	2.599	-0.001	0.000	0.000	0.000
	15	0.225	2.599	-0.001	0.000	0.000	0.000
	16	0.102	2.772	0.018	0.000	0.000	0.000
	17	-0.033	1.827	0.025	0.000	0.000	0.000

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Software licensed to	Job No	Sheet No	Rev
Job Title	Part		
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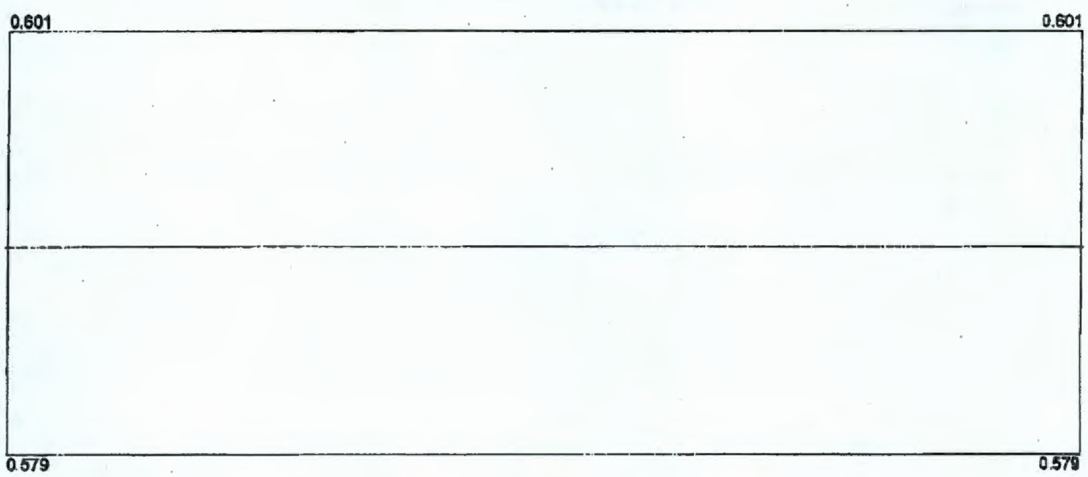
Cut Section Design Report



Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
1	10.51	-204.00	Top	0.17	18	0.60
			Bottom	0.00	18	0.58
1	10.56	-198.00	Top	0.00	18	0.60
			Bottom	-0.07	22	0.58
2	10.60	-192.00	Top	0.00	18	0.60
			Bottom	-0.30	18	0.58
2	10.64	-186.00	Top	0.04	22	0.60
			Bottom	0.00	18	0.58
2	10.68	-180.00	Top	0.41	22	0.60
			Bottom	0.00	18	0.58
3	10.73	-174.00	Top	0.47	22	0.60
			Bottom	0.00	18	0.58
3	10.77	-168.00	Top	0.58	22	0.60
			Bottom	0.00	18	0.58
4	10.81	-162.00	Top	0.58	22	0.60
			Bottom	0.00	18	0.58
5	10.85	-156.00	Top	0.56	22	0.60
			Bottom	0.00	18	0.58
5	10.90	-150.00	Top	0.44	22	0.60
			Bottom	0.00	18	0.58
5	10.94	-144.00	Top	0.29	22	0.60
			Bottom	0.00	18	0.58
6	10.98	-138.00	Top	0.03	22	0.60
			Bottom	0.00	18	0.58

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Software licensed to	Job No	Sheet No	Rev
Job Title	Part		
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Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:33	

Cut Section Design Report Contd..

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
6	10.98	-138.00	Top	0.03	22	0.60
			Bottom	0.00	18	0.58
6	11.02	-132.00	Top	0.00	18	0.60
			Bottom	-0.26	18	0.58
7	11.06	-126.00	Top	0.00	18	0.60
			Bottom	-0.68	18	0.58
7	11.11	-120.00	Top	0.00	18	0.60
			Bottom	-1.15	18	0.58
8	11.15	-114.00	Top	0.00	18	0.60
			Bottom	-1.79	18	0.58
8	11.19	-108.00	Top	0.00	18	0.60
			Bottom	-2.44	18	0.58
9	11.23	-102.00	Top	0.00	18	0.60
			Bottom	-3.52	18	0.58
10	11.28	-96.00	Top	0.00	18	0.60
			Bottom	-4.56	18	0.58
10	11.32	-90.00	Top	0.00	18	0.60
			Bottom	-4.73	18	0.58
11	11.36	-84.00	Top	0.00	18	0.60
			Bottom	-4.87	18	0.58
11	11.40	-78.00	Top	0.00	18	0.60
			Bottom	-4.14	18	0.58
12	11.45	-72.00	Top	0.00	18	0.60
			Bottom	-3.37	18	0.58
12	11.49	-66.00	Top	0.00	18	0.60
			Bottom	-3.10	18	0.58
12	11.53	-60.00	Top	0.00	18	0.60
			Bottom	-2.84	18	0.58
13	11.57	-54.00	Top	0.00	18	0.60
			Bottom	-2.84	18	0.58
13	11.62	-48.00	Top	0.00	18	0.60
			Bottom	-2.90	18	0.58
14	11.66	-42.00	Top	0.00	18	0.60
			Bottom	-3.23	18	0.58
14	11.70	-36.00	Top	0.00	18	0.60
			Bottom	-3.56	22	0.58
15	11.74	-30.00	Top	0.00	18	0.60
			Bottom	-4.43	22	0.58
15	11.78	-24.00	Top	0.00	18	0.60
			Bottom	-5.28	22	0.58

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Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:33	

Cut Section Design Report Contd..

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
15	11.78	-24.00	Top	0.00	18	0.60
			Bottom	-5.28	22	0.58
16	11.83	-18.00	Top	0.00	18	0.60
			Bottom	-5.28	22	0.58
17	11.87	-12.00	Top	0.00	18	0.60
			Bottom	-5.13	22	0.58
17	11.91	-6.00	Top	0.00	18	0.60
			Bottom	-4.42	22	0.58
17	11.95	-0.00	Top	0.00	18	0.60
			Bottom	-3.85	22	0.58
18	11.98	3.23	Top	0.00	18	0.60
			Bottom	-3.34	22	0.58
45	12.00	6.46	Top	0.00	18	0.60
			Bottom	-2.80	22	0.58
45	12.02	9.23	Top	0.00	18	0.60
			Bottom	-2.26	22	0.58
45	12.04	12.00	Top	0.00	18	0.60
			Bottom	-1.86	22	0.58
46	12.08	18.00	Top	0.00	18	0.60
			Bottom	-1.33	22	0.58
47	12.12	24.00	Top	0.00	18	0.60
			Bottom	-0.78	22	0.58
47	12.17	30.00	Top	0.00	18	0.60
			Bottom	-0.40	22	0.58
47	12.21	36.00	Top	0.05	18	0.60
			Bottom	-0.12	18	0.58
48	12.25	42.00	Top	0.14	18	0.60
			Bottom	0.00	18	0.58
49	12.29	48.00	Top	0.35	22	0.60
			Bottom	0.00	18	0.58
49	12.34	54.00	Top	0.47	22	0.60
			Bottom	0.00	18	0.58
50	12.38	60.00	Top	0.60	22	0.60
			Bottom	0.00	18	0.58
50	12.42	66.00	Top	0.65	22	0.60
			Bottom	0.00	18	0.58
50	12.46	72.00	Top	0.71	22	0.60
			Bottom	0.00	18	0.58
51	12.51	78.00	Top	0.69	22	0.60
			Bottom	0.00	18	0.58

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Job Title	Ref	
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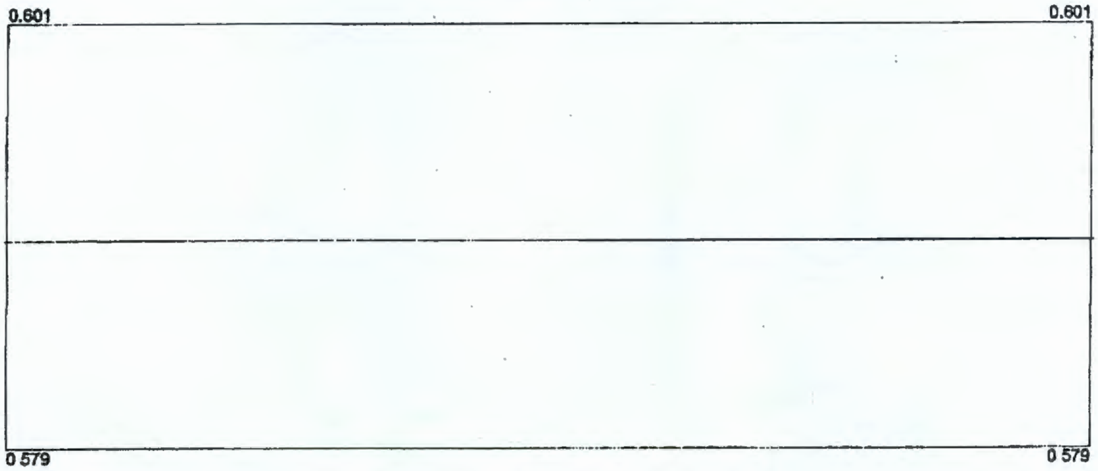
Cut Section Design Report



Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
514	231.27	-204.00	Top	0.02	18	0.60
			Bottom	0.00	18	0.58
514	231.29	-198.00	Top	0.00	18	0.60
			Bottom	-0.20	18	0.58
514	231.32	-192.00	Top	0.00	18	0.60
			Bottom	-0.52	18	0.58
515	231.35	-186.00	Top	0.00	18	0.60
			Bottom	-0.28	22	0.58
515	231.38	-180.00	Top	0.04	18	0.60
			Bottom	-0.09	18	0.58
516	231.41	-174.00	Top	0.00	18	0.60
			Bottom	-0.00	22	0.58
516	231.44	-168.00	Top	0.09	18	0.60
			Bottom	-0.01	18	0.58
517	231.47	-162.00	Top	0.14	18	0.60
			Bottom	0.00	18	0.58
517	231.50	-156.00	Top	0.21	18	0.60
			Bottom	0.00	18	0.58
518	231.52	-150.00	Top	0.25	18	0.60
			Bottom	0.00	18	0.58
518	231.55	-144.00	Top	0.30	18	0.60
			Bottom	0.00	18	0.58
519	231.58	-138.00	Top	0.34	18	0.60
			Bottom	0.00	18	0.58

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Software licensed to	Job No	Sheet No	Rev
Job Title	Part		
	Ref		
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Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:50	

Cut Section Design Report Contd..

