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STRUCTRUAL ANALYSIS DESIGN & EVALUATION OF MOCKUP
PLATFORM MONORAIL & TANK PLATE CUT OUT [SEC 1 OF
3]

Pages: 102

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DOCUMENT NUMBER: SD-WM-ER-521

SECTION 1 OF 3

TITLE: STructural Analysis Design & Evaluation
of mock-up platform monorail & Tank Plate
CUT-OUT

DATE: 12-19-95

ORIGINATOR: T. S. Hundal

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Page 1 of 1

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STRUCTURAL ANALYSIS, DESIGN AND EVALUATION OF MOCK-UP PLATFORM, MONORAIL, AND TANK PLATE CUT-OUT

T. S. HUNDAL

WHC, Richland, WA 99352

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Key Words: Double Shell Tank, DST, Mock-up platform, structural seismic analysis, Robotic UT inspection, CMA, seismic, design, finite element analysis, monorail, hoist, trolley, plate cut-out.

Abstract: Platform - Structural analyses were performed for design seismic, live and dead load combinations for the freestanding platform over the partial DST mock-up section. The platform is to be used for Robotic ultrasonic inspection of the tank wall. It is a free standing structure anchored to floor slab with Hilti Kwik bolts.

Monorail - The Monorail, trolley and hoist arrangement was designed and provided for accidental Robot fall.

Plate cut-out - The primary tank plate cut-out section was designed to validate the Robot test results.

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AUTHOR'S NOTE:

This report was initially prepared for the analysis of Mock-up Platform only but later, two more analyses were performed and are included in Appendix C and Appendix D for Monorail Design and Details, and Primary Tank Plate Cut-Out Design and Details, respectively.

So accordingly, it will be noticed that the main body of the report represents the platform analysis whereas the Appendices C and D describe analyses for Monorail and Primary Tank Plate Cut-out. This was done to avoid the cost of writing two SDs and two EDTs.

STRUCTURAL ANALYSIS, DESIGN AND EVALUATION OF DST MOCK-UP PLATFORM

1.0 INTRODUCTION

Structural analyses have been performed for the Hanford Site Double-Shell Tank (DST) mock-up platform (DMP) mounted on the concrete floor slab of 300 Area, highbay building 337. This DMP accommodates the Cable Management Assembly (CMA) frame unit with the hoisting cable reel. The CMA frame stands on four jacks for raising and lowering the unit to suit the various DST riser heights. It is recommended that these jacks be directly bolted to DMP beams. Six loading cases were analyzed including the normal operational vertical deadweight plus live loads, and the deadweight combined with seismic response loads.

The DMP and CMA frame will be used with the DST partial mock-up to test and qualify a robotic ultrasonic examination system. The DMP is a braced steel space frame structure with mixture of welded and bolted joints. It is fabricated from various size structural shapes. The six DMP columns are anchored to the concrete floor with Hilti¹ Kwik bolts through base plates. The CMA unit is prefabricated from structural steel tubes with welded connections, and stands on the support jacks. The objectives of the structural analyses include determining and evaluating the stresses in the frame members and the joints subject to required design seismic, live loads, and dead load combinations. Three dimensional equivalent static finite element analyses of the DMP were performed (ANSYS 1990) to determine the stresses in the members and forces in the joints. The output results were printed for member stresses and joint forces. For these analyses, it was necessary to presume the CMA support racks are anchored (bolted) to the DMP beams. The joint forces were used to calculate the bolt and weld stresses for the joints with methods from AISC 1989 and Blodgett 1982. The member, joints and weld stresses were evaluated and determined to be in conformance with AISC 1989 and AWS 1992, respectively.

2.0 CONCLUSIONS AND RECOMMENDATIONS

The DMP structural analyses (ANSYS) results are the structural member stresses and joint forces. The joint forces were then used to calculate the bolted and welded joint stresses. These calculated members, bolts and welds stresses are all within the allowable values. Each CMA support jack should be anchored (bolted) to the DMP beams with two $\frac{1}{2}$ " diameter SAE Grade 8 bolts.

¹Trade Name: Hilti, Incorporated, Tulsa, Oklahoma.

3.0 MATERIALS AND ALLOWABLE STRESSES

The drawings for the DMP (WHC 1995a), specify ASTM A36 steel for all structural members. For CMA frame, the structural steel tubes are ASTM A1020, (WHC 1995b). The steel plates and other components used are ASTM A36. The weld metal used has a specified minimum ultimate strength of 70,000 psi (E70XX Electrodes).

3.1 STRUCTURAL STEEL STRENGTH AND ALLOWABLE STRESSES

The elastic modulus, strength and allowable* stresses used for all the structural steel members and components of the DMP and CMA frames are as follows:

Modulus of Elasticity, E	= 29,000,000 psi
ASTM A36 Steel for DMP frame:	
Ultimate Tensile Strength, F_u	= 58,000 psi
Yield Strength, F_y	= 36,000 psi
Allowable Axial Stress, F_t	= $0.60 \times F_y = 21,600$ psi
Allowable Bending Stress, F_b	= $0.66 \times F_y = 23,760$ psi
Allowable Shear Stress, F_v	= $0.40 \times F_y = 14,400$ psi
ASTM A1020 Steel for CMA frame:	
Ultimate Tensile Strength, F_u	= 52,000 psi
Yield Strength, F_y	= 38,000 psi
Allowable Axial Stress, F_t	= $0.60 \times F_y = 22,800$ psi
Allowable Bending Stress, F_b	= $0.66 \times F_y = 25,080$ psi
Allowable Shear Stress, F_v	= $0.40 \times F_y = 15,200$ psi

* Allowable stresses may be increased by 33% for seismic load combinations.

3.2 WELD ALLOWABLE STRENGTH

The ultimate strength and allowable stress for the welds joining the DMP structural members were established in accordance with the Structural Welding Code (AWS 1992), and the Manual of Steel Construction (AISC 1989). These forces per unit length values are determined based on the minimum ultimate strength (F_{UWM}) of the weld metal, and the thickness (t_w) of the weld as follows:

Weld Metal Ultimate Strength, F_{UWM} = 70,000 psi

Fillet Weld Ultimate Strength, F_{UW} = $0.707 \times t_w \times F_{UWM}$ lbs/in

Fillet Weld Allowable* Stress, F_w = $0.30 \times F_{UW} = 14,800 \times t_w$ lbs/in

* Allowable stress may be increased by 33% for seismic load combinations.

4.0 CONFIGURATION AND LOADS

The configuration of the DMP structure was obtained from the design drawing H-3-306027 Sh.1 thru 7* (WHC 1995a). It is a braced steel space frame structure with welded and bolted joints. It is fabricated from various structural steel (A36) shapes and plates. The CMA frame assembly is fabricated from A1020 steel tube members as shown on drawing 9213-CMA-ASSY-001 (WHC 1995b).

In lieu of the design load requirements in WHC 1992, the platform structure was analyzed for more realistic actual loads as described below.

The complete DMP assembly was analyzed for dead load plus 75 psf live load on the platform. The CMA frame supports the cable reel from two beams at the top. The reel carries about 6000 lbs total operating load, including the robotic system. The complete structure was further analyzed for: two orthogonal horizontal seismic design response forces of 0.20g and 0.06g combined with the dead load; and a 0.133g vertical seismic design response force combined with the dead load. These seismic forces are appropriate for the safety class 3 (SC3) of the platform (WHC 1992).

* To be issued

5.0 STRUCTURAL ANALYSES AND RESULTS

Three dimension finite element static analyses were conducted for the DMP structure (ANSYS 1990) for the normal deadweight and live loads, and for deadweight combined with the seismic design forces. The frame was modeled as a mixture of welded and bolted connections. It was presumed that the CMA support jacks are bolted to the DMP beams. The six columns bases are anchored to the floor slab with Hilti Kwik bolts and the top of the columns are connected to platform beams with bolts. These columns are idealized as pinned joints.

Six load cases were run. This was necessary to ensure that the analyses results for the DMP will capture the maximum stresses in the members and the maximum forces at the joints. The finite element models are described in detail, and all analyses results are provided in Appendix A.

The analyses results given in Appendix A, include the forces and moments in the members and joints, and the member stresses. The bending, axial, shear, and combined stresses are calculated for each beam element in the DMP model. The maximum bending, shear, and combined stress values in the DMP members and connection joints for various load cases are listed in tables on pages A-221 through A-226 of Appendix A. Tables on page A-220 list the enveloped forces and stress values for all load cases used for the Appendix B design evaluation of members and joints.

Appendix B is the structural design evaluation for the DMP and CMA members and joints using the ANSYS analyses results. The structural member stresses were determined to be within the allowable limits. The stresses in the bolted and welded joints were calculated using methods from AISC 1989 and Blodgett 1982. The calculated stresses in the bolts and welds are within the allowable limits.

6.0 REFERENCES

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- UBC, 1991, *Uniform Building Code*, International Conference of Building Officials, Whittier, California.
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Figure 1. DMP Frame Assembly.

Figure 2. CMA Frame Assembly.

Figure 3. DMP and CMA Frame Assembly.

APPENDIX A
FINITE ELEMENT ANALYSES

INDEPENDENT REVIEW CHECKLIST

Document Reviewed: Structural analysis, design and evaluation of DST Mock-up Platform

Author: T. S. Hundal

Document No. WHC-SD-WM-ER-521, R/0

Yes No N/A

☒	☐	☐	Problem completely defined.
☒	☐	☐	Necessary assumptions explicitly stated and supported.
☒	☐	☐	Computer codes and data files documented.
☒	☐	☐	Data used in calculations explicitly stated in document.
☒	☐	☐	Data checked for consistency with original source information as applicable.
☐	☐	☒	Mathematical derivations checked including dimensional consistency of results.
☒	☐	☐	Models appropriate and used within range of validity or use outside range of established validity justified.
☒	☐	☐	Hand calculations checked for errors.
☒	☐	☐	Code run streams correct and consistent with analysis documentation.
☒	☐	☐	Code output consistent with input and with results reported in analysis documentation.
☒	☐	☐	Acceptability limits on analytical results applicable and supported. Limits checked against sources.
☒	☐	☐	Safety margins consistent with good engineering practices.
☒	☐	☐	Conclusions consistent with analytical results and applicable limits.
☒	☐	☐	Results and conclusions address all points required in the problem statement.

F.R. Volant
Reviewer

12/7/95
Date

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<u>Section</u>	<u>Description</u>	<u>Page</u>
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A.2	Applied Loads & Material Properties	A-5
A.3	Finite Element Model ANSYS Inputs and Outputs	A-13
A.4	Summary of ANSYS output results	A-220

A.1 FINITE ELEMENT MODEL

The Double Shell Tank (DST) Mock-up platform (DMP) is mounted on the 300 Area Highbay building 337 floor. This platform is a braced space frame with a steel plate at its top serves as a working area for the Robot operation to be lowered into the DST annulus space and is anchored to the concrete floor with Hilti Kwik bolts. A Cable Management Assembly (CMA) prefabricated steel frame is mounted on the top of the DMP. The CMA frame is supported on four jacks to accomodate the varying heights of different risers on top of the tanks. The DMP is made up of various A36 structural shapes and sizes. See Drawings H-3-306027 Sh.1 thru 7; for details. The CMA is fabricated from A1020 tube steel. See Drawing 9213-CMA-ASSY-001 by RedZone Robotics, Inc., for details.

The purpose of the analysis is to determine the forces in the joints and stresses in the members of the DMP and CMA. The analysis loads are: the deadweight of DMP and CMA frames and the hoisting reel weight (approx. 6000 lbs) including the weight of the Robot. To accomplish this, three dimensional finite element model was generated for both frames using the ANSYS computer program. For seismic events, a 0.12g free field horizontal acceleration value was used as per SDC-4.1. Applied seismic loads were computed and applied as per UBC 1991 methods. The maximum computed horizontal acceleration value was applied in one direction and a thirty percent of this computed value was applied in the other orthogonal horizontal direction combined with the dead loads. Various boundary conditions were applied to represent the field conditions. See page A-14 for the model geometry and configuration. Six load cases were run to get the maximum reactions, forces and/or stresses in the joints and/or members. These load cases are as follows:

- Load Case 1. DL + LL
- Load Case 2. DL +0.2g (x) + 0.06g (z)
- Load Case 3. DL +0.2g (-x) +0.06g (z)
- Load Case 4. DL +0.06g (x) +0.2g (z)
- Load Case 5. DL +0.06g (x) +0.2g (-z)
- Load Case 6. DL +0.133g (y)

(Note: x,y,z are the directions in which the seismic accelerations were applied to represent the seismic loads)

The output for maximum forces and/or stresses for joints and members were tabulated for each load case and the enveloped values were compiled in the final table. The final enveloped values were used to design and/or evaluate the joint and members. The design and evaluation of members and joints is given in Appendix B.

*To be issued

A.2 APPLIED LOADS AND MATERIAL PROPERTIES

(1) Drawing _____ (2) Doc. No. _____ (3) Page 1 of _____
 (4) Building _____ (5) Rev. _____ (6) Job No. _____
 (7) Subject DST Mock-up Platform
 (8) Originator L.E. ULBRICHT LE Ulbricht Date 8/24/93
 (9) Checker T. Stendal Date 7/10/95

(10)

LOAD CONDITIONS:STATIC:

UNIFORM PLATFORM LOAD OF 75 lb/ft^2 FOR LIGHT MANUFACTURING PLATFORM (UBC 1991, TABLE 23-A)

SEISMIC:

FOR SAFETY CLASS 3 COMPONENTS, SDCL 4.1 (DOE 1989) SPECIFIES THE FOLLOWING SEISMIC DESIGN CRITERIA

$$Z = 0.12g = \text{ZERO PERIOD ACCELERATION}$$

$$I = 1.25 = \text{IMPORTANCE FACTOR}$$

PER UCRL 1990, THE STATIC EQUIVALENT METHOD SPECIFIED BY UBC 1991 IS APPROPRIATE FOR EQUIPMENT AND NON-STRUCTURAL ELEMENTS (SC3 & SC4).

$$F_p = Z I C_p W_p$$

WHERE: F_p = THE EQUIVALENT STATIC LOAD APPLIED TO THE COMPONENT TO REPRESENT SEISMIC LOADING

$$C_p = 2(.75) = 1.5 = \text{HORIZONTAL FORCE FACTOR PER TABLE 23-P AND PARA. 2336(6) OF UBC 1991}$$

W_p = SEISMIC DEAD LOAD: PER PARA. 2334A OF UBC 1991, THE 75 lb/ft^2 LIVE LOAD IS EXCLUDED

$$F_p = 0.12(1.25)(1.5)W_p = 0.2W_p$$

THEREFORE, USE A HORIZONTAL ACCELERATION OF $a_h = 0.2g$

THE VERTICAL ACCELERATION IS $a_v = \frac{2}{3} a_h = \frac{2}{3}(0.2g) = 0.133g$ (UCRL 1990, SECT. 4.4.1)

PER SECTION 4.4.3 OF UCRL 15910, THE EARTHQUAKE DIRECTIONAL COMPONENTS ARE COMBINED BY ADDING 100% OF THE HORIZONTAL SEISMIC FORCES IN ONE DIRECTION WITH 30% OF THE HORIZONTAL SEISMIC FORCE IN THE ORTHOGONAL DIRECTION. ALSO, FOR SAFETY CLASS 3 COMPONENTS, THE VERTICAL SEISMIC ACCELERATION IS NOT COMBINED WITH THE HORIZONTAL ACCELERATION.

THEREFORE, THE LOAD CONDITIONS, IN TERMS OF ACCELERATION, ARE AS FOLLOWS. NOTE: THE 75 lb/ft^2 PLATFORM LOADING DOES NOT APPLY TO THE SEISMIC CONDITIONS.

$$1) \quad a_x = 0.2g, \quad a_y = 1g, \quad a_z = 0.06g$$

$$2) \quad a_x = 0.06g, \quad a_y = 1g, \quad a_z = 0.2g$$

$$3) \quad a_x = 0, \quad a_y = 1.133g, \quad a_z = 0$$

NOTE:

Y IS VERTICAL

A-6

ANALYTICAL CALCULATIONS

Page 2 of

Subject DST MOCK-UP PLATFORM

Originator T Stundel

Date 7-10-95

Checker

Date

PLATFORM SAFETY CLASSIFICATION (SC) IS 3

PLATFORM LOADING

$$\frac{DL}{\frac{1}{4}'' R} = 10.2 \text{ psf}$$

$$LL = 75.0 \text{ psf (Ref. UBC 91)}$$

$$(1) \begin{cases} DL + LL = 85.2 \text{ psf (STATIC)} \\ DL \text{ of CMA} = 6000 \text{ lbs} \end{cases}$$

SEISMIC (Ref. SDC-4.1)

$$F_p = .2 W_p$$

THREE SEISMIC LOADING CASES

$$2) a_x = .2g, a_y = 1g, a_z = .06g$$

$$3) a_x = .06g, a_y = 1g, a_z = .2g$$

$$4) a_x = 0, a_y = 1.133g, a_z = 0$$

CALCULATE (DL+LL) FOR BEAMS @ MID SPAN

$$\text{BEAM 1} = 85.2 (9.5 \times 2.1) / 2 = 850 \#$$

$$2 = 85.2 (9.5 \times 5.2) / 2 = 2104 \#$$

$$3 = 85.2 (9.5 \times 4.75) / 2 = 1922$$

$$4 = 85.2 (9.5 \times 3.1) / 2 = 1255$$

$$5 = 85.2 (9.5 \times 3.42) / 2 = 1384$$

$$6 = 85.2 (9.5 \times 2) / 2 = 809$$

$$7 \& 8 = 85.2 (4.2 \times 2.25) / 2 = 403 + 150 = 553$$

$$9 \& 10 = 85.2 (6.2 \times 2.25) / 2 = 594 + 300 = 894$$

$$\frac{DL \text{ ONLY @ } 10.2 \text{ psf}}{105 \#}$$

$$252$$

$$230$$

$$150$$

$$166$$

$$97$$

$$48 + 150 = 198$$

$$71 + 300 = 371$$

* DL OF STAIRS (ASSUMED)

$$20 \# / F_1 \times 15' = 300 \#$$

A-7

ANALYTICAL CALCULATIONS

Page 3 of

Subject DST MOCK-UP PLATFORM

Originator T. Stundel

Date 7-10-95

Checker

Date

SEISMIC LOADS

$.2g \pm .06g \pm .133g$

BEAM	NODE	F_y	$.2F_y$	$.06F_y$	$1.133F_y$
1	20	105	21	6	119
2	23	252	50	15	286
3	26	230	46	14	261
4	29	150	30	9	170
5	54	166	33	10	188
6	55	97	19	6	110
7 & 8	49,57	198	40	12	224
9 & 10	60,62	371	74	22	420
11 & 12	41,42	3000	600	180	3399

DESIGN CALCULATION

WHC-SD-WM-ER-521
Rev. 10

(1) Drawing _____ (2) Doc. No. _____ (3) Page 4 of _____
(4) Building _____ (5) Rev. _____ (6) Job No. _____
(7) Subject DST MOCK-UP PLATFORM
(8) Originator RE Ullrich Date 8/24/93
(9) Checker T. Stundal Date 7/10/95

(10)

ALLOWABLE STRESSES:

STATIC:

STRUCTURAL MEMBERS: ASTM-A36 REF AISC 1989

TENSION: $F_T = 0.6 F_y = 0.6(36,000) = 21,600 \text{ lb/in}^2$

BENDING: $F_b = 0.6 F_y = 21,600 \text{ lb/in}^2$ or CALCULATED CASE BY CASE

SHEAR: $F_v = 0.4 F_y = 0.4(36,000) = 14,400 \text{ lb/in}^2$

COMPRESSION: $F_c \rightarrow$ BASED ON BUCKLING CRITERIA, EVALUATED CASE BY CASE

PLATE: ASTM-A36, REF AISC 1989

TENSION: $F_T = 0.6 F_y = 21,600 \text{ lb/in}^2$

BENDING ABOUT MINOR AXIS: $F_b = 0.75 F_y = 0.75(36,000) = 27,000 \text{ lb/in}^2$

SHEAR: $F_v = 0.4 F_y = 14,400 \text{ lb/in}^2$

WELDS: E70XX ROD REF AISC 1989, TABLE J2.5

SHEAR: $F_v = 0.3(\text{NOM. TENSILE STRENGTH OF WELD METAL})$

$F_v = 0.3(70,000) = 21,000 \text{ lb/in}^2$

BOLTS: REF AISC 1989 TABLE J3.2 & TABLE J3.7

THE FOLLOWING VALUES ARE FOR FULLY PRELOADED BOLTS IN OVERSIZE HOLES

ASTM A325 BOLTS $F_T = 44,000 \text{ lb/in}^2$, $F_v = 15,000 \text{ lb/in}^2$

BOLT SIZE	AREA	PRELOAD	TENSILE LOAD	SHEAR LOAD
1/2 in	0.19 in ²	12,000 lb	8360 lb	2850 lb
5/8 in	0.3 in ²	19,000 lb	13,200 lb	4500 lb

ANCHOR BOLTS: REF SDC 4.2 (DOE 1992) TABLE 11

HILTI KWIK BOLT II IN 3000 lb/in² CONCRETE

BOLT SIZE	EMBEDMENT	TENSILE LOAD	SHEAR LOAD
5/8 in	2 3/4 in	1750 lb	2530 lb
5/8 in	4 in	2670 lb	2750 lb
3/4 in	3 1/4 in	2170 lb	3410 lb
3/4 in	4 3/4 in	3870 lb	3710 lb

STRESS COMBINATIONS:

STRUCTURAL MEMBERS: TENSION AND BENDING: $\frac{f_T}{F_T} + \frac{f_{bx}}{F_{bx}} + \frac{f_{by}}{F_{by}} \leq 1$

COMPRESSION AND BENDING: IF $\frac{f_c}{F_c} < 0.15$, $\frac{f_c}{F_c} + \frac{f_{bx}}{F_{bx}} + \frac{f_{by}}{F_{by}} \leq 1$

INTERACTION FOR BOLTS & ANCHOR BOLTS:

$$\frac{f_T}{F_T} + \frac{f_v}{F_v} \leq 1$$

DESIGN CALCULATION

WHC-SD-WM-ER-521
Rev. 0

(1) Drawing _____ (2) Doc. No. _____ (3) Page 5 of _____
(4) Building _____ (5) Rev. _____ (6) Job No. _____
(7) Subject DST MOCK-UP PLATFORM
(8) Originator L. E. Ullrich Date 8/24/93
(9) Checker T. Stundel Date 7/10/95

(10)

ALLOWABLE STRESSES (CONT.):

SEISMIC:

PER AISC 1989, PARA A5.2 AND UBC 1991, PARA. 2303(d), THE ALLOWABLE SEISMIC STRESSES ARE $\frac{1}{3}$ GREATER THAN STATIC ALLOWABLES. THIS DOES NOT APPLY TO ANCHOR BOLTS.

STRUCTURAL MEMBERS: ASTM A36

TENSION: $F_t = \frac{4}{3}(21,600) = 28,800 \text{ lb/in}^2$

BENDING: $F_b = \frac{4}{3}(21,600) = 28,800 \text{ lb/in}^2$

SHEAR: $F_v = \frac{4}{3}(14,400) = 19,200 \text{ lb/in}^2$

COMPRESSION: $F_c = \frac{4}{3}(F_c \text{ FOR STATIC})$

PLATE: ASTM A36

TENSION: $F_t = \frac{4}{3}(21,600) = 28,800 \text{ lb/in}^2$

BENDING (MINOR AXIS): $F_b = \frac{4}{3}(27,000) = 36,000 \text{ lb/in}^2$

SHEAR: $F_v = \frac{4}{3}(14,400) = 19,200 \text{ lb/in}^2$

WELDS: E70XX ROD

SHEAR: $F_v = \frac{4}{3}(21,000) = 28,000 \text{ lb/in}^2$

BOLTS:

TENSION: $F_t = \frac{4}{3}(44,000) = 58,667 \text{ lb/in}^2$

SHEAR: $F_v = \frac{4}{3}(15,000) = 20,000 \text{ lb/in}^2$

BOLT SIZE

TENSILE LOAD

SHEAR LOAD

$\frac{1}{2}$ in

$\frac{4}{3}(8360) = 11,147 \text{ lb}$

$\frac{4}{3}(2850) = 3800 \text{ lb}$

$\frac{5}{8}$ in

$\frac{4}{3}(13,200) = 17,600 \text{ lb}$

$\frac{4}{3}(4500) = 6000 \text{ lb}$

ANCHOR BOLTS: HKB-II IN 3000 lb/in²

NO INCREASE FOR SEISMIC LOAD → SEE STATIC ALLOWABLES

STRESS COMBINATIONS:

SAME AS FOR STATIC CONDITIONS

DESIGN CALCULATION

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(4) Building _____ (5) Rev. _____ (6) Job No. _____
(7) Subject DST Mock-Up Platform
(8) Originator LE Webb Date 8/24/93
(9) Checker T. Standa Date 7/10/95

(10)

SECTIONAL PROPERTIES OF STRUCTURAL MEMBERS: REF AISC 1989

W6x20:

$$\begin{aligned} A &= 5.87 \text{ in}^2 \\ d &= 6.2 \text{ in} \\ t_w &= 0.26 \text{ in} \\ b_f &= 6.02 \text{ in} \\ t_f &= 0.365 \text{ in} \end{aligned}$$

$$\begin{aligned} I_z &= 41.4 \text{ in}^4 & S_z &= 13.4 \text{ in}^3 \\ I_y &= 13.3 \text{ in}^4 & S_y &= 4.41 \text{ in}^3 \\ r_z &= 2.66 \text{ in} \\ r_y &= 1.5 \text{ in} \\ J &= 0.24 \text{ in}^4 \end{aligned}$$

$$\text{SHEAR AREA} = A_s = d t_w = 6.2(0.26) = 1.612 \text{ in}^2$$

C6x8.2:

$$\begin{aligned} A &= 2.4 \text{ in}^2 \\ d &= 6 \text{ in} \\ t_w &= 0.2 \text{ in} \\ b_f &= 1.92 \text{ in} \\ t_f &= 0.343 \text{ in} \\ X &= 0.511 \text{ in} \\ e_o &= 0.599 \text{ in} \end{aligned}$$

$$\begin{aligned} I_z &= 13.1 \text{ in}^4 & S_z &= 4.38 \text{ in}^3 \\ I_y &= 0.693 \text{ in}^4 & S_y &= -4.92 \text{ in}^3 \\ r_z &= 2.34 \text{ in} \\ r_y &= 0.537 \text{ in} \\ J &= 0.08 \text{ in}^4 \end{aligned}$$

$$\text{SHEAR AREA} = A_s = d t_w = 6(0.2) = 1.2 \text{ in}^2$$

L2x2x1/4:

$$\begin{aligned} A &= 0.938 \text{ in}^2 \\ r_{min} &= 0.391 \text{ in} \\ w_t/f_t &= 3.19 \text{ lb}_f/\text{ft} \end{aligned}$$

DECK PLATE:

1/4" PLATE

$$\text{UNIT WEIGHT} = 0.2836 \text{ lb/in}^3$$

TS 3x3x1/4 (A-1020)

$$\begin{aligned} A &= 2.59 \text{ in}^2 \\ d &= b = 3 \text{ in} \end{aligned}$$

$$\begin{aligned} I_y &= I_z = 3.16 \text{ in}^4 & S &= 2.10 \text{ in}^3 \\ J &= 5.35 \text{ in}^4 \\ r &= 1.10 \text{ in} \end{aligned}$$

A-11

(1) Drawing _____ (2) Doc. No. _____ (3) Page 7 of _____
 (4) Building _____ (5) Rev. _____ (6) Job No. _____
 (7) Subject DST MOCK-UP PLATFORM
 (8) Originator EE Whit Date 8/24/93
 (9) Checker T. Anderson Date 7/10/95

(10)

STATIC EVALUATION:

THE PLATFORM IS ANALYZED USING ANSYS 4.4a (ANSYS 1989). THE INPUT LISTINGS AND RESULTS ARE PRESENTED IN THE ATTACHMENTS. A SUMMARY OF THE RESULTING MAXIMUM VALUES FOR STRESSES AND FORCES ARE TABULATED ON PAGE A-220. THE NOTATION IS AS FOLLOWS:

f_x, f_y, f_z = ELEMENT END NODE FORCES lbf
 m_x, m_y, m_z = " " " MOMENTS lbf-in

SAX = AXIAL STRESS IN STRUCTURAL MEMBERS, lbf/in²

SBY = $\frac{M_y}{S_y}$ = BENDING STRESS IN BEAMS AND COLUMNS, lbf/in²

SBZ = $\frac{M_z}{S_z}$ = BENDING STRESS IN BEAMS AND COLUMNS, lbf/in²

SG1 = SAX + |SBY| + |SBZ|, lbf/in²

SG3 = SAX - |SBY| - |SBZ|, lbf/in²

PREFIXES I AND J, DENOTE START AND END NODE OF AN ELEMENT

THE MAXIMUM STRESSES FOR BEAMS AND COLUMNS ARE BASED ON THE MAXIMUM OF SG1 AND SG3 VALUES, AND AS SUCH THE REPORTED STRESSES OCCUR AT A SINGLE NODE. THE MAXIMUM SHEAR FORCES REPORTED ARE THE MAXIMUM VALUE FOR ALL ELEMENTS OF THAT TYPE, AND AS SUCH, THESE MAXIMUMS MAY NOT OCCUR AT THE SAME NODE. THEREFORE, BEAM CONNECTIONS DESIGNED FOR THE REPORTED MAXIMUM SHEAR FORCES WILL BE CONSERVATIVE.

THE STRESSES AND FORCES FOR THE BEAMS AND COLUMNS ARE REPORTED IN THE ELEMENT'S COORDINATE SYSTEM AS SHOWN BELOW.

THE BASEPLATE REACTION FORCES ARE REPORTED IN GLOBAL COORDINATES (Y-VERTICAL). THE MAXIMUMS REPORTED IN THE FOLLOWING TABLE MAY NOT OCCUR AT THE SAME NODE.

A.3 FINITE ELEMENT MODEL, ANSYS INPUTS AND OUTPUTS

ANSYS 4.4A1
 JUL 19 1995
 14:51:24
 PLOT NO. 1
 POST1 ELEMENTS
 TYPE NUM
 TDIS

XV =1
 YV =1
 ZV =1
 DIST=249.909
 XF =86.5
 YF =206.5
 ZF =57

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DOUBLE SHELL TANK MOCK-UP PLATFORM

/prep7

WHC-SD-WM-ER-521
Rev. 0

/title,DOUBLE SHELL TANK MOCK-UP PLATFORM

et,1,4,,,,,1 *3-D Beam W6X20 beam
et,2,8 *3-D Spar L2x2x1/4
et,3,4 *3-D Beam W6x20 Column
et,4,4 *3-D Beam (TS3x3x1/4)A1020
et,5,4 *3-D Beam C6x8.2

r,1,5.87,41.4,13.3,6.02,6.20, *W6x20 beam
rmore,,.24
r,2,.938 *L2x2x1/4
r,3,5.87,41.4,13.3,6.02,6.20, *W6x20 column
rmore,,.24
r,4,2.59,3.16,3.16,3,3, *TS3x3x1/4
rmore,,5.35
r,5,2.4,13.1,.693,1.92,6, *C6x8.2 beam
rmore,,.08

mp,ex,1,29e6 *Steel
mp,dens,1,7.34e-4 *Mass density of steel

n,1
n,2,,,114
n,3,99
n,4,99,,114
n,5,173
n,6,173,,114
ngen,2,6,1,6,1,,129
ngen,2,6,7,12,1,,132
n,19,,261,30
n,20,,261,57
n,21,,261,103
ngen,2,3,19,21,1,25
ngen,2,3,22,24,1,37
ngen,2,3,25,27,1,20
n,31,82,365,103
n,32,82,413,103
ngen,2,2,31,32,1,,,-73
ngen,2,4,31,32,1,-82
ngen,2,4,33,34,1,-82
n,39,,413,54
n,40,,413,79
ngen,3,2,39,40,1,41
n,45,25,261,114
n,46,62,261,114
n,47,82,261,114
n,48,123,261,114
n,49,148,261,114
n,50,25,261
n,51,62,261
n,52,82,261
n,53,123,261
n,54,99,261,57
n,55,123,261,57
n,56,123,261,87
n,57,148,261,87
n,58,173,261,87
n,59,99,129,27
n,60,136,129,27
n,61,173,129,27
n,62,136,129
n,63,,261,30
n,64,,261,103
n,65,82,261,30

n,66,82,261,103
n,67,,261
n,68,,261,114
n,69,99,261
n,70,99,261,114
n,71,173,261
n,72,173,261,114

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Mat,1
Type,3
real,3 *W6x20 columns
e,1,7
e,7,13
e,3,9
e,9,15
e,5,11
e,11,17
egen,2,1,1,6,1

Type,5
real,5 *C6x8.2
e,7,8
e,10,59
e,59,9
e,12,61
e,61,11
e,59,60
e,60,61
e,9,62
e,62,11
e,56,57
e,57,58
Type,2
real,2 *L2x2x1/4
e,1,8
e,7,14
egen,3,2,24,25,1
e,2,7
e,8,13
egen,3,2,30,31,1
e,9,17
e,10,18
e,11,15
e,12,16

Type,1
real,1 *W6x20 Beams
e,68,45
e,45,46
e,46,47
e,47,70
e,70,48
e,48,49
e,49,72
e,67,19
e,19,20
e,20,21
egen,4,3,48,49,1
e,21,68
e,24,45
e,27,46
e,30,47
e,22,50
e,25,51
e,28,52
e,70,54

e,54,69
e,48,56
e,56,55
e,55,53
e,72,58
e,58,71
e,53,71
e,53,69
e,69,52
e,52,51
e,51,50
e,50,67

Type,4
real,4
e,66,31
e,31,32
e,65,33
e,33,34
e,64,35
e,35,36
e,63,37
e,37,38
e,31,33
e,31,35
e,37,33
e,37,35
e,32,44
e,44,43
e,43,34
e,36,40
e,40,39
e,39,38
e,32,36
e,38,34
e,40,42
e,42,44
e,39,41
e,41,43

*CMA Jack legs bases (nodes 63 - 66)

cp,1,ux,19,63
cp,2,uy,19,63
cp,3,uz,19,63
cp,4,ux,21,64
cp,5,uy,21,64
cp,6,uz,21,64
cp,7,ux,28,65
cp,8,uy,28,65
cp,9,uz,28,65
cp,10,ux,30,66
cp,11,uy,30,66
cp,12,uz,30,66
cp,13,ux,13,67
cp,14,uy,13,67
cp,15,uz,13,67
cp,16,ux,14,68
cp,17,uy,14,68
cp,18,uz,14,68
cp,19,ux,15,69
cp,20,uy,15,69
cp,21,uz,15,69
cp,22,ux,16,70
cp,23,uy,16,70
cp,24,uz,16,70
cp,25,ux,17,71
cp,26,uy,17,71

cp,27,uz,17,71
cp,28,ux,18,72
cp,29,uy,18,72
cp,30,uz,18,72

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d,1,ux,,,6,,uy,uz

*Pinned column bases

iter,1,1,1
f,20,fy,-850
f,23,fy,-2104
f,26,fy,-1922
f,29,fy,-1255
f,54,fy,-1384
f,55,fy,-809
f,49,fy,-553
f,57,fy,-553
f,60,fy,-894
f,62,fy,-894
f,41,fy,-3000
f,42,fy,-3000
acel,,386.4

* (DL + LL) Static Analysis

lwrite

f,20,fy,-105	\$f,20,fx,21	\$f,20,fz,6
f,23,fy,-252	\$f,23,fx,50	\$f,23,fz,15
f,26,fy,-230	\$f,26,fx,46	\$f,26,fz,14
f,29,fy,-150	\$f,29,fx,30	\$f,29,fz,9
f,54,fy,-166	\$f,54,fx,33	\$f,54,fz,10
f,55,fy,-97	\$f,55,fx,19	\$f,55,fz,6
f,49,fy,-198	\$f,49,fx,40	\$f,49,fz,12
f,57,fy,-198	\$f,57,fx,40	\$f,57,fz,12
f,60,fy,-371	\$f,60,fx,74	\$f,60,fz,22
f,62,fy,-371	\$f,62,fx,74	\$f,62,fz,22
f,41,fy,-3000	\$f,41,fx,600	\$f,41,fz,180
f,42,fy,-3000	\$f,42,fx,600	\$f,42,fz,180

acel,-77.28,386.4,-23.18

*DL + Seismic [.2g(x),1g(y),.06g(z)]

lwrite

f,20,fy,-105	\$f,20,fx,-21	\$f,20,fz,6
f,23,fy,-252	\$f,23,fx,-50	\$f,23,fz,15
f,26,fy,-230	\$f,26,fx,-46	\$f,26,fz,14
f,29,fy,-150	\$f,29,fx,-30	\$f,29,fz,9
f,54,fy,-166	\$f,54,fx,-33	\$f,54,fz,10
f,55,fy,-97	\$f,55,fx,-19	\$f,55,fz,6
f,49,fy,-198	\$f,49,fx,-40	\$f,49,fz,12
f,57,fy,-198	\$f,57,fx,-40	\$f,57,fz,12
f,60,fy,-371	\$f,60,fx,-74	\$f,60,fz,22
f,62,fy,-371	\$f,62,fx,-74	\$f,62,fz,22
f,41,fy,-3000	\$f,41,fx,-600	\$f,41,fz,180
f,42,fy,-3000	\$f,42,fx,-600	\$f,42,fz,180

acel,77.28,386.4,-23.18

*DL + Seismic[-.2g(x),1g(y),.06g(z)]

lwrite

f,20,fy,-105	\$f,20,fx,6	\$f,20,fz,21
f,23,fy,-252	\$f,23,fx,15	\$f,23,fz,50
f,26,fy,-230	\$f,26,fx,14	\$f,26,fz,46
f,29,fy,-150	\$f,29,fx,9	\$f,29,fz,30
f,54,fy,-166	\$f,54,fx,10	\$f,54,fz,33
f,55,fy,-97	\$f,55,fx,6	\$f,55,fz,19
f,49,fy,-198	\$f,49,fx,12	\$f,49,fz,40
f,57,fy,-198	\$f,57,fx,12	\$f,57,fz,40
f,60,fy,-371	\$f,60,fx,22	\$f,60,fz,74
f,62,fy,-371	\$f,62,fx,22	\$f,62,fz,74
f,41,fy,-3000	\$f,41,fx,180	\$f,41,fz,600
f,42,fy,-3000	\$f,42,fx,180	\$f,42,fz,600

acel,-23.18,386.4,-77.28

*DL + Seismic [.06g(x), 1g(y),.2g(z)]

lwrite

f,20,fy,-105	\$f,20,fx,6	\$f,20,fz,-21
f,23,fy,-252	\$f,23,fx,15	\$f,23,fz,-50

f,26,fy,-230 \$f,26,fx,14
 f,29,fy,-150 \$f,29,fx,9
 f,54,fy,-166 \$f,54,fx,10
 f,55,fy,-97 \$f,55,fx,6
 f,49,fy,-198 \$f,49,fx,12
 f,57,fy,-198 \$f,57,fx,12
 f,60,fy,-371 \$f,60,fx,22
 f,62,fy,-371 \$f,62,fx,22
 f,41,fy,-3000 \$f,41,fx,180
 f,42,fy,-3000 \$f,42,fx,180

\$f,26,fz,-46
 \$f,29,fz,-30
 \$f,54,fz,-33
 \$f,55,fz,-19
 \$f,49,fz,-40
 \$f,57,fz,-40
 \$f,60,fz,-74
 \$f,62,fz,-74
 \$f,41,fz,-600
 \$f,42,fz,-600

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acel,-23.18,386.4,77.28

*DL + Seismic [.06g(x), 1g(y),-.2g(z)]

lwrite

fdelete,all

f,20,fy,-119

f,23,fy,-286

f,26,fy,-261

f,29,fy,-170

f,54,fy,-188

f,55,fy,-110

f,49,fy,-224

f,57,fy,-224

f,60,fy,-420

f,62,fy,-420

f,41,fy,-3399

f,42,fy,-3399

acel,,437.79

*DL + Seismic[0g(x), 1.133g(y), 0g(z)]

lwrite

afwrite

finish

/input,27

finish

```

/post1
/title, DOUBLE SHELL TANK MOCK-UP PLATFORM ANALYSIS
stress,ifx,4,1 $stress,ify,4,2 $stress,ifz,4,3
stress,imx,4,4 $stress,imy,4,5 $stress,imz,4,6
stress,jfx,4,7 $stress,jfy,4,8 $stress,jfz,4,9
stress,jmx,4,10 $stress,jmy,4,11 $stress,jmz,4,12
stress,isax,4,13 $stress,isby,4,14 $stress,isbz,4,15
stress,jsax,4,16 $stress,jsby,4,17 $stress,jsbz,4,18
stress,isg1,4,19 $stress,isg3,4,20
stress,jsg1,4,21 $stress,jsg3,4,22
stress,sax,8,3
store
set,1
*create,mres
esel,type,1 *W6x20 Beam
esort,isg1,,1,3
prstrs,isg1,ifx,ify,ifz,imx,imy,imz
esort,isg3,,1,3
prstrs,isg3,ifx,ify,ifz,imx,imy,imz
esort,jsg1,,1,3
prstrs,jsg1,jfx,jfy,jfz,jmx,jmy,jmz
esort,jsg3,,1,3
prstrs,jsg3,jfx,jfy,jfz,jmx,jmy,jmz
esel,type,2 *L2x2x1/4
esort,sax,,1,3
prstrs,sax
esel,type,3 *W6x20 Column
prrrfor *Reactions at Column bases
esort,isg1,,1,3
prstrs,isg1,ifx,ify,ifz,imx,imy,imz
esort,isg3,,1,3
prstrs,isg3,ifx,ify,ifz,imx,imy,imz
esort,jsg1,,1,3
prstrs,jsg1,jfx,jfy,jfz,jmx,jmy,jmz
esort,jsg3,,1,3
prstrs,jsg3,jfx,jfy,jfz,jmx,jmy,jmz
esel,elem,2,12,2 *Forces at the top of columns
prstrs,jfx,jfy,jfz,jmx,jmy,jmz
esel,type,4 *TS3x3x1/4 CMA Frame
esort,isg1,,1,3
prstrs,isg1,ifx,ify,ifz,imx,imy,imz
esort,isg3,,1,3
prstrs,isg3,ifx,ify,ifz,imx,imy,imz
esort,jsg1,,1,3
prstrs,jsg1,jfx,jfy,jfz,jmx,jmy,jmz
esort,jsg3,,1,3
prstrs,jsg3,jfx,jfy,jfz,jmx,jmy,jmz
esel,elem,88,99
prstrs,ifx,ify,ifz,imx,imy,imz
prstrs,jfx,jfy,jfz,jmx,jmy,jmz
esel,elem,76,82,2 *Forces at the 4 - CMA jack bases
prstrs,ifx,ify,ifz,imx,imy,imz
esel,type,5 *C6x8.2
esort,isg1,,1,3
prstrs,isg1,ifx,ify,ifz,imx,imy,imz
esort,isg3,,1,3
prstrs,isg3,ifx,ify,ifz,imx,imy,imz
esort,jsg1,,1,3
prstrs,jsg1,jfx,jfy,jfz,jmx,jmy,jmz
esort,jsg3,,1,3
prstrs,jsg3,jfx,jfy,jfz,jmx,jmy,jmz
*end
/outp,static
/title,DST MOCK-UP PLATFORM STATIC ANALYSIS
*use,mres
/outp,seismx

```

set,2
/title,DST MOCK-UP PLATFORM SEISMIC ANALYSIS [DL + 0.2g:x + .06g:z]
*use,mres
/outp,seism-x
set,3
/title,DST MOCK-UP PLATFORM SEISMIC ANALYSIS [DL +0.2g:-x + .06g:z]
*use,mres
/outp,seismz
set,4
/title,DST MOCK-UP PLATFORM SEISMIC ANALYSIS [DL + .06g:x + .2g:z]
*use,mres
/outp,seism-z
set,5
/title,DST MOCK-UP PLATFORM SEISMIC ANALYSIS [DL + .06g:x + .2g:-z]
*use,mres
/outp,seismy
set,6
/title,DST MOCK-UP PLATFORM SEISMIC ANALYSIS [DL + .133g:y]
*use,mres
/outp,model
/title,DST MOCK-UP PLATFORM FRAME MODEL
set,1
nall
eall
nlist
elist
finish

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```

HOST:
USER:
JOB:
CLASS:

```

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DOUBLE SHELL TANK HOCK-UP PLATFORM

15.1264 AUG 1, 1995 CP= 1.600

***** POST1 NODE LISTING *****

NODE	X	Y	Z	THXY	THYZ	THXZ
1	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
2	.00000000E+00	.00000000E+00	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
3	99.000000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
4	99.000000	.00000000E+00	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
5	173.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
6	173.00000	.00000000E+00	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
7	.00000000E+00	129.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
8	.00000000E+00	129.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
9	99.000000	129.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
10	99.000000	129.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
11	173.00000	129.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
12	173.00000	129.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
13	.00000000E+00	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
14	.00000000E+00	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
15	99.000000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
16	99.000000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
17	173.00000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
18	173.00000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
19	.00000000E+00	261.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
20	.00000000E+00	261.00000	57.000000	.00000000E+00	.00000000E+00	.00000000E+00
21	.00000000E+00	261.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
22	25.000000	261.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
23	25.000000	261.00000	57.000000	.00000000E+00	.00000000E+00	.00000000E+00
24	25.000000	261.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
25	62.000000	261.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
26	62.000000	261.00000	57.000000	.00000000E+00	.00000000E+00	.00000000E+00
27	62.000000	261.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
28	82.000000	261.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
29	82.000000	261.00000	57.000000	.00000000E+00	.00000000E+00	.00000000E+00
30	82.000000	261.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
31	82.000000	365.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
32	82.000000	413.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
33	82.000000	365.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
34	82.000000	413.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
35	.00000000E+00	365.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
36	.00000000E+00	413.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
37	.00000000E+00	365.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
38	.00000000E+00	413.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
39	.00000000E+00	413.00000	54.000000	.00000000E+00	.00000000E+00	.00000000E+00
40	.00000000E+00	413.00000	79.000000	.00000000E+00	.00000000E+00	.00000000E+00
41	41.000000	413.00000	54.000000	.00000000E+00	.00000000E+00	.00000000E+00
42	41.000000	413.00000	79.000000	.00000000E+00	.00000000E+00	.00000000E+00
43	82.000000	413.00000	54.000000	.00000000E+00	.00000000E+00	.00000000E+00
44	82.000000	413.00000	79.000000	.00000000E+00	.00000000E+00	.00000000E+00
45	25.000000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00

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DOUBLE SHELL TANK MOCK-UP PLATFORM

15.1264 AUG 1, 1995 CP= 1.610

***** POST1 NODE LISTING *****

NODE	X	Y	Z	THXY	THYZ	THXZ
46	62.000000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
47	82.000000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
48	123.00000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
49	148.00000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
50	25.000000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
51	62.000000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
52	82.000000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
53	123.00000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
54	99.000000	261.00000	57.000000	.00000000E+00	.00000000E+00	.00000000E+00
55	123.00000	261.00000	57.000000	.00000000E+00	.00000000E+00	.00000000E+00
56	123.00000	261.00000	87.000000	.00000000E+00	.00000000E+00	.00000000E+00
57	148.00000	261.00000	87.000000	.00000000E+00	.00000000E+00	.00000000E+00
58	173.00000	261.00000	87.000000	.00000000E+00	.00000000E+00	.00000000E+00
59	99.000000	129.00000	27.000000	.00000000E+00	.00000000E+00	.00000000E+00
60	136.00000	129.00000	27.000000	.00000000E+00	.00000000E+00	.00000000E+00
61	173.00000	129.00000	27.000000	.00000000E+00	.00000000E+00	.00000000E+00
62	136.00000	129.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
63	.00000000E+00	261.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
64	.00000000E+00	261.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
65	82.000000	261.00000	30.000000	.00000000E+00	.00000000E+00	.00000000E+00
66	82.000000	261.00000	103.00000	.00000000E+00	.00000000E+00	.00000000E+00
67	.00000000E+00	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
68	.00000000E+00	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
69	99.000000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
70	99.000000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00
71	173.00000	261.00000	.00000000E+00	.00000000E+00	.00000000E+00	.00000000E+00
72	173.00000	261.00000	114.00000	.00000000E+00	.00000000E+00	.00000000E+00

PRINT ELEMENT LISTING

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DOUBLE SHELL TANK HOCK-UP PLATFORM

***** GN1517 IN34373 1150d *****

[illegible][illegible]

DOUBLE SHELL TANK ROCK-UP PLATFORM
 13.6333 JUL 13, 1995 CP= .990

***** POS11 ELEMENT LISTING *****

ELEM	TYPE	STIF	MAT	ESYS	NODES	
46	1	4	1	0	48	72
47	1	4	1	0	6A	19
48	1	4	1	0	19	20
49	1	4	1	0	20	21
50	1	4	1	0	22	23
51	1	4	1	0	23	24
52	1	4	1	0	25	26
53	1	4	1	0	26	27
54	1	4	1	0	28	29
55	1	4	1	0	29	30
56	1	4	1	0	21	48
57	1	4	1	0	24	45
58	1	4	1	0	27	46
59	1	4	1	0	30	47
60	1	4	1	0	22	50
61	1	4	1	0	25	51
62	1	4	1	0	28	52
63	1	4	1	0	70	54
64	1	4	1	0	54	69
65	1	4	1	0	48	56
66	1	4	1	0	55	55
67	1	4	1	0	55	53
68	1	4	1	0	72	58
69	1	4	1	0	58	71
70	1	4	1	0	53	71
71	1	4	1	0	53	69
72	1	4	1	0	69	52
73	1	4	1	0	52	51
74	1	4	1	0	51	50
75	1	4	1	0	50	67
76	1	4	1	0	66	31
77	4	4	1	0	31	32
78	4	4	1	0	65	33
79	4	4	1	0	33	34
80	4	4	1	0	64	35
81	4	4	1	0	35	36
82	4	4	1	0	63	37
83	4	4	1	0	37	38
84	4	4	1	0	31	31
85	4	4	1	0	31	35
86	4	4	1	0	37	33
87	4	4	1	0	37	35
88	4	4	1	0	32	44
89	4	4	1	0	44	43
90	4	4	1	0	43	34

DOUBLE SHELL TANK ROCK-UP PLATFORM

***** POST1 ELEMENT LISTING *****

ELEM TYPE STIF MAT ESYS NODES

91	4	4	1	0	36	40	0
92	4	4	1	0	40	39	0
93	4	4	1	0	39	38	0
94	4	4	1	0	32	36	0
95	4	4	1	0	38	34	0
96	4	4	1	0	40	42	0
97	4	4	1	0	42	44	0
98	4	4	1	0	39	41	0
99	4	4	1	0	41	43	0

***** ROUTINE COMPLETED ***** CP = 1.000

***** END OF INPUT ENCOUNTERED ON FILE18

***** RUN COMPLETED ***** CP= 1.0200 TIME= 13.6333
 NEW TITLE= DSI ROCK-UP PLATFORM STATIC ANALYSIS

USE MACRO FILE nres

ESEL FOR LABEL= TYPE FROM 1 TO 1 BY 1

36 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISIG ORDER= 0 KABS= 1 HMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

WHC-SD-WM-ER-521
Rev. 0

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HDST:
USER:
JOB:
CLASS:

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JOB: E21085
CLASS: T HUNDAL/2920GWW/211

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[illegible]

NEW TITLE= DST ROCK-UP PLATFORM STATIC ANALYSIS DL + LL
USE MACRO FILE MYES
ESEL FOR LABEL= TYPE FROM 1 TO 1 BY 1
36 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.
SORT ON ISG1 ORDER= 0 KARS= 1 NMAX= 3
SORT COMPLETED FOR 3 VALUES.
PRINT ELEMENT STRESS ITEMS PER ELEMENT

DS1 MOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1258 AUG 1, 1995 CP= .390

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
55	5558.9	-16.982	-916.50	1.8481	-.90255	-44.873	-74064.
62	4843.9	-37.426	-2129.5	-10.624	-.90255	94.772	-64318.
54	4840.4	-16.982	383.45	1.8481	-.90255	-94.772	-64318.

MINIMUMS
 ELEMENT 54 62 55
 VALUE 4840.4 -37.426 -2129.5 -10.624 -.90255 -94.772 -74064.

MAXIMUMS
 ELEMENT 55 54 62
 VALUE 5558.9 -16.982 383.45 1.8481 -.90255 94.772 -64318.

END OF 1263 ORDER= 0 KABS= 1 NMAX= 3

PRINT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1258 AUG 1, 1995 CP= .400

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
55	-5553.1	-16.982	-916.50	1.8481	-.90255	-44.873	-74064.
54	-4834.6	-16.982	383.45	1.8481	-.90255	-94.772	-64318.
62	-4831.1	-37.426	-2129.5	-10.624	-.90255	94.772	-64318.

MINIMUMS ELEMENT VALUE	55	62	62	62	62	54	55
	-5553.1	-37.426	-2129.5	-10.624	-.90255	-94.772	-74064.

MAXIMUMS ELEMENT VALUE	62	54	54	54	55	62	54
	-4831.1	-16.982	383.45	1.8481	-.90255	94.772	-64318.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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MAY 1, 1990

4137 32207

DET MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1258 AUG 1, 1995 CP=

.400

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
54	5558.9	16.982	-338.50	-1.8481	.90255	44.873	74064.
48	4754.1	153.80	-129.01	1.6209	-.72422	-60.209	62959.
50	4701.3	13.316	-1051.9	-.21466	-.57301	14.332	62712.
MINIMUMS							
ELEMENT	50	50	50	54	48	48	50
VALUE	4701.3	13.316	-1051.9	-1.8481	-.72422	-60.209	62712.
MAXIMUMS							
ELEMENT	54	48	48	48	54	54	54
VALUE	5558.9	153.80	-129.01	1.6209	.90255	44.873	74064.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1258 AUG 1,1995 CP= .410

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	J553	JFX	JFY	JFZ	JMX	JMY	JMZ
54	-5553.1	16.982	-338.50	-1.8481	.90255	44.873	74064.
48	-4761.7	153.80	-129.01	1.6209	-.72422	-60.209	62959.
50	-4696.8	13.316	-1051.9	-.21466	-.57301	14.332	62712.

MINIMUMS	54	50	54	48	48	48	50
ELEMENT	54	50	54	48	48	48	50
VALUE	-5553.1	13.316	-1051.9	-1.8481	-.72422	-60.209	62712.

MAXIMUMS	50	48	48	48	54	54	54
ELEMENT	50	48	48	48	54	54	54
VALUE	-4696.8	153.80	-129.01	1.6209	.90255	44.873	74064.

ESEL FOR LABEL= ELEH FROM 56 TO 62 BY 1

7 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

1ST ROCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1258 AUG 1, 1995 CP= .410

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
56	174.25011	2561.9574	14.111900	-.72421999	169.58556	-48.854641
57	13.315805	1146.9544	-.21465741	-.57300653	2.0967398	39.983966
58	-7.0231010	1055.9581	-.18187601	.20600048	-12.139705	120.30091
59	36.759311	2776.5812	-13.590244	.90255270	-189.63304	-298.20431
60	13.315805	1146.8369	-.21465741	-.57300653	-26.567485	46.681102
61	-7.0231010	1055.8331	-.18187601	.20600048	-8.5941599	127.42844
62	37.425952	2179.4705	10.623806	.90255270	223.94211	-317.42197

MINIMUMS
 ELEMENT
 VALUE

58
 -7.0231010
 61
 1055.8331

59
 -13.590244
 56
 -.72421999

MAXIMUMS
 ELEMENT
 VALUE

56
 174.25011
 59
 2776.5812

62
 14.111900
 62
 .90255270

ESEL FOR LABEL= ELEM FROM 64 TO 67 BY 3
 2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DSI HOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1258 AUG 1, 1995 CP= .420

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
64	207.05094	786.82354	.53042214	-.40920827E-01	40.831012	168.36459
67	18.503022	568.55890	.84098868	-4.2065319	37.638533	.78466647E-02
MINIMUMS						
ELEMENT	67	67	64	67	67	67
VALUE	18.503022	568.55890	.53042214	-4.2065319	37.638533	.78466647E-02
MAXIMUMS						
ELEMENT	64	64	67	64	64	64
VALUE	207.05094	786.82354	.84098868	-.40920827E-01	40.831012	168.36459

ESEL FOR LABEL= ELEM FROM 69 TO 69 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1258 AUG 1, 1995 CP= .430

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
69	-10.764487	164.73693	2.1267978	19.390014	106.52648	30.013878

MINIMUMS ELEMENT VALUE	69	69	69	69	69	69
	-10.764487	164.73693	2.1267978	19.390014	106.52648	30.013878

MAXIMUMS ELEMENT VALUE	69	69	69	69	69	69
	-10.764487	164.73693	2.1267978	19.390014	106.52648	30.013878

ESEL FOR LABEL= ELEM FROM 47 TO 47 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DET ROCK-UP PLATFORM STATIC ANALYSIS DC + LL 15.1258 AUG 1, 1995 CP= .430

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
47	-173.58347	1989.0942	10.102150	.72421999	-199.09037	55.073878
MINIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	-173.58347	1989.0942	10.102150	.72421999	-199.09037	55.073878
MAXIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	-173.58347	1989.0942	10.102150	.72421999	-199.09037	55.073878

ESEL FOR LABEL= ELEM FROM 63 TO 65 BY 2

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DS1 HOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1258 AUG 1, 1995 CP= .430

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
63	-207.05094	786.96769	-.53042214	.40920827E-01	19.637111	-160.14811
65	-18.970191	722.58625	-4.2780505	-7.5164473	139.22089	1.6715960

MINIMUMS ELEMENT VALUE	63	65	65	65	63	63
	-207.05094	722.58625	-4.2780505	-7.5164473	19.637111	-160.14811

MAXIMUMS ELEMENT VALUE	65	63	63	63	65	65
	-18.970191	786.96769	-.53042214	.40920827E-01	139.22089	1.6715960

ESEL FOR LABEL= ELEM FROM 68 TO 68 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-38

DST ROCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1258 AUG 1, 1995 CP= .440

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
68	11.231656	319.73448	1.3102641	50.489453	31.583310	-28.297561

MINIMUMS ELEMENT VALUE	68	68	68	68	68	68
11.231656	319.73448	1.3102641	50.489453	31.583310	-28.297561	

MAXIMUMS ELEMENT VALUE	68	68	68	68	68	68
11.231656	319.73448	1.3102641	50.489453	31.583310	-28.297561	

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

16 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON SAX ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DSI ROCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1258 AUG 1, 1995 CP= .450

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM SAX
 32 -523.91244
 26 -519.29011
 33 -443.45126

MINIMUMS
 ELEMENT 32
 VALUE -523.91244

MAXIMUMS
 ELEMENT 33
 VALUE -443.45126

ESEL FOR LABEL= TYPE FROM 3 TO 3 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT REACTION FORCES PER NODE

DSI HOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .450

***** POST1 REACTION FORCE LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z FORCES ARE IN GLOBAL COORDINATES

NODE	FX	FY	FZ	MX	MY	MZ
1	.39009381E-04	3883.6887	206.83713	.00000000E+00	.00000000E+00	.00000000E+00
2	-.39009381E-04	4484.2244	-207.45216	.00000000E+00	.00000000E+00	.00000000E+00
3	30.256864	6421.5330	343.57008	.00000000E+00	.00000000E+00	.00000000E+00
4	4.8723838	6612.3807	-336.82375	.00000000E+00	.00000000E+00	.00000000E+00
5	-26.811030	1316.2975	70.028201	.00000000E+00	.00000000E+00	.00000000E+00
6	-8.3182184	1115.8920	-76.159514	.00000000E+00	.00000000E+00	.00000000E+00
TOTAL	-.19675639E-09	23834.016	-.19453239E-09	.00000000E+00	.00000000E+00	.00000000E+00

SORT ON ISF1 ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DS1 ROCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .460

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

	ISL1	IFX	IFY	IFZ	IMX	IMY	IMZ
9	-1059.8	6221.2	-4.8724	-11.400	.00000E+00	.11369E-12	-.45475E-12
6	846.17	6221.2	25.139	21.017	.00000E+00	.00000E+00	.22737E-12
9	846.17	6221.2	25.139	21.017	.00000E+00	.11369E-12	3318.4

MINIMUMS

ELEMENT

VALUE

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SORT ON ISL3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1261 AUG 1, 1995 CP= .460

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION- 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
4	-1660.5	4677.3	-29.013	19.313	.41633E-16	-2549.3	-3829.8
10	-1362.3	5843.2	4.6952	-10.728	.21094E-14	1416.0	619.77
9	-1059.8	6221.2	-4.8724	-11.400	.00000E+00	.11369E-12	-.45475E-12

MINIMUMS ELEMENT VALUE	4	4	4	9	9	4	4
	-1660.5	4677.3	-29.013	-11.400	.00000E+00	-2549.3	-3829.8

MAXIMUMS ELEMENT VALUE	9	9	10	4	10	10	10
	-1059.8	6221.2	4.6952	19.313	.21094E-14	1416.0	619.77

SORT ON JSG1 ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-43

DS1 HOCK-UP PLATFORM STATIC ANALYSIS DL + LL
 15.1261 AUG 1, 1995 CP= .470

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

	JSE1	JFY	JFZ	JX	JY	JZ
10	-957.99	-5623.4	-4.6952	-21094E-14	.11369E-12	.56843E-11
5	-659.40	-1022.8	-29.013	.00000E+00	.45475E-12	.90949E-12
3	-659.40	-1022.8	-29.013	.00000E+00	.45475E-12	.90949E-12

SORT ON JSE3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .470

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
3	-1897.2	-5818.9	30.257	-21.017	.00000E+00	-2711.2	-3903.1
9	-1403.1	-6006.5	4.8724	11.400	.00000E+00	1470.6	-628.54
5	-1036.9	-1022.8	-26.811	-20.677	.00000E+00	-2667.3	3458.6

MINIMUMS
 ELEMENT 3
 VALUE -1897.2 -6006.5 -26.811 -21.017 .00000E+00 -2711.2 -3903.1

MAXIMUMS
 ELEMENT 5
 VALUE -1036.9 -1022.8 30.257 11.400 .00000E+00 1470.6 3458.6

ESEL FOR LABEL= ELEM FROM 2 TO 12 BY 2
 6 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

1ST ROCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .470

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JRX	JRY	JRZ
2	-3126.5413	39009381E-04	-1.7244524	.00000000E+00	-.71054274E-14	.00000000E+00
4	-4457.5581	29.013313	-19.312861	-.41633363E-16	.45474735E-12	.90949470E-12
6	293.69526	-25.139250	-19.585690	.00000000E+00	-.22737368E-12	.45474735E-12
8	3724.6394	-.39009381E-04	1.9952025	.00000000E+00	.00000000E+00	.00000000E+00
10	-5623.4033	-4.6952154	10.727525	-.21094237E-14	.11368684E-12	.56843419E-11
12	-398.54221	8.0661321	10.850573	.00000000E+00	-.11368684E-12	.90949470E-12

MINIMUMS ELEMENT VALUE	10	6	10	6	2	2
-5623.4033	-25.139250	-19.585690	-.21094237E-14	-.22737368E-12	.00000000E+00	.00000000E+00

MAXIMUMS ELEMENT VALUE	6	4	12	2	4	10
293.69526	29.013313	10.850573	.00000000E+00	.45474735E-12	.56843419E-11	.56843419E-11

ESEL FOR LABEL= TYPE FROM 4 TO 4 BY 1
 24 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1261 AUG 1, 1995 CP= .480

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
99	22647.	2.4326	-1499.6	.99401	38.810	-8.8971	-47702.
97	22647.	2.4334	-1500.4	.99401	38.818	8.8977	-47702.
92	8945.0	467.28	6.3346	-1.9121	-30.343	53.085	-19171.

MINIMUMS ELEMENT VALUE	92	99	97	92	92	99	99
	8945.0	2.4326	-1500.4	-1.9121	-30.343	-8.8971	-47702.

MAXIMUMS ELEMENT VALUE	99	92	92	99	97	92	92
	22647.	467.28	6.3346	.99401	38.818	53.085	-19171.

SORT ON 1553 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

11.111 ELEMENT STRESS ITEMS PER ELEMENT

7-47

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MAY 1, 1990
15.1261 AUG 1, 1995 CP= .490

**** POST1 ELEMENT STRESS LISTING ****

LOAD STEP= 1 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	ISLJ	IFX	IFY	IFZ	IMX	IMY	IMZ
99	-22649.	2.4326	-1499.6	.99401	38.810	-8.8971	-47702.
97	-22649.	2.4326	-1500.4	.99401	39.818	8.8977	-47702.
92	-9305.8	467.28	6.3346	-1.9121	-30.343	53.085	-19171.

MINIMUMS
ELEMENT 99 97 92 99
VALUE -22649. 2.4326 -1500.4 -1.9121 -30.343 -8.8971 -47702.

MAXIMUMS
ELEMENT 92 92 92 99 97 92
VALUE -9305.8 467.28 6.3346 .99401 38.818 53.085 -19171.

SORT ON JSLI ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1261 AUG 1, 1995 CP= .490

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
98	22647.	-2.4326	-1500.4	-.99401	-38.810	8.8971	47702.
96	22647.	-2.4334	-1499.6	-.99401	-38.818	-8.8977	47702.
77	13227.	-1591.9	-288.99	469.00	-5.1264	18068.	11092.

MINIMUMS ELEMENT VALUE	77	77	98	98	96	96	77
VALUE	13227.	-1591.9	-1500.4	-.99401	-38.818	-8.8977	11092.

MAXIMUMS ELEMENT VALUE	98	98	77	77	77	77	98
VALUE	22647.	-2.4326	-288.99	469.00	-5.1264	18068.	47702.

SORT ON JSG3 ORDER= 0 KABS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-49

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1261 AUG 1, 1995 CP= .500

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JHX	JMY	JHZ
98	-22649.	-2.4326	-1500.4	-.99401	-38.810	8.8971	47702.
96	-22649.	-2.4334	-1499.6	-.99401	-38.818	-8.8977	47702.
77	-14456.	-1591.9	-288.99	469.00	-5.1264	18068.	11092.
MINIMUMS							
ELEMENT	98	77	98	98	96	96	77
VALUE	-22649.	-1591.9	-1500.4	-.99401	-38.818	-8.8977	11092.
MAXIMUMS							
ELEMENT	77	98	77	77	77	77	98
VALUE	-14456.	-2.4326	-288.99	469.00	-5.1264	18068.	47702.

ESEL FOR LABEL= ELEM FROM 88 TO 99 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-50

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .510

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IHY	INZ
88	468.26533	1560.1488	-4.3450909	14400.180	49.342508	18093.266
89	467.27132	12.029642	-1.9116709	-30.265466	-5.2875613	-19099.930
90	466.27730	-1536.0796	.52094696	-14430.152	-21.221877	-19132.308
91	466.28656	1553.7095	.52131867	-14430.276	8.7161071	17945.211
92	467.28057	6.3345975	-1.9121013	-30.343289	53.084517	-19171.080
93	468.27458	-1542.5193	-4.3447192	14400.076	54.933543	-19138.702
94	284.64903	-31.770708	-.73456941	25.327261	44.216147	3308.4986
95	284.61848	31.770507	.73457754	25.300958	-44.214952	-3308.6460
96	2.4334199	1529.7453	.99401065	38.817864	-31.856762	14399.933
97	2.4334199	-1500.3721	.99401065	38.817864	8.8976751	-47702.216
98	2.4326179	1530.4897	.99401239	38.810234	-49.651558	14430.419
99	2.4326179	-1499.6277	.99401239	38.810234	-8.8970502	-47702.253

MINIMUMS ELEMENT VALUE	98	93	88	91	98	99
	2.4326179	-1542.5193	-4.3450909	-14430.276	-49.651558	-47702.253
MAXIMUMS ELEMENT VALUE	93	88	99	88	93	88
	468.27458	1560.1488	.99401239	14400.180	54.933543	18093.266

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .510

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
88	-468.26533	-1542.5191	4.3450909	-14400.180	54.939673	19138.748
89	-467.27132	6.3345975	1.9116709	30.265466	53.079335	19171.118
90	-466.27730	1553.7093	-52094696	14430.152	8.7191503	-17945.159
91	-466.28656	-1536.0798	-52131867	14430.276	-21.227753	19132.262
92	-467.29057	12.029642	1.9121013	30.343289	-5.2819848	19099.892
93	-468.27458	1560.1490	4.3447192	-14400.076	49.339717	-18093.318
94	-284.64903	-28.463998	.73456941	-25.327261	16.018545	-3444.0737
95	-284.61848	28.464198	-73457754	-25.300958	-16.020407	3444.2046
96	-2.4334199	-1499.6279	-99401065	-38.817864	-8.8976751	47702.216
97	-2.4334199	1530.4895	-99401065	-38.817864	-49.652112	-14430.445
98	-2.4326179	-1500.3723	-99401239	-38.810234	8.8970502	47702.253
99	-2.4326179	1529.7450	-99401239	-38.810234	-31.857458	-14399.887

MINIMUMS
 ELEMENT 93 88 97 93
 VALUE -468.27458 -1542.5191 -99401239 -14400.180 -49.652112 -18093.318

MAXIMUMS
 ELEMENT 98 91 88 98
 VALUE -2.4326179 1560.1490 4.3450909 14430.276 54.939673 47702.253

ESEL FOR LABEL= ELEM FROM 76 TO 82 BY 2
 4 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.
 PRINT ELEMENT STRESS ITEMS PER ELEMENT

PST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .520

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IHY	IMZ
76	1765.1858	-11.742129	19.777229	.00000000E+00	-.68212103E-12	.00000000E+00
78	1746.0747	-12.471922	-20.443870	.00000000E+00	.00000000E+00	.00000000E+00
80	1746.0747	12.490958	20.449579	.00000000E+00	-.45474735E-12	-.17053026E-12
82	1765.1858	11.723093	-19.782939	.00000000E+00	.45474735E-12	.00000000E+00

MINIMUMS ELEMENT VALUE	78	78	76	76	76	80
	1746.0747	-12.471922	-20.443870	.00000000E+00	-.68212103E-12	-.17053026E-12

MAXIMUMS ELEMENT VALUE	76	80	80	76	82	76
	1765.1858	12.490958	20.449579	.00000000E+00	.45474735E-12	.00000000E+00

ESEL FOR LABEL= TYPE FROM 5 TO 5 BY 1

11 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISGL ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

GET ROCK UP PLATFORM STRESS ANALYSIS PL 11 15.1261 AUG 1, 1995 CP= .520

***** POST ELEMENT STRESS PRINTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFZ	IMX	IMY	IMZ
19	3892.9	-1.2854	-1.2854	-3.1395E-01	-3.8877	-1.6973.
21	2294.4	-124.12	-124.12	.26134E-01	3.3104	-9773.2
20	1827.5	-124.12	-124.12	.26134E-01	7.4339	7709.2

MINIMUMS	19	20	21
ELEMENT	19	20	21
VALUE	-446.98	-446.98	-1.6193

MAXIMUMS	19	20	21
ELEMENT	19	20	19
VALUE	485.09	485.09	-1.6973.

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .530

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IHY	IMZ
19	-3891.8	-1.2854	-446.98	-.16193	.31395E-01	-3.8877	-1.6973.
21	-2191.0	-124.12	-434.10	-.11145	.26134E-01	3.3104	-9773.2
20	-1724.1	-124.12	485.09	-.11145	.26134E-01	7.4339	7709.2

MINIMUMS							
ELEMENT	19	21	19	19	21	19	19
VALUE	-3891.8	-124.12	-446.98	-.16193	.26134E-01	-3.8877	-1.6973.

MAXIMUMS							
ELEMENT	20	19	20	20	19	20	20
VALUE	-1724.1	-1.2854	485.09	-.11145	.31395E-01	7.4339	7709.2

SORT, ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM STATIC ANALYSIS DL + LL 15.1261 AUG 1, 1995 CP= .530

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JHX	JHY	JHZ
18	3892.9	1.2854	-447.02	.16193	-.31395E-01	3.8877	16973.
20	2294.4	124.12	-459.90	.11145	-.26134E-01	-3.3104	9773.2
22	1624.0	3.4371	-275.34	-.46717	7.2619	.13474	7084.4
MINIMUMS							
ELEMENT	22	18	20	22	18	20	22
VALUE	1624.0	1.2854	-459.90	-.46717	-.31395E-01	-3.3104	7084.4
MAXIMUMS							
ELEMENT	18	20	22	18	22	18	18
VALUE	3892.9	124.12	-275.34	.16193	7.2619	3.8877	16973.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1261 AUG 1, 1995 CP= .540

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
18	-3891.8	1.2854	-447.02	.16193	-.31395E-01	3.8877	16973.
20	-2191.0	124.12	-459.90	.11145	-.26134E-01	-3.3104	9773.2
22	-1621.1	3.4371	-275.34	-.46717	7.2619	.13474	7084.4

MINIMUMS ELEMENT	18	18	20	22	18	20	22
VALUE	-3891.8	1.2854	-459.90	-.46717	-.31395E-01	-3.3104	7084.4

MAXIMUMS ELEMENT	22	20	22	18	22	18	18
VALUE	-1621.1	124.12	-275.34	.16193	7.2619	3.8877	16973.

ESEL FOR LABEL= ELEM FROM 18 TO 22 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-57

DST MOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1261 AUG 1, 1995 CP= .540,

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
18	-1.2853841	472.20434	-.16193440	.31394996E-01	2.1038737	32.426529
22	-3.4370619	292.35393	.46716892	-7.2618729	-11.813959	11.722979

MINIMUMS ELEMENT VALUE	22	22	18	22	22	22
	-3.4370619	292.35393	-.16193440	-7.2618729	-11.813959	11.722979

MAXIMUMS ELEMENT VALUE	18	18	22	18	18	18
	-1.2853841	472.20434	.46716892	.31394996E-01	2.1038737	32.426529

ESEL FOR LABEL= ELEM FROM 19 TO 23 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

4-58

DST HOCK-UP PLATFORM STATIC ANALYSIS DL + LL

15.1261 AUG 1, 1995 CP= .550

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
19	1.2853841	472.16614	.16193440	-.31394996E-01	9.8792720	-31.013205
23	3.4370619	294.68019	-.46716892	7.2618729	-11.544488	-69.879467

MINIMUMS						
ELEMENT	19	23	23	19	23	23
VALUE	1.2853841	294.68019	-.46716892	-.31394996E-01	-11.544488	-69.879467

MAXIMUMS						
ELEMENT	23	19	19	23	19	19
VALUE	3.4370619	472.16614	.16193440	7.2618729	9.8792720	-31.013205

USE LOAD STEP 2 ITERATION 0 SECTION 1 FOR LOAD CASE 1

DISPLACEMENT STORED FOR 72 NODES

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL IFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL IFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL IFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL IMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL IMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL IMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL JFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL JFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611
 DATA FOR STRESS LABEL JFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .580 TIME= 15.12611

DATA FOR STRESS LABEL JMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12611

***WARNING ***
CP= .580 TIME=
DATA FOR STRESS LABEL JMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12611

***WARNING ***
CP= .580 TIME=
DATA FOR STRESS LABEL JMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12611

***WARNING ***
CP= .590 TIME=
DATA FOR STRESS LABEL ISAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12611

***WARNING ***
CP= .590 TIME=
DATA FOR STRESS LABEL ISBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12611

***WARNING ***
CP= .590 TIME=
DATA FOR STRESS LABEL ISBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12611