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
519	231.58	-138.00	Top	0.34	18	0.60
			Bottom	0.00	18	0.58
520	231.61	-132.00	Top	0.39	18	0.60
			Bottom	0.00	18	0.58
520	231.64	-126.00	Top	0.42	18	0.60
			Bottom	0.00	18	0.58
521	231.67	-120.00	Top	0.47	18	0.60
			Bottom	0.00	18	0.58
521	231.70	-114.00	Top	0.49	18	0.60
			Bottom	0.00	18	0.58
521	231.72	-108.00	Top	0.53	18	0.60
			Bottom	0.00	18	0.58
522	231.75	-102.00	Top	0.54	18	0.60
			Bottom	0.00	18	0.58
523	231.78	-96.00	Top	0.57	18	0.60
			Bottom	0.00	18	0.58
523	231.81	-90.00	Top	0.57	18	0.60
			Bottom	0.00	18	0.58
523	231.84	-84.00	Top	0.59	18	0.60
			Bottom	0.00	18	0.58
524	231.87	-78.00	Top	0.57	18	0.60
			Bottom	0.00	18	0.58
524	231.90	-72.00	Top	0.57	18	0.60
			Bottom	0.00	18	0.58
525	231.93	-66.00	Top	0.53	18	0.60
			Bottom	0.00	18	0.58
525	231.95	-60.00	Top	0.51	18	0.60
			Bottom	0.00	18	0.58
526	231.98	-54.00	Top	0.45	18	0.60
			Bottom	0.00	18	0.58
527	232.01	-48.00	Top	0.40	18	0.60
			Bottom	0.00	18	0.58
527	232.04	-42.00	Top	0.29	18	0.60
			Bottom	0.00	18	0.58
527	232.07	-36.00	Top	0.20	18	0.60
			Bottom	0.00	18	0.58
528	232.10	-30.00	Top	0.04	18	0.60
			Bottom	0.00	18	0.58
529	232.13	-24.00	Top	0.00	18	0.60
			Bottom	-0.13	22	0.58

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Job No	Sheet No	Rev
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Cut Section Design Report Contd..

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
529	232.13	-24.00	Top	0.00	18	0.60
			Bottom	-0.13	22	0.58
529	232.15	-18.00	Top	0.00	18	0.60
			Bottom	-0.36	22	0.58
530	232.18	-12.00	Top	0.00	18	0.60
			Bottom	-0.60	22	0.58
530	232.21	-6.00	Top	0.00	18	0.60
			Bottom	-1.07	22	0.58
530	232.24	-0.00	Top	0.00	18	0.60
			Bottom	-1.52	18	0.58
531	232.27	6.00	Top	0.00	18	0.60
			Bottom	-1.19	22	0.58
532	232.30	12.00	Top	0.00	18	0.60
			Bottom	-0.85	22	0.58
532	232.33	18.00	Top	0.00	18	0.60
			Bottom	-0.73	22	0.58
532	232.36	24.00	Top	0.00	18	0.60
			Bottom	-0.63	22	0.58
533	232.38	30.00	Top	0.00	18	0.60
			Bottom	-0.59	22	0.58
534	232.41	36.00	Top	0.00	18	0.60
			Bottom	-0.56	22	0.58
534	232.44	42.00	Top	0.00	18	0.60
			Bottom	-0.56	22	0.58
535	232.47	48.00	Top	0.00	18	0.60
			Bottom	-0.54	22	0.58
535	232.50	54.00	Top	0.00	18	0.60
			Bottom	-0.53	22	0.58
535	232.53	60.00	Top	0.00	18	0.60
			Bottom	-0.51	22	0.58
536	232.56	66.00	Top	0.00	18	0.60
			Bottom	-0.49	22	0.58
537	232.58	72.00	Top	0.00	18	0.60
			Bottom	-0.45	22	0.58
537	232.61	78.00	Top	0.00	18	0.60
			Bottom	-0.42	22	0.58
537	232.64	84.00	Top	0.00	18	0.60
			Bottom	-0.39	22	0.58
538	232.67	90.00	Top	0.00	18	0.60
			Bottom	-0.36	22	0.58

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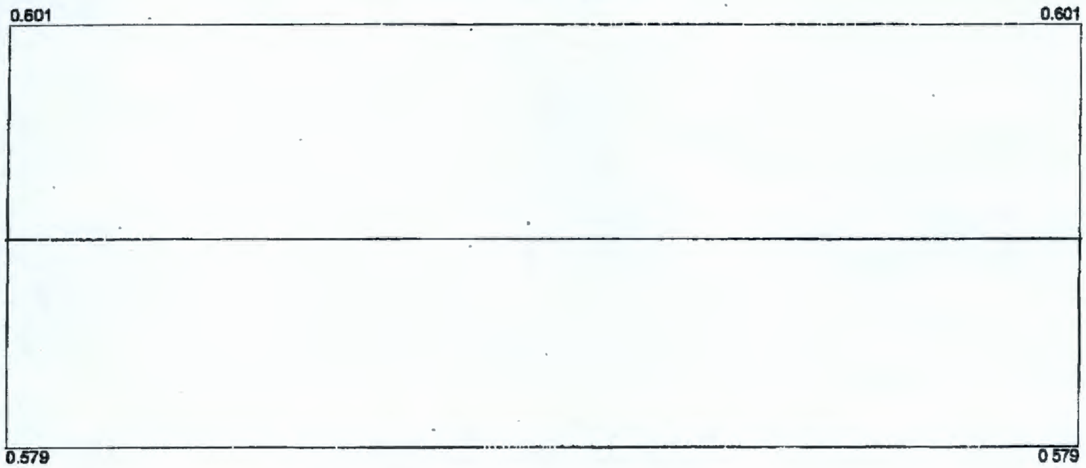
Cut Section Design Report



Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
1	0.00	-192.38	Top	0.20	22	0.60
			Bottom	0.00	18	0.58
1	6.00	-192.30	Top	0.00	18	0.60
			Bottom	-0.06	22	0.58
28	12.00	-192.22	Top	0.00	18	0.60
			Bottom	-0.23	22	0.58
28	18.00	-192.14	Top	0.33	18	0.60
			Bottom	0.00	18	0.58
28	24.00	-192.07	Top	0.82	22	0.60
			Bottom	0.00	18	0.58
55	26.55	-192.03	Top	0.92	22	0.60
			Bottom	0.00	18	0.58
56	29.11	-192.00	Top	1.00	22	0.60
			Bottom	0.00	18	0.58
56	32.55	-191.96	Top	1.09	22	0.60
			Bottom	0.00	18	0.58
56	36.00	-191.91	Top	1.31	22	0.60
			Bottom	0.00	18	0.58
83	42.00	-191.83	Top	1.53	22	0.60
			Bottom	0.00	18	0.58
110	48.00	-191.76	Top	1.75	22	0.60
			Bottom	0.00	18	0.58
110	54.00	-191.68	Top	1.91	22	0.60
			Bottom	0.00	18	0.58

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Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
110	54.00	-191.68	Top	1.91	22	0.60
			Bottom	0.00	18	0.58
137	60.00	-191.60	Top	2.07	22	0.60
			Bottom	0.00	18	0.58
137	66.00	-191.52	Top	2.18	22	0.60
			Bottom	0.00	18	0.58
164	72.00	-191.45	Top	2.29	22	0.60
			Bottom	0.00	18	0.58
164	78.00	-191.37	Top	2.36	22	0.60
			Bottom	0.00	18	0.58
164	84.00	-191.29	Top	2.43	22	0.60
			Bottom	0.00	18	0.58
191	90.00	-191.21	Top	2.46	22	0.60
			Bottom	0.00	18	0.58
218	96.00	-191.13	Top	2.48	22	0.60
			Bottom	0.00	18	0.58
218	102.00	-191.06	Top	2.47	22	0.60
			Bottom	0.00	18	0.58
218	108.00	-190.98	Top	2.45	22	0.60
			Bottom	0.00	18	0.58
245	114.00	-190.90	Top	2.41	18	0.60
			Bottom	0.00	18	0.58
272	120.00	-190.82	Top	2.35	18	0.60
			Bottom	0.00	18	0.58
272	126.00	-190.75	Top	2.28	18	0.60
			Bottom	0.00	18	0.58
299	132.00	-190.67	Top	2.19	18	0.60
			Bottom	0.00	18	0.58
299	138.00	-190.59	Top	2.09	18	0.60
			Bottom	0.00	18	0.58
326	144.00	-190.51	Top	1.98	18	0.60
			Bottom	0.00	18	0.58
326	150.00	-190.44	Top	1.85	18	0.60
			Bottom	0.00	18	0.58
326	156.00	-190.36	Top	1.72	18	0.60
			Bottom	0.00	18	0.58
353	162.00	-190.28	Top	1.58	18	0.60
			Bottom	0.00	18	0.58
380	168.00	-190.20	Top	1.44	18	0.60
			Bottom	0.00	18	0.58

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Job Title	Part		
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Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:50	

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Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
380	168.00	-190.20	Top	1.44	18	0.60
			Bottom	0.00	18	0.58
380	174.00	-190.13	Top	1.28	18	0.60
			Bottom	0.00	18	0.58
380	180.00	-190.05	Top	1.13	18	0.60
			Bottom	0.00	18	0.58
407	186.00	-189.97	Top	0.97	18	0.60
			Bottom	0.00	18	0.58
434	192.00	-189.89	Top	0.80	18	0.60
			Bottom	0.00	18	0.58
434	198.00	-189.82	Top	0.63	18	0.60
			Bottom	0.00	18	0.58
434	204.00	-189.74	Top	0.45	18	0.60
			Bottom	0.00	18	0.58
461	210.00	-189.66	Top	0.27	18	0.60
			Bottom	0.00	18	0.58
488	216.00	-189.58	Top	0.16	18	0.60
			Bottom	0.00	18	0.58
488	222.00	-189.50	Top	0.00	18	0.60
			Bottom	-0.16	18	0.58
488	228.00	-189.43	Top	0.00	18	0.60
			Bottom	-0.50	18	0.58
515	234.00	-189.35	Top	0.00	18	0.60
			Bottom	-0.20	18	0.58
515	240.00	-189.27	Top	0.04	18	0.60
			Bottom	0.00	18	0.58

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Software licensed to	Job No	Sheet No	Rev
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Job Title	Ref		
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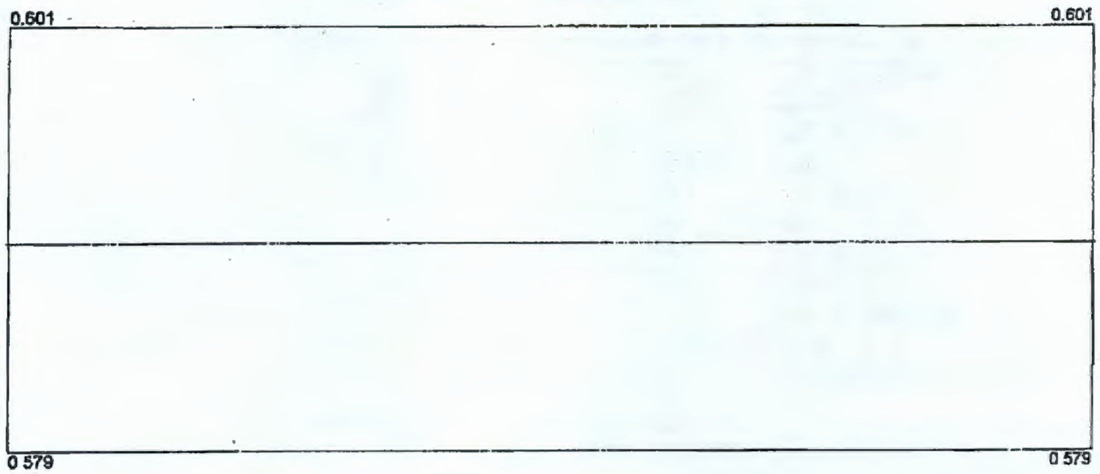
Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:50	

Cut Section Design Report



Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
27	0.00	108.09	Top	0.11	22	0.60
			Bottom	0.00	18	0.58
27	6.00	108.07	Top	0.02	18	0.60
			Bottom	0.00	18	0.58
27	12.00	108.05	Top	0.10	18	0.60
			Bottom	-0.03	22	0.58
54	18.00	108.03	Top	0.41	18	0.60
			Bottom	0.00	18	0.58
54	24.00	108.01	Top	0.73	22	0.60
			Bottom	0.00	18	0.58
81	26.08	108.01	Top	0.87	22	0.60
			Bottom	0.00	18	0.58
80	28.15	108.00	Top	0.92	22	0.60
			Bottom	0.00	18	0.58
80	32.08	107.99	Top	0.97	22	0.60
			Bottom	0.00	18	0.58
80	36.00	107.97	Top	1.17	22	0.60
			Bottom	0.00	18	0.58
107	42.00	107.95	Top	1.34	22	0.60
			Bottom	0.00	18	0.58
134	48.00	107.93	Top	1.51	22	0.60
			Bottom	0.00	18	0.58
134	54.00	107.91	Top	1.63	22	0.60
			Bottom	0.00	18	0.58

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	Job No	Sheet No	Rev
Software licensed to	Part		
Job Title	Ref		
	By	Date	Chd
Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:50	

Cut Section Design Report Contd..

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
134	54.00	107.91	Top	1.63	22	0.60
			Bottom	0.00	18	0.58
161	60.00	107.89	Top	1.75	22	0.60
			Bottom	0.00	18	0.58
161	66.00	107.87	Top	1.83	22	0.60
			Bottom	0.00	18	0.58
188	72.00	107.85	Top	1.90	22	0.60
			Bottom	0.00	18	0.58
188	78.00	107.83	Top	1.94	22	0.60
			Bottom	0.00	18	0.58
188	84.00	107.81	Top	1.98	22	0.60
			Bottom	0.00	18	0.58
215	90.00	107.79	Top	1.99	22	0.60
			Bottom	0.00	18	0.58
242	96.00	107.78	Top	1.98	22	0.60
			Bottom	0.00	18	0.58
242	102.00	107.76	Top	1.96	22	0.60
			Bottom	0.00	18	0.58
242	108.00	107.74	Top	1.93	22	0.60
			Bottom	0.00	18	0.58
269	114.00	107.72	Top	1.87	18	0.60
			Bottom	0.00	18	0.58
296	120.00	107.70	Top	1.81	18	0.60
			Bottom	0.00	18	0.58
296	126.00	107.68	Top	1.73	18	0.60
			Bottom	0.00	18	0.58
323	132.00	107.66	Top	1.64	18	0.60
			Bottom	0.00	18	0.58
323	138.00	107.64	Top	1.55	18	0.60
			Bottom	0.00	18	0.58
350	144.00	107.62	Top	1.44	18	0.60
			Bottom	0.00	18	0.58
350	150.00	107.60	Top	1.33	18	0.60
			Bottom	0.00	18	0.58
350	156.00	107.58	Top	1.20	18	0.60
			Bottom	0.00	18	0.58
377	162.00	107.56	Top	1.08	18	0.60
			Bottom	0.00	18	0.58
404	168.00	107.54	Top	0.95	18	0.60
			Bottom	0.00	18	0.58

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Software licensed to	Job No	Sheet No	Rev
Job Title	Part		
	Ref		
	By	Date	Chd
Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:50	

Cut Section Design Report Contd..

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
404	168.00	107.54	Top	0.95	18	0.60
			Bottom	0.00	18	0.58
404	174.00	107.52	Top	0.82	18	0.60
			Bottom	0.00	18	0.58
404	180.00	107.50	Top	0.69	18	0.60
			Bottom	0.00	18	0.58
431	186.00	107.48	Top	0.56	18	0.60
			Bottom	0.00	18	0.58
458	192.00	107.46	Top	0.43	18	0.60
			Bottom	0.00	18	0.58
458	198.00	107.44	Top	0.31	18	0.60
			Bottom	0.00	18	0.58
458	204.00	107.42	Top	0.17	18	0.60
			Bottom	0.00	18	0.58
485	210.00	107.40	Top	0.06	18	0.60
			Bottom	0.00	18	0.58
512	216.00	107.38	Top	0.06	18	0.60
			Bottom	-0.05	18	0.58
512	222.00	107.36	Top	0.00	18	0.60
			Bottom	-0.23	18	0.58
512	228.00	107.34	Top	0.00	18	0.60
			Bottom	-0.51	18	0.58
539	234.00	107.32	Top	0.00	18	0.60
			Bottom	-0.20	18	0.58
539	240.00	107.30	Top	0.04	18	0.60
			Bottom	0.00	18	0.58

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Job No	Sheet No	Rev
Software licensed to	Part	
Job Title	Ref	
	By Date Chd	
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Cut Section Design Report

0.601 0.601

0.579 0.579

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
16	0.00	-18.08	Top	0.05	18	0.60
			Bottom	0.00	18	0.58
16	6.00	-18.04	Top	0.00	18	0.60
			Bottom	-0.36	22	0.58
16	12.00	-18.00	Top	0.00	18	0.60
			Bottom	-0.89	18	0.58
43	18.00	-17.96	Top	0.00	18	0.60
			Bottom	-0.85	18	0.58
43	24.00	-17.92	Top	0.00	18	0.60
			Bottom	-0.70	18	0.58
70	30.00	-17.88	Top	0.16	22	0.60
			Bottom	0.00	18	0.58
97	36.00	-17.85	Top	1.03	22	0.60
			Bottom	0.00	18	0.58
97	42.00	-17.81	Top	1.46	22	0.60
			Bottom	0.00	18	0.58
124	48.00	-17.77	Top	1.88	22	0.60
			Bottom	0.00	18	0.58
124	54.00	-17.73	Top	2.16	22	0.60
			Bottom	0.00	18	0.58
151	60.00	-17.69	Top	2.43	22	0.60
			Bottom	0.00	18	0.58
151	66.00	-17.65	Top	2.60	22	0.60
			Bottom	0.00	18	0.58

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Software licensed to	Job No	Sheet No	Rev
Job Title	Part		
	Ref		
	By	Date	Chd
Client	File CREST PAD FNDTN FIN	Date/Time 21-Mar-2007 10:50	

Cut Section Design Report Contd..