```

***WARNING ***
DATA FOR STRESS LABEL JSAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
15.12611

***WARNING ***
DATA FOR STRESS LABEL JSBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
15.12611

***WARNING ***
DATA FOR STRESS LABEL JSBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
15.12611

***WARNING ***
DATA FOR STRESS LABEL ISG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
15.12611

***WARNING ***
DATA FOR STRESS LABEL ISG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
15.12611

***WARNING ***
DATA FOR STRESS LABEL JSG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
15.12611

***WARNING ***
DATA FOR STRESS LABEL JSG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
15.12611

***WARNING ***
DATA FOR STRESS LABEL SAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
SAX DATA FOR TYPE 1. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 3. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 4. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 5. STIF 4. ELEMENTS WILL BE SET TO ZERO
15.12611

STRESSES STORED FOR 23 SELECTED ITEMS

ITERATION SUMMARY INFORMATION STORED

NODAL FORCES STORED FOR 99 ELEMENTS

REACTIONS STORED FOR 18 REACTIONS

FOR LOAD STEP= 2 ITERATION= 1 SECTION= 1
TIME= .000000E+00 LOAD CASE= 1
TITLE= DOUBLE SHELL TANK ROCK-UP PLATFORM

NEW TITLE= DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

USE MACRO FILE nres

ESEL FOR LABEL= TYPE FROM 1 TO 1 BY 1

36 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

```

DSI ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .04g:z
 15.1261 AUG 1, 1995 CP= .600

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
62	5769.3	-103.74	-2311.1	341.29	-5.4878	-2425.7	-69481.
54	5747.5	24.331	-205.83	4.2674	-5.4878	2425.7	-69481.
55	5282.6	36.027	-400.78	-34.723	-5.4878	2419.5	-63317.

MINIMUMS							
ELEMENT	55	62	62	55	62	62	62
VALUE	5282.6	-103.74	-2311.1	-34.723	-5.4878	-2425.7	-69481.

MAXIMUMS							
ELEMENT	62	55	54	62	62	54	55
VALUE	5769.3	36.027	-205.83	341.29	-5.4878	2425.7	-63317.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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MAY 1, 1990

A137 32207

15.1261 AUG 1, 1995 CP= .610

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	INX	INY	INZ
54	-5755.8	24.331	-205.83	4.2674	-5.4878	2425.7	-69481.
62	-5734.0	-103.74	-2311.1	341.29	-5.4878	-2425.7	-69481.
55	-5294.8	36.027	-400.78	-34.723	-5.4878	2419.5	-63317.

MINIMUMS
ELEMENT
VALUE

MAXIMUMS
ELEMENT
VALUE

MINIMUMS
ELEMENT
VALUE

MAXIMUMS
ELEMENT
VALUE

POST1 ELEMENT STRESS ITEMS PTP ELEMENT

SWANSON ANALYSIS SYSTEM 1.2gpx + .05gpx

15.1261 AUG 1, 1995 CP= .510

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
54	5284.1	-27.027	250.78	4.7227	5.4878	-2419.5	63317.
55	3328.2	-40.621	477.36	50.039	5.4878	-470.02	43120.
43	2692.1	-863.85	3945.8	-211.29	324.65	-214.89	-37268.

MINIMUMS ELEMENT VALUE	43	43	54	43	54	54	43
VALUE	2692.1	-863.85	250.78	-211.29	5.4878	-2419.5	-37268.

MAXIMUMS ELEMENT VALUE	54	54	43	55	43	43	54
VALUE	5284.1	-27.027	3945.8	50.039	324.65	-214.89	63317.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-64

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .620

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSE3	JFX	JFY	JFZ	JMX	JMY	JMZ
54	-5293.3	-27.027	250.78	4.7227	5.4878	-2419.5	63317.
55	-3342.1	-40.621	477.36	50.039	5.4878	-470.02	43120.
43	-2986.4	-863.85	3945.8	-211.29	324.65	-214.89	-37268.

MINIMUMS ELEMENT VALUE	54	43	54	43	54	54	43
	-5293.3	-863.85	250.78	-211.29	5.4878	-2419.5	-37268.

MAXIMUMS ELEMENT VALUE	43	54	43	55	43	43	54
	-2986.4	27.027	3945.8	50.039	324.65	-214.89	63317.

ESSEL FOR LABEL FROM 56 TO 62 BY 1

7 ELEMENTS (OF 95 DEFINED) SELECTED BY ESSEL COMMAND.

STRESS ITEMS PER ELEMENT

A-65

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MAY 1, 1990 32207 15.1261 AUG 1, 1995 CP= .620

DSY ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g: x + .06g: z

***** POSTI ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
56	-337.70201	988.11341	405.45046	-4.9230593	2909.5475	-28.685280
57	299.31254	220.76835	-16.737147	-3.9587966	-2264.9989	26.661054
58	-235.24987	209.77844	-9.2592379	1.0228906	-1893.6519	280.99004
59	-128.11279	3983.9922	394.94655	5.4878454	3854.2524	-603.61104
60	325.69805	221.02288	-104.69539	-3.9587966	-4636.6558	12.153028
61	-209.86437	210.01278	-93.217483	1.0228906	-3947.5212	267.63265
62	106.74011	2361.0833	-351.27844	5.4878454	-7982.8349	-602.40322

MINIMUMS ELEMENT VALUE	56	58	62	56	62	59
	-337.70201	209.77844	-351.27844	-4.9230593	-7982.8349	-603.61104

MAXIMUMS ELEMENT VALUE	60	59	56	59	58	58
	325.69805	3983.9922	405.45046	5.4878454	3854.2524	280.99004

ESEL FOR LABEL= ELEM FROM 64 TO 67 BY 3

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .630

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JHX	JMY	JMZ
64	309.84344	177.90003	-57.586415	5.6783521	-2127.1349	328.02144
67	23.765865	170.83057	-56.299058	-6.7413946	-2109.4312	1.1487131

MINIMUMS ELEMENT VALUE	67	67	64	67	64	67
	23.765865	170.83057	-57.586415	-6.7413946	-2127.1349	1.1487131

MAXIMUMS ELEMENT VALUE	64	64	67	64	67	64
	309.84344	177.90003	-56.299058	5.6783521	-2109.4312	328.02144

ESEL FOR LABEL= ELEM FROM 69 TO 69 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-67

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .630

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
69	103.33371	122.33710	-43.720841	6.8454177	-1520.5337	3.9787269
MINIMUMS						
ELEMENT	69	69	69	69	69	69
VALUE	103.33371	122.33710	-43.720841	6.8454177	-1520.5337	3.9787269
MAXIMUMS						
ELEMENT	69	69	69	69	69	69
VALUE	103.33371	122.33710	-43.720841	6.8454177	-1520.5337	3.9787269

1 ELEMENTS (OF 1 DEFINED) SELECTED BY ESEL COMMAND.
 PRINT ELEMENT STRESS ITEMS PER ELEMENT

POST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .640

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
47	113.44323	343.91439	379.74522	4.9230593	-8500.8329	10.531339
MINIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	113.44323	343.91439	379.74522	4.9230593	-8500.8329	10.531339
MAXIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	113.44323	343.91439	379.74522	4.9230593	-8500.8329	10.531339

ESEL FOR LABEL= ELEM FROM 63 TO 65 BY 2

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

```

DST WOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z
15.1261 AUG 1,1995 CP=
.640

```

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      2  ITERATION=      1  SECTION=      1
TIME=.00000E+00  LOAD CASE=      1
```

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
63	-288.45793	177.89120	-13.371830	-5.6783521	-393.09641	-328.52485
65	5.8278478	232.12330	-10.930242	-28.579577	-570.62206	6.9085210

MINIQUERS	
ELEMENT	63
VALUE	177.99120
	63
	-13.371830
	65
	-28.579577
	65
	-570.62206
	63
	-328.52485

MAXIMUMS	65	65	65	65	65
ELEMENT	5.8278478	233.12330	-10.930242	-5.6783521	-393.09641
VALUE					

```

ESEL FOR LABEL=ELEN FROM 68 TO 68 BY 1

```

```
1 1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.
```

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g: X + .06g: Z 15.1261 AUG 1, 1995 CP= .650

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
68	-90.114710	183.32560	-30.773171	21.196327	-268.28957	-3.0288888

MINIMUMS
 ELEMENT
 VALUE
 68
 -90.114710
 183.32560
 -30.773171
 21.196327
 -268.28957
 -3.0288888

MAXIMUMS
 ELEMENT
 VALUE
 68
 -90.114710
 183.32560
 -30.773171
 21.196327
 -268.28957
 -3.0288888

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

16 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON SAK ORDER= 0 KAES= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

1ST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .660

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEH 39 SAX
 37 -2410.0296
 38 2363.3012
 -2294.7139

MINIMUMS
 ELEMENT 39
 VALUE -2410.0296

MAXIMUMS
 ELEMENT 37
 VALUE 2363.3012

ESEL FOR LABEL= TYPE FROM 3 TO 3 BY 1
 12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT REACTION FORCES PER NODE

1ST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .660

***** POST1 REACTION FORCE LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z FORCES ARE IN GLOBAL COORDINATES

NODE	FX	FY	FZ	MX	MY	HZ
1	-56.616004	69.182625	-218.66510	.00000000E+00	.00000000E+00	.00000000E+00
2	-56.622130	3482.3922	-389.76837	.00000000E+00	.00000000E+00	.00000000E+00
3	-794.03812	-1251.2984	-108.69349	.00000000E+00	.00000000E+00	.00000000E+00
4	-606.45787	2098.3037	-146.80850	.00000000E+00	.00000000E+00	.00000000E+00
5	-819.10390	5868.1417	260.53036	.00000000E+00	.00000000E+00	.00000000E+00
6	-617.36442	4487.2944	-281.48738	.00000000E+00	.00000000E+00	.00000000E+00
TOTAL	-2950.2032	14754.016	-884.89248	.00000000E+00	.00000000E+00	.00000000E+00

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-73

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .660

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
12	5582.2	2035.4	-555.64	-13.950	.00000E+00	971.35	-76245.
10	5310.7	3151.7	-545.03	-14.734	-.63061E-13	1074.8	-74845.
4	3434.6	1349.7	-326.04	.93216	.35527E-14	-993.14	-45937.

MINIMUMS
 ELEMENT 4
 VALUE 3434.6 1349.7 -555.64 -14.734 -63061E-13 -993.14 -76245.

MAXIMUMS
 ELEMENT 12
 VALUE 5582.2 3151.7 -326.04 .93216 .35527E-14 1074.8 -45937.

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .670

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
10	-6384.5	3151.7	-345.03	-14.734	-.63061E-13	1074.8	-74845.
12	-6275.7	2035.4	-555.64	-13.950	.00000E+00	971.35	-76245.
4	-3894.4	1349.7	-326.04	.93216	.35527E-14	-993.14	-45937.

MINIMUMS ELEMENT VALUE	10	4	12	10	10	4	12
	-6384.5	1349.7	-555.64	-14.734	-.63061E-13	-993.14	-76245.

MAXIMUMS ELEMENT VALUE	4	10	4	4	4	10	4
	-3894.4	3151.7	-326.04	.93216	.35527E-14	1074.8	-45937.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-75

PSI HOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .670

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
3	8000.1	1361.2	-746.51	-18.427	.00000E+00	-1546.1	99070.
5	7100.4	-5340.4	-771.57	-18.422	.00000E+00	-1545.4	.10230E+06
9	5446.5	-1708.4	-558.93	-1.9479	.00000E+00	579.71	74872.

MINIMUMS	ELEMENT	VALUE
9	5446.5	-5340.4
5	-771.57	-771.57
3	-18.427	-18.427

MAXIMUMS	ELEMENT	VALUE
3	8000.1	1361.2
9	-558.93	-558.93
5	-1.9479	-1.9479

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

```
***** POST1 ELEMENT STRESS LIST *****
```

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
5	-8919.9	-5340.4	-771.57	-18.422	.00000E+00	-1545.4	.10230E+06
3	-7536.3	1361.2	-746.51	-18.427	.00000E+00	-1546.1	.99070.
11	-6530.6	-3945.6	-569.83	-1.4140	.00000E+00	648.58	.76379.

MAXIMUMS	11	3	11	11	5	11	5
ELEMENT							
VALUE	-6530.6	1364.2	-569.83	-1.4140	.00000E+00	648.58	.10230E+06

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .680

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
2	-440.25536	51.847092	-5.4185889	-1.9539925E-13	-1.7053026E-12	.17735147E-10
4	-1129.8977	369.98687	-14.115379	-3.5527137E-14	.39790393E-12	-.11687007E-09
6	-1430.7246	346.59079	-14.928966	.00000000E+00	-.56843419E-13	.28649083E-10
8	-1860.2765	51.841766	-1.5834951	.00000000E+00	.17053026E-12	.32287062E-10
10	-2931.9671	588.98601	1.5510638	.63060668E-13	.17053026E-12	-.76852302E-10
12	-1815.6585	599.58823	.76712955	.00000000E+00	-.28421709E-13	.61390892E-10

MINIMUMS
 ELEMENT
 VALUE -2931.9671 8 51.841766 -14.928966 -1.9539925E-13 2 -1.7053026E-12 4 -1.1687007E-09

MAXIMUMS
 ELEMENT
 VALUE -440.25536 2 599.58823 10 1.5510638 10 .63060668E-13 4 .39790393E-12 12 .61390892E-10

ESEL FOR LABEL= TYPE FROM 4 TO 4 BY 1
 24 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISGI ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .690

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	INZ
97	23482.	245.93	-1576.0	145.72	422.50	-1965.5	-47703.
99	23447.	358.93	-1570.8	48.389	124.87	-1983.3	-47703.
85	18411.	-292.90	-933.55	-59766	103.85	-21.740	-38525.

MINIMUMS
 ELEMENT
 VALUE

85	97	85	99	99
18411.	-292.90	-1576.0	-59766	-47703.

MAXIMUMS
 ELEMENT
 VALUE

97	99	85	85	85
23482.	358.93	-933.55	145.72	422.50
			-21.740	-38525.

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT-COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .690

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
99	-23724.	358.93	-1570.8	48.389	124.87	-1983.3	-47703.
97	-23672.	245.93	-1576.0	145.72	422.50	-1965.5	-47703.
85	-18184.	-292.90	-933.55	-.59766	103.85	-21.740	-38525.

MINIMUMS ELEMENT VALUE	99	85	97	85	85	99	99
	-23724.	-292.90	-1576.0	-.59766	103.85	-1983.3	-47703.

MAXIMUMS ELEMENT VALUE	85	99	85	97	97	85	85
	-18184.	358.93	-933.55	145.72	422.50	-21.740	-38525.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

7-100

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      2  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

FILE#	J551	JFX	JFY	JFZ	JMX	JMY	JMZ
96	23713.	354.07	-1424.0	34.276	-422.50	1965.5	47703.
98	23678.	241.07	-1429.2	131.61	-124.87	1983.3	47703.
82	23362.	-77.464	-345.69	118.22	.00000E+00	12533.	36746.

	82	96	98	96	96	96
THINKS						
ELEMENT	82		98	96	96	96
VALUE	23362.	-77.464	-1429.2	34.276	-422.50	1965.5
						36746.

MAXIMUMS	96	82	98	82	98
ELEMENT					
VALUE	23713.	354.07	-345.69	131.61	.00000E+00
					12533.
					47703.

```

SORT ON JSG3 ORDER=0 KARS=1 NMAX=3

```

3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1,1995 CP= .700

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JEX	JFY	JFZ	JHX	JHY	JMZ
77	-24201.	-2092.3	-617.92	593.50	-476.31	23172.	26109.
98	-23492.	241.07	-1429.2	131.61	-124.87	1983.3	47703.
96	-23440.	354.07	-1424.0	34.276	-422.50	1965.5	47703.

MINIMUMS							
ELEMENT	77	77	98	96	77	96	77
VALUE	-24201.	-2092.3	-1429.2	34.276	-476.31	1965.5	26109.

MAXIMUMS							
ELEMENT	96	96	77	77	98	77	98
VALUE	-23440.	354.07	-617.92	593.50	-124.87	23172.	47703.

ESEL FOR LABEL= ELEM. FROM 88 TO 99 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .710

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
88	518.01534	1765.4240	-358.71342	17318.785	3582.0771	23506.530
89	369.42717	141.63093	-103.23552	-213.90725	-938.54545	-18229.587
90	318.12971	-1477.6966	265.39467	-17533.006	-3435.8419	-21415.932
91	603.33474	1573.3741	-291.22150	-11511.648	3348.1786	20742.046
92	566.19425	101.67309	72.399411	-214.73206	-3075.6595	-17229.878
93	431.67492	-1375.9626	323.16186	11295.004	-4669.5417	-19667.027
94	259.20579	-326.87357	-75.481677	334.85510	3105.7704	-8790.3227
95	309.63220	-243.53282	-65.071616	24.226722	2650.7832	-14597.814
96	-360.09498	1454.0713	-36.082888	422.50273	-523.16664	11296.916
97	245.92849	-1576.0460	145.72364	422.50273	-1965.5271	-47702.602
98	-247.08960	1459.2715	-133.41767	124.87475	3449.7781	11509.736
99	358.93367	-1570.8459	48.389059	124.87475	-1983.3084	-47702.988

MINIMUMS
 ELEMENT 96
 VALUE -360.09498 -1576.0460 -358.71342 90 -17533.006 93 -4669.5417 99 -47702.988

MAXIMUMS
 ELEMENT 91
 VALUE 603.33474 1765.4240 323.16186 88 17318.785 88 3582.0771 88 23506.530

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DSI MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .710

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
88	-516.95774	-1747.7943	355.18749	-17318.785	4984.7338	18652.090
89	-368.32550	-123.26669	99.562675	213.90725	3473.5229	21540.807
90	-317.07212	1495.3262	-268.92060	17533.006	-2975.9413	-14260.341
91	-602.27714	-1555.7444	287.69556	11511.648	3598.8261	16807.376
92	-565.09259	-83.308846	-76.072259	214.73206	1219.7636	19542.153
93	-430.61732	1393.5923	-326.68779	-11295.004	-3128.6541	-13567.632
94	-247.15885	266.63887	71.868218	-334.85510	2935.5753	-15543.687
95	-321.67914	303.76753	61.458158	-24.226722	2536.9376	-7841.5001
96	354.07151	-1423.9540	34.276158	-422.50273	1965.5271	47702.602
97	-251.95197	1606.1634	-147.53057	-422.50273	-4046.1884	-17532.692
98	241.06613	-1429.1541	131.61094	-124.87475	1983.3084	47702.988
99	-364.95734	1600.9632	-50.195789	-124.87475	-37.680992	-17319.099

MINIMUMS
 ELEMENT 91 88 93 88 97 97
 VALUE -602.27714 -1747.7943 -326.68779 -17318.785 -4046.1884 -17532.692

MAXIMUMS
 ELEMENT 96 97 88 90 88 98
 VALUE 354.07151 1606.1634 355.18749 17533.006 4984.7338 47702.988

ESEL FOR LABEL= ELEM FROM 76 TO 82 BY 2

4 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-84

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .720

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	INZ
76	3488.3189	341.24475	-86.392776	.00000000E+00	.25437430E-11	.50590443E-11
78	2516.9654	337.02199	-128.07462	.00000000E+00	.14068746E-11	.22168933E-11
80	863.37777	365.27253	-84.068866	.00000000E+00	.25437430E-11	.86970431E-11
82	153.85879	360.96490	-122.80441	.00000000E+00	.14068746E-11	.30524916E-10

MINIMUMS ELEMENT VALUE	82	78	76	78	78	78
	153.85879	337.02199	-128.07462	.00000000E+00	.14068746E-11	-.22168933E-11

MAXIMUMS ELEMENT VALUE	76	80	80	76	76	82
	3488.3189	365.27253	-84.068866	.00000000E+00	.25437430E-11	.30524916E-10

ESEL FOR LABEL= TYPE FROM 5 TO 5 BY 1

11 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISGL ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1241 AUG 1, 1995 CP= .730

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
20	13376.	-111.89	-1309.1	-30.032	.35708	846.59	-53082.
19	1992.6	22.436	-187.95	-5.3124	.32374	-235.76	-7315.6
15	1890.4	-126.78	-187.10	61.747	-50.469	-870.22	-2760.3

MINIMUMS ELEMENT VALUE	15	15	20	20	15	15	20
	1890.4	-126.78	-1309.1	-30.032	-50.469	-870.22	-53082.

MAXIMUMS ELEMENT VALUE	20	19	15	15	20	20	15
	13376.	22.436	-187.10	61.747	.35708	846.59	-2760.3

SORT ON ISG3 ORDER= 0 KABS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

7-86

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .730

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1

	IFX	IFY	IFZ	IPX	IPY	IPZ
20	-111.89	-1309.1	-30.032	.25798	846.59	-53082.
19	-111.89	-1309.1	-30.032	.25798	846.59	-53082.
15	-126.78	-1309.1	-30.032	-50.469	-870.22	-53082.

MINIMUMS
 ELEMENT
 VALUE

MAXIMUMS
 ELEMENT
 VALUE

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .740

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
21	14234.	27.812	1730.5	5.0100	-.35708	449.96	-59383.
18	2023.4	51.564	-183.05	27.312	-.32374	235.76	7315.6
15	1807.6	127.88	205.48	-65.423	50.469	-846.59	-2539.6

MINIMUMS ELEMENT VALUE	15	21	18	15	21	15	21
	1807.6	27.812	-183.05	-65.423	-.35708	-846.59	-59383.

MAXIMUMS ELEMENT VALUE	21	15	21	18	15	21	18
	14234.	127.88	1730.5	27.312	50.469	449.96	7315.6

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

7-88

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Accession #: D195067914

Document #: SD-WM-ER-521

Title/Desc:

STRUCTRUAL ANALYSIS DESIGN & EVALUATION OF MOCKUP
PLATFORM MONORAIL & TANK PLATE CUT OUT [SEC 2 OF
3]

Pages: 102

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-WM-ER-521

SECTION 2 OF 3

TITLE: STructural Analysis Design & Evaluation
of mock-up platform monorail ; Tank Plate
CUT-OUT

DATE: 12-19-95

ORIGINATOR: I. S. Hundal

CO: _____

RECIPIENT: _____

CO: _____

REFERENCES: _____

NOT ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1,1995 CP= .740

***** POST1 ELEMENT STRESS LISTING *****

JOB=SEISMIC EVALUATION SECTION= 1
 CASE= 1

ELEM	JSC3	JFX	JFY	JFZ	JMX	JMY	JMZ
21	-14211.	27.812	1730.5	5.0100	-.35708	449.96	-59383.
18	-1980.4	51.564	-183.05	27.312	-.32374	235.76	7315.6
15	-1701.1	127.88	205.48	-65.423	50.469	-846.59	-2539.6

MINIMUMS
 ELEMENT
 VALUE

MAXIMUMS
 ELEMENT
 VALUE

ESEL FOR LABEL= ELEH FROM 18 TO 22 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z

15.1261 AUG 1, 1995 CP= .750

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
18	-56.601013	208.23236	-28.823228	.32373893	802.74501	-76.933295
22	-10.271055	116.16264	-12.208204	-.74922899	214.10089	35.320971

MINIMUMS ELEMENT VALUE	18	22	18	22	22	18
	-56.601013	116.16264	-28.823228	-.74922899	214.10089	-76.933295

MAXIMUMS ELEMENT VALUE	22	18	22	18	18	22
	-10.271055	208.23236	-12.208204	.32373893	802.74501	35.320971

ESEL FOR LABEL= ELEM FROM 19 TO 23 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-90

BEST AVAILABLE COPY

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + 0.2g:x + .06g:z 15.1261 AUG 1, 1995 CP= .750

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 2 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
19	-27.473084	213.13813	3.8015204	-32373893	404.37068	-104.58002
23	-36.535767	115.87147	-1.8334907	.74922899	45.266935	-28.041745

MINIMUMS
ELEMENT 23
VALUE -36.535767 115.87147 23 -1.8334907 -32373893 19 45.266935 23 -104.58002

MAXIMUMS
ELEMENT 19
VALUE -27.473084 213.13813 3.8015204 .74922899 23 404.37068 23 -28.041745
USE LOAD STEP 3 ITERATION 0 SECTION 1 FOR LOAD CASE 1

DISPLACEMENT STORED FOR 72 NODES

***WARNING ***
DATA FOR STRESS LABEL IFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
IFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL IFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
IFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL IFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
IFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL IMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
IMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL IMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
IMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL INZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
INZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL JFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL JFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL JFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO CP= .770 TIME= 15.12611

***WARNING ***

DATA FOR STRESS LABEL JMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .790 TIME= 15.12611
DATA FOR STRESS LABEL JMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL JMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL ISAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL ISBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL ISBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

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Rev. .0

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***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL JSAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL JSBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL JSBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL ISG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL ISG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL JSG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL JSG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .780 TIME= 15.12611
DATA FOR STRESS LABEL SAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
SAX DATA FOR TYPE 1. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 3. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 4. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 5. STIF 4. ELEMENTS WILL BE SET TO ZERO

STRESSES STORED FOR 23 SELECTED ITEMS

ITERATION SUMMARY INFORMATION STORED

NODAL FORCES STORED FOR 99 ELEMENTS

REACTIONS STORED FOR 18 REACTIONS

FOR LOAD STEP= 3 ITERATION= 1 SECTION= 1
TIME= .000000E+00 LOAD CASE= 1
TITLE= DOUBLE SHELL TANK MOCK-UP PLATFORM

NEW TITLE= DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

USE MACRO FILE mres

ESEL FOR LABEL= TYPE FROM 1 TO 1 BY 1

36 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .790

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
48	5944.6	-433.17	-225.94	9.1017	.91852	-3090.2	-69064.
49	5357.8	-424.48	-375.89	39.092	.91852	-2723.1	-62357.
56	3429.0	-333.12	-3947.5	395.95	.91852	-572.63	-43305.

MINIMUMS							
ELEMENT	56	48	56	48	56	48	48
VALUE	3429.0	-433.17	-3947.5	9.1017	.91852	-3090.2	-69064.

MAXIMUMS							
ELEMENT	48	56	48	56	48	56	56
VALUE	5944.6	-333.12	-225.94	395.95	.91852	-572.63	-43305.

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-94

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x +.06g:z

15.1261 AUG 1, 1995 CP= .800

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
48	-5797.1	-433.17	-225.94	9.1017	.91852	-3090.2	-69064.
49	-5213.2	-424.48	-375.89	39.092	.91852	-2723.1	-62357.
56	-3315.5	-333.12	-3947.5	395.95	.91852	-572.63	-43305.

MINIMUMS ELEMENT VALUE	48	48	56	48	56	48	48
	-5797.1	-433.17	-3947.5	9.1017	.91852	-3090.2	-69064.

MAXIMUMS ELEMENT VALUE	56	56	48	56	48	56	56
	-3315.5	-333.12	-225.94	395.95	.91852	-572.63	-43305.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

56-4

DST MOCK-UP PLATFORM SEISHIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .810

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JHZ
47	5966.5	561.65	-2284.3	327.15	-.91852	3090.2	69064.
48	5358.9	430.48	270.89	-18.092	-.91852	2723.1	62357.
49	3443.7	419.88	452.47	-54.408	-.91852	572.63	43305.

HINIUMS ELEMENT VALUE	49	49	47	49	48	49	49
VALUE	3443.7	419.88	-2284.3	-54.408	-.91852	572.63	43305.

MAXIMUMS ELEMENT VALUE	47	47	49	47	47	47	47
VALUE	5966.5	561.65	452.47	327.15	-.91852	3090.2	69064.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-96

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z 15.1261 AUG 1,1995 CP=.810

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
47	-5775.2	561.65	-2284.3	327.15	-.91852	3090.2	69064.
48	-5212.2	430.48	270.89	-18.092	-.91852	2723.1	62357.
49	-3300.7	419.88	452.47	-54.408	-.91852	572.63	43305.