Element	X (in)	Z (in)	Face	Moment kip-in/in	Load Case	Area Reqd.in²/ft
151	66.00	-17.65	Top	2.60	22	0.60
			Bottom	0.00	18	0.58
178	72.00	-17.61	Top	2.77	22	0.60
			Bottom	0.00	18	0.58
178	78.00	-17.57	Top	2.87	22	0.60
			Bottom	0.00	18	0.58
178	84.00	-17.53	Top	2.96	22	0.60
			Bottom	0.00	18	0.58
205	90.00	-17.49	Top	3.00	22	0.60
			Bottom	0.00	18	0.58
205	96.00	-17.45	Top	3.03	22	0.60
			Bottom	0.00	18	0.58
232	102.00	-17.41	Top	3.02	22	0.60
			Bottom	0.00	18	0.58
259	108.00	-17.37	Top	3.00	22	0.60
			Bottom	0.00	18	0.58
259	114.00	-17.33	Top	2.94	22	0.60
			Bottom	0.00	18	0.58
286	120.00	-17.29	Top	2.88	22	0.60
			Bottom	0.00	18	0.58
286	126.00	-17.25	Top	2.78	22	0.60
			Bottom	0.00	18	0.58
286	132.00	-17.21	Top	2.69	18	0.60
			Bottom	0.00	18	0.58
313	138.00	-17.17	Top	2.57	18	0.60
			Bottom	0.00	18	0.58
313	144.00	-17.13	Top	2.44	18	0.60
			Bottom	0.00	18	0.58
340	150.00	-17.09	Top	2.30	18	0.60
			Bottom	0.00	18	0.58
367	156.00	-17.05	Top	2.16	18	0.60
			Bottom	0.00	18	0.58
367	162.00	-17.01	Top	2.00	18	0.60
			Bottom	0.00	18	0.58
367	168.00	-16.97	Top	1.84	18	0.60
			Bottom	0.00	18	0.58
394	174.00	-16.93	Top	1.67	18	0.60
			Bottom	0.00	18	0.58
394	180.00	-16.89	Top	1.50	18	0.60
			Bottom	0.00	18	0.58

Print Time/Date: 21/03/2007 10:57

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APPENDIX I

LEACHATE DRAIN SIZE REQUIREMENT – 0600-SR-G0524-M-01

Calculation Cover Sheet

Project Title: ERDF Cells 7-10

Area: 600 Area Calculation No. 0600-SR-G0524-M-01

Discipline: Mechanical
Subject: ERDF Cells 7-10 Verify Existing Leachate Header Capacity
Computer Program: Microsoft Excel
Computer Program Version Excel 2007

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be thoroughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation ☒ Preliminary ☐ Superseded ☐

Rev	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	3	[signature]	[signature]	[signature]	[signature]	7-28-07
Summary of Revisions						

Title: ERDF Leachate Cells 7-10 Drain Line Size Requirement

[redacted]

Calculated by: Tony Benegas Date: 9-28-07
Checked by: Geoff Barnes Date: 9-28-07
Calculation # BE CAL-0600-SR-G0524-M-01

1. Purpose

Verify that the existing 10" (HDPE SDR11) Gravity Drain Line has sufficient capacity for cells 7 and 9, (8 and 10 drain through South Line).

2. Acceptance Criteria

Maximum flow in the North and the South 10" gravity drain lines shall not be greater than 500 gpm in each drain line. (Design Analysis BHI-00355, Rev 0, page C146).

3. Assumptions

Same assumptions used in ERDF Design Analysis BHI-00355, specifically:

3.1 All other factors except the maximum expected flow rates and pump capacities remain unchanged as listed on page C146.
3.2 All pumps operating in automatic mode are pumping simultaneously (worst cases).

4. Boundary Conditions
4.1 Flow rate for ERDF Cells, (any one of cells 7, 8, 9, or 10), is 85 gpm minimum. However, to be conservative, a flow rate of 140 gpm, which matches cells 5 and 6 (ERDF Cells 5 & 6 Design Analysis Variance Report, CCN 117640), will be used for the primary high volume pumps and 15 gpm minimum (BHI-00355) for the primary and secondary low volume pumps.
4.2 Total Flow Rate into North Drain line is 500 gpm.
4.3 Total Flow Rate into South Drain line is 500 gpm.

5. References
5.1 BHI-00355 Design Analysis Report, Rev. 00 Volume 1.
5.1.1 Leachate Piping calculation starting on page C145
5.2 ERDF Cells 5&6 Design Analysis Variance Report, CCN 117640.

6. Calculation Details

6.1 Calculate the leachate flows in the North and South Headers after cells 7-10 are constructed.

The entire leachate network was reviewed for flow capacity. Per discussion with WCH 3-14-07, the worst case scenario to review:

- Cells 1 & 2: continue high capacity pumps in manual operation mode. Always keep primary low capacity and secondary pumps in automatic operation mode. Refer to DVAR for Cells 5 & 6 for switching Cells 1 & 2 to manual. As calculated in the HELP model, leachate flows are greatly reduced once the cell is covered with 35' level of waste and that the low volume pumps can easily manage leachate flows and high capacity pumps are not required.
- Cells 3 & 4: switch high capacity pumps to manual operation mode once waste is placed in Cells 7 & 8. Always keep primary low capacity and secondary pumps in automatic operation mode.
- Cells 5 & 6: continue high capacity pumps in automatic mode until waste is placed in Cells 9 & 10, then switch high capacity pumps to manual operation mode. Always keep primary low capacity and secondary pumps in automatic operation mode.
- Cells 7 & 8: high capacity pumps ~ 140 gpm (85 gpm minimum required) and low capacity and secondary pumps @ 15 gpm....same as previous cells. Always keep primary low capacity and secondary pumps in automatic operation mode.

Title: ERDF Leachate Cells 7-10 Drain Line Size Requirement [redacted]

Calculated by: Tony Benegas Date: 9-28-07
Checked by: Geoff Barnes Date: 9-28-07
Calculation # BE CAL-0600-SR-G0524-M-01

- Cells 9 & 10: high capacity pumps ~ 140 gpm (85 gpm minimum required) and low capacity and secondary pumps @ 15 gpm....same as previous cells. Always keep primary low capacity and secondary pumps in automatic operation mode.

The review showed that the overall network is below the 500 gpm capacity of the existing headers.

Refer to attachment 1, Excel spreadsheet, "Cells 7-10 Leachate Pump Sizes to Maintain 500 gpm or Less Flow in existing Leachate Transmission Pipeline Headers".

The velocity flow through the 10" header will be (assuming the 500 gpm in the referenced spreadsheet):

Fluid Velocity=Volumetric Flow/Pipe Area

Pipe Area = Pi*r^2
Radius =Pipe Inner Diameter/2
Pipe Inner Diameter (ID) = Outer Diameter – (2 x wall thickness)
Outer Diameter = 10.75"
Wall Thickness = 0.977" (SDR 11)
Pipe ID = 10.75-2 x 0.977 = 8.79

=3.14*$(8.79/2)^2$= 60.74 square inches or 0.42 square feet.

Volumetric Flow
=500 gallons/min * 1 cubic feet/7.48 gallons= 66.84 cubic feet/min

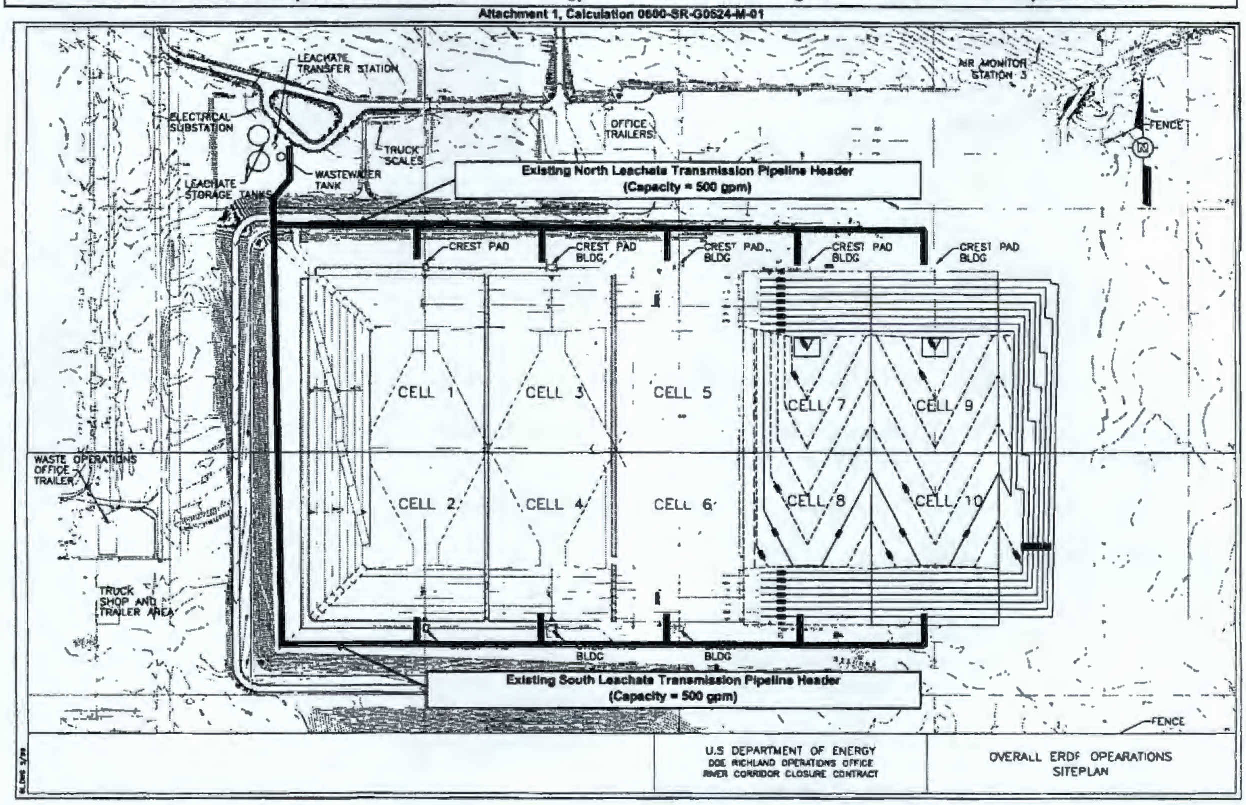
Fluid Velocity = 66.84 cubic feet/min/0.42 square feet = 159.14 feet/min or 2.65 feet/second

7. Conclusions

The existing North and South gravity drain 10" headers have sufficient capacity to handle the leachate flows from cells 7-10. Refer to Calculation 0600-SR-G0524-M-02.

Cells 7-10 Leachate Pump Sizes Needed to Maintain 500 gpm or less flow in Existing Leachate Transmission Pipeline Headers

Attachment 1, Calculation 0600-SR-G0524-M-01



Scenario: ***Cell 5 Existing*** *North Header*	Volume Pumped into North Leachate Transmission Pipeline "Worst Case" All Pumps Pumping Simultaneously					
	Cell 1 (gpm)	Cell 3 (gpm)	Cell 5 (gpm)			Total Flow (gpm)
Pump #1 - High Capacity Primary	0 gpm Manually Pumped	250	140			390
Pump #2 - Low Capacity Primary	15	15	15			45
Pump #3 - Secondary	15	15	15			45
Total (gpm)	30	280	170	0	0	**480**

Scenario ***Cell 6 Existing*** *South Header*	Volume Pumped into South Leachate Transmission Pipeline "Worst Case" All Pumps Pumping Simultaneously					
	Cell 1 (gpm)	Cell 3 (gpm)	Cell 5 (gpm)			Total Flow (gpm)
Pump #1 - High Capacity Primary	0 gpm Manually Pumped	250	140			390
Pump #2 - Low Capacity Primary	15	15	15			45
Pump #3 - Secondary	15	15	15			45
Total (gpm)	30	280	170	0	0	**480**

Scenario: ***Cell 7 Proposed*** *North Header*	Volume Pumped into North Leachate Transmission Pipeline "Worst Case" All Pumps Pumping Simultaneously					
	Cell 1 (gpm)	Cell 3 (gpm)	Cell 5 (gpm)	Cell 7(1) (gpm)		Total Flow (gpm)
Pump #1 - High Capacity Primary	0 gpm Manually Pumped	0 gpm Manually Pumped	140	140		280
Pump #2 - Low Capacity Primary	15	15	15	15		60
Pump #3 - Secondary	15	15	15	15		60
Total (gpm)	30	30	170	170	0	**400**

Scenario: ***Cell 8 Proposed*** *South Header*	Volume Pumped into South Leachate Transmission Pipeline "Worst Case" All Pumps Pumping Simultaneously					
	Cell 1 (gpm)	Cell 3 (gpm)	Cell 5 (gpm)	Cell 7(1) (gpm)		Total Flow (gpm)
Pump #1 - High Capacity Primary	0 gpm Manually Pumped	0 gpm Manually Pumped	140	140		280
Pump #2 - Low Capacity Primary	15	15	15	15		60
Pump #3 - Secondary	15	15	15	15		60
Total (gpm)	30	30	170	170	0	**400**

Scenario: ***Cell 9 Proposed*** *North Header*	Volume Pumped into North Leachate Transmission Pipeline "Worst Case" All Pumps Pumping Simultaneously					
	Cell 1 (gpm)	Cell 3 (gpm)	Cell 5 (gpm)	Cell 7(1) (gpm)	Cell 9(1) (gpm)	Total Flow (gpm)
Pump #1 - High Capacity Primary	0 gpm Manually Pumped	0 gpm Manually Pumped	0 gpm Manually Pumped	140	140	280
Pump #2 - Low Capacity Primary	15	15	15	15	15	75
Pump #3 - Secondary	15	15	15	15	15	75
Total (gpm)	30	30	30	170	170	**430**

Scenario: ***Cell 10 Proposed*** *South Header*	Volume Pumped into South Leachate Transmission Pipeline "Worst Case" All Pumps Pumping Simultaneously					
	Cell 1 (gpm)	Cell 3 (gpm)	Cell 5 (gpm)	Cell 7(1) (gpm)	Cell 9(1) (gpm)	Total Flow (gpm)
Pump #1 - High Capacity Primary	0 gpm Manually Pumped	0 gpm Manually Pumped	0 gpm Manually Pumped	140	140	280
Pump #2 - Low Capacity Primary	15	15	15	15	15	75
Pump #3 - Secondary	15	15	15	15	15	75
Total (gpm)	30	30	30	170	170	**430**

Notes:

(1) **Pump #1 - High Capacity Primary Pump sizes for ERDF Cells 7-10 pumps.** Calcs from Cells 7-10 DAVR calculate minimum 85 gpm required to maintain leachate depth less than 12 inches on the bottom liner. Calcs above use 140 gpm to match Cells 5&6 pump sizes.

APPENDIX J

LEACHATE DRAIN SLOPE – 0600-SR-G0524-M-02

Calculation Cover Sheet

Project Title: ERDF Cells 7-10

Area: 600 Area — Calculation No. 0600-SR-G0524-M-02

Discipline: Mechanical
Subject: ERDF Leachate Cells 7-10 Capacity of 10" Gravity Drain Line with 0.3% Slope
Computer Program: N/A
Computer Program Version: N/A

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be thoroughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation ☒ Preliminary ☐ Superseded ☐

Rev	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	3					9/28/07
Summary of Revisions						

Title: **ERDF Leachate Cells 7-10 Capacity of 10" Gravity Drain Line with 0.3% Slope**

Calculated by: **Tony Benegas** **Date:** **9-28-07**
Checked by: **Geoff Barnes** **Date:** **9-28-07**
Calculation # **BE CAL-0600-SR-G0524-M-02**

1. Purpose

Determine if the 0.3% slope of the 10" gravity drain line header between the cells (invert elevations for cells 7 & 9 -manholes 30 and 32) will be sufficient to allow gravity draining to the leachate tanks. This same analysis applies to South line (Cells 8 & 10 - Manholes 31 and 33). Refer to drawings 0600X-DD-M0022, "Environmental Restoration Disposal Facility Cells 7-10 Piping Details" and 0600X-DD-M0023, "Environmental Restoration Disposal Facility Cells 7-10 Mechanical Schedules" for clarification.

2. Acceptance Criteria

Given:

- The as-built dimensions for the manholes for cells 5 and 6 (inlet elevations or invert elevation)
- The required slope of 0.3% is the minimum per the Design Analysis (BHI-00355, Rev 0). Pipeline slopes between cells was 0.6% previously.
- The Distances to the crest pads and manholes 30 and 32, ~100 feet.
- Ground level elevation at Crest pads for cells 7 and 9 is 732.80 feet (Crest Pad interior floor level - minimum). Reference Civil Drawing 0600X-DD-C0293, Crest Pad Plan and Elevations.
- Minimum 3.5 feet cover over the pipeline is preferred.

Criteria
Manholes 30 and 31 inlet elevations preferred to be 3.5' below the ground elevation.
Crest pad at ground level elevation.

3. Assumptions

3.1 Same assumptions set forth in Design Report BHI-00355.

4. Boundary Conditions

4.1 At this point forward it is understood that whenever manhole 28 is mentioned then the results are identical for manhole 29. Similarly manholes 30 and 31 are identical as are the results for manholes 32 and 33.
4.2 As Built Invert Elevation of drain line into manhole 28 is 722.57.
4.3 Distance between manholes 28 & 30 and 30 & 32, center to center dimension, is 500'. Reference 0600X-DD-C0294 and 0600X-DD-C0295.
4.4 Manhole 28 and 29 is 7' in Diameter. Manholes 30 and 32 are 10' in diameter.
4.5 Invert Elevation Distance from Manhole 28 to 30 is 491.5'. Between manhole 30 and 32 is 490'. See Figure 1.
4.6 Distance from manhole to crest pads - 100'.

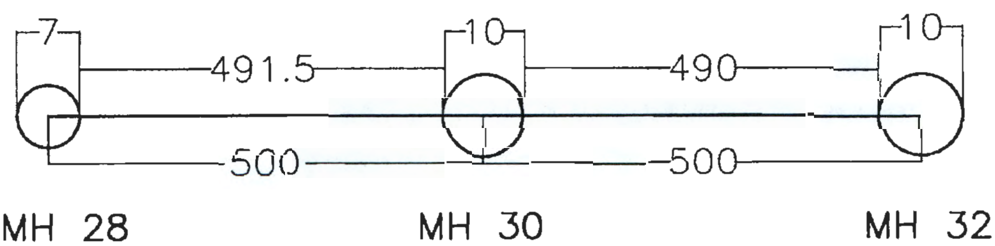


Figure 1, Distance from Invert Elevations as measured between manholes

5. References

5.1 BHI-00355 Design Analysis Report, Rev. 00 Volume 1, page C150

6. Calculation Details

6.1 Invert Elevations at manhole 30 and 32 based on Manhole 28 (Identical for 31 and 33 and manhole 29).

As-Built Invert inlet elevation of manhole 28 is 722.57 ft.