MINIMUMS
 ELEMENT
 VALUE

MAXIMUMS
 ELEMENT
 VALUE

ESEL FOR LABEL= ELEM FROM 56 TO 62 BY 1

7 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .820

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JHZ
56	332.02146	3965.8222	-399.61511	-.91852193	-3802.9931	-218.79834
57	-301.91988	220.85637	-8.5852266	-.65537463	843.74454	217.02671
58	207.76434	209.77615	.70715177	.70333824	1398.1934	38.931195
59	-66.316481	986.85031	-108.97741	1.9217565	-3416.6046	-84.128361
60	-275.53437	220.93485	79.373019	-.65537463	3188.1592	212.55329
61	233.14985	210.01508	84.665397	.70333824	3468.0419	25.311921
62	160.16741	370.67741	385.68373	1.9217565	9174.2945	-61.743994

MINIMUMS ELEMENT VALUE	57	58	59	56	56	56
VALUE	-301.91988	209.77615	-408.97941	-.91852193	-3802.9931	-218.79834

MAXIMUMS ELEMENT VALUE	56	56	62	62	62	57
VALUE	332.02146	3965.8222	385.68373	1.9217565	9174.2945	217.02671

ESEL FOR LABEL= ELEM FROM 64 TO 67 BY 3

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-92

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z 15.1261 AUG 1, 1995 CP= .820

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
64	-76.994356	177.99988	79.140572	1.4863722	3366.9775	37.436069
67	24.707920	170.79959	75.669872	-1.7815603	3180.6428	-2.6186053
MINIMUMS						
ELEMENT	64	67	67	67	67	67
VALUE	-76.994356	170.79959	75.669872	-1.7815603	3180.6428	-2.6186053
MAXIMUMS						
ELEMENT	67	64	64	64	64	64
VALUE	24.707920	177.99988	79.140572	1.4863722	3366.9775	37.436069

ESEL FOR LABEL= ELEM FROM 69 TO 69 BY 1
 1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x +.06g:z 15.1261 AUG 1,1995 CP=.830

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME=.00000E+00 LOAD CASE= 1

ELEM	69	JFX	JFY	JFZ	JMX	JMY	JMZ
		-79.746844	122.42088	64.703889	3.3091129	2635.5710	3.2515341
MINIMUMS							
ELEMENT							
VALUE		-79.746844	122.42088	64.703889	3.3091129	2635.5710	3.2515341
MAXIMUMS							
ELEMENT							
VALUE		-79.746844	122.42088	64.703889	3.3091129	2635.5710	3.2515341

ESEL FOR LABEL= ELEM FROM 47 TO 47 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .830

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
47	-564.64925	2334.2533	-337.14241	.91852193	6874.1964	214.19022
MINIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	-564.64925	2334.2533	-337.14241	.91852193	6874.1964	214.19022
MAXIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	-564.64925	2334.2533	-337.14241	.91852193	6874.1964	214.19022

ESEL FOR LABEL= ELEM FROM 63 TO 65 BY 2

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-101

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
63	98.379865	177.79134	-8.1823272	-1.4863722	1610.4278	-49.323076
65	-12.424140	231.86155	-3.8467770	-4.3447984	1575.1497	6.0717303
MINIMUMS						
ELEMENT	65	63	63	65	65	63
VALUE	-12.424140	177.79134	-8.1823272	-4.3447984	1575.1497	-49.323076
MAXIMUMS						
ELEMENT	63	65	65	63	63	65
VALUE	98.379865	231.86155	-3.8467770	-1.4863722	1610.4278	6.0717303

ESEL FOR LABEL= ELEM FROM 68 TO 68 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM SEISHIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .840

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
68	110.27578	183.53454	5.1963282	10.174337	1331.0923	-3.7174474
MINIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	110.27578	183.53454	5.1963282	10.174337	1331.0923	-3.7174474
MAXIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	110.27578	183.53454	5.1963282	10.174337	1331.0923	-3.7174474

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

16 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON SAX ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-103

DST MOCK-UP PLATFORM SEISHIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .850

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	SAX
37	-2355.5475
39	2334.3229
36	-2188.6574

MINIMUMS
ELEMENT 37
VALUE -2355.5475

MAXIMUMS
ELEMENT 39
VALUE 2334.3229

ESEL FOR LABEL= TYPE FROM 3 TO 3 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT REACTION FORCES PER NODE

A-104

***** PDST1 REACTION FORCE LISTING *****

```
LOAD STEP      3  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

THE FOLLOWING X, Y, Z FORCES ARE IN GLOBAL COORDINATES

NODE	FX	FY	FZ	HX	HY	HZ
1	56.617684	2938.4483	120.33618	.00000000E+00	.00000000E+00	.00000000E+00
2	56.621249	5202.9510	-283.08980	.00000000E+00	.00000000E+00	.00000000E+00
3	828.34448	6223.3959	144.34324	.00000000E+00	.00000000E+00	.00000000E+00
4	605.03472	7177.7764	-550.43789	.00000000E+00	.00000000E+00	.00000000E+00
5	803.67226	-4475.8364	-331.73168	.00000000E+00	.00000000E+00	.00000000E+00
6	599.91285	-2312.7370	15.687471	.00000000E+00	.00000000E+00	.00000000E+00
TOTAL	2950.2032	14754.016	-884.89248	.00000000E+00	.00000000E+00	.00000000E+00

```

SORT ON ISGL ORDER= 0 KABS= 1 NHAX= 3

```

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DS1 KOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x +.06g:z
 15.1261 AUG 1,1995 CP= .860

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
12	5981.8	-1175.7	538.64	-14.639	.00000E+00	1062.2	74001.
10	5154.5	4014.2	543.59	-14.903	-.15987E-13	1097.1	74654.
6	3935.2	-1404.1	328.24	1.2576	.00000E+00	-1036.1	46228.

MINIMUMS							
ELEMENT	6	6	6	10	6	6	6
VALUE	3935.2	-1404.1	328.24	-14.903	-.15987E-13	-1036.1	46228.

MAXIMUMS							
ELEMENT	12	10	10	6	10	10	10
VALUE	5981.8	4014.2	543.59	1.2576	.00000E+00	1097.1	74654.

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .860

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
10	-6522.2	4014.2	543.59	-14.903	-.15987E-13	1097.1	74654.
12	-5581.3	-1175.7	538.64	-14.639	.00000E+00	1062.2	74001.
4	-3888.7	2628.6	304.35	.61920	.17764E-14	-951.83	43075.

MINIMUMS ELEMENT VALUE	10	12	4	10	10	4	4
	-6522.2	-1175.7	304.35	-14.903	-.15987E-13	-951.83	43075.

MAXIMUMS ELEMENT VALUE	4	10	10	4	4	10	10
	-3888.7	4014.2	543.59	.61920	.17764E-14	1097.1	74654.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-107

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .870

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
5	8583.1	4334.0	756.14	-17.862	.00000E+00	-1473.2	-.10031E+06
3	7097.5	-5826.7	780.81	-18.103	.00000E+00	-1504.3	-.10350E+06
11	6111.8	2518.4	552.38	-1.6589	.00000E+00	616.99	-74028.

MINIMUMS ELEMENT VALUE	11	3	11	3	5	3	3
VALUE	6111.8	-5826.7	552.38	-18.103	.00000E+00	-1504.3	-.10350E+06

MAXIMUMS ELEMENT VALUE	5	5	3	11	5	11	11
VALUE	8583.1	4334.0	780.81	-1.6589	.00000E+00	616.99	-74028.

SORT ON JSG3 ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

2010A

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z 15.1261 AUG 1,1995 CP= .870

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
3	-9082.7	-5826.7	780.81	-18.103	.00000E+00	-1504.3	-.10350E+06
5	-7106.4	4334.0	756.14	-17.862	.00000E+00	-1473.2	-.10031E+06
9	-6832.2	-6332.3	557.50	-.93366	.00000E+00	710.55	-74688.

MINIMUMS							
ELEMENT	3	9	3	3	3	3	3
VALUE	-9082.7	-6332.3	557.50	-18.103	.00000E+00	-1504.3	-.10350E+06

MAXIMUMS							
ELEMENT	9	5	3	9	3	9	9
VALUE	-6832.2	4334.0	780.81	-.93366	.00000E+00	710.55	-74688.

SEL FOR LABEL= ELEM FROM 2 TO 12 BY 2

3 ELEMENTS (3 OF 77 DELETED) SELECTED BY ESEL COMMAND.

***** ELEMENT STRESS ITEMS PER ELEMENT *****

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JHX	JHY	JMZ
2	-2426.7507	-51.846211	-6.2623304	.88817842E-14	-.14210855E-12	-.61390892E-10
4	-2408.8530	-348.30374	-13.802425	-.17763568E-14	.39790393E-12	.36834535E-10
6	1623.8695	-372.18795	-14.440792	.00000000E+00	-.56843419E-13	.62300387E-10
8	-4224.7374	-51.842646	-2.4454869	.00000000E+00	.00000000E+00	.40472514E-10
10	-3794.4696	-587.53806	1.7200574	-.15987212E-13	.51159077E-12	.40927262E-11
12	1595.4173	-582.58911	1.4555630	.00000000E+00	.56843419E-13	.11368684E-10

MINIMUMS
 ELEMENT
 VALUE

MAXIMUMS
 ELEMENT
 VALUE

ESEL FOR LABEL= TYPE FROM 4 TO 4 BY 1
 24 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISCT ORDER= 0 KABS= 1 NMAX= 3
 SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      3  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
97	23713.	-354.07	-1423.7	33.676	-446.67	-1965.5	-47702.
99	23678.	-241.06	-1429.4	131.01	-149.05	-1983.3	-47702.
86	18159.	-293.67	901.68	18.370	-197.67	-805.27	37210.

[illegible]

```

SORT ON ISCT ORDER=0 KABS=1 NMAX=3

```

3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-111

BEST AVAILABLE COPY

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .890

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IHY	IMZ
99	-23492.	-241.06	-1429.4	131.01	-149.05	-1983.3	-47702.
97	-23439.	-354.07	-1423.7	33.676	-446.67	-1965.5	-47702.
86	-17932.	-293.67	901.68	18.370	-197.67	-805.27	37210.

MINIMUMS ELEMENT VALUE	99	97	99	86	97	99	99
	-23492.	-354.07	-1429.4	18.370	-446.67	-1983.3	-47702.

MAXIMUMS ELEMENT VALUE	86	99	86	99	99	86	86
	-17932.	-241.06	901.68	131.01	-149.05	-805.27	37210.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-112

MAY 1, 1990

AL37 32207

15.1261 AUG 1, 1995 CP= .890

POST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g-x + .06g-z

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
96	23481.	-245.93	-1576.3	146.32	446.67	1965.5	47702.
98	23446.	-358.94	-1570.6	48.989	149.05	1983.3	47702.
78	23336.	-84.179	345.58	117.84	.00000E+00	12494.	-36735.

MINIMUMS	96	98	78
ELEMENT	23336.	-358.94	-1576.3
VALUE			48.989

MAXIMUMS	96	78	98
ELEMENT	23481.	-84.179	345.58
VALUE			146.32

SORT ON JSC3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z 15.1261 AUG 1,1995 CP= .900

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
81	-24235.	-2095.4	619.35	594.58	475.36	23204.	-26146.
98	-23723.	-358.94	-1570.6	48.989	149.05	1983.3	47702.
96	-23671.	-243.93	-1576.3	146.32	446.67	1965.5	47702.
MINIMUMS							
ELEMENT	81	81	96	98	98	96	81
VALUE	-24235.	-2095.4	-1576.3	48.989	149.05	1965.5	-26146.
MAXIMUMS							
ELEMENT	96	96	81	81	81	81	98
VALUE	-23671.	-243.93	619.35	594.58	475.36	23204.	47702.

ESEL FOR LABEL= ELEH FROM 88 TO 99 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS FOR ELEMENT

BEST AVAILABLE COPY

DET ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x +.06g:z 15.1261 AUG 1, 1995 CP= .900

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
88	602.75429	1571.3193	292.37034	11520.913	-3365.5557	20694.372
89	566.21397	99.860043	-71.250941	232.95112	3061.2584	-17252.403
90	432.29480	-1378.0171	-322.00551	-11288.016	4659.2289	-19668.403
91	518.64788	1767.4788	358.86575	-17310.634	-3597.4868	23554.532
92	369.45955	143.44397	104.38842	232.92742	924.17908	-18206.733
93	317.56133	-1475.6421	-134.2483	17543.461	3425.7083	-21414.228
94	247.44051	267.70973	72.315577	-330.18612	-2953.9039	15586.142
95	322.27530	302.69619	61.010789	-39.593751	-2518.6251	7800.4661
96	251.95159	1606.4052	-148.13074	-446.66942	4070.8056	17543.562
97	-354.07188	-1423.7122	33.675904	-446.66942	-1965.5165	-47701.644
98	364.96522	1600.7218	-50.795951	-149.05188	62.270709	17310.533
99	-241.05825	-1429.3955	131.01078	-149.05188	-1983.3253	-47701.655
MINIMUMS						
ELEMENT	97	93	90	91	91	99
VALUE	-354.07188	-1475.6421	-322.00551	-17310.634	-3599.4868	-47701.655
MAXIMUMS						
ELEMENT	88	91	91	93	90	91
VALUE	602.75429	1767.4788	359.86595	17543.461	4659.2289	23554.532

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z 15.1261 AUG 1, 1995 CP= .910

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
88	-601.69669	-1553.6896	-288.84441	-11520.913	-3609.0213	16805.734
89	-565.11230	-81.495804	74.923789	-232.95112	-1234.0743	19519.351
90	-431.23720	1395.6468	325.53144	11288.016	3111.2145	-13615.563
91	-517.59028	-1749.8491	-356.34001	17310.634	-4994.9847	18653.403
92	-368.35788	-125.07973	-100.71557	-232.92742	-3487.9790	21563.280
93	-316.50433	1493.2718	267.77558	-17543.461	2958.5944	-14212.738
94	-259.48756	-327.94464	-75.929056	350.18612	-3124.1269	8835.6949
95	-310.22836	-242.46148	-64.624248	39.593751	-2632.4115	14550.998
96	-245.92812	-1576.2878	146.32401	446.66942	1965.5166	47701.644
97	360.09535	1453.6295	-35.482723	446.66942	547.76289	-11287.961
98	-358.94175	-1570.6045	48.989221	149.05188	1983.3253	47701.655
99	247.08172	1459.5129	-132.81751	149.05188	-3425.1545	-11520.968

MINIMUMS
 ELEMENT
 VALUE

88 -601.69669 91 -356.34001 93 -17543.461

MAXIMUMS
 ELEMENT
 VALUE

97 360.09535 90 325.53144 91 17310.634

ESEL FOR LABEL= ELEM FROM 76 TO 82 BY 2

4 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x +.06g:z
 15.1261 AUG 1, 1995 CP=.910

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
76	856.66250	-365.84350	-83.670638	.00000000E+00	.34532377E-11	-.19610980E-10
78	160.57406	-360.86140	-122.42774	.00000000E+00	-.45048409E-11	.39790393E-12
80	3495.0341	-341.54421	-86.761626	.00000000E+00	-.20037305E-11	-.50590443E-11
82	2510.2502	-336.25507	-128.48066	.00000000E+00	-.21174174E-11	-.68780537E-11
MINIMUMS						
ELEMENT	78	76	82	76	78	76
VALUE	160.57406	-365.84350	-128.48066	.00000000E+00	-.45048409E-11	-.19610980E-10
MAXIMUMS						
ELEMENT	80	82	76	76	76	78
VALUE	3495.0341	-336.25507	-83.670638	.00000000E+00	.34532377E-11	.39790393E-12

ESEL FOR LABEL= TYPE FROM 5 TO 5 BY 1
 11 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x +.04gzz 15.1261 AUG 1, 1995 CP= .920

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
20	14408.	31.853	1756.4	4.5257	-.98359E-02	-433.87	60348.
19	2021.0	-51.018	-183.02	26.307	-.80652E-01	-234.20	-7315.6
17	1730.7	248.55	-186.60	-60.851	51.184	865.04	-2777.0
MINIMUMS							
ELEMENT	17	19	17	17	19	20	19
VALUE	1730.7	-51.018	-186.60	-60.851	-.80652E-01	-433.87	-7315.6
MAXIMUMS							
ELEMENT	20	17	20	19	17	17	20
VALUE	14408.	248.55	1756.4	26.307	51.184	865.04	60348.

SORT ON ISG3 ORDER= 0 KABS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .920

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISX3	IFY	IFZ	IMX	IMY	IMZ
20	-14435.	31.853	1756.4	4.5357	-.98358E-02	-433.87
19	-1978.5	-51.018	-183.02	26.307	-.80652E-01	-234.20
17	-1937.8	248.55	-186.60	-60.851	51.184	865.04

MINIMUMS ELEMENT VALUE	20	19	17	17	19	20	19
	-14435.	-51.018	-186.60	-60.851	-.80652E-01	-433.87	-7315.6

MAXIMUMS ELEMENT VALUE	17	17	20	19	17	17	20
	-1937.8	248.55	1756.4	26.307	51.184	865.04	60348.

SORT ON JSG1 ORDER= 0 KABS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-119

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x +.06g:z 15.1261 AUG 1,1995 CP= .930

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
21	13542.	52.221	-1335.0	-29.557	.98358E-02	-827.57	54033.
18	1990.2	-22.982	-187.98	-4.3070	.80652E-01	234.20	7315.6
17	1618.0	-247.45	204.98	64.527	-51.184	827.57	-2509.3

MINIMUMS	17	21	17	21	17	21	17
ELEMENT	1618.0	-247.45	-1335.0	-29.557	-51.184	-827.57	-2509.3
VALUE							

MAXIMUMS	21	17	18	17	21	17	21
ELEMENT	13542.	52.221	204.98	64.527	.80652E-01	827.57	54033.
VALUE							

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

BEST AVAILABLE COPY

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z 15.1261, AUG 1, 1995 CP= .930

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JS63	JFX	JFY	JFZ	JMX	JMY	JMZ
21	-13499.3	52.221	-1335.0	-29.557	.98358E-02	-827.57	54033.
18	-2009.3	-22.982	-187.98	-4.3070	.80652E-01	234.20	7315.6
17	-1824.2	-247.45	204.98	64.527	-51.184	827.57	-2509.3

MINIMUMS
 ELEMENT 21
 VALUE -13499.

MAXIMUMS
 ELEMENT 17
 VALUE -1824.2

ESEL FOR LABEL= ELEM F63 18 TO 22 BY 4
 2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL +0.2g:-x + .06g:z

15.1261 AUG 1, 1995 CP= .940

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
18	28.019022	213.16043	2.7961779	-.80651967E-01	-365.60875	105.43119
22	14.864850	115.86991	5.1017295	-.98123925	-222.60203	6.1263587

MINIMUMS ELEMENT VALUE	22	22	18	22	18	22
14.864850	115.86991	2.7961779	-.98123925	-365.60875	6.1263587	

MAXIMUMS ELEMENT VALUE	18	18	22	18	22	18
28.019022	213.16043	5.1017295	-.80651967E-01	-222.60203	105.43119	

ESEL FOR LABEL= ELEM FROM 19 TO 23 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-122

DST MOCK-UP PLATFORM SEISHIC ANALYSIS DL +0.2g:-x +.06g:z 15.1261 AUG 1, 1995 CP= .940

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
19	56.055076	208.21006	-27.817886	.80651967E-01	-767.11160	77.732706
23	31.941972	116.16420	-19.143424	.98123925	-383.52680	-13.483450

MINIMUMS ELEMENT VALUE	23	23	19	19	19	23
	31.941972	116.16420	-27.817886	.80651967E-01	-767.11160	-13.483450

MAXIMUMS ELEMENT VALUE	19	19	23	23	23	19
	56.055076	208.21006	-19.143424	.98123925	-383.52680	77.732706

USE LOAD STEP 4 ITERATION 0 SECTION 1 FOR LOAD CASE 1

DISPLACEMENT STORED FOR 72 NODES

***WARNING *** CP= .970 TIME= 15.12611
 DATA FOR STRESS LABEL IFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL IFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL IFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL IMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL IMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL IMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL JFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL JFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
 DATA FOR STRESS LABEL JFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611

A-123

DATA FOR STRESS LABEL JMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
DATA FOR STRESS LABEL JMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
DATA FOR STRESS LABEL JMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
DATA FOR STRESS LABEL ISAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
DATA FOR STRESS LABEL ISBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= .980 TIME= 15.12611
DATA FOR STRESS LABEL ISBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

A-12A


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***WARNING ***
DATA FOR STRESS LABEL JSAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= .980 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL JSBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= .980 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL JSBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= .990 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL ISG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= .990 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL ISG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= .990 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL JSG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= .990 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL JSG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= .990 TIME= 15.12611

***WARNING ***
DATA FOR STRESS LABEL SAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
SAX DATA FOR TYPE 1. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 3. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 4. STIF 4. ELEMENTS WILL BE SET TO ZERO
SAX DATA FOR TYPE 5. STIF 4. ELEMENTS WILL BE SET TO ZERO
CP= .990 TIME= 15.12611

```

STRESSES STORED FOR 23 SELECTED ITEMS

ITERATION SUMMARY INFORMATION STORED

NODAL FORCES STORED FOR 99 ELEMENTS

REACTIONS STORED FOR 18 REACTIONS

```

FOR LOAD STEP= 4 ITERATION= 1 SECTION= 1
TIME= .000000E+00 LOAD CASE= 1
TITLE= DOUBLE SHELL TANK MOCK-UP PLATFORM

```

NEW TITLE= DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

USE MACRO FILE mres

ESEL FOR LABEL= TYPE FROM 1 TO 1 BY 1

36 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1, 1995 CP= 1.000

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
59	3017.0	379.05	-3541.6	-128.52	-9.0101	-819.25	-38678.
43	2999.1	194.77	-3518.4	373.05	-200.88	-4304.3	-27487.
55	2912.1	32.871	77.322	-30.497	-9.0101	689.27	-36882.
MINIMUMS							
ELEMENT	55	55	59	59	43	43	59
VALUE	2912.1	32.871	-3541.6	1128.52	-200.88	-4304.3	-38678.
MAXIMUMS							
ELEMENT	59	59	55	43	59	55	43
VALUE	3017.0	379.05	77.322	373.05	-9.0101	689.27	-27487.

SORT ON ISG1 ORDER= 0 KABS= 1 MHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1, 1995 CP= 1.000

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
59	-3146.1	379.05	-3541.6	-128.52	-9.0101	-819.25	-38678.
43	-3065.5	194.77	-3518.4	373.05	-200.88	-4304.3	-27487.
55	-2923.3	32.871	77.322	-30.497	-9.0101	689.27	-36882.

MINIMUMS
 ELEMENT 59 55 59 59 43 43 59
 VALUE -3146.1 32.871 -3541.6 -128.52 -200.88 -4304.3 -38678.

MAXIMUMS
 ELEMENT 55 59 55 43 59 43 59
 VALUE -2923.3 379.05 77.322 373.05 -9.0101 689.27 -27487.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

MAY 1, 1990

A137 32207

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g: x + .2g: z 15.1261 AUG 1, 1995 CP= 1.010

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
55	3073.4	-48.197	-739.14	35.091	9.0101	819.25	38678.
54	2817.2	-2.8709	-227.32	21.497	9.0101	-689.27	36882.
43	2877.1	-196.47	3546.7	-378.71	200.88	-2085.6	-32567.

MINIMUMS	ELEMENT	VALUE
43	2877.1	-196.47
54	-227.32	-227.32
43	-378.71	-378.71
55	9.0101	9.0101
43	-2085.6	-2085.6
55	-32567.	-32567.

MAXIMUMS	ELEMENT	VALUE
55	3073.4	3073.4
54	-2.8709	-2.8709
43	3546.7	3546.7
55	35.091	35.091
43	200.88	200.88
55	819.25	819.25
55	38678.	38678.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.020

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
55	-3089.8	-48.187	-.73914	35.091	9.0101	819.25	38678.
43	-2944.1	-196.47	3546.7	-378.71	200.88	-2085.6	-32567.
54	-2918.2	-2.8709	-227.32	21.497	9.0101	-689.27	36882.

MINIMUMS ELEMENT VALUE	55	43	54	43	55	43	43
	-3089.8	-196.47	-227.32	-378.71	9.0101	-2085.6	-32567.

MAXIMUMS ELEMENT VALUE	54	54	43	55	43	55	55
	-2918.2	-2.8709	3546.7	35.091	200.88	819.25	38678.

ESEL FOR LABEL= ELEM FROM 56 TO 62 BY 1

7 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-129

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1,1995 CP= 1.020

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
56	-371.46923	2649.0375	98.140032	-7.1938390	-866.57568	-83.838965
57	58.262350	220.48960	-42.892202	-5.6943126	-2826.6999	80.725786
58	-106.28947	209.37425	-15.222581	2.0572991	-1287.0990	182.33757
59	-382.71441	3559.6730	129.61446	9.0100683	2238.9631	-380.10798
60	146.22059	221.30162	-69.277711	-5.6943126	-3566.9851	34.440481
61	-22.331220	210.41698	-40.608090	2.0572991	-1895.2492	122.90209
62	387.62979	1039.3718	-77.263569	9.0100683	-1039.6854	-294.11716

MINIMUMS
 ELEMENT 59
 VALUE -382.71441 209.37425 62 -77.263569 -7.1938390 60 -3566.9851 59 -380.10798

MAXIMUMS
 ELEMENT 62
 VALUE 387.62979 3559.6730 59 129.61446 9.0100683 59 2238.9631 58 182.33757

ESEL FOR LABEL= ELEM FROM 64 TO 67 BY 3
 2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-130

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15.1261 AUG 1, 1995 CP= 1.030

***** F03:1 ALL FOLD STRESS LISTING *****

```
LOAD STEP      4  ITERATION=      1  SECTION=      1
TIME= .000000E+00  LOAD CASE=      1
```

ELEM	JFJ	JFZ	JHX	JHY	JHZ
64	200.47635	178.23853	14.009831	9.3301240	1147.0750
67	57.149910	170.76671	9.4428188	-3.8517806	838.78652

MINIMUMS					
ELEMENT	67	67	67	67	67
VALUE	57.149910	170.76671	9.4428188	-3.8517805	838.76652
					2.9751492

MAXIMUMS					
ELEMENT	64	64	64	64	64
VALUE	205.47665	178.28853	14.009831	9.3301240	1147.0750
					162.97132

```
ESEL FOR LABEL= ELEM FROM 69 TO 69 BY 1
```

```
1 ELEMENTS (OF 99 DEFINED), SELECTED BY ESEL COMMAND.
```

PRINT ELEMENT STRESS ITEMS PER ELEMENT

W-1-A

BEST AVAILABLE COPY

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1,1995 CP= 1.030

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	69	JFX	JFY	JFZ	JMX	JMY	JHZ
		71.483526	122.36143	14.188748	4.9224373	1000.1472	3.6562039
MINIMUMS							
ELEMENT	69						
VALUE		71.483526	122.36143	14.188748	4.9224373	1000.1472	3.6562039
MAXIMUMS							
ELEMENT	69						
VALUE		71.483526	122.36143	14.188748	4.9224373	1000.1472	3.6562039

ESEL FOR LABEL= ELEM FROM 47 TO 47 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.040

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	ITX	ITY	ITZ
47	-389.60724	408.82099	154.09362	7.1938390	-4551.7695	32.828089
MINIMUMS ELEMENT VALUE	47 -389.60724	47 408.82099	47 154.09362	47 7.1938390	47 -4551.7695	47 32.828089
MAXIMUMS ELEMENT VALUE	47 -389.60724	47 408.82099	47 154.09362	47 7.1938390	47 -4551.7695	47 32.828089

ESEL FOR LABEL= ELEM FROM 63 TO 65 BY 2

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-133

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DST MOCK-UP PLATFORM SEISHIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.040

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
63	-134.51840	177.50269	-35.395340	-9.3301240	1669.0197	-207.76424
65	15.486442	232.11174	-18.618559	-23.939212	1089.4235	10.220135

MINIMUMS ELEMENT VALUE	63	63	63	65	65	63
	-134.51840	177.50269	-35.395340	-23.939212	1089.4235	-207.76424

MAXIMUMS ELEMENT VALUE	65	65	65	63	63	65
	15.486442	232.11174	-18.618559	-9.3301240	1669.0197	10.220135

ESEL FOR LABEL= ELEM FROM 68 TO 68 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

7-1-W-A

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DST ROCK-UP PLATFORM SEISMIC ANALYSIS OL + .06g: x + .2g: z

**** POST1 ELEMENT STRESS LISTING ****

LOAD STEP 4 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
68	-2.3965653	183.37668	-47.825720	19.359979	1398.4699	-3.3394858
MINIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	-2.3965653	183.37668	-47.825720	19.359979	1398.4699	-3.3394858
MAXIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	-2.3965653	183.37668	-47.825720	19.359979	1398.4699	-3.3394858

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

16 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON SAX ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

BEST AVAILABLE COPY

DST HOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.050

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	SAX
30	-1250.6438
31	-1120.2998
32	-1056.1338

MINIMUMS
ELEMENT 30
VALUE -1250.6438

MAXIMUMS
ELEMENT 32
VALUE -1056.1338

ESEL FOR LABEL= TYPE FROM 3 TO 3 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT REACTION FORCES PER NODE

A-136

BEST AVAILABLE COPY

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.050

***** POST1 REACTION FORCE LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z FORCES ARE IN GLOBAL COORDINATES

NODE	FX	FY	FZ	MX	MY	MZ
1	-16.980901	-1495.0709	-548.58111	.00000000E+00	.00000000E+00	.00000000E+00
2	-16.984918	6653.1139	-801.07203	.00000000E+00	.00000000E+00	.00000000E+00
3	-218.68692	-749.43804	-414.08418	.00000000E+00	.00000000E+00	.00000000E+00
4	-189.95227	5990.1799	-684.11642	.00000000E+00	.00000000E+00	.00000000E+00
5	-243.52601	1640.5744	-134.80650	.00000000E+00	.00000000E+00	.00000000E+00
6	-199.86146	2714.6570	-367.54302	.00000000E+00	.00000000E+00	.00000000E+00
TOTAL	-884.89248	14754.016	-2950.2032	.00000000E+00	.00000000E+00	.00000000E+00

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-137

BEST AVAILABLE COPY

WHC-SD-MM-ER-521
 Rev. 0

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1,1995 CP= 1.060

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
12	2036.2	983.58	-180.99	-33.681	.00000E+00	1545.1	-24761.
10	1406.8	4381.8	-170.29	-35.532	.44409E-13	1789.4	-23348.
7	-979.76	5751.2	15.611	-19.665	.00000E+00	-.22737E-12	-.14495E-11

MINIMUMS	7	12	10	7	12	10	7
ELEMENT	7	12	10	7	12	10	7
VALUE	-979.76	983.58	-180.99	-35.532	-.44409E-13	-.22737E-12	-24761.

MAXIMUMS	12	7	10	7	12	10	7
ELEMENT	12	7	10	7	12	10	7
VALUE	2036.2	5751.2	15.611	-19.665	.00000E+00	1789.4	-.14495E-11

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

POST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1, 1995 CP= 1.060

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
10	-2899.8	4381.8	-170.29	-35.532	-44409E-13	1789.4	-23348.
12	-2371.3	983.58	-180.99	-33.681	.00000E+00	1545.1	-24761.
4	-1285.9	901.25	-101.69	-19.899	.57732E-14	-274.13	-14294.

MINIMUMS							
ELEMENT	10	4	12	10	10	4	12
VALUE	-2899.8	901.25	-180.99	-35.532	-44409E-13	-274.13	-24761.

MAXIMUMS							
ELEMENT	4	10	4	4	4	10	4
VALUE	-1285.9	4381.8	-101.69	-19.899	.57732E-14	1789.4	-14294.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** POSTI ELEMENT STRESS LISTING *****

```
LOAD STEP      4  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
3	2555.1	531.44	-204.43	-36.126	.00000E+00	-1889.8	27202.
5	2448.0	-1542.8	-229.27	-36.342	.00000E+00	-1917.6	30407.
11	1552.4	-2092.7	-185.60	-19.633	.00000E+00	237.83	24774.

MINIMUMS	11	5	3	11
ELEMENT	1552.4	-2092.7	-36.342	-1917.6
VALUE			.00000E+00	24774.

	MAXIMUMS				
	ELEMENT				
	VALUE	3	3	11	5
	2555.1	531.44	-185.60	-19.633	.00000E+00
					237.83
					30407.

```

SORT ON JSG3 ORDER=0 KABS=1 NMAX=3

```

3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1, 1995 CP= 1.070

**** POST1 ELEMENT STRESS LISTING ****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
5	-2973.6	-1542.8	-229.27	-36.342	.00000E+00	-1917.6	30407.
9	-2662.1	-5010.2	-174.59	-19.425	.00000E+00	264.66	23354.
3	-2374.1	531.44	-204.43	-36.126	.00000E+00	-1889.8	27202.

MINIMUMS	ELEMENT	VALUE
5	9	-5010.2
5	5	-2973.6
5	5	-36.342
5	5	.00000E+00
5	9	-1917.6
5	5	23354.

MAXIMUMS	ELEMENT	VALUE
3	3	531.44
3	9	-174.59
3	9	-19.425
5	5	.00000E+00
5	9	264.66
5	5	30407.

ESEL FOR LABEL= ELEM FROM 2 TO 12 BY 2

6 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1,1995 CP= 1.080

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JHX	JHY	JHZ
2	1.9527253	15.552654	-15.233746	-4.4408921E-14	.34106051E-12	-87538865E-11
4	-681.49525	114.87751	-24.052584	-57731597E-14	-56843419E-12	-54228622E-10
6	-334.56010	91.229128	-26.056877	.00000000E+00	.34106051E-12	.85265128E-11
8	-3827.1755	15.548637	-11.402824	.00000000E+00	.34106051E-12	.21600499E-11
10	-4162.0522	183.47258	-8.4195154	.44408921E-13	-34106051E-12	-19667823E-10
12	-763.82270	194.17506	-10.270805	.00000000E+00	.56843419E-13	-51159077E-11

MINIMUMS	10	8	6	4	4	4
ELEMENT	10	8	6	4	4	4
VALUE	-4162.0522	15.548637	-26.056877	-57731597E-14	-56843419E-12	-54228622E-10

MAXIMUMS	2	12	10	2	6	6
ELEMENT	2	12	10	2	6	6
VALUE	1.9527253	194.17506	-8.4195154	.34106051E-13	.34106051E-12	.85265128E-11

ESEL FOR LABEL= TYPE FROM 4 TO 4 BY 1
 24 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.090

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
97	25800.	-95.916	-1522.5	316.05	99.653	-6572.5	-47702.
99	25664.	280.78	-1521.5	286.85	10.362	-6590.3	-47703.
84	19181.	-490.60	1055.3	1.1823	-24.801	-127.99	39881.

KINIMUMS ELEMENT VALUE	84	84	97	84	84	99	99
VALUE	19181.	-490.60	-1522.5	1.1823	-24.801	-6590.3	-47703.

MAXIMUMS ELEMENT VALUE	97	99	84	97	97	84	84
VALUE	25800.	280.78	1055.3	316.05	99.653	-127.99	39881.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-143

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.090

**** POST1 ELEMENT STRESS LISTING ****

LOAD STEP 1 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IPX	IPY	IPZ
99	-25880.	280.78	-1521.5	286.85	10.342	-6590.3	-47703.
97	-25726.	-95.916	-1522.5	316.05	99.653	-6572.5	-47702.
84	-18802.	-490.60	1055.3	1.1823	-24.801	-127.99	39881.

MINIMUMS ELEMENT VALUE	99	84	97	84	84	99	99
	-25880.	-490.60	-1522.5	1.1823	-24.801	-6590.3	-47703.

MAXIMUMS ELEMENT VALUE	84	99	84	97	97	84	84
	-18802.	280.78	1055.3	316.05	99.653	-127.99	39881.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT.

1-1-1

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WHC-SD-WM-ER-521
 Rev. 0

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.090

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
96	25870.	275.92	-1477.5	283.95	-99.653	6572.5	47702.
98	25733.	-100.78	-1478.5	313.15	-10.362	6590.3	47703.
82	23653.	83.796	-112.87	355.67	.00000E+00	37784.	11977.

MINIMUMS ELEMENT VALUE	82	98	98	96	96	96	82
VALUE	23653.	-100.78	-1478.5	283.95	-99.653	6572.5	11977.

MAXIMUMS ELEMENT VALUE	96	96	82	82	82	82	98
VALUE	25870.	275.92	-112.87	355.67	.00000E+00	37784.	47703.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-145

DSI ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1,1995 CP= 1.100

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
98	-25811.	-100.78	-1478.5	313.15	-10.362	6590.3	47703.
96	-25657.	275.92	-1477.5	283.95	-99.653	6572.5	47702.
82	-23588.	83.796	-112.87	355.67	.00000E+00	37784.	11977.

MINIMUMS
 ELEMENT
 VALUE

98	-25811.	98	98	96	96	82	82
		-100.78	-1478.5	283.95	-99.653	6572.5	11977.

MAXIMUMS
 ELEMENT
 VALUE

82	-23588.	96	82	82	82	98	98
		275.92	-112.87	355.67	.00000E+00	37784.	47703.

ESEL FOR LABEL= ELEM FROM 88 TO 99 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.100

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
88	765.18821	1958.3195	-203.02761	15296.630	1362.7651	32063.666
89	439.58741	388.03364	-296.07970	-42.855074	3011.8723	-14624.792
90	143.03997	-1181.9759	-12.389438	-15340.272	917.72563	-24085.718
91	792.12020	-1905.3498	10.598040	-13535.480	677.82159	31342.817
92	498.62219	380.14161	289.37878	-44.179857	-4247.9989	-14273.675
93	175.77699	-1146.8121	191.50530	13487.948	-3372.0419	-23558.025
94	182.00376	-117.92620	-27.628112	83.412729	1136.5857	-224.82272
95	387.19570	-53.193106	-25.500532	-9.7881645	1021.1622	-6793.4375
96	-277.72314	1507.5785	-289.97208	99.653095	5192.8647	13491.300
97	-95.916410	-1522.5388	316.05139	99.653095	-6572.5095	-47702.013
98	98.975137	1508.5894	-319.17235	10.362100	6372.2832	13532.128
99	280.78187	-1521.5279	286.85112	10.362100	-6590.3020	-47702.634

MINIMUMS ELEMENT VALUE	96	97	98	90	99	99
	-277.72314	-1522.5388	-319.17235	-15340.272	-6590.3020	-47702.634

MAXIMUMS ELEMENT VALUE	91	88	97	88	98	88
	792.12020	1958.3195	316.05139	15296.630	6372.2832	32063.666

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-147

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.110

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
88	-761.66227	-1940.6898	201.97002	-15296.630	3497.2064	14724.446
89	-435.91456	-369.66940	294.97803	42.855074	4376.3494	24096.080
90	-139.51404	1199.6055	11.331840	15340.272	-633.07029	-4493.2586
91	-788.59427	-1887.7201	-11.655638	13535.480	-944.86573	14174.022
92	-494.94934	-361.77737	-290.48044	44.179857	-3000.2413	23547.663
93	-172.25105	1164.4417	-192.56290	-13487.948	-1236.7766	-4177.0210
94	-178.39030	57.691492	15.581171	-83.412729	634.99490	-6975.5026
95	-390.80916	113.42781	13.453591	9.7881645	575.95683	-38.020119
96	275.91641	-1477.4612	283.94861	-99.653095	6572.5095	47702.013
97	94.109681	1552.6562	-322.07486	-99.653095	-6509.0787	-15339.485
98	-100.78187	-1478.4721	313.14888	-10.362100	6590.3020	47702.634
99	-282.58860	1551.6453	-292.87459	-10.362100	-5294.0750	-15297.417

MINIMUMS ELEMENT VALUE	91	88	97	88	97	97
	-788.59427	-1940.6898	-322.07486	-15296.630	-6509.0787	-15339.485

MAXIMUMS ELEMENT VALUE	96	97	98	90	98	98
	275.91641	1552.6562	313.14888	15340.272	6590.3020	47702.634

ESEL FOR LABEL= ELEM FROM 76 TO 82 BY 2

4 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

7-1-A-2

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1,1995 CP= 1.120

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
76	3542.2990	93.424947	-330.86438	.00000000E+00	-.22168933E-11	.43698378E-11
78	717.15467	93.067573	-371.52158	.00000000E+00	.32400749E-11	.10736301E-10
80	2770.4677	117.39576	-331.16943	.00000000E+00	.68780537E-11	.11645795E-10
82	-7.4004948	117.45239	-370.94878	.00000000E+00	.86977043E-11	.16413537E-11
MINIMUMS						
ELEMENT	82	78	78	76	76	82
VALUE	-7.4004948	93.067573	-371.52158	.00000000E+00	-.22168933E-11	.16413537E-11
MAXIMUMS						
ELEMENT	76	82	76	76	82	80
VALUE	3542.2990	117.45239	-330.86438	.00000000E+00	.86977043E-11	.11645795E-10

ESEL FOR LABEL= TYPE FROM 5 TO 5 BY 1

11 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      4  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
20	4163.2	223.20	-47.753	.55572	871.66	-12901.
19	2778.0	-186.23	31.022	.37594	-785.30	-7315.6
21	2059.0	-619.39	31.284	.55572	-802.02	-4176.6
MINIMUMS						
ELEMENT	19	21	20	19	21	20
VALUE	-35.484	-619.39	-47.753	.37594	-802.02	-12901.
MAXIMUMS						
ELEMENT	21	19	21	21	20	21
VALUE	20.389	-186.23	31.284	.55572	871.66	-4176.6

SDRT ON ISG3 ORDER= 0 KARS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      4  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
20	-4160.6	-3.1214	-223.20	-47.753	.55572	871.66	-12901.
19	-2748.4	-35.484	-186.23	31.022	.37594	-785.30	-7315.6
21	-2076.0	20.389	-619.39	31.284	.55572	-802.02	-4176.6
MINIMUMS							
ELEMENT	20	19	21	20	19	21	20
VALUE	-4160.6	-35.484	-619.39	-47.753	.37594	-802.02	-12901.
MAXIMUMS							
ELEMENT	21	21	19	21	21	20	21
VALUE	-2076.0	20.389	-186.23	31.284	.55572	871.66	-4176.6

```

SORT ON JSG1 ORDER=0 KABS=1 NMAX=3

```

3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1,1995 CP= 1.130

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSC1	JFX	JFY	JFZ	JMX	JMY	JMZ
21	5010.9	-21.900	644.58	-36.321	-.55572	-448.66	-19207.
18	2787.1	57.484	-184.77	42.978	-.37594	785.30	7315.6
20	2068.2	1.6105	248.39	42.716	-.55572	802.02	4176.6

MINIMUMS							
ELEMENT	20	21	18	21	21	21	21
VALUE	2068.2	-21.900	-184.77	-36.321	-.55572	-448.66	-19207.

MAXIMUMS							
ELEMENT	21	18	21	18	18	20	18
VALUE	5010.9	57.484	644.58	42.978	-.37594	802.02	7315.6

SORT ON JSC3 ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT.

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.140

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
21	-5029.1	-21.900	644.58	-36.321	-.55572	-448.66	-19207.
18	-2739.2	57.484	-184.77	42.978	-.37594	785.30	7315.6
20	-2066.8	1.6105	248.39	42.716	-.55572	802.02	4176.6

MINIMUMS ELEMENT VALUE	21	21	18	21	21	21	21
	-5029.1	-21.900	-184.77	-36.321	-.55572	-448.66	-19207.

MAXIMUMS ELEMENT VALUE	20	18	21	18	18	20	18
	-2066.8	57.484	644.58	42.978	-.37594	802.02	7315.6

ESEL FOR LABEL= ELEM FROM 18 TO 22 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-153

DST MOCK-UP PLATFORM SEISHIC ANALYSIS DL + .06g:x + .2g:z

15.1261 AUG 1, 1995 CP= 1.140

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IHX	IHY	IHZ
18	-58.994635	209.96007	-48.015080	.37593785	898.07413	-12.998834
22	8.2097687	116.08723	-15.678107	-.85455441	82.398459	27.790992

MINIMUMS ELEMENT VALUE	18	22	18	22	22	18
	-58.994635	116.08723	-48.015080	-.85455441	82.398459	-12.998834

MAXIMUMS ELEMENT VALUE	22	18	22	18	18	22
	8.2097687	209.96007	15.678107	.37593785	898.07413	27.790992

USE LABEL= ELEM FROM 19 TO 23 BY 4

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:z 15.1261 AUG 1, 1995 CP= 1.150

**** POST1 ELEMENT STRESS LISTING ****

LOAD STEP 4 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JHX	JHY	JHZ
19	33.972927	211.41042	-36.059018	-37593785	-455.69983	-40.664175
23	-22.251463	115.94688	-31.128716	.85455441	-468.66369	-24.282416

HINTHUS	ELEM	VALUE
19	23	115.94688
23	19	-36.059018

HAXTHUS	ELEM	VALUE
19	23	211.41042
23	19	-31.128716

USE LOAD STEP 5 ITERATION 0 SECTION 1 FOR LOAD CASE 1

DISPLACEMENT STORED FOR 72 NODES

***WARNING ***
 DATA FOR STRESS LABEL IFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL IFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL IFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL IMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL IMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL IMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 IMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL JFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL JFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***
 DATA FOR STRESS LABEL JFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING ***

DATA FOR STRESS LABEL JMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= 1.180 TIME= 15.12611
***WARNING ***
DATA FOR STRESS LABEL JMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= 1.180 TIME= 15.12611
***WARNING ***
DATA FOR STRESS LABEL JMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= 1.180 TIME= 15.12611
***WARNING ***
DATA FOR STRESS LABEL ISAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= 1.180 TIME= 15.12611
***WARNING ***
DATA FOR STRESS LABEL ISBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= 1.180 TIME= 15.12611
***WARNING ***
DATA FOR STRESS LABEL ISBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO
CP= 1.180 TIME= 15.12611

***WARNING *** CP= 1.180 TIME= 15.12611
 DATA FOR STRESS LABEL JSAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JSAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

 ***WARNING *** CP= 1.180 TIME= 15.12611
 DATA FOR STRESS LABEL JSBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JSBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

 ***WARNING *** CP= 1.190 TIME= 15.12611
 DATA FOR STRESS LABEL JSBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JSBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

 ***WARNING *** CP= 1.190 TIME= 15.12611
 DATA FOR STRESS LABEL ISG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
 ISG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

 ***WARNING *** CP= 1.190 TIME= 15.12611
 DATA FOR STRESS LABEL ISG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
 ISG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

 ***WARNING *** CP= 1.190 TIME= 15.12611
 DATA FOR STRESS LABEL JSG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JSG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

 ***WARNING *** CP= 1.190 TIME= 15.12611
 DATA FOR STRESS LABEL JSG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
 JSG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

 ***WARNING *** CP= 1.190 TIME= 15.12611
 DATA FOR STRESS LABEL SAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
 SAX DATA FOR TYPE 1. STIF 4. ELEMENTS WILL BE SET TO ZERO
 SAX DATA FOR TYPE 3. STIF 4. ELEMENTS WILL BE SET TO ZERO
 SAX DATA FOR TYPE 4. STIF 4. ELEMENTS WILL BE SET TO ZERO
 SAX DATA FOR TYPE 5. STIF 4. ELEMENTS WILL BE SET TO ZERO

STRESSES STORED FOR 23 SELECTED ITEMS

ITERATION SUMMARY INFORMATION STORED

NODAL FORCES STORED FOR 99 ELEMENTS

REACTIONS STORED FOR 18 REACTIONS

FOR LOAD STEP= 5 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1
 TITLE= DOUBLE SHELL TANK MOCK-UP PLATFORM

NEW TITLE= DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

USE MACRO FILE mres

ESEL FOR LABEL= TYPE FROM 1 TO 1 BY 1

36 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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MHC-SD-WM-ER-521
 Rev. 0

A-157

DST ROCK UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1261 AUG 1, 1995 CP= 1.200

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IHY	IHZ
54	6247.0	21.623	-727.73	28.067	4.6185	-33.802	-83374.
62	6190.8	351.30	-2775.3	120.26	4.6185	33.802	-83374.
48	5340.8	26.264	-645.96	-37.483	-3.2997	1950.8	-65490.

MINIMUMS ELEMENT VALUE	48	54	62	48	48	54	62
	5340.8	21.623	-2775.3	-37.483	-3.2997	-33.802	-83374.

MAXIMUMS ELEMENT VALUE	54	62	48	62	54	48	48
	6247.0	351.30	-645.96	120.26	4.6185	1950.8	-65490.

SORT BY ISG1 ORDER= 0, KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEM 111 ELEMENT

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WHC-SD-WM-ER-521
 Rev. 0

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DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1261 AUG 1, 1995 CP= 1.200

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
62	-6310.5	351.30	-2775.3	120.26	4.6185	33.802	-83374.
54	-6254.3	21.623	-727.73	28.067	4.6185	-33.802	-83374.
48	-5349.8	26.264	-645.96	-37.483	-3.2997	1950.8	-65490.
MINIMUMS							
ELEMENT	62	54	62	48	48	54	62
VALUE	-6310.5	21.623	-2775.3	-37.483	-3.2997	-33.802	-83374.
MAXIMUMS							
ELEMENT	48	62	48	62	54	48	48
VALUE	-5349.8	351.30	-645.96	120.26	4.6185	1950.8	-65490.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DSI ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z
 15.1261 AUG 1,1995 CP= 1.210

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSC1	JFX	JFY	JFZ	JHX	JHY	JMZ
47	5284.2	-358.62	-2163.8	-78.493	3.2997	-1950.8	65490.
54	4879.7	-12.633	772.68	-25.371	-4.6185	-687.61	63119.
48	3753.7	-17.274	690.91	40.180	3.2997	-902.33	47442.

MINIMUMS
 ELEMENT 48
 VALUE 3753.7

MAXIMUMS
 ELEMENT 47
 VALUE 5284.2

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3
 SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g: x + .2g: - z 15.1261 AUG 1, 1995 CP= 1.220

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JHX	JHY	JNZ
47	-5406.4	-358.62	-2163.8	-78.493	3.2997	-1950.8	65490.
54	-4884.0	-12.633	772.68	-25.371	-4.6185	-687.61	63119.
48	-3759.6	-17.274	690.91	40.180	3.2997	-902.33	47442.

MINIMUMS
 ELEMENT
 VALUE

MAXIMUMS
 ELEMENT
 VALUE

ESEL FOR LABEL= ELEM FROM 56 TO 62 BY 1

7 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DST	HOCK-UP PLATFORM SEISMIC ANALYSIS	DL + .06g:x + .2g:-z	15.1261	AUG 1, 1995	CP=
					1.220

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      5  ITERATION=      1  SECTION=      1
TIME=          -.00000E+00  LOAD CASE=      1
```

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
56	394.83654	844.14225	170.66364	3.2997042	3198.8758	-116.37027
57	145.02337	221.37404	39.979857	2.5687840	1889.2739	116.62201
58	-31.516351	210.52678	12.023773	-1.2164836	276.99515	222.14051
59	406.68702	1773.9928	83.706934	-4.6185236	-420.25704	-499.20032
60	57.065125	220.41718	13.594348	2.5687840	1164.4559	171.16303
61	-115.47460	209.26444	-13.361735	-1.2164836	-353.25897	294.09383
62	-361.29299	2825.2520	-123.25194	-4.6185236	-3686.4176	-834.26769

MINIMUMS	62	61	62	59	62	62
ELEMENT						
VALUE	-361.29299	209.26444	-123.25194	-4.6185236	-3686.4176	-634.26769

MAXIMUMS				
ELEMENT	59	62	56	56
VALUE	406.68702	2325.2520	170.66364	3.2997042
				3198.8758
				294.09383

```

ESEL FOR LABEL= ELEH FROM 64 TO 67 BY 3
2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

```

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
64	116.43659	177.27838	-54.020571	-5.2946022	-2720.8539	343.95387
67	-37.537862	170.91818	-46.894850	-7.1473859	-2309.9540	-6.0103629
MINIMUMS						
ELEMENT	67	67	64	67	64	67
VALUE	-37.537862	170.91818	-54.020571	-7.1473859	-2720.8539	-6.0103629
MAXIMUMS						
ELEMENT	64	64	67	64	67	64
VALUE	116.43659	177.27838	-46.894850	-5.2946022	-2309.9540	343.95387

ESEL FOR LABEL= ELEM FROM 69 TO 69 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1261 AUG 1, 1995 CP= 1.230

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JHZ
69	-20.451391	122.37567	-43.057492	6.8809043	-2056.1896	3.8510671
MINIMUMS						
ELEMENT	69	69	69	69	69	69
VALUE	-20.451391	122.37567	-43.057492	6.8809043	-2056.1896	3.8510671
MAXIMUMS						
ELEMENT	69	69	69	69	69	69
VALUE	-20.451391	122.37567	-43.057492	6.8809043	-2056.1896	3.8510671

ESEL FOR LABEL= ELEM FROM 47 TO 47 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1261 AUG 1, 1995 CP= 1.240

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IHZ
47	368.60411	2213.7162	81.489169	-3.2997042	-448.94462	172.78374
MINIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	368.60411	2213.7162	81.489169	-3.2997042	-448.94462	172.78374
MAXIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	368.60411	2213.7162	81.489169	-3.2997042	-448.94462	172.78374

ESEL FOR LABEL= ELEM FROM 63 TO 65 BY 2

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-165

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DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1261 AUG 1, 1995 CP= 1.240

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
63	-187.39483	178.51284	32.635062	5.2946022	-2218.5171	-273.58982
65	-30.937946	231.88302	10.421262	-12.963549	-1507.1198	-.78176973E-01

MINIMUMS ELEMENT VALUE	63	63	65	65	63	63
	-187.39483	178.51284	10.421262	-12.963549	-2218.5171	-273.58982

MAXIMUMS ELEMENT VALUE	65	65	63	63	65	65
	-30.937946	231.88302	32.635062	5.2946022	-1507.1198	-.78176973E-01

ESEL FOR LABEL= ELEM FROM 68 TO 68 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-166

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1261 AUG 1, 1995 CP= 1.250

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
68	-52.796113	183.43970	36.718368	13.584320	-1767.9374	-3.1400634
MINIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	-52.796113	183.43970	36.718368	13.584320	-1767.9374	-3.1400634
MAXIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	-52.796113	183.43970	36.718368	13.584320	-1767.9374	-3.1400634

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1

16 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON SAX ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-167

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z 15.1261 AUG 1, 1995 CP= 1.250

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM 24 SAX
 24 -1140.3213
 26 -1093.0702
 25 -1013.3504

MINIMUMS
 ELEMENT 24
 VALUE -1140.3213

MAXIMUMS
 ELEMENT 25
 VALUE -1013.3504

ESEL FOR LABEL= TYPE FROM 3 TO 3 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT REACTION FORCES PER NODE

POST HOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z 15.1261 AUG 1, 1995 CP= 1.260

***** POST1 REACTION FORCE LISTING *****

```

LOAD STEP      5  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1

```

THE FOLLOWING X, Y, Z FORCES ARE IN GLOBAL COORDINATES

NODE	FX	FY	FZ	KX	KY	KZ
1	-16.983472	5841.5184	732.59524	.00000000E+00	.00000000E+00	.00000000E+00
2	-16.982347	-683.50947	480.31522	.00000000E+00	.00000000E+00	.00000000E+00
3	-240.00074	5292.0631	711.72092	.00000000E+00	.00000000E+00	.00000000E+00
4	-170.45142	-51.241549	447.65246	.00000000E+00	.00000000E+00	.00000000E+00
5	-265.09344	3376.9704	402.46455	.00000000E+00	.00000000E+00	.00000000E+00
6	-175.39107	978.21537	175.45087	.00000000E+00	.00000000E+00	.00000000E+00
TOTAL	-884.89248	14754.016	2950.2032	.00000000E+00	.00000000E+00	.00000000E+00

```

SORT ON ISG1 ORDER= 0 KABS= 1 NHAX= 3

```

3 VALUES* COMPLETED FOR SORT COMPLETED FOR

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST HOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1261 AUG 1, 1995 CP= 1.260

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IHX	IHY	IHZ
12	1486.0	777.17	-157.07	22.002	.00000E+00	-3.4327	-21603.
10	1328.1	1729.4	-152.31	23.720	-.43521E-13	-230.17	-20975.
6	1305.7	632.52	-88.788	37.731	.00000E+00	-2079.7	-12590.

MINIMUMS ELEMENT VALUE	6	6	12	12	10	6	12
VALUE	1305.7	632.52	-157.07	22.002	-.43521E-13	-2079.7	-21603.

MAXIMUMS ELEMENT VALUE	12	10	6	6	12	12	6
VALUE	1486.0	1729.4	-88.788	37.731	.00000E+00	-3.4327	-12590.

SORT ON ISG3 ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-170

DST ROCK-UP PLATFORM SEISMIC ANALYSIS. DL + .06g:x + .2g:-z 15.1264 AUG 1, 1995 CP= 1.270

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP		5	ITERATION=		1	SECTION=		1
TIME=		.00000E+00	LOAD CASE=		1			
ELEM	ISG3	IFX	IFV	IFZ	IMX	IMY	IMZ	
4	-2281.5	3461.2	-112.20	39.304	.35527E-14	-2287.3	-15681.	
10	-1917.3	1729.4	-152.31	23.720	-.43521E-13	-230.17	-20975.	
12	-1750.8	777.17	-157.07	22.002	.00000E+00	-3.4327	-21603.	
MINIMUMS								
ELEMENT	4	12	12	12	10	4	12	
VALUE	-2281.5	777.17	-157.07	22.002	-.43521E-13	-2287.3	-21603.	
MAXIMUMS								
ELEMENT	12	4	4	4	4	12	4	
VALUE	-1750.8	3461.2	-112.20	39.304	.35527E-14	-3.4327	-15681.	
SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3								
SORT COMPLETED FOR 3 VALUES.								
PRINT ELEMENT STRESS ITEMS PER ELEMENT								

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1264 AUG 1, 1995 CP= 1.270

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JHX	JHY	JHZ
5	2198.7	-2720.2	-250.84	15.415	.00000E+00	-781.87	33189.
9	1830.2	-199.53	-156.17	31.519	.00000E+00	1295.5	20980.
11	1773.9	-921.71	-161.12	32.173	.00000E+00	1379.9	21616.
MINIMUMS							
ELEMENT	11	5	5	5	5	5	9
VALUE	1773.9	-2720.2	-250.84	15.415	.00000E+00	-781.87	20980.
MAXIMUMS							
ELEMENT	5	9	9	11	5	11	5
VALUE	2198.7	-199.53	-156.17	32.173	.00000E+00	1379.9	33189.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-172

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1264 AUG 1,1995 CP= 1.280

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSE3	JFX	JFY	JFZ	JMX	JMY	JMZ
3	-3168.9	-4286.1	-225.74	14.763	.00000E+00	-866.02	29952.
5	-3125.5	-2720.2	-250.84	15.415	.00000E+00	-781.87	33189.
11	-2087.9	-921.71	-161.12	32.173	.00000E+00	1379.9	21616.

MINIMUMS ELEMENT VALUE	3	3	5	3	3	3	11
VALUE	-3168.9	-4286.1	-250.84	14.763	.00000E+00	-866.02	21616.

MAXIMUMS ELEMENT VALUE	11	11	11	11	3	11	5
VALUE	-2087.9	-921.71	-161.12	32.173	.00000E+00	1379.9	33189.

ESEL FOR LABEL= ELEM FROM 2 TO 12 BY 2

6 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-173

DSI ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1264 AUG 1, 1995 CP= 1.280

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
2	-3247.5102	15.550083	11.965350	-.39968029E-14	.79580786E-12	-.14210855E-11
4	-3241.4746	125.38776	4.6475311	-.35527137E-14	-.34106051E-12	-.32343905E-10
6	-412.75882	101.97163	6.2203621	.00000000E+00	-.22737368E-12	.76738615E-11
8	-572.46267	15.551207	15.770066	.00000000E+00	-.11368684E-12	.13130830E-10
10	-1509.6843	165.49329	20.232101	.43520743E-13	-.45474735E-12	-.46895821E-10
12	-557.41371	170.25445	21.949821	.00000000E+00	-.11368684E-12	-.14210855E-11

MINIMUMS ELEMENT VALUE	2	2	4	2	10	10
	-3247.5102	15.550083	4.6475311	-.39968029E-14	-.45474735E-12	-.46895821E-10

MAXIMUMS ELEMENT VALUE	6	12	12	10	2	8
	-412.75882	170.25445	21.949821	.43520743E-13	.79580786E-12	.13130830E-10

ESEL FOR LABEL= TYPE FROM 4 TO 4 BY 1

24 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-174

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1264 AUG 1, 1995 CP= 1.290

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
99	25800.	-95.919	-1521.0	-311.85	63.635	6572.5	-47702.
97	25664.	280.78	-1523.1	-282.65	152.92	6590.3	-47703.
87	19232.	-473.43	1059.8	5.7143	-32.683	-130.31	40000.

MINIMUMS ELEMENT VALUE	87	87	97	99	87	87	97
19232.	-473.43	-1523.1	-311.85	-32.683	-130.31	-47703.	

MAXIMUMS ELEMENT VALUE	99	97	87	87	97	97	87
25800.	280.78	1059.8	5.7143	152.92	6590.3	40000.	

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-175

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
97	-25880.	280.78	-1523.1	-282.65	152.92	6590.3	-47703.
99	-25726.	-95.919	-1521.0	-311.85	63.635	6572.5	-47702.
87	-18867.	-473.43	1059.8	5.7143	-32.683	-130.31	40000.

MINIMUMS
 ELEMENT 97
 VALUE -25880. -473.43 -1523.1 -311.85 -32.683 -130.31 -47703.

MAXIMUMS
 ELEMENT 87
 VALUE -18867. 280.78 1059.8 5.7143 152.92 6590.3 40000.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1244 AUG 1, 1995 CP= 1.300

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

	JSG1	JFX	JLY	JFZ	JHX	JHY	JMZ
98	25870.	275.92	-1479.0	-288.15	-63.635	-6572.5	47702.
96	23793.	123.06	-114.21	-356.85	.00000E+00	-37907.	12116.
MINIMUMS							
ELEMENT	80	96	98	80	96	80	80
VALUE	23793.	-100.78	-1479.0	-356.85	-152.92	-37907.	12116.
MAXIMUMS							
ELEMENT	98	98	80	98	80	98	96
VALUE	25870.	275.92	-114.21	-288.15	.00000E+00	-6572.5	47703.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-177

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DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1264 AUG 1, 1995 CP= 1.300

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JHZ
96	-25811.	-100.78	-1476.9	-317.35	-152.92	-6590.3	47703.
98	-25657.	275.92	-1479.0	-288.15	-63.635	-6572.5	47702.
80	-23698.	123.06	-114.21	-356.85	.00000E+00	-37907.	12116.

MINIMUMS ELEMENT VALUE	96	96	98	80	96	80	80
	-25811.	-100.78	-1479.0	-356.85	-152.92	-37907.	12116.

MAXIMUMS ELEMENT VALUE	80	98	80	98	80	98	96
	-23698.	275.92	-114.21	-288.15	.00000E+00	-6572.5	47703.

ESEL FOR LABEL= ELEM FROM 88 TO 99 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-178

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DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z
 15.1264 AUG 1, 1995 CP= 1.310

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JHX	JHY	JHZ
88	-147.24721	-1195.4605	-4.2970281	-15276.295	-846.47289	24099.858
89	-439.58983	376.10296	-287.98879	84.733712	-2910.7437	14773.912
90	-760.98580	1944.8349	-194.93391	15360.212	-1239.7892	-31754.204
91	-171.57333	-1133.3274	199.59702	13552.141	3443.2828	23543.862
92	-498.62335	392.07229	297.47199	83.826197	4349.1719	14124.533
93	-796.32618	1918.8344	18.688457	-13470.889	-554.87215	-31652.302
94	-387.20166	60.097257	28.603173	-116.78947	1148.3702	-7076.5108
95	-181.84586	111.02202	24.525472	-23.592143	1009.3696	58.997748
96	-100.78337	-1476.9181	-317.35370	-152.92486	-6590.3014	47702.734
97	-282.59010	1553.1992	288.66977	-152.92486	5121.6781	-15361.029
98	275.91921	-1479.0151	-288.15343	-63.634902	-6572.5135	47702.309
99	94.112480	1551.1023	317.87004	-63.634902	6336.6771	-15275.478

MINIMUMS
 ELEMENT
 VALUE

93	-796.32618
98	-1479.0151
96	-317.35370
88	-15276.295

MAXIMUMS
 ELEMENT
 VALUE

98	275.91921
90	1944.8349
99	317.87004
90	15360.212
99	6336.6771
96	47702.734

ESEL FOR LABEL= ELEM FROM 76 TO 82 BY 2

4 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g:x + .2g:-z

15.1264 AUG 1, 1995 CP= 1.320

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
76	756.41837	94.384796	370.34088	.00000000E+00	-.17791990E-10	.61817218E-11
78	3503.0353	92.188570	329.68088	.00000000E+00	-.10516032E-10	.52722271E-11
80	-46.664194	118.79083	372.13150	.00000000E+00	-.10516032E-10	.84554586E-11
82	2999.7314	115.97647	332.35091	.00000000E+00	-.86970431E-11	.25437430E-11

MINIMUMS ELEMENT VALUE	80	78	78	76	76	82
	-46.664194	92.188570	329.68088	.00000000E+00	-.17791990E-10	.25437430E-11

MAXIMUMS ELEMENT VALUE	78	80	80	76	82	80
	3503.0353	118.79083	372.13150	.00000000E+00	-.86970431E-11	.84554586E-11

ESEL FOR LABEL= TYPE FROM 5 TO 5 BY 1

11 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

101

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15.1264 AUG 1, 1995 CP= 1.330

WORK UP PLATE-OR SEISMIC ANALYSIS DL + .06gin + .29"-z

***** POST1 ELEMENT STRESS LISTING *****

STEP 3 ITERATION 1 STARTED 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	ISZ
20	4000.3	-169.55	-260.03	37.245	-37273	-473.90	-14263.
19	2733.4	55.939	-186.23	-40.527	-17747	730.61	-7315.6
21	5133.6	-146.04	-656.21	-41.772	-37873	805.99	-4175.6

MINIMUMS	21	20	21	21	20	20	20
ELEMENT	2133.6	169.55	456.21	-41.792	-37873	-473.90	-14263.
VALUE							

MAXIMUMS	20	19	19	20	19	21	21
ELEMENT	4000.3	55.939	-186.23	37.245	-17747	805.99	-4175.6
VALUE							

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISEZ	IFX	IFY	IFZ	IMX	IMY	IMZ
20	-3859.0	-169.55	-260.03	37.245	-37873	-478.90	-14263.
19	-2780.0	55.939	-186.23	-40.827	-17747	780.61	-7315.6
21	-2011.9	-146.04	-656.21	-41.792	-37873	805.99	-4175.6

MINIMUMS
 ELEMENT 20
 VALUE -3859.0 -169.55 -260.03 -37873

MAXIMUMS
 ELEMENT 21
 VALUE -2011.9 55.939 -186.23 37.245

SORT ON JSG1 ORDER= 0 KAES= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      5  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
21	5925.6	144.53	681.40	46.829	.37873	833.49	-20570.
18	2742.5	-33.939	-184.77	-33.173	.17747	-780.61	7315.6
20	2142.8	168.04	285.21	-32.208	.37873	-805.99	4175.6
MINIMUMS							
ELEMENT	20	18	18	18	18	20	21
VALUE	2142.8	-33.939	-184.77	-33.173	.17747	-805.99	-20570.
MAXIMUMS							
ELEMENT	21	20	21	21	21	21	18
VALUE	5925.6	168.04	681.40	46.829	.37873	833.49	7315.6

```
SORT ON JSG3 ORDER=0 KAE5=1 NHAX=3
```

3 VALUES.
SORT COMPLETED FOR

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g: x + .2g: -z 15.1264 AUG 1, 1995 CP= 1.340

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSE3	JFX	JFY	JFZ	JMX	JMY	JMZ
21	-5805.1	144.53	681.40	46.829	.37873	833.49	-20570.
18	-2770.8	-33.939	-184.77	-33.173	.17747	-780.61	7315.6
20	-2002.7	168.04	285.21	-32.208	.37873	-805.99	4175.6

MINIMUMS	18
ELEMENT	21
VALUE	-5805.1
	-33.939
	-184.77
	-33.173
	.17747
	-805.99
	-20570.

MAXIMUMS	20
ELEMENT	20
VALUE	-2002.7
	168.04
	285.21
	46.829
	.37873
	833.49
	7315.6

ESEL FOR LABEL= ELEM FROM 18 TO 22 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL, COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

7-1-85

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .04g:x + .2g:-z
 15.1264 AUG 1,1995 CP= 1.340

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
18	32.428292	209.95222	38.209583	-1.17746853	-539.96137	-13.290002
22	-19.088080	116.00997	11.517563	-78544782	22.586949	20.110934

MINIMUMS	22	22	22	22	18	18
ELEMENT						
VALUE	-19.088080	116.00997	11.517563	-78544782	-539.96137	-13.290002

MAXIMUMS	18	18	18	18	22	22
ELEMENT						
VALUE	32.428292	209.95222	38.209583	-1.17746853	22.586949	20.110934

ESEL FOR LABEL= ELEM FROM 19 TO 23 BY 4

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MCK-UP PLATFORM SEISMIC ANALYSIS DL + .06g*x + .2g*-z 15.1264 AUG 1, 1995 CP= 1.350

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 5 ITERATION= 1 SECTION= 1
TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JHX	JMY	JHZ
19	-57.450000	211.41827	45.864514	-17746853	823.19382	-40.953916
23	5.0463852	116.02414	35.289259	.78544782	571.70546	-20.465224

MINIUMS
ELEMENT 19 23
VALUE -57.450000 116.02414 35.289259 .17746853 19 23
-40.953916

MAXIMUMS
ELEMENT 23 19
VALUE 5.0463852 211.41827 45.864514 .78544782 19 23
USE LOAD STEP 6 ITERATION 0 SECTION 1 FOR LOAD CASE 1 823.19382 -20.465224

DISPLACEMENT STORED FOR 72 NODES

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL IFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
IFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL IFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
IFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL IFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
IFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL IMX HAS NOT BEEN STORED FOR ALL ELEMENTS.
IMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL IMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
IMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL IMZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
IMZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL JFX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JFX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL JFY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JFY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639
DATA FOR STRESS LABEL JFZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JFZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO

***WARNING *** CP= 1.380 TIME= 15.12639

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DATA FOR STRESS LABEL JXZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL JMY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JMY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL JNZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JNZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL ISAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL ISBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL ISBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

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Accession #: D195067915

Document #: SD-WM-ER-521

Title/Desc:

STRUCTRUAL ANALYSIS DESIGN & EVALUATION OF MOCKUP
PLATFORM MONORAIL & TANK PLATE CUT OUT [SEC 3 OF
3]

Pages: 93

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-WM-ER-521

SECTION 3 OF 3

TITLE: STructural Analysis Design & Evaluation
of mock-up platform monorail; Tank Plate
CUT-OUT

DATE: 12-19-95

ORIGINATOR: T. S. Hundal

CO: _____

RECIPIENT: _____

CO: _____

REFERENCES: _____

***WARNING ***
DATA FOR STRESS LABEL JSAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSAX DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL JSBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBY DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL JSBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSBZ DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL ISG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL ISG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
ISG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL JSG1 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG1 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL JSG3 HAS NOT BEEN STORED FOR ALL ELEMENTS.
JSG3 DATA FOR TYPE 2. STIF 8. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL SAX HAS NOT BEEN STORED FOR ALL ELEMENTS.
SAX DATA FOR TYPE 1. STIF 4. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL SBY HAS NOT BEEN STORED FOR ALL ELEMENTS.
SBY DATA FOR TYPE 1. STIF 4. ELEMENTS WILL BE SET TO ZERO 15.12639

***WARNING ***
DATA FOR STRESS LABEL SBZ HAS NOT BEEN STORED FOR ALL ELEMENTS.
SBZ DATA FOR TYPE 1. STIF 4. ELEMENTS WILL BE SET TO ZERO 15.12639

STRESSES STORED FOR 23 SELECTED ITEMS

ITERATION SUMMARY INFORMATION STORED

MODAL FORCES STORED FOR 99 ELEMENTS

REACTIONS STORED FOR 18 REACTIONS

FOR LOAD STEP= 6 ITERATION= 1 SECTION= 1
TIME= .000000E+00 LOAD CASE= 1
TITLE= DOUBLE SHELL TANK MOCK-UP PLATFORM

NEW TITLE= DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g=y

USE MACRO FILE mres

ESEL FOR LABEL= TYPE FROM 1 TO 1 BY 1

36 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISHIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.400

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
62	4092.0	-23.932	-1794.5	-11.674	-1.8824	113.79	-54249.
54	4088.1	-1.1883	-195.79	1.9805	-1.8824	-113.79	-54249.
48	4069.6	-104.11	-220.63	-1.9717	1.5260	130.18	-53718.