Distance to Manhole 30 is 491.5 ft (Invert Elevation distance, see figure 1).

Required Slope =0.3% (Design Analysis BHI-00355, Rev. 0, page C146)
Elevation Change = Distance between manholes x required slope = 491.5 ft x 0.003 = 1.47 ft.

Required outlet Invert Elevation at Manhole 30 (minimum), (refer to drawings 0600X-DD-M0022, "Environmental Restoration Disposal Facility Cells 7-10 Piping Details" and 0600X-DD-M0023, "Environmental Restoration Disposal Facility Cells 7-10 Mechanical Schedules" for clarification):

Title: **ERDF Leachate Cells 7-10 Capacity of 10" Gravity Drain Line with 0.3% Slope**

[redacted]

Calculated by: **Tony Benegas** **Date:** **9-28-07**
Checked by: **Geoff Barnes** **Date:** **9-28-07**
Calculation # **BE CAL-0600-SR-G0524-M-02**

= Inlet Invert Elevation at Manhole 28 + Elevation Change ==722.57 ft + 1.47 ft = 724.04

Manhole 30 internal elevation change

Manhole 30 change in Invert Elevation, outlet to inlet, via the 10' diameter manhole
=Manhole Diameter x slope= 10' x 0.003= 0.03'=Manhole 30 internal elevation change

Manhole 30 Inlet Invert Elevation = Outlet Invert Elevation at Manhole 30 + Internal Elevation Change
=724.04 ft + 0.03 ft = 724.07

Required Outlet Invert Elevation at Manhole 32 (minimum), (refer to drawings 0600X-DD-M0022, "Environmental Restoration Disposal Facility Cells 7-10 Piping Details" and 0600X-DD-M0023, "Environmental Restoration Disposal Facility Cells 7-10 Mechanical Schedules" for clarification):

Distance to Manhole 32 is 490 ft (Invert Elevation distance, see figure 1).
Required Slope =0.3% (Design Analysis BHI-00355, Rev. 0, page C146)
Elevation Change = Distance between manholes x required slope = 490 ft x 0.003 = 1.47 ft.

= Inlet Invert Elevation at Manhole 30 + Elevation Change ==724.07 ft + 1.47 ft = 725.54

6.2 Elevation of 30 and 32 manhole side inlet based on required 2% drain slope from crest pad elevation for cells 7 & 9, (Identical for Manholes 31 and 33 for crest pads for cells 8 & 10).

Elevation of Crest pads: 732.8 feet -refer to drawing 0600X-DD-C0293
Distance to Crest pad from manholes ~ 100ft.
Required minimum slope = 2%

Elevation required at manhole =Elevation of Crest Pad - Required slope x Distance between manhole and crest pad.

Crest Pad 7 (to Manhole 30):
Crest Pad Elevation = 732.8 feet
Desired soil coverage = 3.5 feet
Starting elevation at Crest Pad 7 = 732.8 – 3.5=729.3 feet

Elevation required at Manhole 30:
= 729.3 ft - 0.02 x 100 ft = 727.3

Crest Pad 9 (to Manhole 32):

Elevation required at Manhole 32:
=729.3 ft - 0.02 x 100 ft = 727.3

Side Inlet Elevation maximums = 727.3 for manholes 30 and 32 for the 2% draining requirement and given crest pad elevation.

Manhole 30 and 32 Top elevations are 730.3 feet. However, proposed soil elevation around manholes is 729.4 feet.

Minimum Side inlet elevations for manholes 30 and 32=729.4 feet – preferred soil coverage (3.5')
=729.4 feet – 3.5 feet = 725.9 feet

Therefore, the maximum side inlet elevation for Manholes 30 and 32 is 725.9 feet

Proposed elevation of side inlet elevations is 724.28 (manholes 30 and 31) and 725.54 (manholes 32 and 33). This elevation is based on a straight line consideration from manhole 28 to manhole 31 at the 0.3% required slope. Proposed elevations meet or are under the required maximum elevations and are acceptable for use. The slope for these elevations will be:
={729.3 (Crest Pads Max Allowable Elev.)-725.54 (Proposed Side Inlet Elev. for manhole 32/33)}/100 feet
= 3.76%

3.76% exceeds the 2% requirement.

Velocity considerations are covered in Calculation 0600-SR-G0524-M-01.

7. Conclusions

The ground elevations at the crest pad and manholes locations are, respectively, 730.3 feet and 732.80 feet (Crest pad building floor). Refer to drawing 0600X-DD-C0293. Therefore, the manholes and crest pads will gravity drain and the desired soil cover of 3.5 feet will be achieved at their respective locations.

APPENDIX K

LEACHATE PUMP HEAD REQUIREMENT – 0600-SR-G0524-M-03

Calculation Cover Sheet

Project Title: ERDF Cells 7-10

Area: 600 Area Calculation No. 0600-SR-G0524-M-03

Discipline: Mechanical
Subject: ERDF Cells 7-10 Pump Head Requirement
Computer Program: N/A
Computer Program Version N/A

> Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be thoroughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation ☒ Preliminary ☐ Superseded ☐

Rev	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	5	[signature]	[signature]	[signature]	[signature]	9-28-07
Summary of Revisions						

[redacted]

Title: ERDF Leachate Cells 7-10 Pump Head Requirement

Calculated by: Tony Benegas **Date: 9-28-07**
Checked by: Geoff Barnes **Date: 9-28-07**
Calculation # BE CAL-0600-SR-G0524-M-03

1. Purpose

Determine pump head requirements for ERDF Cells 7-10

2. Acceptance Criteria

Pump head must be determined.

3. Assumptions
   3.1 Same assumptions used in ERDF Cells 5 & 6 Design Analysis Variance Report. Specifically, the requirements and dimensions outlined in 0600X-CA-M0001, page 3 of 5.
   3.2 ERDF Cells 7, 8, 9 & 10 are identical.
   3.3 Per the HELP model, the minimum flow rate is 85 gpm.

4. Boundary Conditions
   4.1 Minimum pump flow rate is 85 gpm, 20% contingency ~100 gpm. However 170 gpm is used as a 140 gpm flow rate was originally established for cells 5&6 and cells 8-10 are similar. In addition, the secondary pumps may also be active so an additional 30 gpm is added to the original 140 gpm value, (15 gpm for the low capacity primary and 15 gpm from the secondary). Therefore, 170 gpm is the most conservative value to be used to establish a head loss.

5. References
   5.1 ERDF Cells 5 & 6 Design Analysis Variance Report
      5.1.1 ERDF Cell 5&6 Calc # 0600X-CA-M0001, High Flow Leachate Pump Sizing Calculation

6. Calculation Details

Sump Inlet Elevation for Cells 7&8:

Sump Elevation for Cells 7 & 8 is 640 ft

Cell 7 & 8 Sump Pump inlet elevation is approximately 5-6" above sump Floor. Reference 0600X-DD-C0289

Therefore Cell 7&8 Sump Pump Inlet elevation is approximately = 640 ft + 0.5' (6") = 640.5 ft.

Crest pad Primary Piping inlet is at approximately:

Crest Pad floor ~ 730 ft, Reference 0600X-DD-M0017
High Capacity Primary Line is 2.5 feet above crest pad floor, Reference 0600X-DD-M0027.
Crest pad primary piping elevation inlet = Crest pad Floor elevation + High Capacity Primary Line height
=730 ft + 2.5 ft
=732.5 ft.

Head loss from elevation difference:

=Crest Pad Piping-Sump Inlet elevation
=732.5-640.5
=92 ft

Head Loss from piping run:

Title: **ERDF Leachate Cells 7-10 Pump Head Requirement**

Calculated by: **Tony Benegas** **Date:** **9-28-07**
Checked by: **Geoff Barnes** **Date:** **9-28-07**
Calculation # **BE CAL-0600-SR-G0524-M-03**

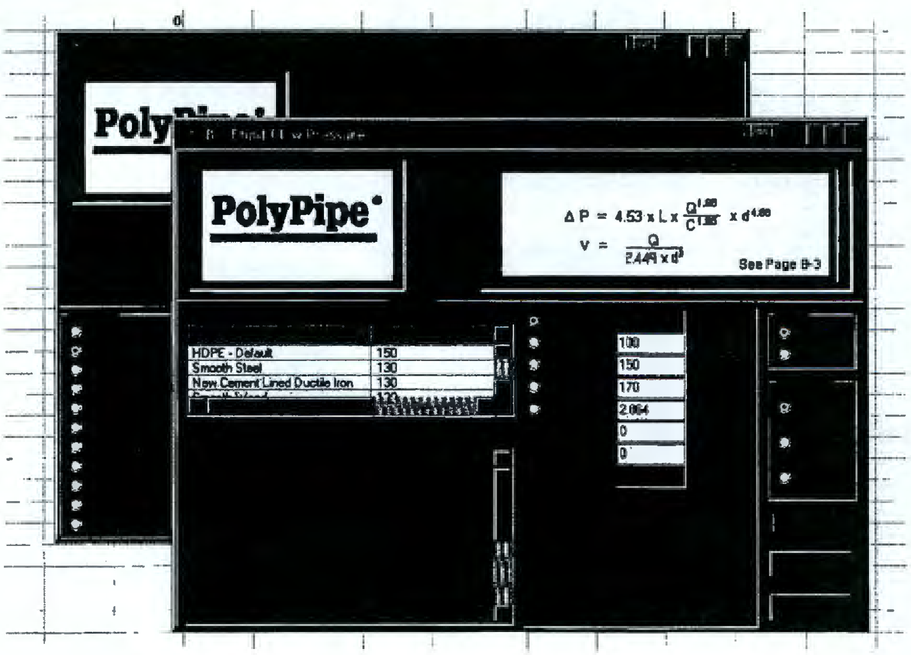
New calculation table is as follows:

Description	Length (ft)	Flow (gpm)	ID (in)	Head Loss (ft)
3" HDPE (SDR 11)	312	170	2.86	24.73 [3][5]
2 fittings [1]	6 [2]	170	1.94	3.13[4]
3" fittings	69	170	2.86	5.47
4" fittings	29	170	3.68	0.68[5]
3" valves				2.31
4" HDPE (SDR 11)	100	170	3.68	2.33
Subtotal				38.67
Add 20%				46.40
Elevation Head				92
TDH				138.40

(1) Use of 3" flow meter included to keep head loss down.
(2) Length is 6', reference 0600-DD-M0027, Detail B
(3) Per manufactures Pressure Loss Calculator (See Figure 1) Pressure drop = 7.93 ft/100 ft.
(4) Per manufactures Pressure Loss Calculator (See Figure 1) Pressure drop = 52.25 ft/100 ft.
(5) Per manufactures Pressure Loss Calculator Pressure drop = 2.34 ft/100 ft.
(6) Head loss calculation example => Length (ft) * Press drop (ft/100 ft) = Head Loss (ft)

Figure 1, manufactures calc for flow loss in HPE piping

Note, these head loss calculations were checked against tabulated values in other sources and are determined to be reasonable and accurate. For example, the head loss values were compared to water flow in steel Pipes, see figure 2.



Title: ERDF Leachate Cells 7-10 Pump Head Requirement

Calculated by: Tony Benegas **Date:** 9-28-07
Checked by: Geoff Barnes **Date:** 9-28-07
Calculation # BE CAL-0600-SR-G0524-M-03

INGERSOLL-RAND CAMERON HYDRAULIC DA

Friction of Water **Asphalt-dipped Cast Iron and New Steel Pi**
(Based on Darcy's Formula) *(Continu*
3 Inch

Flow U.S. gal per min	Asphalt-dipped cast iron 3.0" inside dia			Std wt steel sch 40 3.068" inside dia			Extra strong steel sch 80 2.900" inside dia			Schedule 160—ste 2.624" inside dia		
	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft	Velocity ft per sec	Velocity head ft	Head loss ft per 100 ft
10	.454	00	.042	434	003	[illegible]	48	.00	[illegible]	.593	005	[illegible]
15	.681	01	.088	651	007	.077	73	01	.101	880	012	[illegible]
20	908	01	.140	868	.012	.129	.97	02	.180	1.19	022	[illegible]
25	1 13	.02	.225	1.08	.018	.192	1.21	02	.283	1.48	034	.41[illegible]
30	1.36	.03	.319	1 30	026	.267	1 45	03	.351	1.78	049	[illegible]
35	1.59	.04	.421	1.52	.036	.353	1.70	04	.464	2 08	067	.787
40	1.82	.05	.541	1.74	.047	.448	1.94	06	.596	2.37	087	[illegible]
45	2.04	.06	.676	1.95	.059	.557	2.18	07	.734	2.67	111	1.16
50	2.27	08	.823	2.17	073	.675	2.43	09	.889	2.97	137	1.41
55	2.50	10	.990	2.39	088	.776	2 67	11	1.06	3 26	165	[illegible]
60	2.72	12	1.17	2.60	105	.912	2.91	13	1.21	3.56	197	[illegible]
65	2.95	14	1.36	2.82	124	1.06	3.16	15	1.40	3.86	231	2.21
70	3.18	.16	1.57	3.04	143	1.22	3.40	18	1.61	4.15	268	2.55
75	3 40	18	1.79	3.25	.165	1.38	3.64	21	1.83	4.45	307	[illegible]
80	3.63	21	2.03	3.47	187	1.56	3.88	23	2.07	4 75	350	3.41
85	3.86	23	2.28	3.69	.211	1.75	4 12	26	2.31	5.04	395	3.83
90	4.08	.26	2.55	3.91	237	1.96	4.37	29	2.58	5.34	443	4.27
95	4.31	.29	2.83	4 12	264	2.16	4 61	33	2.86	5 63	493	4.73
100	4.54	.32	3.12	4.34	293	2.37	4.85	36	3.15	5 93	546	5.21
110	4.99	39	3.79	4.77	354	2.84	5 33	44	3.77	6.53	661	6.29
120	5.45	.46	4.46	5.21	421	3.36	5.81	52	4.45	7 12	.787	7.38
130	5.90	54	5.18	5.64	495	3.90	6.30	62	5.19	7 71	923	8.61
140	6.36	.63	5.96	6.08	574	4.50	6.79	71	5.96	8.31	1.07	9.92
150	6.81	72	6.87	6.51	659	5.13	7 28	82	6.82	8.90	1.23	11.3
160	7.26	82	7.79	6.94	749	5.80	7 76	93	7.72	9.49	1.40	12.8
180	8.17	1.04	9.81	7.81	948	7.27	8 72	1 01	9.66	10.68	1 77	16.1
200	9.08	1.28	12.1	8.68	1 17	8.90	9.70	1.46	11.86	11.87	2.19	19.8
220	9.98	1.55	14.5	9.55	1.42	10.7	10.7	1 78	14.26	13.05	2.64	23.8
240	10.9	1.84	17.3	10.4	1.69	12.7	11.6	2 07	16.88	14.24	3.15	28.2
260	11.8	2.16	20.2	11.3	1.98	14.8	12 6	2.46	19.71	15.43	3.69	32.9
280	12.7	2.51	23.4	12.2	2.29	17.1	13.6	2.86	22.77	16.61	4.28	38.0
300	13.6	2.88	26.8	13.0	2.63	19.5	14.5	3.28	26.04	17.80	4.92	43.5
320	14.5	3.28	30.4	13.9	3.00	22.1	15.5	3.77	29.53	18.99	5.60	49.4
340	15.4	3 70	34.3	14.8	3.39	24.9	16.5	4.22	33.24	20.17	6.32	55.6
360	16.3	4.15	38.4	15.6	3 79	27.8	17.5	4.73	37.16	21.36	7.08	62.2
380	17.2	4.62	42.7	16.5	4.23	30.9	18.4	5.27	41.31	22.55	7.89	69.2
400	18.2	5.12	47.3	17.4	4.68	34.2	19.4	5.81	45.67	23.73	8.74	76.6
420	19.1	5.65	52.1	18.2	5.16	37.6	20 4	6.43	50.25	24.92	9.64	84.2
440	20.0	6.20	57.1	19 1	5.67	41.3	21.4	7.13	55.06	26.11	10.58	92.2
460	20.9	6.77	62.4	20.0	6.19	44.9	22.3	7.75	60.08	27.29	11 56	101
480	21.8	7.38	67.9	20.8	6.74	48.8	23.3	8.37	65.30	28.48	12.58	109
500	22.7	8.00	73.6	21.7	7.32	52.9	24.2	9.15	70.73	29.66	13.66	118
550	25.0	9.68	89.0	23.9	8.85	63.8	26.7	11.1	85.30	32.63	16.53	142
600	27.2	11.5	106	26.0	10.5	75.7	29.1	13.1	101	35.60	19.67	170
650	29.5	13 5	124	28.2	12 4	88.6	31.6	15.5	118	38.56	23.08	199

Note: No allowance has been made for age, difference in diameter, or any abnormal condition of interior surface. Any factor of safety must be estimated from the local conditions and the requirements of each particular installation. It is recommended that for most commercial design purposes a safety factor of 15 to 20% be added to the values in the tables— see page 3-3.

3-18

Figure 2, Pressure Loss for water flowing through steel pipes

7. Conclusions

Cells 7, 8, 9, and 10 will require a pump with a head capacity of 130-140 feet ~ 140 ft.

APPENDIX L

FAULT, LOAD, VOLTAGE, CONDUIT FILL – 0600X-CA-E001

Calculation Cover Sheet

Project Title: ERDF Cells 7-10

Area: 600 Area Calculation No. 0600X-CA-E001

Discipline: Electrical

Subject: ERDF Cells 7-10 Crest Building, Fault, Load, Voltage Drop, Conduit Fill

Computer Program: N/A

Computer Program Version N/A

Use of this calculation by persons who do not have access to all of the pertinent facts could lead to incorrect conclusions or assumptions. Before applying this calculation to your work, this calculation must be thoroughly reviewed with appropriate and authorized Hanford Site personnel. Without this review, these personnel cannot assume responsibility for the use of these calculations.

Committed Calculation ☒ Preliminary ☐ Superseded ☐

Rev	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	7	R.E. Nemm				9-24-07
Summary of Revisions						

Title: **ERDF Cells 7-10 Crest Building, Fault, Load, Voltage Drop, Conduit Fill**
Calculated by: **RE Merriman** **Date:** **September 28, 2007**
Checked by: **TR Benegas** **Date:** **September 28, 2007**
Calculation: **#0600X-CA-E001**

[redacted]

Calculation No. 1:

Subject: Fault Current Availability; Substation No. 1 & 2

Purpose: Equipment, circuit breakers-fuses-disconnect switches, must be rated equal to or greater than the available fault current or the protective device may not perform its safety function, which is to de-energize a circuit.

Assumption: Equipment today is rated at a minimum of 10,000 Amps @ 480 V.

Background: Calculating only transformer impedance fault current is a conservative approach, because other limiting impedance factors, not included in the calculation, (utility, cables, etc.) would further limit the current.