MINIMUMS ELEMENT VALUE	48	48	62	62	62	54	62
VALUE	4069.6	-104.11	-1794.5	-11.674	-1.8824	-113.79	-54249.

MAXIMUMS ELEMENT VALUE	62	54	54	54	48	48	48
VALUE	4092.0	-1.1883	-195.79	1.9805	1.5260	130.18	-53718.

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-190

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.410

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
54	-4087.7	-1.1883	-195.79	1.9805	-1.8824	-113.79	-54249.
62	-4083.8	-23.932	-1794.5	-11.674	-1.8824	113.79	-54249.
48	-4034.1	-104.11	-220.63	-1.9717	1.5260	130.18	-53718.

MINIMUMS ELEMENT VALUE	54	48	62	62	62	54	62
	-4087.7	-104.11	-1794.5	-11.674	-1.8824	-113.79	-54249.

MAXIMUMS ELEMENT VALUE	48	54	54	54	48	48	48
	-4034.1	-1.1883	-195.79	1.9805	1.5260	130.18	-53718.

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-191

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
47	4073.5	126.94	-1767.3	-11.775	-1.5260	-130.18	53718.
54	3628.7	1.1883	246.72	-1.9805	1.8824	60.319	48275.
48	3560.0	104.11	271.56	1.9717	-1.5260	-76.942	47074.

MINIMUMS							
ELEMENT	48	54	47	47	48	47	48
VALUE	3560.0	1.1883	-1767.3	-11.775	-1.5260	-130.18	47074.

MAXIMUMS							
ELEMENT	47	47	48	48	54	54	47
VALUE	4073.5	126.94	271.56	1.9717	1.8824	60.319	53718.

SORT ON JSG3 ORDER= 0 KARS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y
 15.1264 AUG 1, 1995 CP= 1.420

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
47	-4030.2	126.94	-1767.3	-11.775	-1.5260	-130.18	53718.
54	-3628.3	1.1883	246.72	-1.9805	1.8824	60.319	48275.
48	-3524.5	104.11	271.56	1.9717	-1.5260	-76.942	47074.

MINIMUMS ELEMENT VALUE	47	54	47	47	48	47	48
	-4030.2	1.1883	-1767.3	-11.775	-1.5260	-130.18	47074.

MAXIMUMS ELEMENT VALUE	48	47	48	48	54	54	47
	-3524.5	126.94	271.56	1.9717	1.8824	60.319	53718.

ESEL FOR LABEL= ELEM FROM 56 TO 62 BY 1

7 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.420

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
56	126.85410	2488.3528	15.651208	-1.5259924	185.91784	-145.69591
57	13.267052	250.57241	-.23501245	-1.2096228	-.47823143	144.11405
58	-2.7511181	238.07824	-.20272044	.42203513	-14.203082	187.97145
59	24.013928	2512.2200	-15.752305	1.8823911	-204.06008	-409.82433
60	13.267052	250.46046	-.23501245	-1.2096228	-26.313188	150.49569
61	-2.7511181	237.95463	-.20272044	.42203513	-8.9070480	195.01714
62	23.931812	1851.0694	11.674161	1.8823911	236.43231	-434.02819

MINIMUMS ELEMENT VALUE	58	61	59	56	59	62
	-2.7511181	237.95463	-15.752305	-1.5259924	-204.06008	-434.02819

MAXIMUMS ELEMENT VALUE	56	59	56	62	62	61
	126.85410	2512.2200	15.651208	1.8823911	236.43231	195.01714

ESEL FOR LABEL= ELEM FROM 64 TO 67 BY 3

2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-194

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.430

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JHZ
64	116.72473	201.40631	.64755355	1.5748589	44.948667	237.80790
67	11.215114	193.56882	1.3777086	-5.3850114	70.643091	-2.3666234
MINIMUMS						
ELEMENT	67	67	64	67	64	67
VALUE	11.215114	193.56882	.64755355	-5.3850114	44.948667	-2.3666234
MAXIMUMS						
ELEMENT	64	64	67	64	67	64
VALUE	116.72473	201.40631	1.3777086	1.5748589	70.643091	237.80790

ESEL FOR LABEL= ELEM FROM 69 TO 69 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-195

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .1339:Y 15.1264 AUG 1, 1995 CP= 1.430

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	69	JFX	JFY	JFZ	JHX	JHY	JHZ
		-2.2707525	138.61800	2.1272412	6.0817708	110.47891	4.1316994
MINIMUMS							
ELEMENT	69						
VALUE		-2.2707525	138.61800	2.1272412	6.0817708	110.47891	4.1316994
MAXIMUMS							
ELEMENT	69						
VALUE		-2.2707525	138.61800	2.1272412	6.0817708	110.47891	4.1316994

ESEL: FOR LABEL= ELEM FROM 47 TO 47 BY 1

1 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:Y 15.1264 AUG 1, 1995 CP= 1.440

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
47	-126.93622	1823.9366	11.775258	1.5259924	-223.08158	151.05762
MINIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	-126.93622	1823.9366	11.775258	1.5259924	-223.08158	151.05762
MAXIMUMS						
ELEMENT	47	47	47	47	47	47
VALUE	-126.93622	1823.9366	11.775258	1.5259924	-223.08158	151.05762

ESEL FOR LABEL= ELEM FROM 63 TO 65 BY 2
 2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

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DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g=y 15.1264 AUG 1, 1995 CP= 1.440

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
63	-116.72473	201.62656	-64755355	-1.5748589	28.872438	-225.25395
65	-11.800218	262.73022	-3.4315405	-16.780375	127.15286	5.6115844

MINIMUMS	63	65
ELEMENT	-116.72473	201.62656
VALUE		

MAXIMUMS	63	65
ELEMENT	-11.800218	262.73022
VALUE		

1 ELEMENTS (63 65) (2) FROM 68 TO 68 BY 1

1 ELEMENTS (63 65) (2) FROM 68 TO 68 BY 1

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      6  ITERATION=      1  SECTION=      1
TIME=.00000E+00  LOAD CASE=      1
```

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
68	2.8558559	207.70924	-.73409347E-01	16.788589	62.034247	-3.7923703
MINIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	2.8558559	207.70924	-.73409347E-01	16.788589	62.034247	-3.7923703
MAXIMUMS						
ELEMENT	68	68	68	68	68	68
VALUE	2.8558559	207.70924	-.73409347E-01	16.788589	62.034247	-3.7923703

```

ESEL FOR LABEL= TYPE FROM 2 TO 2 BY 1
16 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.
SORT ON SAX ORDER= 0 KARS= 1 NMAX= 3
SORT COMPLETED FOR 3 VALUES.
PRINT ELEMENT STRESS ITEMS PER ELEMENT

```

A-199

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15.1264 AUG 1, 1995 CP= 1.450

DST KOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:Y

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM SAX
 26 -321.23164
 32 -314.86551
 27 -263.34868
 MINIMUMS
 ELEMENT 26
 VALUE -321.23164

MAXIMUMS
 ELEMENT 27
 VALUE -263.34868

ESEL FOR LABEL= TYPE FROM 3 TO 3 BY 1
 12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT REACTION FORCES PER NODE

BST ROCK UP PLATFORM SEISMIC ANALYSIS PL # 1133g:y

15.1264 AUG 1, 1995 CP= 1.460

***** POST1 REACTION FORCE LIST *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

THE FOLLOWING X,Y,Z FORCES ARE IN GLOBAL COORDINATES

NODE	FX	FY	FZ	MX	MY	HZ
1	.62280521E-04	2950.4264	161.93357	.00000000E+00	.00000000E+00	.00000000E+00
2	-.62280521E-04	3674.1418	-163.52626	.00000000E+00	.00000000E+00	.00000000E+00
3	15.803209	3843.9026	211.57049	.00000000E+00	.00000000E+00	.00000000E+00
4	2.3188905	4227.6729	-202.59678	.00000000E+00	.00000000E+00	.00000000E+00
5	-12.395212	1083.5757	50.920817	.00000000E+00	.00000000E+00	.00000000E+00
6	-5.7268875	936.20647	-58.301839	.00000000E+00	.00000000E+00	.00000000E+00
TOTAL	-.10211743E-09	16715.926	-.15285904E-09	.00000000E+00	.00000000E+00	.00000000E+00

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-201

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DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y
 15.1264 AUG 1, 1995 CP= 1.460

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG1	IFX	IFY	IFZ	IMX	IMY	IMZ
9	-678.10	3980.4	-2.3189	-7.0207	.00000E+00	.00000E+00	-.11369E-12
3	-611.95	3592.2	-15.803	12.040	.00000E+00	.22737E-12	-.11369E-12
7	-590.43	3465.8	.62281E-04	-2.3412	.00000E+00	-.28422E-13	.00000E+00
MINIMUMS							
ELEMENT	9	7	3	9	9	7	9
VALUE	-678.10	3465.8	-15.803	-7.0207	.00000E+00	-.28422E-13	-.11369E-12
MAXIMUMS							
ELEMENT	7	9	7	3	9	3	7
VALUE	-590.43	3980.4	.62281E-04	12.040	.00000E+00	.22737E-12	.00000E+00

SORT ON ISG3 ORDER= 0 KAPS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-202

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DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y
 15.1264 AUG 1,1995 CP= 1.470

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISL3	IFX	IFY	IFZ	IMX	IMY	IMZ
4	-923.71	2689.2	-14.059	10.933	.83267E-16	-1443.2	-1855.8
10	-837.50	3608.6	2.2333	-6.7173	.13678E-14	886.68	294.79
9	-678.10	3980.4	-2.5189	-7.0207	.00000E+00	.00000E+00	-.11369E-12

MINIMUMS	4	4	9	4	9	4	4
ELEMENT	4	4	9	4	9	4	4
VALUE	-923.71	2689.2	-14.059	-7.0207	.00000E+00	-1443.2	-1855.8

MAXIMUMS	9	9	10	4	10	10	10
ELEMENT	9	9	10	4	10	10	10
VALUE	-678.10	3980.4	2.2333	10.933	.13678E-14	886.68	294.79

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-203

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.470

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 3 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
10	-572.34	-3359.6	-2.2333	6.7173	-.13878E-14	.11369E-12	.20464E-11
8	-493.08	-2894.4	-.62281E-04	2.3238	.00000E+00	-.56843E-13	.00000E+00
7	-480.62	-3222.5	-.62281E-04	2.3412	.00000E+00	302.02	.80342E-02
MINIMUMS							
ELEMENT	10	10	10	8	10	8	8
VALUE	-572.34	-3359.6	-2.2333	2.3238	-.13878E-14	-.56843E-13	.00000E+00
MAXIMUMS							
ELEMENT	7	8	8	10	8	7	7
VALUE	-480.62	-2894.4	-.62281E-04	6.7173	.00000E+00	302.02	.80342E-02

SORT ON JSG3 ORDER= 0 KABS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-204

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 Rev. 0

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A-205

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.480

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
2	-2176.5043	.62280521E-04	-1.9952046	.24980018E-15	-.14210855E-13	-.45474735E-12
4	-2440.1846	14.059336	-10.933418	-.83246727E-16	-.11368684E-12	.18189894E-11
6	96.129645	-12.665600	-11.147680	.00000000E+00	-.11368684E-12	-.45474735E-12
8	-2894.3904	-.62280521E-04	2.3238039	.00000000E+00	-.56843419E-13	.00000000E+00
10	-3359.6107	-2.2332647	6.7172933	-.13877788E-14	.11368684E-12	.20463631E-11
12	-202.50294	5.5657091	6.7302792	.00000000E+00	.00000000E+00	-.45474735E-12

MINIMUMS ELEMENT VALUE	10	6	6	10	4	2
	-3359.6107	-12.665600	-11.147680	-.13877788E-14	-.11368684E-12	-.45474735E-12

MAXIMUMS ELEMENT VALUE	6	4	12	2	10	10
	96.129645	14.059336	6.7302792	.24980018E-15	.11368684E-12	.20463631E-11

ESEL FOR LABEL= TYPE FROM 4 TO 4 BY 1

24 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-206

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      6  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

ELEM	ISL1	IFX	IFY	IFZ	IMX	IMY	IMZ
99	25659.	2.7560	-1699.5	-.11850	-4.6353	-10.080	-54047.
97	25659.	2.7571	-1697.5	-.11850	-4.6295	10.081	-54047.
90	10109.	529.54	-1744.4	2.9842	-16330.	-45.150	-21681.

MINIMUMS	90	99	90	97	90	99
ELEMENT	10109.	2.7560	-1744.4	-11850	-16330.	-45.150
VALUE						-54047.

MAXIMUMS	99	90	97	90	97	90
ELEMENT	25659.	529.54	-1699.5	2.9842	-4.6295	10.081
VALUE						-21681.

```

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

```

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

***** FOST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      6  ITERATION=      1  SECTION=      1
TIME=.00000E+00  LOAD CASE=      1
```

ELEM	ISG3	IFX	IFY	IFZ	IMX	IMY	IMZ
99	-25661.	2.7560	-1699.5	-.11850	-4.6353	-10.080	-54047.
97	-25661.	2.7571	-1699.5	.11850	-4.6295	10.081	-54047.
90	-10517.	529.54	-1744.4	2.9842	-16330.	-45.150	-21681.

MINIMUMS							
ELEMENT	99						
VALUE	-25661.	99	90	97	90	90	99
		2.7560	-1744.4	-.11850	-16330.	-45.150	-54047.

MAXIMUMS							
ELEMENT	90						
VALUE	-10517.	90	97	90	97	90	90
		529.54	-1699.5	2.9842	-4.6295	10.081	-21681.

```

SORT=ON JSG1 ORDER=0 KABS=1 NHAX=
3

```

3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.500

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JHY	JMZ
98	25659.	-2.7560	-1699.5	.11850	4.6353	10.080	54047.
96	25659.	-2.7571	-1699.5	.11850	4.6295	-10.081	54047.
81	14939.	-1798.7	325.49	529.63	6.9090	20422.	-12513.

MINIMUMS ELEMENT VALUE	81	81	96	98	96	96	81
	14939.	-1798.7	-1699.5	.11850	4.6295	-10.081	-12513.

MAXIMUMS ELEMENT VALUE	98	98	81	81	81	81	98
	25659.	-2.7560	325.49	529.63	6.9090	20422.	54047.

SORT ON JSG3 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-209

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.500

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG3	JFX	JFY	JFZ	JMX	JMY	JMZ
98	-25661.	-2.7560	-1699.5	.11850	4.6353	10.080	54047.
96	-25661.	-2.7571	-1699.5	.11850	4.6295	-10.081	54047.
81	-16328.	-1798.7	325.49	529.63	6.9090	20422.	-12513.

MINIMUMS ELEMENT VALUE	98	81	96	98	96	96	81
	-25661.	-1798.7	-1699.5	.11850	4.6295	-10.081	-12513.

MAXIMUMS ELEMENT VALUE	81	98	81	81	81	81	98
	-16328.	-2.7560	325.49	529.63	6.9090	20422.	54047.

ESEL FOR LABEL= ELEM FROM 88 TO 99 BY 1

12 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-210

BEST AVAILABLE COPY

DST WOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y 15.1264 AUG 1, 1995 CP= 1.510

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IXX	IYY	IYZ
88	529.29846	1763.6158	-2.5288918	16334.230	19.554779	20406.906
89	529.41696	10.063184	.22817777	3.6658415	-35.916251	-21684.811
90	529.53546	-1744.4107	2.9841989	-16330.499	-45.150328	-21680.943
91	529.54242	1764.3853	2.9846848	-16330.656	-26.474355	20424.645
92	529.42392	10.743442	.22761529	3.5641187	30.218689	-21676.279
93	529.30542	-1743.6416	-2.5284059	16334.088	41.130681	-21680.147
94	322.50239	-33.925334	.87601481E-01	-3.0083507	12.382037	3833.4574
95	322.46247	32.925184	-.87595368E-01	-3.0281372	-12.380290	-3833.6454
96	2.7570695	1733.6675	-.11850023	-4.6295201	14.939392	16334.220
97	2.7570695	-1699.4554	-.11850023	-4.6295201	10.080802	-54046.626
98	2.7560212	1733.5785	-.11849892	-4.6352591	-5.2216096	16330.524
99	2.7560212	-1699.5444	-.11849892	-4.6352591	-10.080065	-54046.674

ELEM	IFX	IFY	IFZ	IXX	IYY	IYZ
93	2.7560212	-1744.4107	-2.5288918	16334.230	19.554779	20406.906
91	529.54242	1764.3853	2.9846848	-16330.499	-45.150328	-21680.943

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.510

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
88	-529.29846	-1743.6415	2.5288918	-16334.230	41.138623	21680.182
89	-529.41696	10.743442	-.22817777	-3.6658415	30.211806	21676.308
90	-529.53546	1764.3851	-2.9841989	16330.499	-26.470447	-20424.606
91	-529.54242	-1744.4109	-2.9846848	16330.656	-45.158081	21680.909
92	-529.42392	10.063184	-.22761529	-3.5641187	-35.909071	21684.782
93	-529.30542	1763.6160	2.5284059	-16334.088	19.551061	-20406.945
94	-322.50239	-34.320401	-.87601481E-01	3.0083507	-19.565358	-3817.2596
95	-322.46247	34.320551	.87595368E-01	3.0281372	19.563110	3817.4353
96	-2.7570695	-1699.5446	.11850023	4.6295201	-10.080882	54046.626
97	-2.7570695	1733.5783	.11850023	4.6295201	-5.2223729	-16330.564
98	-2.7560212	-1699.4556	.11849892	4.6352591	10.080065	54046.674
99	-2.7560212	1733.6673	.11849892	4.6352591	14.938521	-16334.165

MINIMUMS ELEMENT VALUE	91	91	91	88	91	90
VALUE	-529.54242	-1744.4109	-2.9846848	-16334.230	-45.158081	-20424.606

MAXIMUMS ELEMENT VALUE	98	90	88	91	88	98
VALUE	-2.7560212	1764.3851	2.5288918	16330.656	41.138623	54046.674

ESEL FOR LABEL= ELEM FROM 76 TO 82 BY 2

4 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-212

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:y

15.1264 AUG 1, 1995 CP= 1.520

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .000000E+00 LOAD CASE= 1

ELEM	IFX	IFY	IFZ	IMX	IMY	IMZ
76	1987.9824	-13.771795	22.825627	.000000000E+00	.22737368E-12	.000000000E+00
78	1990.2741	-13.654672	-22.743510	.000000000E+00	.000000000E+00	-.22737368E-12
80	1990.2741	13.679554	22.747805	.000000000E+00	-.34106051E-12	.000000000E+00
82	1987.9824	13.746912	-22.829922	.000000000E+00	.000000000E+00	-.11368684E-12

MINIMUMS ELEMENT VALUE	82	76	82	76	80	78
VALUE	1987.9824	-13.771795	-22.829922	.000000000E+00	-.34106051E-12	-.22737368E-12

MAXIMUMS ELEMENT VALUE	80	82	76	76	76	76
VALUE	1990.2741	13.746912	22.825627	.000000000E+00	.22737368E-12	.000000000E+00

ESEL FOR LABEL= TYPE FROM 5 TO 5 BY 1

11 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

SORT ON ISG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-213

DST MOCK-UP PLATFORM SEISMIC ANALYSIS	DL	+ .133g=y			
			15.1264	AUG	1,1995 CP=
					1.530

***** POST1 ELEMENT STRESS LISTING *****

```
LOAD STEP      6  ITERATION=      1  SECTION=      1
TIME=.00000E+00  LOAD CASE=      1
```

ELEM	ISG1	IFX	IFY	IFZ	IXX	IYY	IZZ	IMZ
19	1900.3	-78222	-209.99	-20483	.43624E-01	-2.3912	-8282.2	IMZ
21	1115.8	-73.508	-201.58	-11193	.37822E-01	1.9978	-4726.7	
20	928.30	-73.508	246.95	-11193	.37822E-01	6.1392	3882.7	
MINIMUMS								
ELEMENT	20	20	19	19	20	19	19	
VALUE	928.30	-73.508	-209.99	-20483	.37822E-01	-2.3912	-8282.2	
MAXIMUMS								
ELEMENT	19	19	20	20	19	20	20	
VALUE	1900.3	-78222	246.95	-11193	.43624E-01	6.1392	3882.7	

```

SORT ON ISG3 ORDER= 0 KABS= 1 NMAX= 3

```

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST MOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g+y

15.1264 AUG 1, 1995 CP= 1.530

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	ISG3	IFX	IFY	IFZ	IMX	IHY	IMZ
19	-1899.7	-.78222	-209.99	-.20483	.43624E-01	-2.3912	-8282.2
21	-1054.6	-73.508	-201.58	-.11193	.37822E-01	1.9978	-4726.7
20	-867.05	-73.508	246.95	-.11193	.37822E-01	6.1392	3882.7

MINIMUMS ELEMENT VALUE	19	20	19	19	20	19	19
	-1899.7	-73.508	-209.99	-.20483	.37822E-01	-2.3912	-8282.2

MAXIMUMS ELEMENT VALUE	20	19	20	20	19	20	20
	-867.05	-.78222	246.95	-.11193	.43624E-01	6.1392	3882.7

SORT ON JSG1 ORDER= 0 KABS= 1 NMAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

A-215

BEST AVAILABLE COPY

MHC-SD-WM-ER-521
 Rev. 0

DST HOCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:Y 15.1264 AUG 1, 1995 CP= 1.540

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JSG1	JFX	JFY	JFZ	JMX	JMY	JMZ
18	1900.3	.78222	-210.01	.20483	-.43624E-01	2.3912	8282.2
20	1115.8	73.508	-218.42	.11193	-.37822E-01	-1.9978	4726.7
14	870.69	355.61	-22.799	.85905E-01	4.3459	7.4738	3109.8

MINIMUMS	14	18	20
ELEMENT	14	18	20
VALUE	870.69	.78222	-218.42

MAXIMUMS	14	18	20
ELEMENT	18	14	14
VALUE	1900.3	355.61	-22.799

SORT ON JSG3 ORDER= 0 KABS= 1 NHAX= 3

SORT COMPLETED FOR 3 VALUES.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:Y
 15.1264 AUG 1, 1995 CP= 1.540

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP		6		ITERATION=		1		SECTION=		1	
TIME=		.00000E+00		LOAD CASE=		1					
ELEM		JSG3	JFX	JFY	JFZ	JWX	JMY	JMZ			
18		-1899.7	.78222	-210.01	.20483	-.43624E-01	2.3912	8282.2			
20		-1054.6	73.508	-218.42	.11193	-.37822E-01	-1.9978	4726.7			
16		-726.44	52.707	-22.930	-.29152	-4.0949	-25.362	3114.6			
MINIMUMS											
ELEMENT	18		18	20	16	16	16	16			
VALUE	-1899.7		.78222	-218.42	-.29152	-4.0949	-25.362	3114.6			
MAXIMUMS											
ELEMENT	16		20	16	18	20	18	18			
VALUE	-726.44		73.508	-22.930	.20483	-.37822E-01	2.3912	8282.2			
ESEL FOR LABEL= ELEM FROM 18 TO 22 BY 4											
2 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.											
PRINT ELEMENT STRESS ITEMS PER ELEMENT											

DL + .133g:y	15.1264	AUG	1,1995	CP=	1.550
DST ROCK-UP PLATFORM SEISMIC ANALYSIS					

```
***** POST1 ELEMENT STRESS LISTING *****
```

```
LOAD STEP      6  ITERATION=      1  SECTION=      1
TIME=          .00000E+00  LOAD CASE=      1
```

ELEM	IFX	IFY	IFZ	IXX	INY	IWZ
18	-78221506	238.54611	-20482545	.43624132E-01	5.1873526	16.082957
22	-2.0538318	131.26617	.58510337	-.96979062	-14.716388	22.165386

MINIMUMS	22	22	19	22	22	18
ELEMENT	-2.0538318	131.26617	-20482545	-96979062	-14716288	16.082957
VALUE						

MAXIMUMS	18	22	18	22
ELEMENT	-782221506	238.54611	.43624132E-01	5.1873526
VALUE				22.145386

```

ESEL FOR LABEL=ELEM FROM 19 TO 23 BY 4

```

22 ELEMENTS (OF 99 DEFINED) SELECTED BY ESEL COMMAND.

PRINT ELEMENT STRESS ITEMS PER ELEMENT

DST ROCK-UP PLATFORM SEISMIC ANALYSIS DL + .133g:Y 15.1264 AUG 1, 1995 CP= 1.550

***** POST1 ELEMENT STRESS LISTING *****

LOAD STEP 6 ITERATION= 1 SECTION= 1
 TIME= .00000E+00 LOAD CASE= 1

ELEM	JFX	JFY	JFZ	JMX	JMY	JMZ
19	.78221506	238.52350	.20482545	-.43624132E-01	9.9697303	-15.246403
23	2.0538318	131.29437	-.58510337	.96979062	-14.538880	-22.870360
MINIMUMS						
ELEMENT	19	23	23	19	23	23
VALUE	.78221506	131.29437	-.58510337	-.43624132E-01	-14.538880	-22.870360
MAXIMUMS						
ELEMENT	23	19	19	23	19	19
VALUE	2.0538318	238.52350	.20482545	.96979062	9.9697303	-15.246403

A.4 SUMMARY OF OUTPUT RESULTS

LOAD CASE NUMBERS: (1-6) Maximum Enveloped Force Values
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	6311	864	3948	396	325	9174	83374
L2x2x1/4	2	-----	-2410*	-----	-----	-----	-----	-----
W6x20 Col	3	9083	6332	781	39	-	2711	103500
TS3x3x1/4	4	25880	2095	1745	595	5	10	54047
						16330	37907	12116
C6x8.2	5	14435	356	1756	65	51	871	60348

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	565	3984	409	50	9174	604
L2x2x1/4	2	-2261	-----	-----	-----	-----	-----
TS3x3x1/4	4	3503	1958	372	16334	6590	32063
C6x8.2	5	247	1756	170	51	898	59383

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6) (GLOBAL COORD. SYSTEM)

Fx = 828 lbs Fy = +7177 lbs , -4476 lbs Fz = 801 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2, 4,6,8,10,12

fx = -5623 lbs, +1624 lbs fy = 600 lbs fz = 26 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3503 lbs fy = 366 lbs fz = 372 lbs

LOAD CASE NUMBER: (1) Static [DL + LL]
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	5559	154	2129	11	-	95	74000
L2x2x1/4	2	-----	-524*	-----	-----	-----	-----	-----
W6x20 Col	3	1897	6221	30	21	--	2711	3903
TS3x3x1/4	4	22649	1592	1500	469	39	18068	47702
C6x8.2	5	3893	124	485	-	7	7	16973

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	207	2774	14	50	224	317
L2x2x1/4	2	-491	-----	-----	-----	-----	-----
TS3x3x1/4	4	468	1560	4	14430	55	19138
C6x8.2	5	124	485	-	7	12	7709

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6)
(GLOBAL COORDINATE SYSTEM)

Fx = 30 lbs Fy = 6612 lbs Fz = 343 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem.2,4,6,8,10,12

fx = -5623 lbs , +294 lbs fy = 29 lbs fz = 20 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 1765 lbs fy = 12 lbs fz = 20 lbs

LOAD CASE NUMBER: (2) Seismic [DL + .2g (x) + .06g (z)]
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	5769	864	3945	341	325	2426	69481
L2x2x1/4	2	-----	-2410*	-----	-----	-----	-----	-----
W6x20 Col	3	8920	5340	772	18	--	1546	102300
TS3x3x1/4	4	24201	2092	1576	594	476	23172	47703
C6x8.2	5	14234	128	1731	65	50	870	59383

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	338	3984	405	7	8500	604
L2x2x1/4	2	-2261	-----	-----	-----	-----	-----
TS3x3x1/4	4	603	1765	359	17533	4046	23507
C6x8.2	5	128	1731	65	50	803	59383

**MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6)
(GLOBAL COORDINATE SYSTEM)**

Fx = 819 lbs Fy = +5868 lbs, -1251lbs Fz = 389 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem.2,4,6,8,10,12

fx = -2932 lbs fy = 600 lbs fz = 15 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3488 lbs fy = 365 lbs fz = 128 lbs

LOAD CASE NUMBER: (3) Sesmic [DL + .2g (-x) + .06g (z)]
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	5967	562	3948	396	-	9174	69064
L2x2x1/4	2	-----	-2356*	-----	-----	-----	-----	-----
W6x20 Col	3	9083	6332	781	18	-	1504	103500
TS3x3x1/4	4	24235	2095	1576	595	475	1966	47702
C6x8.2	5	14435	249	1756	65	51	865	60348

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	565	3966	409	10	9174	219
L2x2x1/4	2	-2210	-----	-----	-----	-----	-----
TS3x3x1/4	4	603	1767	360	17543	3599	23554
C6x8.2	5	247	1756	65	51	828	54033

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6)
(GLOBAL COORDINATE SYSTEM)

Fx = 828 lbs Fy = +7177 lbs, -4476 lbs Fz = 550 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem.2,4,6,8,10,12

fx = -4225 lbs, +1624 lbs fy = 588 lbs fz = 14 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3495 lbs fy = 366 lbs fz = 128 lbs

LOAD CASE NUMBER: (4) Seismic [DL + .06g (x) + .2g (z)]
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	3146	379	3547	379	201	4304	38678
L2x2x1/4	2	-----	-1251*	-----	-----	-----	-----	-----
W6x20 Col	3	2974	5751	229	36	-	1918	30407
TS3x3x1/4	4	25870	491	1523	356	100	37784	47703
C6x8.2	5	5029	57	645	48	-	871	19207

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	390	3560	154	9	4552	380
L2x2x1/4	2	-1173	-----	-----	-----	-----	-----
TS3x3x1/4	4	792	1958	322	15340	6590	32063
C6x8.2	5	59	645	48	--	898	19207

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6)
(GLOBAL COORDINATE SYSTEM)

Fx = 243 lbs Fy = +6653 lbs, -1495 lbs Fz = 801 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem.2,4,6,8,10,12

fx = -4162 lbs fy = 194 lbs fz = 26 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3488 lbs fy = 365 lbs fz = 128 lbs

LOAD CASE NUMBER: (5) Seismic [DL + .06g (x) + .2g (-z)]
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	6311	358	2164	170	7	1951	83374
L2x2x1/4	2	-----	-1140*	-----	-----	-----	-----	-----
W6x20 Col	3	3169	4286	251	39	-	2287	33189
TS3x3x1/4	4	25880	473	1523	357	153	37907	47703
C6x8.2	5	5926	170	681	47	-	833	20570

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	407	2825	171	7	3686	344
L2x2x1/4	2	-1069	-----	-----	-----	-----	-----
TS3x3x1/4	4	3503	1945	372	13471	6545	31754
C6x8.2	5	57	211	170	-	823	20570

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6)
(GLOBAL COORDINATE SYSTEM)

Fx = 265 lbs Fy = +5292 lbs, -684 lbs Fz = 732 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem.2,4,6,8,10,12

fx = -3248 lbs fy = 170 lbs fz = 22 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3503 lbs fy = 119 lbs fz = 372 lbs

LOAD CASE NUMBER: (6) Seismic [DL + .133g (y)]
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	4092	127	1795	12	2	130	53718
L2x2x1/4	2	-----	-321*	-----	-----	-----	-----	-----
W6x20 Col	3	1075	3980	16	12	-	1553	2039
TS3x3x1/4	4	25661	1799	1745	530	16330	20422	54047
C6x8.2	5	1900	356	247	-	4	25	8282

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	127	2512	16	6	236	434
L2x2x1/4	2	-301	-----	-----	-----	-----	-----
TS3x3x1/4	4	530	1764	3	16334	45	20424
C6x8.2	5	74	247	-	-	15	3883

**MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6)
(GLOBAL COORDINATE SYSTEM)**

Fx = 16 lbs Fy = 4227 lbs Fz = 203 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem.2,4,6,8,10,12

fx = -3360 lbs fy = 14 lbs fz = 11lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 1990 lbs fy = 14 lbs fz = 23 lbs

APPENDIX B
DESIGN EVALUATION OF MEMBERS AND JOINTS

ANALYTICAL CALCULATIONS

Page ____ of ____

Subject DST MOCK-UP PLATFORM
 Originator Standal Date 8-10-95
 Checker F.R. VOLERT Date 12-7-95

SUMMARY

LOAD CASE NUMBER: (1-6) Maximum Enveloped Force Values
 Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	6311	864	3948	396	325	9174	83374
L2x2x1/4	2	-----	-2410*	-----	-----	-----	-----	-----
W6x20 Col	3	9083	6332	781	39	-	2711	103500
TS3x3x1/4	4	25880	2095	1745	595	5	10	54047
						16330	37907	12116
C6x8.2	5	14435	356	1756	65	51	871	60348

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	565	3984	409	50	9174	604
L2x2x1/4	2	-2261	-----	-----	-----	-----	-----
TS3x3x1/4	4	3503	1958	372	16334	6590	32063
C6x8.2	5	247	1756	170	51	898	59383

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6) (GLOBAL COORD. SYSTEM)

Fx = 828 lbs Fy = +7177 lbs , -4476 lbs Fz = 801 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2,4,6,8,10,12

fx = -5623 lbs, +1624 lbs fy = 600 lbs fz = 26 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3503 lbs fy = 366 lbs fz = 372 lbs

ANALYTICAL CALCULATIONS

Page ____ of ____

Subject DST MOCK-UP PLATFORM

Originator T. Stundal

Date 8-10-95

Checker E.R. Vauert

Date 12-5-95

LOAD CASE NUMBER: (1) Static [DL + LL]

Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	5559	154	2129	11	-	95	74000
L2x2x1/4	2	-----	-524*	-----	-----	-----	-----	-----
W6x20 Col	3	1897	6221	30	21	--	2711	3903
TS3x3x1/4	4	22649	1592	1500	469	39	18068	47702
C6x8.2	5	3893	124	485	-	7	7	16973

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	207	2774	14	50	224	317
L2x2x1/4	2	-491	-----	-----	-----	-----	-----
TS3x3x1/4	4	468	1560	4	14430	55	19138
C6x8.2	5	124	485	-	7	12	7709

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6) (GLOBAL COORDINATE SYSTEM)

Fx = 30 lbs

Fy = 6612 lbs

Fz = 343 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2,4,6,8,10,12

fx = -5623 lbs , +294 lbs

fy = 29 lbs

fz = 20 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 1765 lbs

fy = 12 lbs

fz = 20 lbs

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ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM
 Originator Standal Date 8-10-95
 Checker F.R. VOUERT Date 12-5-95

LOAD CASE NUMBER: (2) Seismic [DL + .2g (x) + .06g (z)]
 Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	5769	864	3945	341	325	2426	69481
L2x2x1/4	2	-----	-2410*	-----	-----	-----	-----	-----
W6x20 Col	3	8920	5340	772	18	--	1546	102300
TS3x3x1/4	4	24201	2092	1576	594	476	23172	47703
C6x8.2	5	14234	128	1731	65	50	870	59383

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	338	3984	405	7	8500	604
L2x2x1/4	2	-2261	-----	-----	-----	-----	-----
TS3x3x1/4	4	603	1765	359	17533	4046	23507
C6x8.2	5	128	1731	65	50	803	59383

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6) (GLOBAL COORDINATE SYSTEM)