Calculation: Transformers 1& 2 are both 300 kVA (361 Amp @ 480 V, 3 ph) Z= 4.5% (Std.).

$I_{SC} = I_{FLC} \times 100/ \%Z$ Source: Cutler Hammer Consulting Application Cat. (P. A-30).

$= 361 \times 100/4.5$

= 8,019 Amps Available at secondary of transformer.

Conclusion: The available fault current (8 kA) is lower than the equipment rating (10 kA); therefore the equipment is protected.

Calculation No. 2:

Subject: Load Calculation for Crest Pad Buildings.

Purpose: Determine amperage load to size equipment and conductors.

Assumption: 1 HP = 1 kVA, Power Factor = 90%, hence; kW = 0.9 kVA.

Background: The design for cells 5 & 6 was a starting point. However, loads were refigured for loads shown on the Cell 7-10 drawings.

Ref Dwgs.: MCC One-Line Diagram, 0600X-DD-E0114 and Electrical Schedules, 0600X-DD-E0117.

Title:ERDF Cells 7-10 Crest Building, Fault, Load, Voltage Drop, Conduit Fill
Calculated by: RE Merriman Date: September 28, 2007
Checked by: TR Benegas Date: September 28, 2007
Calculation: #0600X-CA-E001

[redacted]

Calculation:	15.0 kVA	Lighting Transformer
	0.3 "	Site Light
	7.5 "	Primary Sump Pump - Hi
	1.0 "	Primary Sump Pump – Lo
	1.0 "	Secondary Sump Pump –Lo
	0.1 "	Motor Operated Valve
	24.9 kVA	Each Crest Pad Bld'g 7,8,9,10 @480 V, 3 Ø = 30.0 Amps.

Conclusion: Each Crest Pad Bld'gs load is 24.9 kVA, 30.0 Amps @ 480 V, 3 Ø. Two Bld'gs load is 49.8 kVA, 60 Amp. Sub. #1 will supply Cell 8 & 10. New Sub. #2 will supply Cell 7 & 9.

Sub. #1 is rated 300kVA with a utility maximum Demand of 153.1 kW, leaving capacity for the new 49.8 kVA load.

Sub #2 is also a 300 kVA unit with only 128.8 kVA connected (Dwg. 0600X-DD-E0101. Rev. 1). Therefore, it has sufficient spare capacity for the additional load.

Calculation No. 3:

Subject: Voltage Drop of Feeder and Branch Circuit.

Purpose: Demonstrate that the Voltage Drop for the loads and conductors selected is within equipment operating limits, and the loads will operate as designed.

Assumptions:
1) Equipment voltage limitations are defined in ANSI/IEEE Std. 141-Section 3 and Voltage Tolerance Limits in ANSI C84.1 for a standard induction motor at +/- 10 %.
2) Recommended voltage drop limits are described in NEC Article 210.19 (A)(1) FPN No. 4 & 215.2(A)(3) FPN No. 2 for Branch Circuits (3%) /Feeders (3%) respectively, as well as total voltage drop (5%).
3) Circuit lengths were scaled from the Dwgs and are estimates.

Background:
1) Based on an Options Evaluation, it was decided to use existing duct and conduits for the power feeder from substation #1 (Leachate Station) to Cell 8 & 10.

Title: ERDF Cells 7-10 Crest Building, Fault, Load, Voltage Drop, Conduit Fill
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Calculation: #0600X-CA-E001

[redacted]

2) Cells 7 & 9 power will be supplied from Substation #2 (new) & MDP #2.

3) Layout Dwgs 0600X-DD-E0111 and 0600X-DD–E0112 and Cell 1-6 layout Dwgs were used to determine conductor lengths.

Calculation: formula used for Voltage Drop (V_D).

V_D = Amperes x circuit length (ft) /100 x K

K is from Cutler Hammer Consulting Application Cat. Table A12. Assume copper wire, non-magnetic conduit, 90% power factor.

K = 0.1970 (# 10 AWG)
K = 0.0333 (# 2 AWG)
K = 0.0270 (#1 AWG)
K = 0.0220 (#1/0 AWG)
K = 0.0110 (250 kcmil)

A. Sub. #1 to Cell 10:

1. Swgr to PB-PTS9: (2- 250 kcmil / phase) — V_D = 60 A x 4700'/100 x 0.0110/(2)
   = 15.5 V
   (x100/480) = 3.2 %

2. PB-PTS9 to Loop Feed Encl. # 10: (2-250 kcmil/phase) — V_D = 30 A x 500'/100 x 0.0110/(2)
   = 0.8 V
   (x100/480) = 0.2 %

3. Loop Feed Encl. #10 to MCC-T10: (#1/0) — V_D = 30 A x 100'/100 x 0.022
   = 0.7 V
   (x100/480) = <u>0.1 %</u>

FEEDER V_D = (1.+2.+3.) 3.5 %

BRANCH CIRCUIT: MCC-T10 TO Pri Sump Pump (7 ½ HP):

V_D = 11 A x 200'/100 x 0.1970

Title:ERDF Cells 7-10 Crest Building, Fault, Load, Voltage Drop, Conduit Fill
Calculated by: RE Merriman Date: September 28, 2007
Checked by: TR Benegas Date: September 28, 2007
Calculation: #0600X-CA-E001

[redacted]

= 4.3 V

(x100/480) = 0.9 %

TOTAL V_D = 4.4 %

Conclusion: The Feeder V_D is 0.5 % over the recommended NEC limit; the Branch Circuit is 2.1 % below the limit; the total V_D is 0.6 % below the 5 % recommendation. No Diversity of loads was taken which would further lower the V_D. The value will not limit the system operation and is satisfactory as designed.

B. Sub. #2 (New) to Cell 9:

1. MDP #2 to Loop Feed Encl.(LFE) # 7: V_D = 60 A x 500'/100 x 0.027
   (#1 AWG)

   = 8.1 V

   (x100/480) = 1.7 %

2. LFE # 7 to LFE #9: V_D = 30 A x 500'/100 x 0.027
   (#1 AWG)

   = 4.1 V

   (x100/480) = 0.8 %

3. LFE # 9 to MCC-T9: V_D = 30 A x 100'/100 x 0.0333
   (#2 AWG)

   = 1.0 V

   (x100/480) = 0.2%

FEEDER V_D = (1.+2.+3.) = 2.7 %

BRANCH CIRCUIT (Same as Cell 10) = 0.9 %

TOTAL V_D = 3.6 %

Conclusion: The feeder and total V_D are below the NEC recommended limits of 5 %. No diversity of loads was taken which would further lower the V_D. The value will not limit the system operation and is satisfactory as designed.

Title: ERDF Cells 7-10 Crest Building, Fault, Load, Voltage Drop, Conduit Fill
Calculated by: RE Merriman Date: September 28, 2007
Checked by: TR Benegas Date: September 28, 2007
Calculation: #0600X-CA-E001

[redacted]

Calculation No. 4:

Subject: Conduit Fill by Conductors.

Purpose: Demonstrate that the conductors specified will fit in the conduit allowable space, typically 40 %.

Assumption: If the cable fits per NEC ANNEX C, Table C10, it is acceptable. Otherwise, calculations can be performed to demonstrate the fit.

Background: Circuits often have wires of different sizes. Two circuits need calculations:

1) First is 3- 250 kcmil, 1-#2 GRD in an existing 2" PVC, Sch. 40 conduit. This power circuit is selected sections between Substation #1 and Cell 8.
2) Second is the I & C wires in existing 2" PVC, Sch. 40 conduit. This circuit is selected sections between the Leachate Bld'g and Cells 7 & 8.

Calculation 1):

1) 3-250 kcmil, 1-#2 GRD, Type XHHW, 2" PVC, Sch. 40:

Conductor	Area	#		Total Area	
#2	0.1146 in^2	1		0.1146 in^2	PER NEC Chap. 9, Table 5
#250	0.3904 in^2	3		1.1712 in^2	
Total Conductor Area			=	1.2858 in^2	
2" PVC, Sch. 40			=	1.316 in^2	Allowable 40 % Fill, NEC Chap. 9, Table 4

Conclusion 1): The conduit allowable area is greater that the wire area. Therefore, it is acceptable.

Calculation 2):

2) Each I & C conductor bundle consist of 11 - # 12 Type XHHW (or smaller THWN) wire and 1-4 Pr 2-#16 TW/SH cable (O.D. = 0.516" IS/OS Anixter Cat. P. 9-181) or (3-2 Pr 2-#16 Tw/ Sh cable- less area).

Title: **ERDF Cells 7-10 Crest Building, Fault, Load, Voltage Drop, Conduit Fill**
Calculated by: **RE Merriman** **Date:** **September 28, 2007**
Checked by: **TR Benegas** **Date:** **September 28, 2007**
Calculation: **#0600X-CA-E001**

The most confining conduit run are 2" PVC with an existing Bundle of I & C wires.

Will another Bundle fit in the same conduit?

2" PVC, 40% Fill = 1.316 in^2 Conduit Usable Area, 40%.

#12 XHHW wire = 0.0181 in^2 x 22 wires = 0.398 in^2
4 Pr Cable = 0.209 in^2 x 2 cables = 0.418 in^2
[$A = \pi d^2/4 = 3.14 \times 0.516^2/4 \approx 0.209$ in^2]

Cable Area (2 Bundles) = 0.816 in^2 (25% fill)

Conclusion 2): Two Bundles of I & C cable area is less than the 40% fill of 2" PVC conduit; therefore, two I & C cable bundles will fit in an existing 2' conduit.

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