Fx = 819 lbs Fy = +5868 lbs, -1251 lbs Fz = 389 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2,4,6,8,10,12

fx = -2932 lbs fy = 600 lbs fz = 15 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3488 lbs fy = 365 lbs fz = 128 lbs

ANALYTICAL CALCULATIONS

Page ____ of ____

Subject DST MOCK-UP PLATFORM
 Originator T. Stundel Date 8-10-95
 Checker E.R. VOLLERT Date 12-7-95

LOAD CASE NUMBER: (3) Seismic [DL + .2g (-x) + .06g (z)]
 Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	5967	562	3948	396	-	9174	69064
L2x2x1/4	2	-----	-2356*	-----	-----	-----	-----	-----
W6x20 Col	3	9083	6332	781	18	-	1504	103500
TS3x3x1/4	4	24235	2095	1576	595	475	1966	47702
C6x8.2	5	14435	249	1756	65	51	865	60348

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	565	3966	409	10	9174	219
L2x2x1/4	2	-2210	-----	-----	-----	-----	-----
TS3x3x1/4	4	603	1767	360	17543	3599	23554
C6x8.2	5	247	1756	65	51	828	54033

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6) (GLOBAL COORDINATE SYSTEM)

Fx = 828 lbs Fy = +7177 lbs, -4476 lbs Fz = 550 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2,4,6,8,10,12

fx = -4225 lbs, +1624 lbs fy = 588 lbs fz = 14 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3495 lbs fy = 366 lbs fz = 128 lbs

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM
 Originator Stendal Date 8-10-95
 Checker FRV Date 12-7-95

LOAD CASE NUMBER: (4) Seismic [DL + .06g (x) + .2g (z)]
 Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	3146	379	3547	379	201	4304	38678
L2x2x1/4	2	-----	-1251*	-----	-----	-----	-----	-----
W6x20 Col	3	2974	5751	229	36	-	1918	30407
TS3x3x1/4	4	25870	491	1523	356	100	37784	47703
C6x8.2	5	5029	57	645	48	-	871	19207

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	390	3560	154	9	4552	380
L2x2x1/4	2	-1173	-----	-----	-----	-----	-----
TS3x3x1/4	4	792	1958	322	15340	6590	32063
C6x8.2	5	59	645	48	--	898	19207

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6) (GLOBAL COORDINATE SYSTEM)

Fx = 243 lbs Fy = +6653 lbs, -1495 lbs Fz = 801 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2,4,6,8,10,12

fx = -4162 lbs fy = 194 lbs fz = 26 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3488 lbs fy = 365 lbs fz = 128 lbs

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ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM
 Originator TS Stendal Date 8-10-95
 Checker FRV Date 12-7-95

LOAD CASE NUMBER: (5) Seismic [DL + .06g (x) + .2g (-z)]
 Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	6311	358	2164	170	7	1951	83374
L2x2x1/4	2	-----	-1140*	-----	-----	-----	-----	-----
W6x20 Col	3	3169	4286	251	39	-	2287	33189
TS3x3x1/4	4	25880	473	1523	357	153	37907	47703
C6x8.2	5	5926	170	681	47	-	833	20570

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	407	2825	171	7	3686	344
L2x2x1/4	2	-1069	-----	-----	-----	-----	-----
TS3x3x1/4	4	3503	1945	372	13471	6545	31754
C6x8.2	5	57	211	170	-	823	20570

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6)
 (GLOBAL COORDINATE SYSTEM)

Fx = 265 lbs Fy = +5292 lbs, -684 lbs Fz = 732 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2,4,6,8,10,12

fx = -3248 lbs fy = 170 lbs fz = 22 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 3503 lbs fy = 119 lbs fz = 372 lbs

ANALYTICAL CALCULATIONS

Page ____ of ____

Subject DST MOCK-UP PLATFORM

Originator D Stundal Date 8-10-95

Checker ERV Date 12-7-95

LOAD CASE NUMBER: (6) Seismic [DL + .133g (y)]
Ref. ANSYS Run (August 1, 1995)

MAXIMUM STRESS/FORCES (Element Coordinate System)

Elem.	Elem Type	sig1/sig3	fx lbs Sax *	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	4092	127	1795	12	2	130	53718
L2x2x1/4	2	-----	-321*	-----	-----	-----	-----	-----
W6x20 Col	3	1075	3980	16	12	-	1553	2039
TS3x3x1/4	4	25661	1799	1745	530	16330	20422	54047
C6x8.2	5	1900	356	247	-	4	25	8282

*-psi

MAXIMUM CONNECTION FORCES (Element Coordinate System)

Elem	Elem Type	fx lbs	fy lbs	fz lbs	mx lb-in	my lb-in	mz lb-in
W6x20 Bm	1	127	2512	16	6	236	434
L2x2x1/4	2	-301	-----	-----	-----	-----	-----
TS3x3x1/4	4	530	1764	3	16334	45	20424
C6x8.2	5	74	247	-	-	15	3883

MAXIMUM REACTIONS @ COLUMN BASES: (Nodes 1-6) (GLOBAL COORDINATE SYSTEM)

Fx = 16 lbs Fy = 4227 lbs Fz = 203 lbs

MAXIMUM FORCES @ TOP OF COLUMNS: (Nodes 13-18) J nodes of Elem. 2,4,6,8,10,12

fx = -3360 lbs fy = 14 lbs fz = 11 lbs

MAXIMUM FORCES @ CMA BASE: (Nodes 63-66) I nodes of Elem. 76,78,80,82

fx = 1990 lbs fy = 14 lbs fz = 23 lbs

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ANALYTICAL CALCULATIONS

Page 1 of 12

Subject DST MOCK-UP PLATFORM

Originator J. Stundal

Date 8-10-95

Checker FRV

Date 12-7-95

NOTE: MEMBERS & SOME CONNECTIONS WERE ALSO
CHECKED BY ALTERNATE CALCULATIONS.

SEE PAGES B-21 THRU B-32

CHECK MEMBERS

W6X20 BEAM

MAX. COMBINED STRESS = 6311 psi < 21600 psi
∴ OK

W6X20 COLUMN

MAX. COMBINED STRESS = 9083 psi < 21600 psi ∴ OK

$$f_a = \frac{6332}{5.87} = 1079 \text{ psi} \quad kL/r = \frac{264}{2.66} = 99 \Rightarrow F_a = 13.10 \text{ ksi}$$

$$f_b = \frac{103500}{13.4} = 7724 \text{ psi}$$

L 2X2X1/4

MAX. STRESS, $f_a = 2410 \text{ psi}$

$$\text{MAX. UNBRACED LENGTH} = \sqrt{(114/2)^2 + (132/2)^2} = 87.2"$$

$$kL/r = 87.2 / .391 = 223 > C_c = 126.1$$

$$\therefore F_a = \frac{12\pi^2 E}{23(kL/r)^2} = \frac{12\pi^2 (29 \times 10^6)}{23(223)^2} = 3000 \text{ psi}$$

= 1.33(3000) for Seismic
= 3990 psi > f_a
∴ OK

C 6X8.2

MAX. COMBINED STRESS = 14435 psi < 21600 psi

$$f_a = .356 / 2.4 = .148 \text{ ksi} \quad \therefore \text{OK}$$

$$f_{b_z} = 60 / 4.38 = 13.70 \text{ ksi}, \quad f_{b_y} = .9 / .492 = 1.8 \text{ ksi} \quad \text{OK}$$

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ANALYTICAL CALCULATIONS

WHC-SD-WM-ER-521

Rev. 0

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Subject DST MOCK-UP PLATFORMOriginator J. StundalDate 8-10-95Checker FRVDate 12-7-95TS 3x3x1/4 (A-1020) $F_y = 38 \text{ ksi}$

MAX. LENGTH = 104"

MAX. COMP. STRESS = 25.9 ksi

 $f_x = 2095^\#$, $m_y = 10^\# \text{-in}$, $m_z = 54047^\# \text{-in}$, $m_x = 5^\# \text{-in}$

$$f_a = 2/5.87 = .34 \text{ ksi} \quad kL/r = 104/1.1 = 95, \quad C_c = \sqrt{\frac{2\pi^2 E}{F_y}}$$

$$= \sqrt{\frac{2\pi^2 (29 \times 10^6)}{38000}} = 122.74$$

$$kL/r/C_c = 95/122.74 = .77 \Rightarrow C_a = .371$$

$$\therefore F_a = C_a F_y = .371 \times 38 = 14 \text{ ksi}$$

$$f_a/F_a = .34/14 = .024 < .15$$

$$F_{bz} = F_{by} = .6 \times 38 = 22.8 \text{ ksi}$$

$$= 1.33(22.8)$$

$$= 30.3 \text{ ksi}$$

 $\therefore$ check

$$\frac{f_a}{F_a} + \frac{f_{bz}}{F_{bz}} + \frac{f_{by}}{F_{by}} \leq 1.0$$

$$f_{bz} = 54/2.1 = 25.7, \quad f_{by} = .01/2.1 = .005$$

$$\therefore .024 + 25.7/30.3 + .005/30.3 = .87 < 1.0 \therefore \text{ok}$$

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM
Originator Stundal Date 8-10-95
Checker FRV Date 12-7-95

CHECK CONNECTIONS

ANCHOR BOLTS (HILTI KWIK BOLT II)

4- $\frac{3}{4}" \phi \times 34"$ MIN. EMB.

CONC. $f'_c = 3000 \text{ psi}$

ALLOW. LOADS: TEN. $T_A = 2.17 \text{ k}$

$S_A = 3.41 \text{ k}$

DL + SEISMIC

MAX. REACTION @ BASE $\Rightarrow$ $\left\{ \begin{array}{l} \text{TENSION } F_y = 4476 \text{ lbs} \\ \text{SHEAR: } F_x = 828 \text{ lbs} \text{ \& } F_z = 801 \text{ lbs} \end{array} \right.$

TEN. PER BOLT $T = 4476/4 = 1.12 \text{ k}$

SHEAR PER BOLT, $S = \sqrt{(.828)^2 + (.801)^2} / 4 = .3 \text{ k}$

CHECK UNITY FORMULA

$$T/T_A + S/S_A \leq 1.0$$

$$\frac{1.12}{2.17} + \frac{.3}{3.41} = .60 < 1.0 \therefore \text{OK}$$

BASE PLATE

MAX. COMP. LOAD = 7177 lbs (SEISMIC + DL)

ALLOW. CONC. BEARING PRESSURE, $F_p = .7 f'_c = 2100 \text{ psi}$

REQ'D AREA = $7177/2100 = 4 \text{ in}^2$

(AISC MAN.)
P. 5-79

USE $18" \times 18" \times \frac{1}{2}" \text{ PL}$

$M = 1.12 \text{ k} \times 9 \times 2 = 20.16 \text{ k-in}$

$\frac{3}{16}"$ WELD - ALL AROUND
ABOUT 30"
@ 2.7k/in IS
MUCH MORE THAN REQ'D.
 $\therefore \text{OK}$

$$t = \sqrt{\frac{2M}{9b}} = \sqrt{\frac{2 \times 20.16}{9 \times 18}} = .499" = \frac{1}{2}" \therefore \text{OK}$$

ANALYTICAL CALCULATIONS

WHC-SD-WM-ER-521
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Subject DST MOCK-UP PLATFORMOriginator T. StundalDate 8-10-95Checker FRVDate 12-7-95BEAM/BEAM CONNECTION

$$f_x = 565, f_y = 3984, f_z = 409, m_x = 50, m_y = 9174, m_z = 604$$

$$A_w = 2(3\frac{1}{2} + 2 \times 2\frac{1}{2}) = 17 \text{ in}$$

$$S_z = 2(2.5)3.5 + 3.5^2/3 = 21.58 \text{ in}^2$$

$$S_y = 5.5^2/3 = 10 \text{ in}^2$$

WELD (A)

$$P_x = \frac{f_x}{A_w} + \frac{m_z}{S_z} + \frac{m_y}{S_y}$$

$$= \frac{565}{17} + \frac{604}{21.58} + \frac{9174}{10} = .98 \text{ k/in}$$

$$P_y = 3.984/17 = .23 \text{ k/in}$$

$$P_z = .409/17 = .024 \text{ k/in}$$

$$P_r = \sqrt{(.98)^2 + (.23)^2 + (.024)^2} = 1 \text{ k/in}$$

$$w_{req'd} = \frac{1}{14.4} = .069'' < \frac{3}{16}'' = 2.7 \text{ k/in}$$

$\therefore \text{ok}$

$$S_x = 2 \left\{ 2.5 \times 3.5 + \frac{3.5^2}{6} \right\}$$

$$= 21.58 \text{ in}^2$$

$$S_y = 2 \left\{ \frac{2 \times 2\frac{1}{2} \times 3\frac{1}{2}}{3} + 2.5^2/3 \right\}$$

$$= 15.8 \text{ in}^2 \text{ TOP}$$

$$= 2 \left\{ \frac{2.5^2(2 \times 3.5 + 2.5)}{3(2.5 + 3.5)} \right\}$$

$$= 6.6 \text{ in}^2 \text{ BOT}$$

$$J = 2 \left\{ \frac{3.5 + 2(2.5)}{12} \left[\frac{5.17^3}{3} - \frac{(2.5)^2(3.5 + (2.5))}{2} \right] \right\}$$

$$= 49.4 \text{ in}^2$$

WELD (B)

$$P_z = .409/17 + 9174/6.6 + .050/21.58 = 1.42 \text{ k/in}$$

$$P_x = .565/17 + \frac{m_z(c_x)}{J} = .565/17 + \frac{9174 \times 1.75}{49.4} = .36 \text{ k/in}$$

$$P_y = 3.984/17 + \frac{m_z(c_y)}{J} = .23 + \frac{9174 \times 1.76}{49.4} = .56 \text{ k/in}$$

$$P_r = \sqrt{(1.42)^2 + (.36)^2 + (.56)^2} = 1.57 \text{ k/in} < 2.7 \text{ k/in}$$

$\therefore \frac{3}{16}''$ WELD is ok

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ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM

Originator T. Stander

Date 8-10-95

Checker ERV

Date 12-7-95

PLATFORM TO TOP OF COLUMN BOLTED CONNECTION

BEAM / COLUMN CONNECTION (4-5/8" A325 BOLTS)
(NODES 13-18)

MAX. FORCES @ TOP OF COLUMNS (TENSION & SHEAR FORCES)

$$f_x = -5623^{\#} \text{ (COMP.)}, 1624^{\#} \text{ (TENSION)} \ll 13.2^{\text{K}}/\text{BOLT}$$

$$\left. \begin{array}{l} f_y = 600^{\#} \\ f_z = -26^{\#} \end{array} \right\} \ll 4.5^{\text{K}}/\text{BOLT}$$

$\therefore$ OK

1/2" PL WELDED @ COL. TOP

WITH MIN. OF 12" - 3/16" WELD

OK BY INSPECTION

L2X2X1/4 TO GUSSET PL (WELD SIZE 3/16")

$$\text{MAX. FORCE} = 2261^{\#}$$

$$\text{MIN. WELD LENGTH} = 2(2.5") = 5.25" \text{ TO ANGLE}$$

$$\therefore \text{ALLOW. WELD LOAD} = 5.25"(2.7^{\text{K}}/\text{in}) = 14.2^{\text{K}} \gg 2.26^{\text{K}} \therefore \text{OK}$$

GUSSET PL TO COL. WELD LENGTH = 14" MIN. OK

C6X8.2 TO COLUMNS (WELD CONN.)

MAX. FORCES :

$$f_x = 247^{\#}, f_y = 1756^{\#}, f_z = 170^{\#} \quad A_w = 2(6 + 2 \times 2) = 20 \text{ in}$$

$$m_x = 51^{\#}\text{-in}, m_y = 898^{\#}\text{-in}, m_z = 59383^{\#}\text{-in}$$

$$p_x = 247/20 + 898/4.66 + 59.4/36 = 1.86^{\text{K}}/\text{in}$$

$$p_y = 1.76/20 = .09^{\text{K}}/\text{in}, p_z = .17/20 = .01^{\text{K}}/\text{in}$$

$$P_r = \sqrt{(1.86)^2 + (.09)^2 + (.01)^2} = 1.86^{\text{K}}/\text{in} < 2.7^{\text{K}}/\text{in}$$

$\therefore$ 3/16" WELD IS OK

$$S_z = 2 \left\{ 6 \times 2 + \frac{6^2}{16} \right\} = 36 \text{ in}^2$$

$$S_y = \frac{2^2(3 \times 6 + 2) \times 2}{3(2 + 6)} = 4.66 \text{ in}^2$$

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM

Originator Stundal

Date 8-10-95

Checker FRV

Date 12-7-95

C6x8.2 TO COL. FLANGE (WELD CONN.)

LOAD CASE 2

ELEM 15

MAX. FORCES @ J NODE

$$F_x = 128, F_y = 205, F_z = 65$$

$$M_x = 50, M_y = 847, M_z = 2540$$

$$P_x = 128/12 + \frac{2.54 \times 3}{144} = .06 \text{ k/in}$$

$$P_y = 205/12 + \frac{2.54 \times 3}{144} = .07$$

$$P_z = .065/12 + .05/36 + .847/12 = .08 \text{ k/in}$$

$$P_r = \sqrt{(.06)^2 + (.07)^2 + (.08)^2} = .12 \text{ k/in}$$

$$< 2.7 \text{ k/in}$$

∴ OK

$$S_x = 6 \times 6 = 36$$

$$S_y = \frac{6^3}{3} = 12$$

$$J = \frac{6(3 \times 6^2 + 6^2)}{6} = 144$$

$$A = 2 \times 6 = 12$$

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM
Originator T. Stundal Date 10-10-95
Checker FRV Date 12-7-95

CMA BASE JACKS ATTACHMENT TO PLATFORM

MAX. FORCES @ BASE (NODES 63-66)

$$f_x = 3503\#, f_y = 346\#, f_z = 128\# \Rightarrow f_r = 388\#$$

• COMPRESSION or $f_y = 119\#, f_z = 372\# \Rightarrow f_r = 391\#$
• NO TENSION @ BASE

ALLOW. JACK LOADS

MAX. ALLOW. VERTICAL LOAD = 5000# > 3503# ∴ OK

MAX. SIDE LOAD IN RAISED POSITION = 400# > 391# ∴ OK

FOOT PAD NEEDS TO BE ANCHORED TO W6 BEAMS

PAD PL IS 8" ϕ X 7 GAGE SHEET METAL ($t = .174"$)
COMMERCIAL QUALITY (LOW CARBON) SHEET METAL, $F_u = 50,000 \text{ psi}$
(ASTM, A569) $F_y = 27,500 \text{ psi}$ (RYERSON)

TRY 2- $\frac{1}{2}$ " ϕ A307 BOLTS / EACH PAD

ALLOW. SHEAR LOAD / BOLT = $10 \times .2 = 2^k > f_r = 391\# \therefore \text{OK}$
(NO TENSION ON BOLT, ONLY COMPRESSIVE LOAD @ BASE)

ALLOW. BEARING LOAD ON FOOT PAD = $1.5 \times 50 \times .5 \times .174 = 6.38^k / \text{BOLT}$
∴ OK

A-307 BOLTS ARE OK, BUT
FOR STRUCT. CONN. IT IS RECOMMENDED TO USE
GRADE 8 BOLTS
USE 2- $\frac{1}{2}$ " ϕ SAE GRADE 8 BOLTS / PAD
 ϕ @ 180° APART

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORMOriginator J. StandaDate 10-10-95Checker FRVDate 12-7-95TOP TWO BEAMS SUPPORTING CMA(REEL) END SUPPORTS

RED ZONE DWG. 9213-CMA-ASSY-001 SHOWS THAT THESE BEAMS ARE RESTING ON SIDE BEAMS, BUT ACTUALLY THE BEAMS ARE SEATED IN THREE SIDED CLAMPS AT BOTH ENDS, W/ $3/8"$ ϕ REMOVEABLE PIN.

SO RE-EVALUATE THESE BEAMS & END SUPPORTS.
(i.e. SIMPLY SUPPORTED)

BEAM ELEM. 96 THRU 99

$$M_z = 1500(1.133)(81)(.333) = 45,841 \text{ lb-in}$$

$$M_y = 1500(.2)(81)(.333) = 8092 \text{ lb-in}$$

$$f_{bz} = \frac{45,841}{2.1} = 21,829 \text{ per}$$

$$F_b = .66(38) = 25 \text{ ksi}$$

$$f_{by} = \frac{8092}{2.1} = 3,853 \text{ per}$$

$$\text{FOR SEISMIC, } F_b = 1.33 \times 25 = 33.25 \text{ ksi}$$

$$21.83/33.25 + 3.85/33.25 = .77 < 1.0 \therefore \text{OK}$$

CHECK SUPPORT SEAT (14R)

$$\text{REACTION, } R_y = 1500(1.133) = 1700 \text{ lbs}$$

$$R_z = 1500(.2) = 300 \text{ lbs}$$

WELD

$$S_y = 2 \times 4 = 8 \text{ in}^2, S_z = 2^2/3 = 1.33 \text{ in}^2, A = 4 \text{ in}$$

$$f_y = 1700/4 = 425 \text{ #/in}$$

$$f_x = 1700 \times 2/1.33 = 2556 \text{ #/in}$$

$$F_w = 1.33 \times 2.78 = 3.7 \text{ Kip/in}$$

$$f_z = 300 \times 2/8 = 75 \text{ #/in}$$

$$f_r = \sqrt{(425)^2 + (2556)^2 + (75)^2} = 2.59 \text{ K/in} < 3.7 \text{ K/in} \therefore \text{OK}$$

PLAN

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM

Originator T. Stundal

Date 10-10-95

Checker FRV

Date 12-7-95

CHECK SEAT R

$$t = .25"$$

$$X_1 = \frac{2(3.25 \times 4) \times 1.63 + 3 \times .25 \times 1.25}{2(3.25)(.25) + 3 \times .25} = 1.15"$$

ELEV.

PLAN

$$X_2 = 3.25 - 1.15 = 2.1"$$

$$I = 2 \left\{ (3.25^3 / 12) + 3.25 \times .25 \times .47^2 \right\} + 3 \times .25 (1.03)^2 = 6.88 \text{ in}^4$$

$$S_{min} = 6.88 / 2.1 = 3.28 \text{ in}^3$$

$$f_{bz} = \frac{1700 \times 2}{3.28} = 1036 \text{ psi} \ll 27 \text{ ksi} \therefore \text{ok}$$

f_{by} ok by INSPECTION

$\therefore$ BRACKET IS OK

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM

Originator T. Staudel

Date 10-10-95

Checker FKV

Date 12-7-95

CMA TOP BEAM TO COLUMN CONN.

BECAUSE OF CMA REEL BEAMS ARE
SIMPLY SUPPORTED ON BASKETS,
COMPUTER OUTPUT RESULTS
WON'T BE USED.

NEW END FORCES

$$M_z = M_B = \frac{1.133(1.5)(66)^2}{(73)^2} + \frac{1.133(1.5)(30)^2}{(73)^2}$$

$$M_z = 22 \text{ k-in}$$

$$m_y = (1.5 \times 2) 2'' \times 2 = 1.2 \text{ k-in}$$

$$m_x = 1.2 \text{ k-in}$$

$$f_x = -3 \text{ k}, f_y = 1.97 \text{ k}, f_z = .4 \text{ k}$$

WELD

$$\text{WELD AREA, } A_1 = A_2 = 3 \times 3 = 9 \text{ in}^2$$

ASSUME M_z ARE TAKEN BY WELD ①

Also $f_x \neq f_y$

$$\therefore f_x = \frac{m_z(1.5)}{J_{w1}} + f_{x/A_1} = \frac{22(1.5)}{24.75} + .3/9 = 1.37 \text{ k/in}$$

$$f_y = \frac{f_y}{A_1} = \frac{1.97}{9} = .22 \text{ k/in}$$

$$f_x + f_y = 1.37 + .22 = 1.59 \text{ k/in} < 2.78 \text{ k/in}$$

$\therefore \text{OK}$

WELD ② for m_x, m_y, f_z

$$\therefore f_y = \frac{m_x}{S_{x2}} = \frac{1.2}{10.5} = .11 \text{ k/in}$$

$$f_x = \frac{m_y}{J_w}(1.5) = \frac{1.2(1.5)}{24.75} = .07$$

$$f_z = \frac{m_y}{J_w}(1) + \frac{f_z}{A_2} = \frac{1.2(1)}{24.75} + .4/9 = .09$$

$$f_x + f_y + f_z = .07 + .11 + .09 = .27 \text{ k/in} < 2.78 \text{ k/in}$$

$\therefore \text{OK}$

$\therefore \text{CONN. IS OK}$

WELD IS $3/16$
ALLOW. CAP. = 2.78 k/in

$$R_A = \frac{1.50(7+43)}{73} = 1.03 \text{ k}$$

$$R_B = 3 - 1.03 = 1.97 \text{ k}$$

$$J_{w1} = \frac{(3+2 \times 3)^3}{12} - \frac{3^2(3+3)^2}{(3+2 \times 3)} = 24.75 \text{ in}^4$$

$$S_{z2} = \frac{3^2(2 \times 3 + 3)}{3(3+3)} = 4.5 \text{ (RIGHT)}$$

$$S_{z2} = \frac{2 \times 3 \times 3 + 3^2}{3} = 9 \text{ (LEFT)}$$

$$C_y = \frac{3^2}{3+2 \times 3} = 1''$$

$$S_{x2} = 3 \times 3 + \frac{3^2}{6} = 10.5 \text{ in}^2$$

Originator F.R. VOLBERT

Date 11-22-95

Checker T. S. Sundel

Date 11-22-95

CAMERA PLATFORM ATTACHMENT

TOTAL WT. = 750 lbs

SEISMIC: VERT. $1.133 \times 750 = 850 \text{ lbs} = R_v$

HORIZ. $= .2(750) = 150 \text{ lbs}$

HORIZONTAL REACTION (H_B)

$$\Sigma M_A = 0$$

FOR DL ONLY

$$6H_B = 12 \times \frac{750}{2}$$

$$H_B = 750 \text{ LB}^c / \text{EACH TS}$$

FOR SEISMIC + DL

$$H_B = 850 \text{ LB/EA CH TR}$$

LOCAL STRESSES ON TS WALL
W G FLANGE, ETC DUE TO
HB OK BY INSPECTION 1"

CALCULATE BENDING
STRESSES IN $\frac{1}{2}$ IN ϕ 24x24
WITH CAMERA LOAD

REP TIMOSHENKO, PLATES
AND SHELLS PG 147

PRESUME SIMPLY SUPPORTED
RECTANGULAR R CENTER LOADED

$Q = 24 \text{ N}$, $\xi = \frac{Q}{2}$, POISSON'S RATIO $\gamma = 0.3$

$$M = \frac{1}{2} \left[(1+\gamma) \frac{P}{2\pi} \log \frac{2a \sin \frac{\pi y}{2a}}{\pi r} + \frac{(1-\gamma) P y^2}{2\pi r^2} \right]$$

$$y = \frac{a}{2}, \quad r = \sqrt{(x - \frac{a}{2})^2 + y^2}, \quad x = \frac{a}{2}$$

$$r = y = \frac{a}{2}$$

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ANALYTICAL CALCULATIONS

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Subject DCI MUCK-UP PLATFORM

Originator F.R. VOLBERT

Date 11-22-95

Checker T. Shindler

Date 11-22-95

CAMERA PLATFORM CONTINUED

$$M = \frac{1}{2} \left[(1+\nu) \frac{P}{2\pi} \frac{\log 2a \sin \frac{\pi}{2}}{\frac{\pi a}{2}} + \frac{(1-\nu) P a^2/4}{2\pi a^2/4} \right]$$

$$M = \frac{1}{2} \left[1.3 \times \frac{850}{2\pi} \frac{\log \frac{48}{12\pi}}{\frac{12\pi}{2}} + \frac{0.7 \times 850}{2\pi} \right]$$

$$M = 56.6 \text{ IN-LB/IN}$$

$$\text{BENDING STRESS } (f_b) = M/S$$

$$\text{FOR } 1/2" \text{ UNIT LENGTH } S = \frac{0.5^2}{6} = 0.04 \text{ IN}^3$$

$$f_b = \frac{56.6 \text{ IN-LB}}{0.04 \text{ IN}^3} = 1415 \text{ PSI} \leq 23760 \text{ PSI ALLOWED}$$

CALCULATE TORSION STRESS IN W 6x20 ^{OK}

FOR CAMERA WEIGHT ONLY

$$T = 750 \times 12 = 9000 \text{ IN LB}$$

FOR SEISMIC PLUS CAMERA WEIGHT

$$T = 850 \times 12 = 10200 \text{ IN LB}$$

$$\text{TORSION SHEAR STRESS } (\tau) = \frac{3T}{\sum b t^2}$$

$$\text{FOR W6x20 } \sum b t^2 = 2 \times 6.02 \times 0.365^2 + 5.49 \times 0.26^2 = 1.97$$

FOR DL ONLY

$$\tau = \frac{3 \times 9000}{1.97} = 13706 \text{ PSI} < 14400 \text{ PSI ALLOWED}$$

FOR SEISMIC

$$\tau = \frac{3 \times 10200}{1.97} = 15533 \text{ PSI} < 1.33 \times 14400 \text{ PSI ALLOWED}$$

TORSION IN W 6x20 OK

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ANALYTICAL CALCULATIONS

ALTERNATE CALCS.

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Subject DST MOCKUP PLATFORM ANALYSIS REVIEW

Originator E.R. VOLERT

Date 10/17/95

Checker

Date

COLUMN STRESSES

W6x20 COLUMNS ARE CROSS BRACED IN THE GLOBAL Z DIRECTION OR THE WEAK (I_y) DIRECTION. THE UNBRACED LENGTH OF THE COLUMNS IN THE I_y DIRECTION IS 11 FT OR 132 IN, $K=1.0$ EFFECTIVE LN FOR THE BRACED I_y DIRECTION $\frac{Kl}{r_y} = \frac{1.0 \times 132}{1.50} = 88$ IN

TWO OF THE W6x20 COLUMNS ARE UNBRACED IN THE GLOBAL X DIRECTION OR THE STRONGER (I_x) DIRECTION. THE LENGTH OF THESE COLUMNS IS 24 FT 5 IN = 257 IN. TO DETERMINE THE EFFECTIVE LENGTH FACTOR K THE TOP CONNECTION TO THE PLATFORM WILL PROVIDE VERY LITTLE ROTATION RESTRAINT OR ACTS AS A PINNED CONNECTION. THE COLUMN BASE PLATE IS 12x12x $\frac{1}{2}$ ANCHORED TO THE CONCRETE FLOOR WITH 4- $\frac{3}{4}$ IN HILTI KWIK BOLT II. THE COLUMN IS FILLET WELDED ALL AROUND TO THE BASE PLATE. THE BASE WILL ACT AS FIXED - THUS:

$$K = 2.10 \quad (\text{AISC 1989})$$

$$\frac{Kl}{r_x} = \frac{2.10 \times 257}{2.66} = 203$$

EXCEEDS 200
BY $1\frac{1}{2}\%$

$$\text{USE } \frac{Kl}{r_x} = 200$$

$$F_a = 6.22 \text{ KSI} \quad (\text{ALLOWABLE, AISC 1989})$$

$$F_b = \frac{170 \times 10^3}{(l/r)^2} \quad (\text{AISC 1989}) \quad \text{BECAUSE } \frac{l}{r} = \frac{257}{1.64} = 156.7$$

$$\text{AND } 156.7 > \sqrt{\frac{510 \times 10^3}{F_y}} = 119$$

$$F_b = \frac{170 \times 10^3}{(156.7)^2} = 6.92 \text{ KSI}$$

ANALYTICAL CALCULATIONS

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Subject DST MOLEKUA PLATFORM ANALYSIS REVIEWOriginator ER. VOLLERTDate 10/17/95

Checker _____

Date _____

COLUMN STRESSES, CONTINUED

NOTE: THE UNBRACED GLOBAL X DIRECTION COLUMNS ARE ELEMENT NUMBERS 1, 2, 7, 8 IN THE MODEL. ANALYSIS RESULTS AVAILABLE ARE INCOMPLETE FOR THESE ELEMENTS. IT IS NECESSARY TO USE THE MEMBER FORCES FOR COLUMN ELEMENT 3 SORTED AS MAXIMUMS AND THEREFORE EXCEED THE OTHERS TO CALCULATE COLUMN STRESSES

FOR DL + LL, COLUMN ELEMENT 3

$$F_x = 5819 \text{ LB}, \quad M_z = 3903 \text{ IN LB}$$

$$f_a = \frac{F_x}{S_x} = \frac{5819}{5.87} = 991 \text{ PSI}$$

$$f_b = \frac{M_z}{S_z} = \frac{3903}{13.4} = 291 \text{ PSI}$$

$$\frac{f_a}{F_a} + \frac{f_b}{F_b} = \frac{991}{6220} + \frac{291}{6920} = 0.16 + 0.04 = 0.20 < 1$$

OK FOR DL + LL, COL W6X20

FOR DL + 0.29 SEISMIC, COLUMN ELEMENT 3

$$F_x = 5826 \text{ LB}, \quad M_z = 103500$$

$$f_a = \frac{5826}{5.87} = 992 \text{ PSI}$$

$$f_b = \frac{103500}{13.4} = 7724 \text{ PSI}$$

FOR SEISMIC, THE ALLOWABLE STRESSES F_a AND F_b MAY BE INCREASED BY $\sqrt{3}$. THUS:

$$F_a = 1.3 \times 6220 = 8086 \text{ PSI}, \quad F_b = 1.3 \times 6920 = 8996 \text{ PSI}$$

$$\frac{f_a}{F_a} + \frac{f_b}{F_b} = \frac{992}{8086} + \frac{7724}{8996} = 0.12 + 0.86 = 0.98 < 1.0$$

COL W6X20 OK FOR DL + SEISMIC

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ANALYTICAL CALCULATIONS

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Subject DST MOCKUP PLATFORM ANALYSIS REVIEW
Originator F.R. VOLBERT Date 10-19-95
Checker _____ Date _____

C 6X8.2 BEAM

BENDING STRESS GOVERNS

UNBRACED LENGTH MAXIMUM = 9 FT = 108 IN = l_u

AISC 1.5.1.4, 1 REQUIREMENT

$$l_u \leq \frac{76 b_f}{\sqrt{F_y}} = \frac{76 \times 1.92}{6} = 24 \text{ IN} < l_u$$

SO AISC 1.5.1.4.5, EQN 1.5-7 APPLIES

$$F_b = \frac{12 \times 10^3 C_b}{l d / A_f} \quad C_b = \text{UNITY}$$

$$d = 6.0, A_f = 0.343 \times 1.92 = 0.659$$

$$F_b = \frac{12 \times 10^3}{108 \times 6 / 0.659} = 12.2 \text{ KSI}$$

$$\text{FOR SEISMIC, } F_b = 1.3 \times 12.2 = 15.9 \text{ KSI}$$

$$\text{FOR DEAD } F_b = \frac{16.978}{4.38} = 3.9 \text{ KSI} < 12.2 \text{ KSI OK}$$

$$\text{FOR DL + SEISMIC } F_b = \frac{60.348}{4.38} = 13.8 \text{ KSI} < 15.9 \text{ KSI OK}$$

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM ANALYSIS REVIEW

Originator F.R. VOLVERT Date 10/19/95

Checker _____ Date _____

CROSS BRACING, ANGLE 2x2x1/4

COMPRESSIVE STRESS GOVERNS
(MAXIMUM LENGTH)

MAX HORIZONTAL DISTANCE $L_h = 114 - 2(6) = 102 \text{ IN}$

MAX VERTICAL DISTANCE $L_v = 138 - 18 - 9 = 111 \text{ IN}$

$L_u = \sqrt{\left(\frac{102}{2}\right)^2 + \left(\frac{111}{2}\right)^2} = 75.4 \text{ IN}$ $r_{zz} = r_{min} = 0.391 \text{ IN}$

$\frac{KL_u}{r_{min}} = 110 \times 75.4 / 0.391 = 192.8 < 200 \text{ MAX ALLOWED}$

$\frac{b}{t} = \frac{2}{0.25} = 8 < \frac{76}{\sqrt{F_y}} = 12.67 \text{ (AISC 1.9.1.2)}$

$C_c = \sqrt{\frac{2\pi^2 E}{F_y}} = 126$

$\frac{KL_u}{r_{min}} > C_c \text{ AND } > 120 \text{ SO:}$

$F_{LS} = \frac{F_a}{1.6 - \frac{L}{200}}$

$F_a = \frac{12\pi^2 E}{23(KL/r)^2} \left[\begin{array}{l} \text{AISC} \\ 1.5-2 \\ 1.5-3 \end{array} \right]$

$F_a = 4017 \text{ PSI}$

$F_{LS} = \frac{4017}{1.6 - \frac{192.8}{200}} = 6316 \text{ PSI}$

FOR SEISMIC $F_{LS} = 1.3 \times 6316 = 8211 \text{ PSI}$

DL+LL $F_a = 524 \text{ PSI} < 6316 \text{ PSI OK}$

DL+SEISMIC $F_a = 2410 \text{ PSI} < 8211 \text{ PSI OK}$

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ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM ANALYSIS REVIEWOriginator F.R. VALLERT Date 10/20/95

Checker _____ Date _____

TS 3 x 3 x 1/4 (ASTM A 1020, $F_y = 38$ KSI)BEAM MEMBERS, DETERMINE BENDING STRESS ALLOWED $l_u = 82$ IN (MAXIMUM ACTUAL)

$$\frac{b}{t} = \frac{3}{0.25} = 12 \quad \text{USE AISC 1.5.1.4.1} \quad < \frac{190}{\sqrt{F_y}} = \frac{190}{\sqrt{38}} = 30.8$$

$$\frac{d}{t} = \frac{3}{0.25} = 12 < \frac{257}{\sqrt{F_y}} = 41.7$$

$$1200 \left(\frac{b}{F_y} \right) = \frac{1200 \times 3}{38} = 94.7 > l_u = 82$$

BEAM MEMBERS QUALIFY AS COMPACT

$$F_b = 0.66 F_y = 25 \text{ KSI}$$

$$\text{FOR SEISMIC } F_b = 1.3 \times 25 = 32.5 \text{ KSI}$$

FOR DC + LL MAX MOMENT = 47702 IN LB

$$f_b = \frac{M}{S} = \frac{47702}{2.1} = 22715 \text{ PSI} < 25000 \text{ PSI OK}$$

FOR SEISMIC + DL MAX MOMENT = 54047 IN LB

$$f_b = \frac{54047}{2.1} = 25737 \text{ PSI} < 32500 \text{ PSI OK}$$

COLUMN MEMBERS, DETERMINE AXIAL AND BENDING STRESS ALLOWABLES

$$l = 104 \text{ IN}, \quad \frac{KL}{r} = \frac{2 \times 104}{1.1} = 189.1 < 200$$

$$C_c = \sqrt{\frac{2\pi^2 E}{F_y}} = \sqrt{\frac{2\pi^2 \times 29 \times 10^3}{38}} = 122.7 < KL/r \quad (\text{AISC 1.5.1.3})$$

$$F_a = \frac{12\pi^2 E}{23(KL/r)^2} = \frac{12\pi^2 \times 29 \times 10^3}{23(189.1)^2} = 4.176 \text{ KSI} \quad (\text{AXIAL})$$

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ANALYTICAL CALCULATIONS

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Subject DET MOCKUP PLATFORM ANALYSIS REVIEWOriginator F.R. VILBERT Date 10/20/95

Checker _____ Date _____

TS 3x3x1/4 CONTINUED(COLUMNS, CONTINUED)

(AISC 1.5.1.4)

$$1200 \frac{b}{F_y} = \frac{1200 \times 3}{38} = 94.7 < L_u = 104 \text{ IN}$$

$$\text{So } F_b = \frac{12 \times 10^3 C_b}{L_d / A_f} \quad \text{NOT TO EXCEED } 0.6 F_y$$

$$C_b = 1$$

$$F_b = \frac{12 \times 10^3}{104 \times 3 / 0.75} = 28.8 \text{ KSI}, \quad 0.6 \times F_y = 0.6 \times 28 = 22.8 \text{ KSI}$$

$$F_b = 22.8 \text{ KSI}$$

FOR DL + LL

$$f_a = \frac{1765}{2.59} = 681 \text{ PSI} < F_a = 4176 \quad \text{AND}$$

$$\frac{f_a}{F_a} = 0.16 > 0.15 \quad \text{BUT AISC COMBINE STRESS}$$

ERN 1.6-2 $\frac{f_a}{F_a} + \frac{f_{b1}}{F_b} + \frac{f_{b2}}{F_b} < 1.0$ STILL OK
NO USE

$$f_{b1} = \frac{M_1}{S} = \frac{18068}{2.1} = 8604 \text{ PSI}$$

$$f_{b2} = \frac{M_2}{S} = \frac{11072}{2.1} = 5282 \text{ PSI}$$

$$\frac{615}{4176} + \frac{8604}{22800} + \frac{5282}{22800} = 0.15 + 0.38 + 0.23 = 0.76$$

TS 3x3x1/4 COLUMNS OK FOR DL + LL

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TS 3x3x1/4 CONTINUED
COLUMNS, CONTINUED

FOR DL + SEISMIC (USING AVAILABLE MATH RESULTS)

F_x 3503 LB, $M_y = 37907$ IN LB

$M_z = 12116$ IN LB

$$f_a = \frac{3503}{2.59} = 1353 \text{ PSI} \quad \frac{1353}{1.3 F_a} = \frac{1353}{5429} = 0.25 > 0.15$$

AISC COMBINED STRESS EQUATION BECOMES

$$\frac{f_a}{F_a} + \frac{0.85 f_{b1}}{0.75 F_b} + \frac{0.85 f_{b3}}{0.75 F_b} < 1.0 \quad \text{EQN 1.6.1a}$$

$$f_{b1} = \frac{37907}{2.1} = 18051 \text{ PSI}$$

$$f_{b3} = \frac{12116}{2.1} = 5770 \text{ PSI}$$

$$\frac{1353}{5429} + \frac{0.85 \times 18051}{0.75 \times 1.3 \times 22800} + \frac{0.85 \times 5770}{0.75 \times 1.3 \times 22800} = 0.25 + 0.71 + 0.22 = 1.18 > 1.0$$

COLUMNS TS 3x3x1/4 COULD BE OVER STRESSED 18% BY 0.22 SEISMIC RESPONSE

DESIGN CHANGE NOT RECOMMENDED BASED ON THE CRITERIA USED. BASICALLY THIS IS A VERY NON CONSERVATIVE SEISMIC ANALYSIS FOR THE UPPER STRUCTURE BECAUSE IT IS A PENTHOUSE TYPE STRUCTURE THAT WOULD BE SUBJECT TO AMPLIFIED SEISMIC MOTIONS OF THE PLATFORM IT STANDS ON.

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Subject DST MOCKUP PLATFORM ANALYSIS REVIEWOriginator F.R. VOLERTDate 10/23/95

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337 BUILDING FLOOR LOADING FROM COLUMN
BASE PLATES

FOR (DL + LL) THE SUM OF ALL (6) COLUMN
LOADS IS 23,834 LBS
ASSUMING THIS TOTAL LOAD IS DISTRIBUTED OVER
THE AREA THE PLATFORM OCCUPIES; THE FLOOR
LOAD IS; (DL+LL) / AREA

$$AREA = 15.0' \times 9.5' = 142.5 \text{ FT}^2$$

$$FL = \frac{23834}{142.5} = 167 \text{ PSF}$$

250 PSF IS THE
POSTED LIMIT

THE UNIFORM FLOOR LOAD DUE TO THE 20 FT
HIGH PORTION OF THE MOCKUP IS 183 PSF

FOR THE MOCKUP BASE PLATE AREA THAT COINCIDES
WITH THE PLATFORM THE SUM OF THESE
FLOOR LOADS IS 350 PSF. FOR THIS ABOUT
5' x 9.5' AREA THIS ESTIMATED FLOOR LOAD EXCEEDS
THE 250 PSF POSTED LIMIT. THE FLOOR DESIGN
ALSO ALLOWS A 100,000 LB LOAD OVER A 14' x 14'
AREA (H-3-37183) OR 510 PSF, THUS 350 PSF
OVER THIS LOCAL AREA IS ACCEPTABLE.

THE MAXIMUM SINGLE COLUMN LOAD (DUE TO DL + SEISMIC)
IS 7177 LB, $\frac{1}{2}$ " BASE PL IS 18" x 18"

$$CONCRETE \text{ BEARING STRESS } f_{br} = \frac{7177 \text{ LB}}{18 \times 18} = 22 \text{ PSI}$$

$$ALLOWABLE = 0.7 f'_c, f'_c = 3000 \text{ PSI MIN CONCRETE}$$

$$ALLOWABLE = 2100 \text{ PSI} > 22 \text{ PSI} \quad \text{COMPRESSIVE STRENGTH}$$

VERTICAL SHEAR STRESS IN THE FLOOR SLAB

FLOOR SLAB IS 8 IN THICK, ASSUME $d = 7$ IN
(H-3-30494)

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Subject DST MOCK-UP PLATFORM ANALYSIS REVIEWOriginator F.R. VOLLERTDate 10/24/95

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FLOOR SLAB SHEAR CONTINUEDPUNCHING SHEAR AT PERIMETER OF COLUMN BASE #2
ALLOWABLE $V_c = 2\sqrt{f'_c} b_o d$ $b_o = \text{PERIMETER, BASE } R = 4 \times 18 = 72 \text{ IN}$

$$V_c = 2\sqrt{3000} \times 72 \times 7 = 55210 \text{ LB } > 7177 \text{ LB OK}$$

BEAM CONNECTIONS, WELDED

W 6 x 20 PLATFORM BEAMS HAVE FRAMED BEAM (SIMPLE) CONNECTIONS. THESE TYPE CONNECTIONS ARE SHEAR RESISTING, AND DO NOT DEVELOP FULL END MOMENTS. THUS, THESE MUST BE ABLE TO CARRY THE AXIAL FORCES (X, Y, Z) CALCULATED FOR THE CORRESPONDING END NODES. THE CONNECTION IS SKETCHED AND EVALUATED BELOW.

EVALUATE WELD CAPACITY FROM AISC 1989 PART 4, TABLE IV.

WELD B CAPACITY $F_{wB} = 10.4 \text{ K}$ IF $L = 4$, $T_w = 0.38 \text{ IN}$, AND WELD THROAT $t_w = 1/4 \text{ IN}$, SO:

$$\text{AS IS } F_{wB} = 10.4 \times \frac{3.5}{4} \times \frac{0.25}{0.38} \times \frac{3}{16} \times \frac{4}{1} = 4.5 \text{ K}$$

BUT TABLE IV VALUE IS FOR A3x3 SO:

$$F_{wB} = \frac{2.5}{3.0} \times 4.5 = 3.75 \text{ K}$$

WELD A CAPACITY $F_{wA} = 26.4 \text{ K}$, $L = 4$, $t_w = 3/16$, $T_w = 0.38$, SO:

$$\text{AS IS } F_{wA} = 26.4 \times \frac{3.5}{4} \times \frac{0.25}{0.38} = 15.2 \text{ K}, \frac{2.5}{3.0} \times 15.2 = 12.67 = F_{wA}$$

MAX DL + SEISMIC $F_x = 565 \text{ LB}$, $F_y = 3984 \text{ LB}$, $F_z = 409 \text{ LB}$

$$F_w = \sqrt{565^2 + 3984^2 + 409^2} = 4.0 \text{ K} < 1.3 F_{wB} = 4.88 \text{ K}$$

CONNECTION OK

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WELDED BEAM CONNECTIONS, CONTINUED

THE C 6x8.2 PLATFORM BEAM THAT SUPPORTS THE TOP OF THE STAIRWAY HAS SINGLE CLIP ANGLE SIMPLE CONNECTIONS SEE SKETCH AND EVALUATION BELOW

LARGEST CALCULATED FORCE ON CONNECTION IS 292 LBS DUE TO DL + LL

FROM AISC 1989, PART 9, TABLE IV

$$F_{wB} = \frac{10.4 \text{ K}}{2} = 5.2 \text{ K} \quad \text{IF } L=4, T_w=0.38, \angle_w = \frac{1}{4} \text{ AND}$$

FOR 3K3 CLIP ANGLE: 50;

$$F_{wB} = 5.2 \times \frac{3}{4} \times \frac{3}{16} \times \frac{4}{1} \times \frac{0.19}{0.38} \times \frac{2.5}{3.0} = 1.22 \text{ K} > 0.292 \text{ K}$$

$$F_{wA} = \frac{26.4}{2} \times \frac{3}{4} \times \frac{0.19}{0.38} \times \frac{2.5}{3.0} = 4.13 \text{ K}$$

CONNECTION OK

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Subject DST MOCKUP PLATFORM ANALYSIS REVIEWOriginator F.R. VOLLERT Date 9/29/95

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THE ANSYS FINITE ELEMENT MODEL FOR THIS STRUCTURE HAS FIXED CONNECTIONS OR JOINTS BETWEEN MEMBERS EXCEPT FOR: PINNED COLUMN BASES, PINNED JOINTS FOR THE PLATFORM TO THE TOP OF THE COLUMNS, AND PINNED BASES FOR THE JACK LEGS. HOWEVER, MOST OF THE ACTUAL JOINTS IN THE STRUCTURE ARE SIMPLE CONNECTIONS. SIMPLE CONNECTIONS WILL DEVELOP AN INDETERMINATE AMOUNT OF END MOMENT, BUT GENERALLY THE MID SPAN MOMENT WILL EXCEED THAT FOR ACTUAL FIXED END BEAMS. THUS, TO ASSESS HOW REALISTIC AND ADEQUATE THE ANSYS RESULTS ARE WITH THE FIXED JOINT MODEL, SOME SELECTED DETERMINATE ANALYSES OF STRUCTURAL MEMBERS (BEAMS) WILL BE CONDUCTED. THE RESULTS, SHEAR AND MOMENT DIAGRAMS, WILL BE COMPARED TO ANSYS RESULTS.

ANALYTICAL CALCULATIONS

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Subject DET MCKIN PLATFORM ANALYSIS REVIEW
Originator F.R. VOLBERT Date 9/19/95
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DO SELECTED DETERMINATE ANALYSES FOR
STRUCTURAL MEMBERS, COMPARE FORCES AND
MOMENTS CALCULATED WITH ANSYS 4.4 RESULTS,
PLATFORM BEAM THAT IS ELEMENTS 59, 55, 54, 62
IN ANSYS MODEL, A W 6x20 SECTION

THIS MEMBER IS INSTALLED WITH SIMPLE CONNECTIONS
ANSYS MODEL USES FIXED CONNECTION OR SUPPORTS

SOLVE FOR REACTIONS

$$\sum M_B = 0$$

$$114 R_A = 1500 \times 103 + 1255 \times 57 + 1500 \times 30 + \frac{60 \times 114^2}{12 \times 2}$$

$$R_A = 2472.5 \text{ LB}, R_B = 1972.5 \text{ LB}$$

$$M_{MAX} = M_D = 57 R_A - 1500 \times 46 - \frac{20 \times 57^2}{12 \times 2} = 69225 \text{ IN LB}$$

$$M_C = 11 R_A - \frac{20 \times 11^2}{12 \times 2} = 27097 \text{ IN LB}$$

$$M_E = 30 R_B - \frac{20 \times 30^2}{12 \times 2} = 58425 \text{ IN LB}$$

ANALYTICAL CALCULATIONS

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Subject DST MUCK-UP PLATFORM ANALYSIS REVIEW

Originator F.R. VOLLENT

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CALCULATED SHEAR & MOMENT DIAGRAMS 59, 55, 54, 62

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ANSYS SHEAR AND MOMENT DIAGRAMS

EL #	I FY	J FY	I MZ	J MZ	DC+LL
59	*	2776.6	*	-298	
55	-916.5	*	-74064	*	
54	338.5	-338.5	-64318	74064	
62	-2129.5	2129.5	-64318	-317	

* UNAVAILABLE RESULT

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ANALYTICAL CALCULATIONS

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Subject BIT MOCK-UP PLATFORM ANALYSIS REVIEW

Originator F.R. VOLBERT

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PLATFORM BEAM THAT SUPPORTS THE TOP OF THE STAIRWAY, ELEMENTS 22 AND 23,

$$M_{MAX} = M_C = 293.6 \times 25 - \frac{8.2}{12} \times \frac{25^2}{2} = 7126 \text{ IN LB}$$

CALCULATED SHEAR AND MOMENT DIAGRAMS

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Subject DST MOCK-UP PLATFORM ANALYSIS REVIEW

Originator F.R. VOLLENT

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ANSYS SHEAR AND MOMENT DIAGRAMS

EL #	IFV	JFY	IMZ	JMZ
22	292.3	275.3	11.7	708.4
23	*	294.7	*	-69.9

* UNAVAILABLE

VERY GOOD COMPARISON

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ANALYTICAL CALCULATIONS

Page 17 of 18Subject T&T MOCK-UP PLATFORM ANALYSIS REVIEWOriginator F.R. VOLBERT Date 9/19/95

Checker _____ Date _____

STAIR LANDING BEAMS, ELEMENTS 20, 21 AND 18, 19

$$M_{MAX} = M_C = 472.3 \times 37 - \frac{8.2}{12} \times \frac{37^2}{2} = 17,007 \text{ IN-LB}$$

CALCULATED V AND M DIAGRAMS OBVIOUS:

ANSYS SHEAR AND MOMENT DIAGRAM

EL#	IFV	JFY	IMZ	JMZ
18	472.2	447.0	32.4	16973
19	447.0	472.2	16973	-31
20	485.1	459.9	7709	9773
21	434.1	*	9773	*

* UNAVAILABLE.

VERY GOOD COMPARISON
B-37

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP PLATFORM ANALYSIS REVIEW
Originator F.R. VOLBERT Date 9/19/95
Checker _____ Date _____

ANSYS ; 20 - 21

POOR FOR M DIAG COMPARISON; ANSYS RESULTS FOR 20, 21
MORE CLOSELY COMPARE TO FIXED FIXED BEAM
RESULTS WHICH ARE:

$$\text{END MOMENTS } M_E = \frac{Pl}{8} + \frac{wl^2}{12} = \frac{894 \times 74}{8} + \frac{8.2}{12} \times \frac{74^2}{12}$$

$$M_E = 8581 \text{ IN-LB}$$

$$\text{CENTER MOMENT } M_C = \frac{Pl}{8} + \frac{wl^2}{24} = \frac{894 \times 74}{8} + \frac{8.2}{12} \times \frac{74^2}{24}$$

$$M_C = 8425 \text{ IN-LB}$$

APPENDIX C
MONORAIL DESIGN AND DETAILS

ANALYTICAL CALCULATIONS

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Page 1 of 8Subject DST Mock-Up Tank (Monorail)Originator T. S. HundalDate 10-25-95Checker Hassan H. ZaidDate 11-2-95

INTRODUCTION:

The DST mock-up section for Robot inspection needs to have a monorail/hoist system to catch the Robot in case it detaches from the DST walls. If the Robot is allowed to fall to the floor it may be extensively damaged and will hinder the actual testing in the field. To avoid this a trolley will be mounted on a monorail and a hoist arrangement will be hung below it to catch the falling Robot. Allow one foot free fall of Robot.

MATERIALS:

Steel members: Materials used for Monorail and its support system will be A36

Welding: Electrodes to be E70XX.

Trolley and Hoist: Preurchased from s vendor

ALLOWABLES:

Steel: As per ASIC Manual of Steel Construction, ninth edition.

Welds: As per AWS Structural Welding Steel Code D1.1.

Trolley and Hoist: As per manufacturer's recommendations.

REFERENCES:

AISC, 1989 American Institute of Steel Construction, Manual of Steel Construction, 9th Edition.

AWS, 1994 American Welding Society, Structural Welding Steel Code, AWS D1.1.

Kleinlogel, I.A., Rigid Frame Formulas, 12th Edition.

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Subject DST. MOCK-UP TANK (MONORAIL)
Originator T. Stundal Date 10-25-95
Checker Harold H. Zink Date 11-2-95

MONORAIL/HOIST DESIGN

- THE PURPOSE OF THIS HOIST IS TO CATCH THE FALLING ROBOT OFF OF THE TANK WALL.
- HOIST WILL BE HOOKED UNDER TROLLEY ON THE MONORAIL

LOADS

WT. OF ROBOT = 600 # = W

ASSUME IT FALLS 1 FT. (FREE FALL)

$$\therefore v = \sqrt{2gh}$$

$$= \sqrt{2 \times 32.2 \times 1} = 8.03 \text{ fps}$$

ASSUME IT TAKES 0.1 SECOND TO STOP IT COMPLETELY AFTER IMPACT i.e. INSTANT STOP. (DEACCELERATION)

$$\therefore a = \frac{v}{t} = \frac{8.03}{.1} = 80.3 \text{ Ft/sec}^2$$

* ENGINEERING JUDGEMENT

$\therefore$ TOTAL FORCE EXERTED ON THE HOISTING MECHANISM

$$F = W + \left(\frac{W}{g}\right) a$$

$$= 600 + \left(\frac{600}{32.2}\right) 80.3$$

$$= 600 + 1496$$

$$= 2096 \quad \approx 2100 \#$$

USE 3000 #

$\therefore$ USE 1 1/2 TON CAPACITY TROLLEY & HOIST MECHANISM

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP TANK (MONORAIL)
 Originator T. Stundal Date 10-25-95
 Checker Hazen H. Zisch Date 11-2-95

ANALYSIS

THE MONORAIL CONFIGURATION & DETAILS ARE SHOWN
 IN FIGURES 1 THRU 3.

MONORAIL

TRY W6X16 w/10'-0 MAX. SPAN, $L_w = 12' \Rightarrow F_b = 21.6 \text{ ksi}$
 $b_f = 4''$ $t_f = \frac{3}{8}''$ $S = 10.2 \text{ in}^3$ $M_R = 20 \text{ K-ft.}$
 $d = 6\frac{1}{4}''$ $t_w = \frac{1}{4}''$ (Ref. AISC, 1989)
 $F = 1\frac{1}{2} T = 3000 \#$

$$M = \frac{3 \times 10}{4} = 7.5 \text{ K-ft.} < M_R \therefore \text{OK}$$

TRY W4X13 TO SUPPORT THE MONORAIL @ 10' C/C

$$M = \frac{3 \times 2.5}{4} = 1.9 \text{ K-ft.} < M_R = 11 \text{ K-ft.} \therefore \text{OK}$$

(ASSUME SIMPLY SUPPORTED)

W4X13

WELD TO DST WALLS (FIG. 3)

$$S = 4 \times 4 + \frac{(4)^2}{3} = 21.3 \text{ in}^2, A = 4 \times 4 = 16 \text{ in}$$

$$f_a = \frac{.75}{16} = .05 \text{ K/in}$$

$$f_b = \frac{1.9 \times 12}{2 \times 21.3} = .54 \text{ K/in}$$

$$f = .05 + .54 = .59 \text{ K/in} < 2.78 \text{ K/in for } \frac{3}{16}'' \text{ WELD} \therefore \text{OK}$$

MONORAIL TO W4X13

USE $\frac{3}{16}''$ WELD AS SHOWN

$$\text{CAPACITY} = 2 \times 2.78 \times 4'' = 22.2 \text{ K} > 3 \text{ K} \therefore \text{OK}$$

MONORAIL STOP

USE $\angle 2 \times 2 \times \frac{1}{4}''$ @ EA. END (BOTH SIDES
 OF WEB) OF MONORAIL

$$F_A = .3 \times 70 \times .707 \times \frac{3}{16} = 2.78 \text{ K/in}$$

(REF. AWS, 1994)

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP TANK (MONORAIL)Originator Stundel Date 10-25-95Checker Harmon H. Zink Date 11-2-95MONORAIL CANTILEVER

$$M = PL$$

$$M_R = 20 \text{ k-ft (AISC 1989)}$$

$$3l = 20 \text{ k-ft}$$

$$l = 6.67' \quad \text{USE } l = 5'-0"$$

$$\therefore R_1 \times 10 = 3(15) \Rightarrow R_1 = 4.5 \text{ k} \uparrow \quad R_2 = 1.5 \text{ k} \downarrow$$

BENT SUPT. DESIGN @ 9'-0" HIGH SECTION (SEE FIG. 2)

REF. KLEINLOGEL (12TH ED.)

CASE 41/3

ASSUME FIXITY @ A & D

$$k = h/l = 2/2.83 = .71$$

$$\alpha = \frac{3Sl}{8}$$

$$N_1 = k + 2 = .71 + 2 = 2.71$$

$$M_A = M_D = \frac{\alpha}{3N_1} = \frac{3 \times 4.5 \times 2.83}{8(3 \times 2.71)} = .6 \text{ k-ft} = 7.2 \text{ k-in}$$

$$M_B = M_C = -2M_A = -14.4 \text{ k-in}$$

$$M_{\text{MAX. @ E}}, M_E = \frac{4.5 \times 2.83 \times 12}{4} - 14.4 = 23.8 \text{ k-in} < M_R = 11 \text{ k-ft}$$

$$H_A = H_D = 3M_A/h = 3 \times .6/2 = .9 \text{ k}$$

$$V_A = V_D = S/2 = 4.5/2 = 2.25 \text{ k}$$

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP TANK (MONORAIL)
 Originator V. Stundal Date 10-25-95
 Checker Haas H. Zinda Date 11-2-95

WELDSHORIZ. MEMB. TO VERT.

$$S = 4 \times 4 + \frac{(4)^2}{3} = 21.3 \text{ in}^2$$

$$f_a = 2.25/16 = .14 \text{ k/in}$$

$$f = 14.4/21.3 = .68 \text{ k/in}$$

$$A = 4 \times 4 = 16 \text{ in}^2$$

$$f_r = .14 + .68 = .82 \text{ k/in} < 2.78 \text{ k/in for } 3/16 \text{ WELD}$$

VERT. MEMB. TO PS (TRY 2" WELD @ 6" SPACING)

$$A = 5(2)2 = 20 \text{ in} \quad M = 7.2 \text{ k-in}$$

$$I = 10(2)^3/12 + 4\{2(11)^2 + 2(6)^2\} = 1263 \text{ in}^4$$

$$f_a + f_b = 2.25/20 + 7.2(12/1263) = .18 \text{ k/in}$$

$$< 2.78 \text{ k/in for } 3/16 \text{ WELD}$$

$\therefore \text{OK}$

ALTERNATE METHOD

$$\text{WELD EFFICIENCY} = 2/6 = .33 \Rightarrow \text{ALLOW } f_v = 2.78 \times .33 = .927 \text{ k/in}$$

$$S = (24)^2/3 = 192 \text{ in}^2$$

$$f_a + f_b = 2.25/20 + 7.2/192 = .15 \text{ k/in} < .18 \text{ k/in}$$

SEP 17 '95 T.S. HUNDA WHC-SD-WM-ER-521
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Date 10-25-95
Date 11-2-95

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP TANK (MONORAIL)
Originator [Signature] Date 10-25-95
Checker Hanan H. Zinda Date 11-2-95

SECTION A-A
(NTS)

SECTION C-C

FIGURE 2: MONORAIL DETAILS
{FOR DETAILS NOT SHOWN}
{SEE FIG. 3}

SECTION B-B

{WELDS @ W4 TO W6 & W4 TO W4}
{ARE SIMILAR TO AS SHOWN IN FIG. 3}

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Subject DST MOCK-UP TANK (MONORAIL)
Originator Thundal Date 10-25-95
Checker Hassan H. Zaid Date 11-2-95

FIGURE 3
MONORAIL/HOIST DETAILS
(TYP. FOR 10' & 20' HIGH SECTION)

* TYP. @ W4 & DST WALL

APPENDIX D
PRIMARY TANK PLATE CUT-OUT DESIGN AND DETAILS

ANALYTICAL CALCULATIONS

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Subject DST Mock-up Tank (Primary Tank Plate Cut-out for Data Comparison)
Originator T. S. Hundal T. S. Hundal Date 10-30-95
Checker Herman H. Zisch Date 11-2-95

INTRODUCTION:

It is required to demonstrate the accuracy of Robot inspection data report by comparing it to the known characteristics of exiting sample plates data. These sample plates are of various sizes (see data below) and with known defect/flaw characteristics such as stress corrosion cracks, pitting corrosion and wall thinning (uniform corrosion).

To accomplish this, a cut-out in the primary tank wall will be made and the opening will be detailed in such a way that the sample plates are mounted and held in place to be in flush with the primary tank wall on the annulus side.

A sample plate when mounted in the cut-out will be subject to an operational pressure exerted by the Robot foot during normal inspection of the annulus area. And this out of plane force on the sample plate is equal to 550 lbs.

The analysis and evaluation will be in accordance with AISC 1989.

EXISTING SAMPLE PLATES DATA

<u>Length</u>	<u>Width</u>	<u>Thickness</u>
20.153"	12.225"	.875"
21.631	12.005	.500
21.619	14.511	.875
21.613	14.507	.875
21.596	14.500	.875
21.610	14.500	.880
21.604	14.495	.499
21.6	14.5	.880
21.610	14.505	.505
21.610	14.530	.887
12.0	12.0	.875

Minimum Plate Dimensions

12" x 12"

Maximum Plate Dimensions

21.631" x 14.530"

The cut-out needs to be made at about 5 ft. up from the floor, for ease of mounting sample plates. The arrangement should be made in such a way that it is easy to mount/dismount the sample plates at the cut-out and be able to accommodate all plate sizes.

Reference: AISC 1989, Manual of Steel Construction, 9th Edition.

ANALYTICAL CALCULATIONS

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Subject DST MOCK-UP TANK (P CUT-OUT)Originator T. Schindler Date 10-30-95Checker Harold H. Zick Date 11-2-95CUT-OUT ARRANGEMENT DETAILS

(SEE FIGURE 1)

MAX. OUTWARD FORCE FROM ROBOT FOOT = 550 lbs

*NOTE: THE HOLDING BOLTS RESTING AGAINST THE SPECIMEN PLATE ARE HAND TIGHT & WILL NOT IMPOSE APPRECIABLE LOAD ON HOLDING RS ON ANNULUS SIDE.

CHECK PL $t \times 3 \times 16$ " W/HOLDING BOLTS*

ASSUME FOOT LOAD @ TOP BOLT & ONLY ONE PL CARRY THE LOAD.

$$M_A = \frac{.55(11)^2(5)}{16^2} = 1.3 \text{ k-in}$$

$$M_B = \frac{.55(5)^2(11)}{16^2} = .591 \text{ k-in}$$

$$M_C = \frac{2(.55)(5)^2(11)^2}{16^3} = .81 \text{ k-in}$$

$$t_{req'd} = \sqrt{\frac{6M}{F_b b}} = \sqrt{\frac{6M}{27(b)}} = \sqrt{\frac{2M}{9b}}$$

$$S = \frac{bt^2}{6}$$

ALLOW. BENDING STRESS $F_b = .75 F_y$ (RECT. PL @ WEAK AXIS)
 $= .75 (36) = 27 \text{ ksi}$

$$t_A = \sqrt{\frac{2(1.3)}{9(3)}} = .31"$$

$$t_B = \sqrt{\frac{2(.591)}{9(3)}} = .21"$$

NOW ASSUME FOOT @ BOTTOM BOLT

$$M_A = \frac{.55(2)^2(14)}{16^2} = .12 \text{ k-in}$$

$$M_B = \frac{.55(14)^2(2)}{16^2} = .842 \text{ k-in}$$

$$M_C = \frac{.55(14)^2(2)^2}{16^3} = .11 \text{ k-in}$$

$$t_B = \sqrt{\frac{2(.842)}{9(3)}} = .25"$$

USE PL $3 \frac{1}{8} \times 3$ "

D-3

ANALYTICAL CALCULATIONS

Page 3 of 4

Subject DST MOCK-UP (R CUT-OUT)
Originator T. Stundal Date 10-30-95
Checker Hasan H. Zink Date 11-2-95

WELD $3/8" \times 3" R$ TO $\angle 1/2 \times 1/2$ (FILLET WELD ON SIDES)
ALLOW. STRESS = $.3 \times 70 \times .707 = 14.85 \text{ ksi}$

MAX. $M = .842 \text{ K-in}$

DIRECT TENSION = $550 \text{ \#}$

$S = (1.5)^2 / 3 = .75 \text{ in}^2$ $A = 2(1.5) = 3 \text{ in}$

$f = .550 / 3 + .842 / .75 = 1.31 \text{ ksi}$

$< 2.78 \text{ ksi for } 3/16" \text{ WELD}$

$\therefore$ USE $3/16"$ WELD SIZE

WELD $\angle 1/2 \times 1/2$ TO TANK R @ R $3/8" \times 3"$ LOCATION — USE CP WELD
@ OTHER LOCATION — USE $3/16" \rightarrow 2 @ 6"$

WELD R $3/8" \times 3" \times 1/4"$ TO R $3/8" \times 1/2" \times 3"$ — USE CP

" R $3/8" \times 1/2" \times 3"$ TO TANK WALL — " "

CHECK NUT TO $3/8" R$ (SIDE = $7/16"$)

USE MAX. FORCE = 550 lbs

WELD 3 ALTERNATE SIDES WITH $3/16"$ WELD

WELD CAP. = $2.7 \times (7/16 \times 3) = 3.54 \text{ K} >> 550 \text{ \#}$
 $\therefore \text{OK}$

2 HOLDING RS (NO LOADS)

USE R $1/4" \times 2" \times 5 1/2"$ @ BOTTOM &

R $1/4" \times 2" \times 8 1/2"$ @ TOP

2- $1/2" \phi \times 2" \text{ A307 BOLTS @ EA. R}$

ANALYTICAL CALCULATIONS

Page 4 of 4

Subject DST MOCK-UP TANK (PRIMARY TANK PL CUT-OUT FOR COMPARISON)

Originator J. Stundal

Date 10-30-95

REV. 1
11/15/95

Checker Hassan H. Zaidan

Date 11-2-95

NOTES:

1. R MAY BE TURNED UP SIDE DOWN FOR BIGGER TEST RS.
2. ALL HOLES IN RS TO BE 7" ϕ .
3. ALL RS $\approx 1\frac{1}{2} \times 1\frac{1}{2}$ TO BE A-36.

FIGURE 1: PRIMARY TANK #2 CUT-OUT
ELEV. & DETAILS
(VIEW LKG. FROM INSIDE OF TANK)
(NTS)

DISTRIBUTION SHEET

To Integrity Assessment	From Integrity Assessment	Page 1 of 1			
Project Title/Work Order Structural Analysis, Design, and Evaluation of DST Mock-Up Platform, Monorail, and Tank Plate Cut-Out		Date 12/18/95			
		EDT No. 613853			
		ECN No. N/A			
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